NATURAL AREAS:
PROTECTING A VITAL COMMUNITY ASSET

A Sourcebook for Minnesota Local Governments and Citizens

A Publication of the Minnesota Department of Natural Resources
Natural Heritage and Nongame Research Program

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PROTECTING A VITAL COMMUNITY ASSET

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for Minnesota
Local Governments
and Citizens

WRITTEN & DESIGNED BY LAURIE ALLMANN

Acknowledgements

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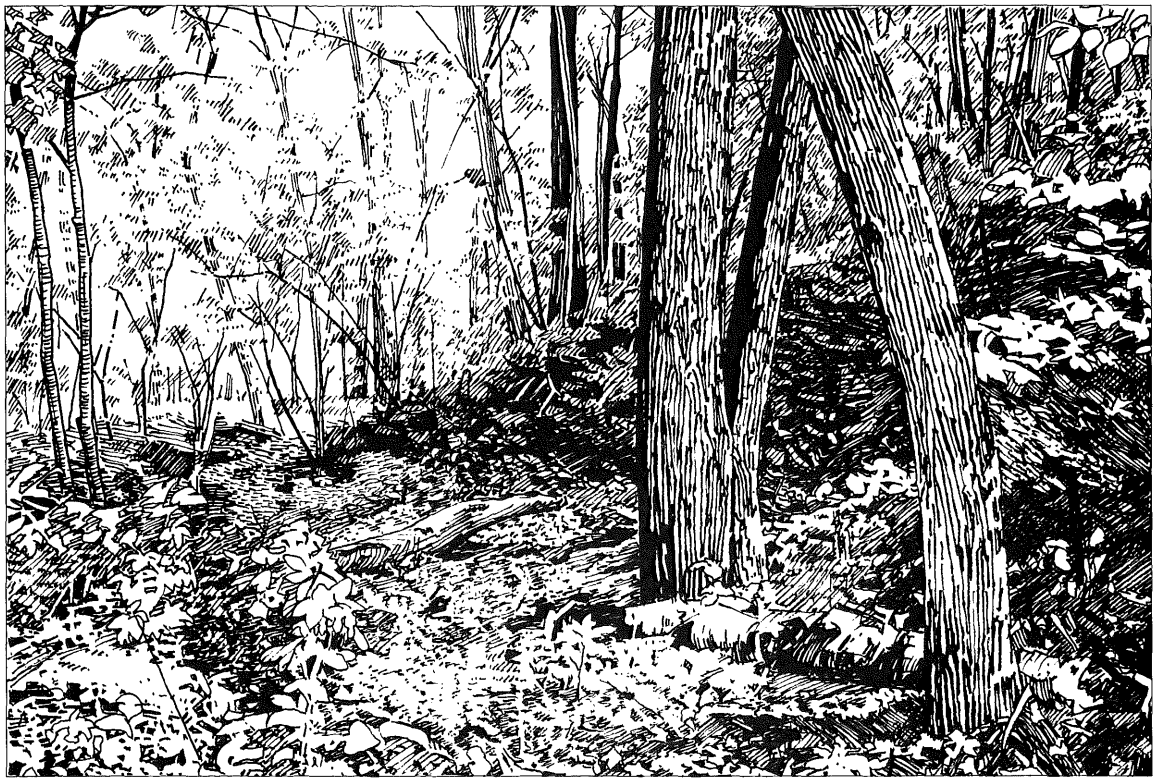
Table of Contents



"The challenge of our time is to secure space for our children that they may observe, investigate, experience, and cultivate an awareness of the natural world. Space on this planet is wasted at will, land and water are exhaustible. The diligence and stewardship we extend to the land will be the key to the ecological, social, and economic health of future generations.

Our society is complex; not everyone agrees on what should be protected and where the protection is appropriate. More than ever, we must collectively develop a sense of the natural world and our responsibility to appreciate, protect, and enhance earth's resources."

Andrea M. Peterson
Mayor of Grand Marais, MN 1992-96

Under her leadership, the Grand Marais City Council voted unanimously to establish a perpetual conservation easement on sixty acres of city-owned land.

PREFACE

What kinds of areas are covered by this guide?
This guide focuses on the protection of natural areas. A natural area is defined as a site largely unaltered by modern human activity, where native vegetation is distributed in naturally-occurring patterns. The tools highlighted in this guide are those that are especially useful for protecting natural areas. However, many of these tools can also be used to conserve other kinds of open space, such as important wildlife habitat, agricultural lands, and developed parks.

Who should read this guide?
This guide is especially designed for people at all levels of local government throughout Minnesota at the county, township, and city levels. It is hoped that many other people will find it useful, including natural resource professionals, citizens interested in natural areas protection, and others. Though an effort was made to gather information about protection tools available throughout the state, it is recognized that some tools that pertain specifically to certain landscapes are not addressed here. For example, sustainable practices that integrate natural area protection with land uses such as rotational grazing of prairies or selective logging of forests that were formerly kept open by fire are beyond the scope of this guide. The guide was funded by a project that provided technical assistance to local governments in an eleven-county area centered in the Twin Cities metropolitan area, and thus contains information that may be of particular interest to local governments in central and southeastern Minnesota.

The purpose of this guide is to provide practical information that assists leaders and citizens at the local government level in their efforts to protect natural areas in and around their communities.

The guide offers a review of the value of natural areas to communities, available tools and strategies that may be used to maintain the integrity of local natural areas, tips for financing and planning, resources for help, and considerations for natural areas management, along with some general background information on the status of natural areas in Minnesota and the basic principles of ecology that guide our understanding of how these areas function. Throughout, the primary focus is on the protection of natural lands that possess a high degree of ecological integrity, and which support healthy and functioning natural communities of native plants and wildlife. It should be noted, however, that many of the same tools and resources may

be used to protect open space lands such as scenic vistas, agricultural lands, community gardens, or small parcels of parkland in urban areas that, while perhaps of limited value from an ecological perspective, are nevertheless of local significance.

Throughout the guide are case studies of communities that have put these ideas and tools to work, adapting their use to the particular circumstances of a given project or initiative. As these case studies demonstrate, there are many success stories of citizens and local leaders that have found creative ways to meet their unique objectives. Their stories are shared here in hopes that they may spark ideas that will be of benefit to other communities engaged in similar efforts.

Readers need not be daunted by the guide's length. While some readers may find all the information useful and choose to read from the first page to the last, others may prefer to use this guide as an occasional reference, using the detailed index to find selected sections as the need arises. Most topics have been summarized on one or two pages.

Though produced by the Natural Heritage and Nongame Research Program of the Minnesota DNR, it should be noted that this publication is not limited in scope to opportunities and programs available through the DNR, nor are its contents intended to represent a recommended course of action for local communities. Instead, the aim is to relate a sampling of the great variety of opportunities available to local government leaders and citizens who wish to act to protect natural areas in their communities, and to spread the word about public and private resources that are available to help. When considering implementing any of the tools or strategies outlined in the guide, local communities are advised to work closely with their legal counsel to ensure that proposed actions are consistent with the statutory authority accorded to local governments by the legislature and within the relevant constitutional limitations. Proper design of natural areas protection programs will help to avoid legal challenges and to improve the potential for a successful outcome.

Reader feedback is invited and welcome. Comments and requests for copies of this guide may be directed to:

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INTRODUCTION

Natural landscapes and wildlife matter to the people of Minnesota. Nature and its seasonal patterns are still so much a part of the everyday lives of Minnesotans that many of us cannot imagine being without them. The passage of time is marked by the colors of autumn woodlands, the migrations of waterfowl and songbirds, the bloom of wildflowers, and the sight of the first moose calf or fawn. As we look back on our childhood years, some of our best memories are of explorations in the natural areas that we found within biking or walking distance of our homes—places that drew us like magnets, that awakened in us a sense of wonder and excitement. Such experiences are part of who we are, part of what defines our character as Minnesotans.

But as the population of the state grows, what will it take to protect natural areas in and around our communities? After all, we must be practical. We must consider the economic aspects. We want our communities to prosper. Can we afford to leave significant parcels of land in a wild and natural condition?

"In the city of Red Wing, the scenic qualities of our natural areas have helped to establish a distinctive 'sense of place' which we recognize to be critical to the community's economic vitality."

Brian Peterson, Community Development Director, City of Red Wing

In fact, economic vitality may be considered one the best reasons for maintaining undeveloped lands in and around our communities. In addition to their positive impact on property values of adjacent lands, wild lands kept in their native vegetation serve many practical functions, including moderation of stormwater runoff, abatement of surface and groundwater pollution, erosion control, flood control, and air quality enhancement. Natural areas promote the overall livability of communities, offering not only quality air and drinking water, but also scenic beauty and an opportunity for low-impact recreation (such as birdwatching and hiking) enjoyed by residents and tourists alike. Communities with ample natural areas and open space are considered good places for children, and offer high quality of life to all residents.

Not to be forgotten are the many economic benefits associated with the role of natural areas in providing habitat and breeding areas for wildlife. Local businesses in many communities rely on revenues received as a result of tourism related to public

In a 1996 survey, environment was among the top three factors that Minnesotans associated with quality of life.

Based on a 1996 statewide survey of 625 randomly selected residents. Survey was commissioned by the State Office of Environmental Assistance, and was conducted and analyzed by the private firms of Himle Horner Inc. and Decisions Resources, Ltd. Margin of error +/- 4%

enjoyment of wildlife and natural areas. Consider, for example, the influx of visitors in Duluth in conjunction with the annual phenomenon of the migration of falcons and hawks seen from nearby Hawk Ridge, the visitors who descend upon the town of Wabasha in fall and winter to observe the gatherings of swans and bald eagles, and the many Minnesotans who travel to enjoy the beauty of autumn colors in the state's woodlands.

In 1991, combined Minnesota retail sales attributed to migratory bird hunting and non-consumptive bird use (such as birdwatching) totaled $128.6 million.

Nationwide in the same year, $6.5 billion was spent by bird enthusiasts for a variety of goods and services, $5.2 billion of which was associated with non-consumptive bird use. Recreational enjoyment of birds supported 234,230 jobs.

International Association of Fish and Wildlife Agencies (IAWF) and Ducks Unlimited

Any serious and comprehensive cost-benefit analysis will look beyond the simplistic notion that "development = increased tax base" and will teach us that we quite literally can't afford not to protect natural areas. Increase in a community's tax base associated with development is only one small part of the economic picture. We must also consider the long-term costs to a community that are often associated with development: increases in infrastructure such as roads and utilities (and their maintenance over time) as well as increased need for the community to provide services such as police and fire protection, schools, and waste treatment facilities. Also factored in must be the present economic value of the services provided by land in its natural state, and the expenditures—such as drinking water treatment systems and flood control devices—that will be required to try to replicate these services and/or to deal with the ramifications of their absence. Unless such monetary values are determined and incorporated into the discussion, the legitimate economic contributions of natural areas will consistently be under-represented in decisions regarding land use. Studies in which such fiscal impact analyses have been applied to open space preservation have indicated that open space is fiscally better than residential and equal to or better than nonresidential development when comparing the net effects on municipal budgets (See Notes, Fausold and Lilieholm, p.101).

In a 1995 survey of residents of southeastern Minnesota, 76% of respondents agreed that a healthy economy depends on a healthy environment.

Based on a 1995 survey of 1,338 randomly selected residents living in the Wells Creek Watershed and the counties of Goodhue, Wabasha, Olmsted, Winona, Fillmore, and Houston. Survey conducted by the Minnesota DNR and the U.S. Forest Service.

Of course, some of the contributions that natural areas make to a community are not as easily quantified. While economists have developed valuation methods to assess the individual and societal benefits of such values as the appreciation of beauty, the opportunity to witness wildlife in its native environment, and to share such experiences with our children, such values are often viewed as intangibles or as minor considerations in the "real world" of planning for a community's future.

Yet, talk to Minnesotans and they will say that these intangibles enrich their lives and are profoundly important to their quality of life. How ironic and unfortunate it would be if we were to discount their great value simply because we are unaccustomed to using the standards of measurement that express them adequately.

Natural areas warrant the same level of administrative attention and planning as any other important community asset. A local government cannot assume that important natural features will be protected by conservation laws and state agencies. Planning and action at the local level are critical. While many communities cite protection of natural areas as a broad goal in their comprehensive plans, many do not clearly define the strategies and tools by which it will be accomplished, or provide the finance and policy framework necessary to support such a goal.

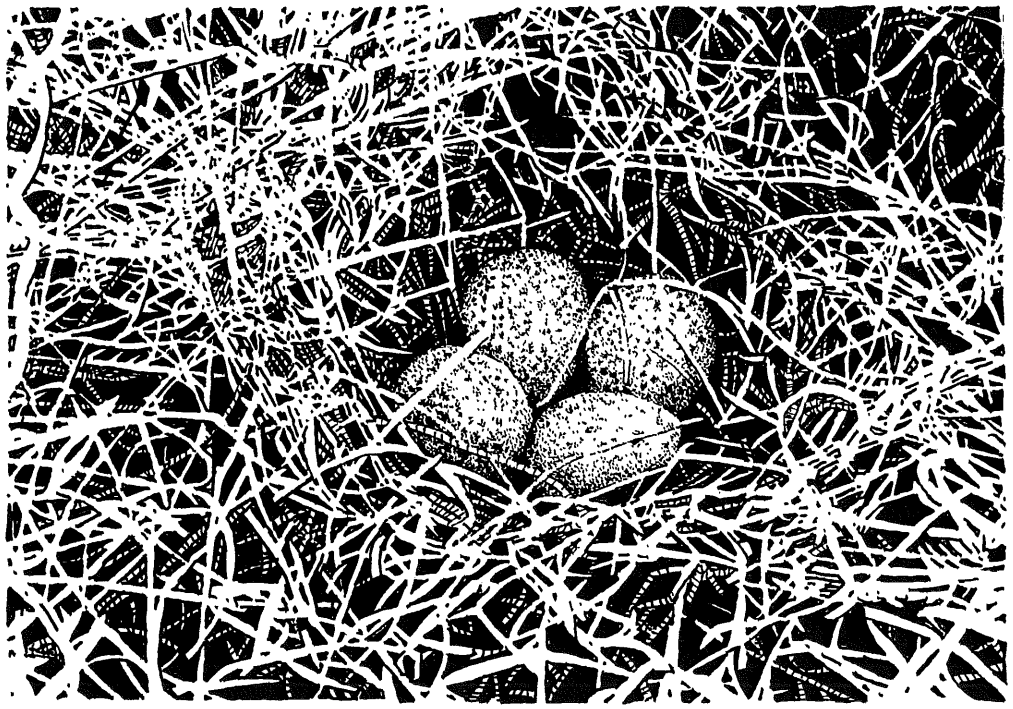
This practical workbook can help. Designed specifically for leaders and decision-makers in local and county governments, it provides an overview of a variety of land protection strategies, while giving special attention to common concerns of community leaders such as:

- how can natural area protection efforts be financed?
- how can natural areas be protected while respecting the rights and wishes of private landowners?
- where can we find the technical support we need to answer our questions?
- what steps can we take to be sure that we're on solid legal ground?
- are there any real-life examples of communities like ours that have used these land protection tools successfully?
- how can natural areas protection fit into our existing policy framework?
- what is the role of citizens in this process?

Though much of Minnesota's natural heritage has already been lost, state biological surveys have found pockets of high quality natural lands that still remain. Many of these critically significant sites are vulnerable to development now or in the immediate future, and will not endure without our thoughtful planning and active participation in their protection. Citizens and local leaders in communities across the state have risen to the challenge, making systematic changes in how land use decisions are made, and rallying to find creative ways to protect highly valued natural areas.

These lands embody both our past and our future. They nurtured the existence of our ancestors and must do the same for our heirs. Protection of natural areas is neither a nicety nor is it a fringe issue. To protect that which sustains us—given that we are physical beings who rely upon our environment for life itself—is nothing more than common sense.

Natural Areas—A Review of Benefits to Communities



Storehouses of biological diversity

Natural areas are irreplaceable storehouses of biological diversity, supporting elements and processes that literally make life on earth possible. Sharing the planet with a diversity of species enriches our lives, and safeguards important genetic material that may be vital to future advances in medical research and our culture's ability to confront diseases that threaten essential food crops.

Community appeal to new residents, families, and tourism

Protection of natural areas promotes the overall livability and vitality of communities, offering not only quality air and drinking water, but also scenic beauty and opportunities for low-impact recreation (birdwatching, hiking) enjoyed by residents and tourists alike. Communities with ample natural areas and open space are considered good places for children, and offer high quality of life to all residents.

Low-cost stormwater management and flood control

Natural areas reduce the rate and volume of stormwater runoff, thereby reducing the incidence and severity of flooding and erosion. When development replaces

natural areas and other areas of vegetated groundcover, communities either must undertake the great expense of installing and maintaining elaborate stormwater management systems or will sustain repeated episodes of property damage related to flooding and loss of agricultural production due to topsoil erosion.

Purification system for drinking water and surface waters

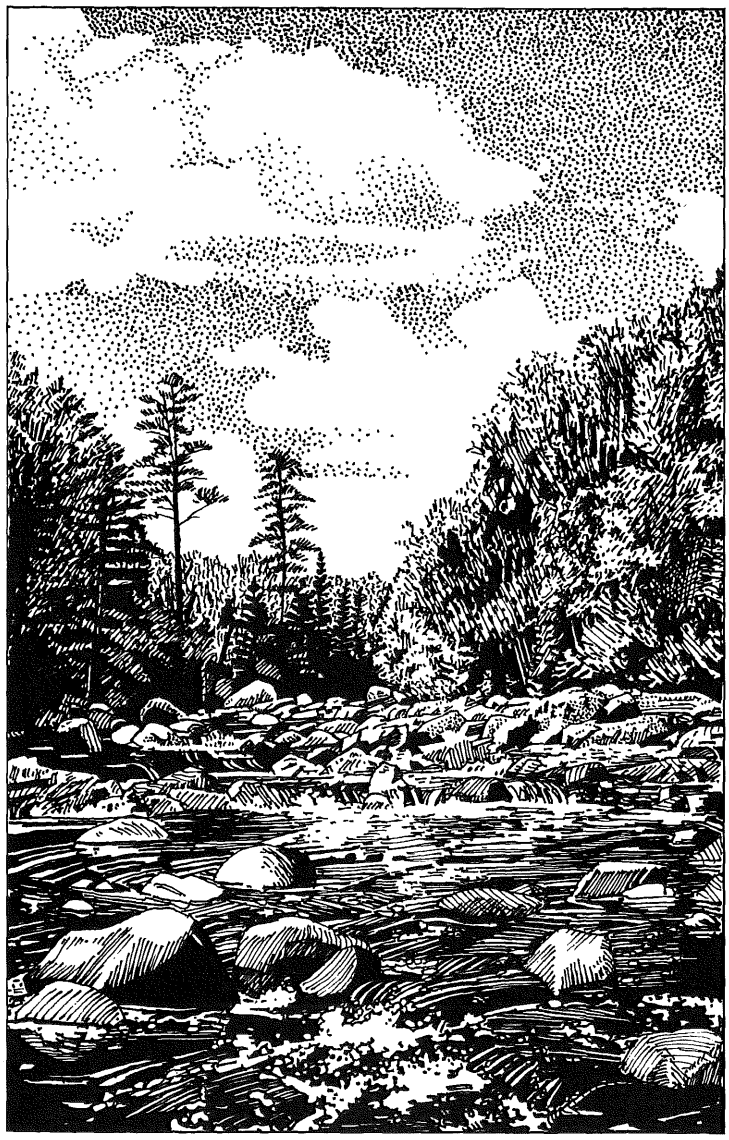
Vegetated natural areas safeguard the quality of surface and groundwater (drinking water sources) by reducing the sediment load that enters waterways and by filtering out toxins and excess nutrients. When natural areas are lost to development—especially when vegetation is replaced by impervious surfaces (such as pavement) or when an area is subjected to chemical-intensive land uses—groundwater may become increasingly compromised over time, creating a public health concern for communities reliant upon wells for drinking water, and/or necessitating expenditure for purification systems to meet drinking water standards. Decreases in surface water quality have a negative impact on resource-related economic activities such as fishing, boating, and tourism.

Contribution to air purity

As is true of vegetated landscapes in general, natural areas promote air purity by utilizing carbon dioxide and producing oxygen. Air quality has direct implications for human health, in particular as regards the incidence and severity of respiratory diseases. Protection of natural areas can be part of a community's overall plan to promote a healthy living environment for its citizens.

Increased property values

While protected natural areas on public or private land may in some cases be subject to a reduced property tax rate, the designation of a site as a natural area is commonly viewed as an amenity that commands a premium for adjacent lands in the real estate market that results in an increase in the property value—and thus, the property tax contribution—of adjacent lands.



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A *(very)* Short Course in Ecology & Related Land Use Philosophy

At the root of every discussion and decision related to natural area protection are qualitative judgements. What qualities are desirable in a natural area? What level and type of impacts resulting from a development or management practice will be considered acceptable? What exactly is it that one is trying to protect? In any genuine initiative aiming to sustain the health of local natural areas, the answers to questions such as these must be grounded in the basic principles of ecology.

Ecology is about relationships—relationships among living things, and between living things and their nonliving environment. As an area of scientific study, ecology pays attention to how things interact. It assumes that it is both impractical and misguided to look at individual living things in isolation, because living things depend for their survival on the set of elements that surround them and the processes that sustain their populations over time. It considers natural areas to be intricate and interacting systems that operate at many scales. Ecologists assess the condition of natural areas by looking at three primary elements: composition, structure, and function.

Composition is a measure of the plant and animal species present, their relative abundance, and the differing characteristics of individuals that make up populations (such as age, ability to reproduce, and relative vigor).

Structure refers to the physical organization of natural elements across a landscape—that is, an awareness of patterns evident in the distribution of living things and how those patterns change naturally over time. Elements of structure include the varying heights of vegetation, the degree to which a community is open (unshaded), and the mosaic of natural community types across a defined area, as well as the presence of nonliving elements such as waterways, rocks, logs and other woody debris on the forest floor.

Function refers to the processes and relationships that sustain the system, such as the flow of nutrients moving through the system, the natural disturbance regimes that determine site conditions (such as wind events, fire, seasonal water level changes), the movements of animals to find food and appropriate sites for breeding/repro-

duction, the many ways that the needs of plants and animals are met through interactions with each other and with their physical (nonliving) surroundings, and the role that each individual and population plays in the operation of the system as a whole.

A site with ecological integrity contains populations of native species in naturally occurring patterns as determined by the unique physical characteristics, climate, and history of a site. Changes and fluctuations in structure and composition over time will be driven by natural processes.

An ecosystem is a dynamic complex of plant, animal, fungal, and microorganism communities and their associated nonliving environment interacting as an ecological unit.

An appreciation of the complexity of ecosystems is at the very root of ecology. It is common for ecologists who have devoted their lives to researching a particular species or natural process to insist that they have only scratched the surface of understanding—in part because natural systems are ever-changing, and in part because our ability to get the right answers is limited by our ability to ask the right questions.

Yet the fact that our study of the natural world will always be a "work in progress" does not mean that we cannot make decisions based upon what knowledge we have acquired. Just as the equally inexact science of medicine is routinely used to guide the decisions we make about our health care, we must actively use the understandings gained by ecological research to guide our land use decisions. What has the study of ecology taught us? A few generally accepted concepts include:

• Having a diversity of native species—many different kinds of naturally occurring plants and animals—tends to make an ecosystem more stable and better able to handle stresses, and may be used as one of the indicators of health. It is therefore desirable to maintain the biological diversity that is naturally characteristic of a site, with the understanding that some areas (e.g. northern latitudes and high altitude environments) are naturally lower in diversity.

• Plants and animals do not occur randomly over the landscape; they occur in identifiable and recurring groupings of species known as "natural communities." Populations that comprise a community may live in proximity because of interdependent relationships (predator/prey), or similar habitat requirements and physical tolerances (for example, fish species that share a need for high oxygen waters, insects that require high humidity environments, plants that can thrive in dry climates, etc.).

• Energy moves through natural systems in complex ways, so that each organism plays a role in determining the conditions for other organisms. For a sys-

tem to be sustained, nutrients must be transferred from one species to another, and dead and decaying material must be allowed to break down (decompose) and re-enter the system to support the development of new life.

• There are limits to the adaptability of species and ecosystems. Although change is inherent in natural systems (species expand their range into new territories, populations fluctuate in response to food availability and climate changes, one plant community is gradually supplanted by another through the process of succession) *accelerated* rates of change can produce conditions that cause populations of species and entire natural systems to collapse. Declines are not always gradual; species may decline to a critical threshold level and then crash. Worldwide, 99% of modern-day (post-1600) species extinctions are considered attributable to human activity (See Notes, Primack, 1995, p.102).

There are limits to the adaptability of species and natural systems: 99% of modern-day species extinctions are attributable to human activity.

Richard Primack

Obviously, these are broad concepts which are not immediately applicable to a given land use decision. Nevertheless, it is with such principles that we begin to build the philosophical foundation that determines the way in which we approach discussions about land use issues. Strategic ways of thinking that may reasonably arise from these principles include:

Assumption of value
The willingness to work under the assumption that each element of a natural system has an important role to play in the health of the system as a whole, even if the specific contribution of the species is unknown. Accordingly, a threat to one component of a system is treated as a threat to the system as a whole.

Thinking system, thinking forever
A shift away from planning and managing for the benefit of a few species and toward planning and management at an ecosystem level, in which an effort is made to preserve the structure and function of natural communities over the long term.

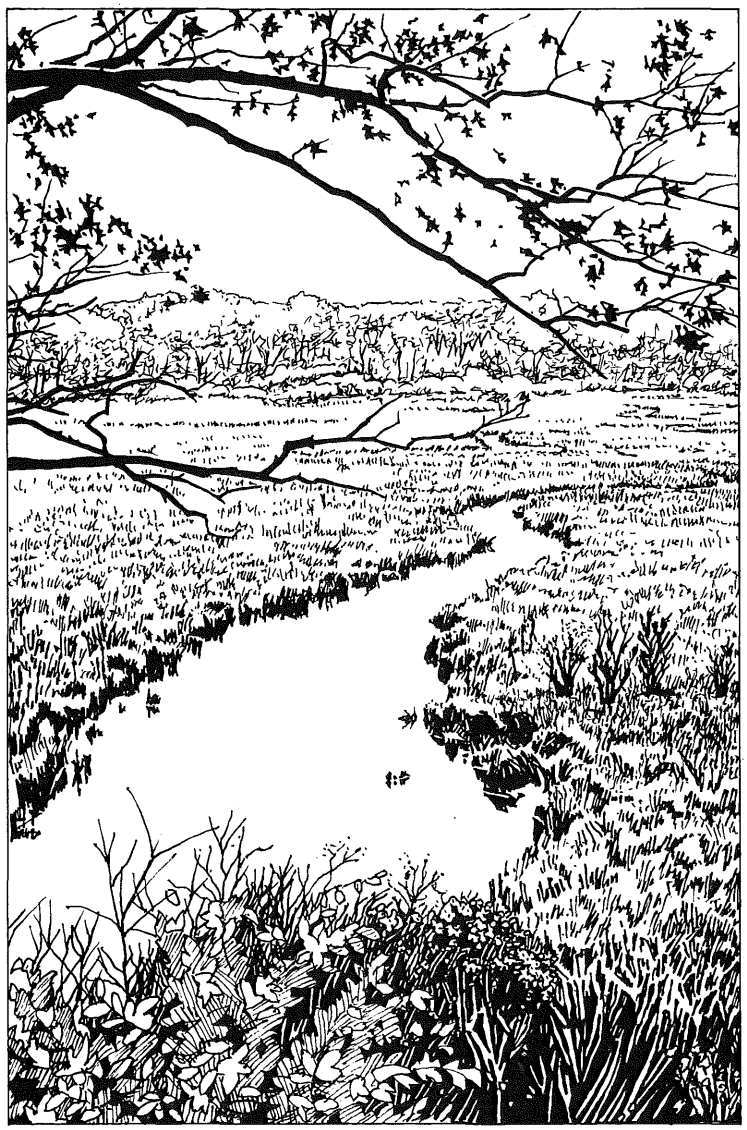
Erring on the side of caution
Acceptance of a certain degree of humility regarding the limits of our knowledge about natural areas, and accordingly, the desire to err on the side of caution when evaluating whether a given land use practice will have a negative affect on a species or community. If the structure of a natural community is unduly compromised, there is a point at which it can be expected to fail, after which it will no longer serve valued ecological functions (such as water quality enhancement and habitat for native species).

Protection over restoration
A heightened emphasis on proactive planning to protect natural sites rather than an emphasis on restoration or mitigation, given the understanding that "created" or

"built" environments seldom achieve the same degree of complexity and diversity found in communities of natural origins and that even modest restoration efforts are extremely costly.

A new aesthetic

A new aesthetic view of natural areas, in which system health and ecological integrity are assigned greater value than purely scenic or recreational considerations.



2

Natural Areas: A Definition & Status Report

Natural area: a working definition

A natural area is a site largely unaltered by modern human activity, where native vegetation is distributed in naturally occurring patterns. These patterns change over time under the influences of natural processes such as windstorms, drought, flooding cycles, and wildfires, as well as interactions between plants and wildlife that inhabit or periodically use a site. A natural area may be host to one or more natural community types such as oak savanna, maple-basswood forest, black spruce bog, or dry prairie, the existence and extent of which are determined by factors such as climate, soil composition, and a site's unique history. Many natural areas do include some evidence of modern human activity, such as small areas of former croplands in a site largely dominated by native prairie, or occasional decayed stumps in a forest that was logged long ago. However, natural areas are characterized by being primarily in a natural state, with only minor evidence of disturbance from modern human activity.

Where natural areas are found

Natural areas occur on private as well as public land, and across political jurisdictions. They may be found in designated preserves, within existing parks, or may be interspersed throughout developed/managed environments such as farms, ranches, commercial and industrial areas, and residential communities.

How natural areas fit into the larger landscape

Of course, today's landscape looks very different from the way it looked 150 years ago. Many natural processes, such as large-scale fires and the presence of large herds of bison, are no longer present on most of the landscape. Natural areas today, ranging in size from a few acres to several thousand acres, are generally within larger landscapes that have been highly altered. Because all natural areas are an integral part of the larger landscape in which they exist, it is important to pay careful attention to wise stewardship of adjacent and nearby lands.

In many parts of the state, it is often not practical or even possible to protect natural areas large enough to include the natural patterns that once existed on the landscape. Nevertheless, even small natural areas are important, and sometimes represent the only opportunity to protect natural communities or rare species in an area. For example, a ten-acre prairie in western Minnesota that is surrounded by croplands bears little resemblance to the huge expanse of prairie that once existed on the landscape. However, if it is a good quality site, it would still be considered a natural area. The surrounding land could be planted to native prairie using seeds from the natural area, or could be kept in other kinds of open space that might help buffer the land from activities that could lessen the integrity of the site. Similarly, a forty-acre old-growth forest is a natural area, even if it is surrounded by recent clearcuts. Allowing the clearcut forest to regenerate naturally would be one alternative that would help buffer the natural area and eventually add to its size.

All natural areas may be considered "open space," but many types of open space are not natural areas. Golf courses, baseball fields, parks with maintained lawns that are landscaped with exotic species, pine plantations—all could be described as open space, but are places where natural features have been partially to totally displaced. While some such areas offer a degree of habitat to native plants and wildlife, others have been highly altered, leading to dramatic declines in diversity of species.

Recognizing qualitative differences among natural areas and other types of open space

The range of land uses on the landscape also leads to variability in the quality of natural areas. For example, one tamarack swamp may be a large, intact natural community with little evidence of human use. Another may have a boardwalk nature trail in it and may occasionally receive some urban stormwater runoff. The second has a lower quality than the first, but could still be defined as a natural area. Similarly, one prairie might be managed with controlled burning and support a large diversity of native plant and animal species. Another may be somewhat overgrown with brush, have a few exotic invasive plants, and support fewer native species. Again, the second has a lower quality than the first, but could still be high enough quality to be considered a natural area.

In addition, lands not considered natural areas often still possess important natural resource values. For example, a field that was plowed in the past and that now supports European bromegrass (an invasive exotic species) may provide important habitat for animals that live in grasslands, even though it is not considered a natural area. A forest that has been recently logged does not qualify as a natural area, but it does provide habitat for some species of wildlife and supports some natural resource functions. Another kind of land not considered a natural area is land supporting restored vegetation, that is, it has been planted to native species in an effort to restore a natural community. These are lands that will someday resemble natural areas, but because they have been planted on altered sites, they are not defined as natural areas.

Status of Minnesota's natural areas

Minnesota is a meeting ground for three of North America's eight major ecological regions, also known as biomes or provinces, largely defined by climate: the decidu-

ous forest biome in the central and eastern portions of the state, the grassland biome along the state's western border, and the coniferous forest (sometimes referred to as the Laurentian mixed forest or conifer-hardwood forest) biome in the north (See Figure 1, below). When combined with the state's wealth of rivers and lakes, including Lake Superior, the resulting range of habitat conditions is capable of supporting a wide array of plant and animal life, as is suggested by the abundance of natural community types that ecologists have identified in the state. (See also, Appendix A: Minnesota's Natural Communities, p.110.)

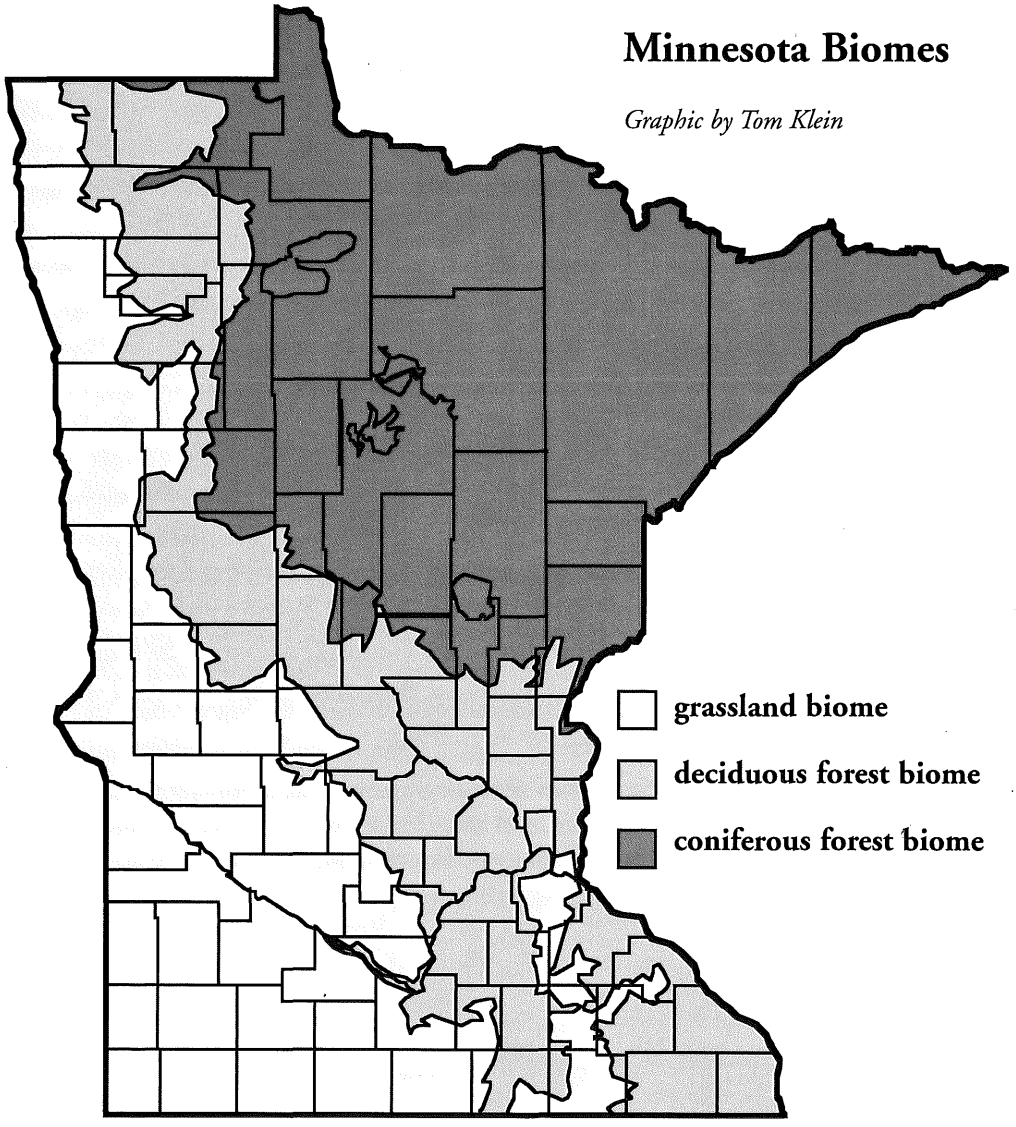


Figure 1.

Of course, there is a vast difference between what the state's landscapes are naturally suited to support and what they in fact do support. Maps such as Marschner's Original Vegetation Map of Minnesota (referenced on p.21) provide a fairly accurate representation of what one might have observed as one traveled across the state in the 1800s. Today, however, while geologic and topographic features persist, modern-day land use has wrought many changes to vegetation patterns, to the extent that such maps must now be understood to depict the potential ranges of natural vegetation types and of the associated wildlife dependent upon them for habitat.

The Minnesota Department of Natural Resources (DNR) is one of the primary state agencies involved with assessing the status of the state's biological diversity. This is accomplished in part through an ongoing statewide initiative known as the MN County Biological Survey, or MCBS. The MCBS is a survey of rare biological features. The goal of the survey is to identify significant natural areas and to collect and interpret data on the distribution and ecology of rare plants, rare animals, and natural communities in the state. Begun in 1987, the program has thus far completed surveys in twenty-nine counties. Data from MCBS are stored in the Natural Heritage Information System, maintained by the DNR's Natural Heritage and Nongame Research Program. (See also, The Natural Heritage Information System: A Source for Natural Areas and Rare Features Information, Appendix B, p.112.)

County Biological Survey data offer an important perspective on the status of natural areas in the surveyed counties, helping to quantify what remains and, in so doing, to quantify what has been lost. In those surveyed counties where such percentages have been calculated, natural communities of sufficient quality to be mapped under MCBS guidelines (See Appendix B, p.112) constitute between 2% and 9% of the total land area of the county (See Figure 2, below). The figures take on even greater impact when one considers that this change has occurred within a time frame of only 150 years.

Minnesota County Biological Survey: A Sampling of Natural Areas by County
Figures represent percent of total county land area that supported natural communities as identified by MCBS at the time of the survey. Figures have been rounded to the nearest whole digit.

Anoka	8%	Lac Qui Parle	2%
Big Stone	3%	Ramsey	2%
Chisago	7%	Rice	4%
Clay	4%	Sherburne	5%
Goodhue	7%	Washington	6%
Houston	9%	Winona	8%
Isanti	6%		

Figure 2.

Of those remnants that exist, some natural community types are better represented than others (See Figure 3, p.24). For example, tallgrass prairie and oak savanna, once abundant in the state, are now greatly diminished in area and confined to very few sites, with current acreages representing respectively <1% and <.1% of their range prior to European settlement. By comparison, 47% of the state's former acreage in wetlands remains. A degree of caution is appropriate when interpreting such figures, however, particularly as regards the status of the state's forested acreage. At face value, the retention of 53% of the state's pre-1850s acreage in forest sounds (and is) far better than the less than 1% that remains of the state's acreage in prairie. But it is important to note that the state's current forests are very different in composition and structure from those that existed prior to European settlement of the state. Intensive logging of red and white pine stands in northern Minnesota, for example, has largely resulted in their replacement by aspen and birch—offering markedly different habitat conditions for many species of native wildlife and forest flora. If the assessment were limited to that forested acreage which met the definition of natural area provided on p.17, the percentage would be far lower than 53%, as is suggested by the figures cited in Figure 3 (p. 24) for the decline of old-growth forests.

Such declines are discouraging, to say the least, for anyone who is concerned about the future of Minnesota's natural heritage and the role it plays in the state's economy and quality of life for its citizens. But in recent years, such statistics have proved to be catalysts for citizens, government leaders, public agencies, and private nonprofit groups around the state, igniting a sense of urgency and engendering the will to act on the state and local level to wisely manage those valued features that remain.

A Minnesota native prairie of a few hundred acres may be home to more than two hundred species of flowering plants, up to forty species of grasses and sedges, fifteen or more species of mammals, and as many as thirty species of birds. More than half of the state-listed rare birds are seasonal or year-round residents of prairies and prairie wetlands.

Estimates courtesy of ecologists with the Minnesota County Biological Survey & Natural Heritage and Nongame Research Program, Minnesota DNR.

A good perspective on Minnesota's native vegetation prior to European settlement is offered in a free brochure entitled Natural Vegetation of Minnesota at the Time of the Public Land Survey: 1847-1907. The brochure features a small-scale color depiction and interpretation of the Francis J. Marschner map, a map based on natural features information documented by the state's early surveyors.

The brochure is available from the Minnesota DNR. For a free copy, write: Natural Heritage and Nongame Research Program, Minnesota DNR, Box 25, 500 Lafayette Rd., St. Paul, MN, 55155-4007.

In Minnesota, a multitude of government agencies and private organizations own and manage land for purposes of outdoor recreation, extraction of natural resources such as timber and game, and the protection of natural features. Of these, comparatively few manage land with preservation and enhancement of ecological diversity as a primary objective.

Among these is the Minnesota Chapter of The Nature Conservancy (TNC), a private nonprofit organization that owns fifty-two preserves totaling eighteen thousand acres, most of which are open to the public and managed for protection of their natural communities (See also, Resources, p. 98).

In the public arena at the state level, land with exceptional natural features and rare resources of scientific and educational value is selectively acquired and/or designated for protection under the Scientific and Natural Areas (SNA) Program, which is administered by the Department of Natural Resources (See also, Resources, p. 99). Presently, 115 designated Scientific and Natural Areas (SNAs) encompass 172,481 acres of the state's highest quality natural features throughout the state.(Note: There is considerable duplication in these figures, in that nearly a quarter of the TNC preserves include lands that have been leased by the state and dedicated as SNAs.)

Some federal lands within Minnesota also contain special designations. Selected areas located within National Forests and Fish and Wildlife Refuges have been designated as Research Natural Areas (RNAs). A Research Natural Area is defined as a physical or biological unit where natural conditions are maintained insofar as possible and which is reserved for the primary purpose of research and education. These conditions are achieved by allowing ordinary physical and biological processes to operate without human intervention. However, under specific circumstances, in certain areas, deliberate manipulation intended to maintain the unique features that the RNA was established to protect may be utilized. In Minnesota, currently eight RNAs totaling 4,144 acres are identified within National Forests, and six RNAs totalling 6,528 acres are identified within Fish and Wildlife Refuges.

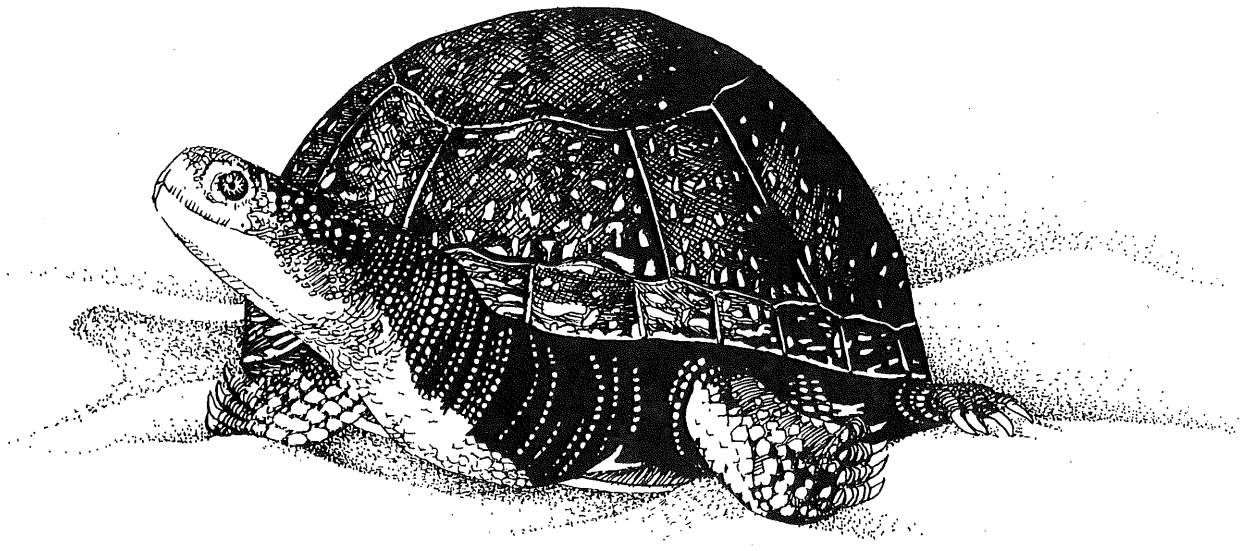
At a glance, such figures may suggest to some readers that Minnesota has protected an ample amount of land in preserves and natural areas. Yet, the combined acreage of natural areas designated for protection as Nature Conservancy preserves, State Scientific and Natural Areas, and Federal Research Natural Areas constitute less than 4% of the total area of the state. Many of the state's best remaining natural features, including the majority of sites mapped by the MN County Biological Survey, are presently afforded little to no protection. Even those natural areas that are located on public lands are only guaranteed protection when specific controls and management guidelines are in place.

Also to be considered is the variety of natural community types represented within protected areas. All but 26,481 of the acres protected in SNAs protect peatland systems, leaving many natural community types relatively under-represented among the sites designated for protection. For example, in the seven counties along the state's western border from Wilkin County to Kittson County, roughly half of the acreage of remnant native prairie is afforded no formal protection and is vulnerable to loss.

Many of the natural areas in the state that are protected through acquisition and formal designation by public or private entities are only a few dozen acres in size—therefore extremely vulnerable to degradation, and too small for many broad-scale natural processes to operate. In sum, while great strides have been made thanks to broad-based citizen support for conservation, there remains much work to be done if Minnesota is to preserve even representative examples of the state's diverse natural systems for future generations.

Local governments play a vital role. As illustrated by the case studies of community initiatives offered throughout this publication, many local governments have taken steps to enhance and protect natural areas important to their communities, in some cases using perpetual conservation easements as a tool to secure their future protection (See references to Grand Marais, p. 4, and City of Red Wing, p.72), or implementing some type of conservation zoning. Local governments can also be instrumental in informing private landowners of voluntary conservation practices that can protect natural areas that are located on privately-owned land. Such initiatives are a necessary complement to activities at the state level and in the private sector, to fill in the gaps that exist in the features represented by the lands now protected, and to ensure that protected lands receive appropriate safeguards at the local level to retain their integrity. Chapter 4 describes the array of tools available to local governments that wish to participate in the statewide effort to foster good stewardship of the state's natural heritage.

While old-growth forest once comprised more than 51% of all forested land in the state, it now represents less than 4% of total forested acreage.



Statistics on Minnesota's Biological Diversity

Compiled by Hannah Dunevitz, Plant Ecologist with the Natural Heritage and Nongame Research Program of the Minnesota DNR.

Vegetation:

All Forest

Current total forested acres in MN is 58% of acreage in forest prior to European settlement (1997: 15.8 million acres; 1850s: 27.1 million acres).

Old-growth Forest

Current old-growth forest in MN is less than 4% of acreage in old growth forest prior to European settlement (1997: <610,000 acres; 1850s: 13.9 million acres).

Wetlands

Current wetland acreage in MN is roughly 47% of acreage in wetlands prior to European settlement (1997: 8.8 million acres; 1850s: 18.6 million acres).

Oak Savanna

Current oak savanna acreage is less than 0.1% of acreage in oak savanna prior to European settlement (1997: 4,400 acres; 1850s: 5,436,200 acres).

Prairie

Current prairie acreage is less than 1% of acreage in prairie prior to European settlement (1997: <150,000 acres; 1850s: 18 million acres).

Species Loss: The following species are known to be extirpated in Minnesota (gone from the state as a naturally occurring population since the early 1900s but exists elsewhere as a wild population).

Birds:
- whooping crane
- McCown's longspur
- long-billed curlew
- American swallow-tailed kite

Mammals:
- brown bear
- bison
- elk
- wolverine
- caribou

Mussels:
- fat pocketbook

Fish:
- blunt-nosed darter

Insects:
- American burying beetle

Plants:
- wild petunia *(Ruellia humilis)*

Extinct Species:
- passenger pigeon

Rare Plants & Animals: Minnesota's List of Endangered, Threatened and Special Concern Species (revised by the MN Dept. of Natural Resources in 1996) includes 157 animal species and 282 species of plants, lichens, and fungi. Of these (in descending order of peril), 96 were listed as endangered, 101 as threatened, 242 as special concern.

SOURCES: **(1)** The Natural Heritage Information System, **(2)** Minnesota's List of Endangered, Threatened, and Special Concern Species, Minnesota Rules, Chapter 6134, **(3)** Forest data from: "Biodiversity, A Technical Paper for a Generic Environmental Impact Statement on Timber Harvesting and Forest Management in Minnesota, Dec. 1992, by Jaako Poyry Consulting, Inc., Raleigh, N.C., **(4)** Wetland data from "Growing Energy Crops on Minnesota's Wetlands: The Land Use Perspective," by Jeffrey P. Anderson and William J. Craig, 1984. Center for Urban and Regional Affairs, Univ. of Minnesota, Mpls. **(5)** Data re. vegetation prior to European settlement based on public land survey data, as interpreted on a map produced by Francis J. Marschner, see p.21.

Figure 3.

3

Local Planning for Natural Areas Protection

Goals for natural areas protection are best defined in a community's Comprehensive Plan, with a corresponding policy framework, action plan, and budget developed to support identified objectives. But what process can be followed to enable a community to define its goals for natural areas? What are the elements common to successful planning efforts? Perhaps most importantly, what constitutes success?

Communities throughout the state and region have undertaken planning efforts to define their goals regarding natural areas and how they intend to implement these goals. This planning has sometimes been done in the context of parks and open space planning, and sometimes in the context of a plan for a particular landscape feature, such as a watershed. For many communities, these efforts have been ongoing for years, with goals revised accordingly as projects are completed and new opportunities are presented. While the unique character of communities makes impractical the application of a single planning model for natural areas protection, communities seeking to undertake such a process may nevertheless gain insight from the experiences of other communities (See "The Bluff Creek Watershed: A Community Planning Effort," p. 28, and "Maplewood Ranks its Open Space," Appendix C, p.115). One common theme in the experiences of communities is the greater chance of success when there is broad-based public support for natural areas and open space protection.

Basic steps in community planning for natural areas protection

1. Compile natural features data
    - Gather existing natural features data.
    - Identify gaps in existing data and take steps to fill them. Natural resource agencies and universities can often help conduct research and inventories.
    - Compile information into maps, using a Geographic Information System if available, and natural features reports.
2. Conduct the planning process
    - Select a facilitator for the process with extensive experience in group facilitation.
    - Involve natural resource specialists with knowledge of local natural features, including those with ecological expertise.

- Educate staff, elected officials, and local citizens about local natural areas and their importance.
- Seek the input of local citizens in developing a vision and goals for the community's desired open space, including natural areas protection.
- Write a comprehensive plan summarizing natural features protection goals, measurable objectives, and strategies.
- Develop a practical action plan to implement the strategies, including timeline, costs, and funding sources.
- Incorporate actions into related official plans such as transportation, sewer and water, utilities, and park plans, and into local ordinances, codes, and regulations.

3. Carry out the action plan
   - Monitor on an ongoing basis to assess the effectiveness of selected strategies, and revise the action plan as needed.

Even communities with relatively extensive land use plans often lack detailed information on natural areas outside of existing designated public parks and open space lands.

Ranking natural areas and other open space

In their planning efforts, communities may wish to establish a ranking system for natural areas that recognizes the qualitative differences between sites and enables the prioritization of protection efforts. Any such ranking system should take into account not only the presence of rare species and high quality natural communities, but also a site's viability (likelihood of retaining ecological integrity over time) given the surrounding land use and other influencing circumstances. Natural resource professionals in the public and private sector can assist local governments in making such evaluations. Appendix C, p.115 offers an example of a ranking system used by the City of Maplewood as part of a process used to determine how best to utilize funds approved through a successful bonding measure for acquisition of open space lands.

If funds are limited, there may be benefits to focusing on protecting a lesser number of large areas rather than numerous smaller sites. Larger areas offer a greater percentage of interior environment (See p.79) and are generally more viable over the long term. Protection of smaller sites may be warranted, however, if other factors are involved such as locations of rare species, critical breeding areas, or migratory stopover sites. For areas of any size, buffer areas that limit development on land adjacent to protected natural areas (through easements or by other means identified in a local government's comprehensive plan) can effectively be used to enhance the protection of natural features on public or private lands.

Making informed decisions

A key aspect of any natural areas plan is a comprehensive inventory of natural features that occur within a local government's jurisdictional boundaries. Even communities with relatively extensive land use plans often lack detailed information on

natural areas outside of existing designated public parks and open space lands. An inventory should indicate locations of protected and unprotected natural areas on public and private lands, the natural communities they contain (ranked by quality), rare or outstanding natural features, local topography, hydrology of surface and groundwater, subsurface geology, and other critical natural resources such as wildlife habitat, environmental corridors, trout streams, etc. Ideally, it will also include information about natural processes typical of the region such as flooding cycles. (See also, Elements of a Management Plan, p.86, and The Natural Heritage Information System: A Source for Natural Areas and Rare Features Information, Appendix B, p.112.)

To help collect and analyze these data in light of a local government's goals, planning efforts often incorporate the concept of a technical team. A technical team is a handpicked assembly of natural resource specialists from varied disciplines, such as hydrology, wildlife biology (game and nongame), soil science, botany, ecology, and conservation biology. Technical team members can be called upon on an as needed basis to answer questions of the plan's primary working group (e.g. a task force or steering committee) or may work side by side with other planning entities throughout a plan's development. They can offer insight into ranking the biodiversity value of various natural features and assessing their long-term viability given different management scenarios. If restoration of degraded areas is a goal, technical team members can offer practical information about the advisability of various techniques and their associated costs. Technical team specialists may include paid private consultants, representatives from government natural resource agencies or from private conservation organizations, university professors and graduate students (including interns), and others with training in the subject areas to be covered by the plan.

It may be helpful to invite a natural resource specialist with ecological expertise to serve as facilitator or co-facilitator of the planning process. Some environmental consulting firms and government offices have ecologists on their staffs, but many do not. Accordingly, if a person with an ecological background were desired, this request would need to be made clear when selecting a facilitator from these or other sources. Ideally, the individual would have good facilitation skills as well as a broad-based knowledge of landscapes, plant communities, and ecological processes, and would have an understanding of the important natural features in the community.

Case Study

The Bluff Creek Watershed: A Community Planning Effort

Where: City of Chanhassen, Carver County, MN

Natural feature targeted for protective measures: Project area encompasses 6.6-mile-long Bluff Creek and its 9.6-square-mile watershed. Roughly 80% of the watershed is undeveloped, and hosts natural areas composed of the following natural communities: maple-basswood forest, lowland hardwood forest, open and emergent marsh, dry oak forest, bluff (dry) prairie, mesic oak forest, oak woodland, and a variety of wetland community types, including high quality calcareous seepage fens and a trout stream. Most of the land in the project area is privately owned.

Sampling of conservation tools proposed by plan:

• selective land acquisition from willing sellers • natural vegetation buffer areas established by conservation easements • establishment of overlay district • ordinance amendment to increase setbacks along bluff lines• landowner education on conservation practices • wildlife underpasses beneath roadways • selective siting of development to protect sensitive features • park/trail dedications from developers to create corridor along creek • acquisition and dedication of park, to include area designated as wild natural sanctuary area with restricted access • restoration of native vegetation and natural floodplains • stormwater management projects to prevent excessive rates/volume of runoff • transfer of development rights (TDR) program • re-creation of linkages (corridors of natural vegetation) between major natural features • capital improvement plan • assigned manager to implement plan

Project Coordination: City Water Resources Coordinator, along with other city staff and private consultants

Existing and Proposed Funding Sources: Watershed district, Stormwater Management Plan budget, park and recreation budget, highway improvements, federal transportation funds (ISTEA), U.S. Fish & Wildlife Service, Minnesota DNR, City of Chanhassen general funds, the Legislative Commission on Minnesota Resources (LCMR), foundation grants, private sector

Working Groups:

• Twenty-member Steering Committee comprised of a city council member, plant ecologist from the DNR's Natural Heritage and Nongame Research Program, nine local residents (including a farmer), representative from city planning commission, a graduate student and professor from a university school of landscape architecture, representative from the local watershed district's board of managers, a teacher from a local elementary school, a representative from a private company conducting business within the watershed, a developer, a parks and recreation commissioner, and a representative from a nonprofit conservation organization.

• Ten-member Technical Committee comprised of the city parks and recreation director, city planning director, city water resources coordinator, city environmental resource coordinator (specializing in forestry), director of a nonprofit conservation organization focused on protection of the Minnesota River and its tributaries, a

professor from a university school of landscape architecture, a fish and wildlife biologist from the U.S. Fish and Wildlife Service, three representatives from the Minnesota DNR (specializing in wildlife, planning, and forestry).

History: In 1994, the project focus area (Bluff Creek Watershed) was identified in the City's comprehensive plan as an environmental and recreational resource, with the cited goal of city acquisition of land adjacent to the stream as opportunities arose and funding permitted. An existing city Stormwater Management Plan addressed many concerns regarding water quality of the creek, but city officials decided that a more extensive natural resources plan was desired to protect the creek. City staff were assigned to the task, and a private consulting firm was hired to help guide plan development.

Planning Process:

1. October, 1995: Steering committee members and technical team members were selected.

2. Steering committee was educated about the project area via guided outings and a series of presentations on selected topics offered by city staff and invited specialists. Topics included natural history, local land use patterns and their current/projected impact on the project area's natural features, potential of project area for education.

3. January, 1996: Steering committee members began to formulate a common vision for the watershed, holding discussions to compose (and then reach consensus on) a series of statements describing scenarios that members considered to be "best outcomes" and "worst outcomes" for the watershed in the next fifty years.

4. City staff and consultants consolidated the eighty "best outcomes" into a draft document representing the group's shared vision, developing language that incorporated the statements into goals and objectives. Steering Committee members had an opportunity to review and amend the draft vision document using consensus decision-making.

5. April, 1996: City staff and consultants (calling upon members of the technical team on an as needed basis) prepared a draft Bluff Creek Watershed Natural Resources Management Plan. They considered the practical and technical implications of the Steering Committee's vision, preparing a document that outlined specific initiatives by which the goals and objectives could conceivably be implemented. Based on ecological data, they defined primary and secondary protection corridors, and examined such aspects as management requirements of the various natural communities, potential protection tools (zoning, easements, acquisition, restoration techniques), and a capital improvement program.

6. Steering committee had opportunity to review/amend the draft.

7. November, 1996: City council accepted the resulting document as an element of the city's Comprehensive Plan.

8. City staff initiated work on priority projects and securing necessary funding. Elected officials began to actively use the plan to guide decisions regarding development. As of February, 1997, plan recommendations have been used to require increased bluff set-backs for a housing development sited along the creek, and to increase the mitigation required for a public works project to include restoration, expansion, and exotic species removal in a wetland. The proposed overlay district is planned for completion in 1997.

A Dozen Positive Steps that Local Governments can take to Protect Natural Areas in their Communities

- Promote voluntary landowner conservation practices through education and incentives
- Utilize the services of natural resource specialists with ecological expertise to advise decision makers
- Review and update local ordinances that may compromise the integrity of natural areas in the community
- Develop and maintain high standards for development, encouraging practices that protect the integrity of quality natural areas
- Apply cash park dedications from new development to acquisition of natural areas
- Include a section in comprehensive plans that identifies specific goals for natural areas
- Ensure that public land managers are trained in the management of natural communities
- Budget for natural areas protection in the same way that budgeting is done for other community assets
- Consider using conservation easements to ensure permanent protection for public open space land
- Establish partnerships with neighboring units of government to protect shared natural areas
- Use native species in plantings on public lands
- Identify natural areas on public lands and take steps to ensure that paved trails, parking lots, or other developments that could negatively impact important natural features will not be placed within them

Figure 4.

4

Land Protection Tools

This chapter provides an overview of ten tools available to local governments for protection of natural areas. These tools may be implemented in the context of a natural areas plan, or for a specific project involving protection of a natural area. Selection of the appropriate tool or tools to use for a given situation will be guided by such factors as the quality of the natural area, the character of land, its ownership status, wishes of the landowner, financial considerations, the local government's desired outcome, and the opportunity.

The tools afford varying types and degrees of protection to natural areas, ranging from permanent to temporary, and formal (legally binding) to informal (nonbinding). The most effective tools are those that will protect the structure and function of natural areas in perpetuity. Those tools that do not provide permanent protection are best used as temporary measures to employ while opportunities for more lasting protection are sought.

The most successful land protection programs employ several techniques in a coordinated package and have the broad-based support of landowners, elected officials, and the community. Any one technique alone cannot achieve protection for more than the short run. A strategic package of techniques should be designed to ensure that

- protection is durable over the long run
- protection efforts are cost-effective
- enough natural lands are protected so that natural vegetation and healthy populations of plants and animals will survive into the future
- economic growth and development are planned in conjunction with planning for the protection of natural areas and open space

It is important that those who are involved in the process of tool selection understand that the process is not one of planning for staged growth, in which natural areas are set aside for future development. Rather, it is a process of ensuring that high quality natural areas will always be a part of the fabric of life in Minnesota, even as the state's population grows. To do so is an acknowledgement that such areas will be at least as important to future generations as they are to citizens today. Even when inaccessibility or fragility make a site ill-suited to intensive forms of recre-

ational use, the public enjoys many benefits from its protection (see Natural Areas: A Review of Benefits to Communities, p.10). References and case studies have been offered throughout this section to provide readers with insight into how the different tools work in practice, and how they have been successfully utilized to achieve local government objectives.

The most successful initiatives combine sound public policy and independent actions by private landowners. It's about choice—about choosing the tools with which you will secure a future for the natural areas in your community.

A. Local Government Land Acquisition to Protect Natural Areas

What it is: The transfer of land (by purchase or donation) from private to public ownership, so that title is held by a local government unit

What it accomplishes: Local control over the use and development of a property, including right to manage public access in order to sustain the site's natural features and processes

When it may be appropriate:

1) When local residents are generally supportive of the site's protection and its designation as a natural preserve and/or a site has natural features of local, regional, or state significance

2) When the community has the capability (human and financial resources) to provide for the site's management on an ongoing basis

Outright donations of land from private citizens

It is important not to underestimate the willingness of private citizens (and corporations) to donate land to a city or county to be managed for permanent protection as a natural preserve. Since the state began keeping records in 1840, Minnesotans have gifted 3,700 parcels of land totaling over 78,234 acres for parks, wildlife management areas, scientific and natural areas, and other management units of the Minnesota Department of Natural Resources, with the great majority donated by private donors.* Many long-time landowners have a great appreciation for wildlife and the other natural features of their property as well as the desire to make a contribution to the good of their communities. Conservation organizations commonly receive calls and letters from landowners who are trying to identify a recipient for donation of a property. *(Cont. p.34)*

* Statistic courtesy of Minnesota Department of Natural Resources Bureau of Real Estate Management. Based on land records as of March 20,1997.

Case Study

Private Reasons for Giving to a Public Cause: A Family Donates Land for a Natural Area

"The children and I thought he would like to see it preserved," Pearl O'Link reflects on her family's decision to donate a piece of property in memory of her late husband, Maurice. "Maurice loved the north country. He'd go up to our cabin whenever he could, to hunt and just to be there. But this other piece of land he had bought sight unseen, and never did get to see it before he died. I think he bought it just because he really believed in land—thought it was the only permanent thing there is."

The O'Link family decided that the best way to honor their husband and father was to donate the 160-acre parcel, located in Beltrami County, to the Department of Natural Resources (DNR). Upon inquiring, they discovered that the DNR had great interest in the land. The property Maurice had purchased was at the heart of a vast peatland landscape, the Red Lake Peatland, that had been designated a high priority for protection as a landscape of state—and even national—significance.

Sometimes called the Big Bog, the Red Lake Peatland is defined as a "patterned" peatland because of the distinctive landforms and vegetation patterns created as nutrient-bearing water creeps across the expanse of nearly level terrain. Fifty miles long and twelve miles wide, it is an immense but inherently fragile ecosystem that supports rare species of rushes and sundews, and wildlife such as the Eastern timber wolf and greater sandhill crane.

The property the O'Link's donated could be added to lands already protected in the region as a State Scientific and Natural Area. Host to a ribbed fen and a complex of teardrop-shaped islands, the parcel was of outstanding scenic as well as ecological value, serving to protect the hydrology so critical to the functioning of a peatland ecosystem.

Because the site is remote and relatively inaccessible, Pearl O'Link has yet to see the property that was donated in her husband's name. But she's pleased with their decision and is sure that Maurice would be pleased as well. "I hope the land stays natural," she says, "for a long, long time."

Why would a landowner wish to give away property that he or she could conceivably sell? In addition to a love for the land, the reason is often economic. The donor may be interested in the associated income tax deduction that they may be eligible to take for donating the land to a charitable organization or public agency. They may also wish to relieve themselves of the land's ownership because of escalating property taxes, or because the land has low development potential and is unlikely to sell if placed on the market.

The Trust for Public Land (TPL) may be able to offer assistance in instances when the land needs to be acquired quickly, before funds have been secured. See p. 99 for contact information.

If a local unit of government is interested in receiving natural preserve lands via donation from private landowners, it is important that landowners be informed of the community's interest in considering such offers. The most effective way to do this is to have a system in place with established criteria to evaluate any such properties offered, as well as the means by which the property will be permanently protected (See Conservation Easements, p.37). For high quality natural areas, a conservation agency or organization may in some cases be willing to enter into a cooperative agreement with a local unit of government to provide management of the site on an ongoing basis. Note: Landowners may also be willing to donate a portion of the value of their land as part of a sale (See Bargain Sales, p.69) or to donate specified development rights to their land (See Conservation Easements, p.37).

Acquisition by purchase

Acquiring title and all rights to land through purchase—a "fee simple acquisition"—allows a government entity to have full authority over a property's future use and its management.While such an acquisition can appear prohibitively costly, there are a variety of financing mechanisms that have successfully been used by local governments to make it feasible (See Chapter 5, p.63). When a seller is supportive of the site's protection as a natural area and would like to make it work for the agency, he/she is often willing to agree to terms and a payment schedule that will coincide with the agency's projected availability of funds. If, however, the seller's circumstances are such that they require a swift transaction, or if the agency has been unsuccessful at establishing a positive dialogue with the seller, the acquiring agency may wish to enlist the aid of a private nonprofit organization that specializes in real estate for conservation purposes.

Organizations such as The Trust for Public Land, The Nature Conservancy, and the Minnesota Land Trust (See Resources, p.97, for contact information) can often work effectively to remove obstacles to a successful transaction in ways that respect the needs of both landowners and the local government units. In instances where a landowner prefers not to negotiate directly with a public agency, a private conservation organization may be able to acquire property from a landowner for resale to a public agency. Each organization has its own criteria as to its role in such projects,

(Cont. p.36)

Case Study

The Rice County Wilderness Area: Landowners' Vision Becomes Reality

In spring, the Rice County Wilderness Area is flush with pastel colors, the pale blooms of the first wildflowers of the season. Swollen with meltwater from the winter's snows, the Cannon River flows swiftly between forested bluffs where the songs of newly returned migratory songbirds announce the onset of the breeding season. Each in their own unique way, the many natural communities of the wilderness area respond to the longer days with a burst of activity among native plants and wildlife. On a June walk along the area's trails, one might meet up with a wood turtle or badger, or catch sight of a scarlet tanager, yellow-breasted chat, or blue-winged warbler flitting among the branches.

Although often described as a remnant of the state's once extensive "Big Woods" landscape (a region dominated by maple-basswood forest), this 818-acre park encompasses a diversity of natural communities, including floodplain forest, hardwood swamp, shrub wetland, wet meadow, calcareous fen, lowland hardwood forest, maple basswood forest, oak forest, dry oak savanna, and dry prairie. That this area should persist in such diversity and beauty while other areas around it have experienced dramatic change is owed largely to the efforts of two landowners out of whose property the park was carved. Some thirty years ago, Jackie May and Aylmer (known as Barney) Code, both of whom recognized and appreciated the natural treasures embodied in the river valley landscape, initiated a campaign to encourage Rice County to take steps to preserve the area. They began with a letter written by Jackie to the Planning Commissioner, then took turns attending monthly meetings of the Rice County Parks and Recreation Board to make sure that the idea was kept alive.

Intrigued by their glowing descriptions of the site, the board representatives agreed to participate in a tour of the property. Also during this period, Jackie and Barney met with other residents of the area, and were pleased to find broad support and a willingness among key landowners to sell parcels to the county at a very reasonable (in some instances, far below market value) price, provided that the land be kept in a natural state.

In 1966, following a meeting of the Parks Board at which Jackie and Barney again urged the board to purchase the land along the river for a wilderness park, the Parks Board assented to form a committee which would recommend the project to the Rice County Board of Commissioners. Reacting favorably to the proposal, the County Board directed county staff to initiate efforts to identify potential sources of funding.

Ten years hence, in 1976, the park was officially dedicated. Funding support from the state Planning Agency for Parks and Recreation, and a federal Department of Interior grant from the Land and Water Conservation Fund enabled the county to acquire properties from thirteen landowners to create the park.

Though Barney Code has since passed away, both he and Jackie May were able to see the valley they loved receive the protection for which they had worked so hard. Now in her eighties, Jackie lives in Maryland, but the Rice County Wilderness Area is still in her thoughts. She writes from her home, "It has always given me a happy feeling that there were enough people who felt the way Barney and I did about the area to make the park possible. Even though I can't walk in it—living thousands of miles away—I know it's there and that's an everlasting joy."

taking into consideration such factors as the conservation value of the site and the scope (real estate value and acreage) of the transaction.

B. Acquisition by Private Conservation Organizations and by State and Federal Natural Resource Agencies that Specialize in Natural Areas Protection

"If you want to get people involved in preservation, you need two things. One, is to get the area known to a good number of people. Two, when the idea of preservation is raised, have faith that people will support it. Being something of a pessimist, I assumed the opposite. I'm delighted that I was wrong."

Jackie May, 1997

What it is: Land is acquired by a private conservation organization or by a government entity other than the local government unit

What it accomplishes: Management of the site according to the mission of the acquiring organization or agency, giving priority to those features the agency considers significant

When it may be appropriate:

1) When the acquiring agency's goals for the site promote the overall integrity of the site's natural features and are compatible with those aspects of the site valued by the local community

2) When the acquiring agency has expertise in management of the site to protect those functions and features of value to the community

3) As an alternative when a local unit of government would like to see an area designated for protection but does not wish to (or is unable to) take on the responsibilities or costs of acquiring/managing the land

4) When the site contains outstanding natural features of state or regional significance

If a site has outstanding ecological value, it is possible that a local unit of government will be able to identify a private conservation organization or public agency that is interested in acquiring the land for protection as a natural area. Chances of success are better if the site is

- known to contain a rare species
- of significant size
- adjacent to land that is already protected for its natural character
- host to one or more natural communities in good condition (such as an oak savanna, prairie, wetland, etc.)
- not unduly threatened by incompatible land use on adjacent lands
- of significant importance to wildlife (e.g. a migration stopover spot for bald eagles or swans, a breeding site for prairie chickens, etc.)

A private conservation organization or public agency may be interested in purchasing the property or acquiring it through a land exchange. With a land exchange, the

conservation organization or agency owns property that it offers in trade for land with greater conservation value. Land exchanges involving state agencies are governed by Minnesota State Statute (ref. 94.341—94.348).

A good place to begin is to contact the managing agency of any protected sites—such as state or national parks, wildlife refuges, or preserves—that are found in the vicinity of the property in question. Agencies such as the National Park Service, Fish and Wildlife Service, Forest Service, and other organizations and agencies that manage natural lands may have funds to acquire adjacent properties that expand or serve as a buffer to protect environmentally sensitive features on their sites.

A next step could be to contact the state Scientific and Natural Areas (SNA) Program of the Minnesota Department of Natural Resources (See p.99), or the Minnesota Chapter of The Nature Conservancy (See p.98), a private, nonprofit organization. Both programs own and manage land in the state for the purpose of enhancing biodiversity and protecting exceptional natural features.

C. Perpetual Conservation Easements

What it is: A legally binding agreement made between a landowner (public or private) and a qualifying organization (also public or private), in which permanent limits are established on a property's use and development

What it accomplishes: Permanent protection for a site's natural features, to the degree that such protection is provided for in the terms of the easement

When it may be appropriate:

1) To protect the natural and open space values of public land planned for sale to private parties or to other public agencies

2) To provide permanent protection of required open space in subdivisions and other developments

3) To provide the appropriate level of protection for highly fragile and environmentally sensitive features (eg. groundwater recharge areas, high quality natural communities, rare species habitat) that are found within existing public parks or on other public lands

4) To promote voluntary private landowner conservation measures

According to Chapter 84C of the Minnesota Statutes (See Appendix D, p.124), land with open space value and/or high quality natural areas may be provided permanent protection through the establishment of a conservation easement. A con-

servation easement is an agreement made between a public or private landowner and a qualifying organization (which may be a private conservation organization or a public agency, as defined by the statute) by which the landowner retains ownership of (title to) a given property, while relinquishing certain development and land use rights to the organization that will "hold" the easement.

Each conservation easement is unique, with mutually agreed-upon terms that set specified limits on development and use of a given property in order to protect its particular conservation values. An easement is recorded on a property's title and "runs with the land;" that is, it is legally binding on not only the present landowner but all future owners of the property. The organization or agency that holds the easement is responsible for regular monitoring (and, if necessary, legal action) to ensure that the terms of the easement are upheld.

When a landowner chooses to enter into an easement on a voluntary basis, it is commonly out of the desire to see the land's natural features protected. A landowner may sell or donate an easement. Though a variety of government conservation programs fund purchase of easements from willing sellers (See Chapter 5, p.63), in Minnesota, easements are frequently donated, due in part to the tax benefits that may be enjoyed by private landowners as a result of a donation. Subject to tax law, a private landowner who donates a perpetual conservation easement to a qualifying organization/agency may deduct from their income taxes any drop in the appraised value of the property that occurred as a result of the development restrictions imposed by the terms of the easement.

Local governments may choose to require conservation easements in certain cases, (for example, as part of the subdivision process) when natural areas are involved. Landowners are not eligible for a related income tax deduction in this instance.

Easements are a tool that can be used to protect natural areas on private land while allowing the land to remain in private ownership (and thus on the tax rolls, albeit potentially at a reduced rate). Local governments can inform private landowners about this voluntary option, and provide information about organizations able to assist them in establishing an easement on their land if they so choose.

Local governments have also established perpetual conservation easements on existing public lands that host high priority natural areas, and on land that private landowners have donated to the local unit of government with the understanding that it is to be maintained as a nature preserve/park. The advice of legal counsel is recommended for any landowner (public or private) considering establishment of a conservation easement.

(Cont. p. 40)

Conservation Easements: A Legal Tool for Permanent Protection of Land	
Common Misunderstanding: The owner of property with a conservation easement can later change his/her mind and develop the land.	**Fact:** A perpetual conservation easement is legally binding on the present owner and all future owners of the land, regardless of whether the owner is a public agency or private individual (Reference Chapter 84C of the Minnesota State Statutes.)
Common Misunderstanding: Land with a conservation easement is exempted from property taxes.	**Fact:** A conservation easement does not exempt land from property tax. Depending on how the land was assessed prior to the easement, it may result in a drop in the amount of property tax assessed.
Common Misunderstanding: All conservation easements are the same.	**Fact:** Terms of conservation easements are negotiated with the landowner, and vary according to the particular features of the property, the landowner's goals, and the goals of the agency or organization that will hold the easement.
Common Misunderstanding: Conservation easements take away a landowner's rights to use their land as they wish.	**Fact:** In many cases, establishment of an easement is a voluntary act on the part of a landowner, by which the landowner chooses to set limits on specified land uses and the amount of development that can occur on their property. An easement can offer many potential benefits to a private landowner, including a significant charitable contribution deduction from his/her income taxes if an easement is donated.
Common Misunderstanding: Only land with rare or outstanding natural features is eligible for a conservation easement.	**Fact:** Outstanding natural areas are good candidates for easements, but easements may also be established on farms, scenic lands, and community open space lands.

Figure 5.

The Minnesota Land Trust, a private, nonprofit organization, specializes in working with public and private landowners in establishment of conservation easements on land with significant natural features, as well as on land with open space, historical, and agricultural values. It operates with a central office in the Twin Cities and locally based chapters throughout the state (See Resources, p.98, for contact information).

D. Transfer of Development Rights (TDR) Programs

What it is: A system adopted by a local unit of government in which landowners in a designated preservation (also called "sending") zone may sell development rights to a broker or land developer, who then uses the purchased rights to increase their allowable building density in another area designated as a "receiving" zone

What it accomplishes: A reduction in level of development that occurs in the sending zone, thereby serving the purpose of protecting natural areas, agricultural lands, and other open space land values, while compensating landowners who relinquish specified development rights to their property

When it may be appropriate:

1) When there is high demand for housing or other development in the receiving zone, such that a good market may be expected for the development credits offered for sale by landowners in the sending zone
2) When the administering government agency has the resources necessary to set up and oversee the program on an ongoing basis
3) When protection from development is sought for a specific geographic area
4) When residents residing in the receiving zone are amenable to the increased density such a plan would bring to their area

The basic idea of a TDR program is to steer development *toward* those areas considered best able to handle such growth—typically areas where utilities, roads, and other public works infrastructure are in place—and *away* from areas that a community wishes to shelter from development, such as prime agricultural lands and high quality natural lands.

Though TDR programs vary somewhat in application, here's how they typically work. Two zones are designated within a given geographic area: a preservation, or "sending" area, and a "receiving" area. Landowners who own land in the designated preservation zone are assigned a number of development credits for their property, with the number of credits assigned reflecting the acreage and development poten-

tial of the property as zoned. A landowner in the sending zone may either develop their property to the allowable density or, through a TDR program, may sell their assigned number of development credits (their unused rights to develop their land) to a land developer, broker, or speculator who owns land in the receiving zone. The purchaser then "spends" the credits in the designated receiving zone, using the credits to exceed the development density they would otherwise be allowed in that area. Credits are bought and sold on the open market, with their value determined by whatever the market will bear. When all the development credits assigned to a parcel of land in the sending zone have been sold, permanent restrictions are placed on the property's title, disallowing future development. This drop in development potential may be reflected in a corresponding drop in the property taxes assessed to the affected land.

TDR programs may be established as a nonregulatory program (in which case landowners in the sending zone have the option of developing their land or selling the development rights) or as a regulatory program incorporated into a local zoning ordinance as an official land use control (in which case development in the sending zone is not allowed and landowners in the sending zone have no alternative but the sale of development rights if they wish to be compensated for their property's unused development potential).

A successful TDR program oriented toward farmland protection has been implemented in Montgomery County, Maryland, with transactions resulting in the permanent protection of twenty-six thousand acres of farmland. The state of New Jersey has also utilized a TDR program as a means to provide permanent protection for 12,969 acres of the ecologically significant New Jersey Pinelands.

Enabling legislation allowing cities, towns, and counties to adopt TDR programs has recently been approved in Minnesota (via amendments to Chapters 394 and 462 of the Minnesota Statutes), making TDR a viable land use planning tool available to the state's local governments. For an update on the status of TDR programs in the state, contact the Land Stewardship Project (See Resources, p. 98).

E. Purchase of Development Rights (PDR) Programs

What it is: A formal program by which a unit of government or nonprofit organization purchases conservation easements (development rights) to privately owned land for the purpose of protecting the land's natural features, open space or agricultural values. Commonly set up with a "willing seller" policy.

(Cont. p. 43)

What it accomplishes: Keeps land in private ownership while establishing permanent, legally binding protection for a site's natural features, to the degree that such protection is specified in the terms of the easements

When it may be appropriate:

1) When a funding mechanism can be identified to finance the purchase of easements

2) When the administering unit of government or nonprofit organization has the staffing and administrative capability to set up and oversee the program on an ongoing basis

3) As an alternative for local protection of high priority natural areas when a community does not have the financial resources to acquire fee simple interest

4) When a local government unit prefers protection methods that compensate landowners for restricted development, as opposed to limiting development through zoning or other regulatory means

PDR programs may be viewed as the systematic application of perpetual conservation easements used as a tool to protect community natural areas. The administering agency (city, county, or state government agency, or nonprofit organization) develops specific criteria used to select sites for which acquisition (purchase) of easements is sought. These criteria will vary according to the priority goals of the PDR program (e.g. protection of watersheds, wildlife habitat, or a highly valued feature of the community such as a bluff). PDR programs commonly operate with a "willing seller" policy, in which local government units contact the owners of land considered high priority for protection and, depending on the landowner's interest, negotiate mutually agreeable terms. Landowners who sell their development rights as part of a PDR program retain ownership of their property and all rights not specifically assigned to the acquiring agency in the terms of the easement. Some local governments finance PDR programs through issuance of bonds or through special taxes assessed on property. The city of Dunn in Dane County, WI (population 5,540) initiated a PDR program in 1996 to acquire development rights for protection of farmland, open space, and natural areas.

As is the case with TDR programs, enabling legislation allowing cities, towns, and counties to adopt PDR programs has recently been approved in Minnesota (via amendments to Chapters 394 and 462 of the Minnesota Statutes), making PDR a viable land use planning tool available to the state's local governments. For information on PDR programs and their status in Minnesota, contact the Land Stewardship Project (See Resources, p.98).

F. Official Land Use Controls

What it is: The exercise of regulatory authority granted to local governments to protect the public health, safety, and general welfare, which the courts have held to include the protection of open space and environmentally sensitive areas, because of the public benefits they provide

What it accomplishes: Protection and enhancement of the natural environment and its attendant elements and processes as embodied in wholly undeveloped areas maintained within the larger context of managed growth. Maintains important resource values (e.g. wildlife habitat, water quality, etc.) and reduces future government costs resulting from development and societal losses due to environmental degradation

When it may be appropriate: Provisions regarding natural areas protection are appropriate for integration into all local land use regulations that have the potential to impact the functions of natural systems, including but not limited to transportation policy and planning, subdivision ordinance, and zoning

Zoning and subdivision ordinances are the most common land use controls actively employed by local governments to influence the patterns of growth that occur within jurisdictional boundaries and to carry out the goals identified in a community's comprehensive plan. Many such controls are effective at minimizing the generalized negative environmental impacts associated with development by regulating such aspects as stormwater runoff, septic systems, wells, construction on steep slopes, reclamation after mineral extraction, criteria for buildable and unbuildable land, and the density and type of development allowable in defined areas. Such controls frequently fail, however, to directly address the protection of high quality natural areas that occur on public and private lands, even when approved comprehensive plans (developed with citizen input) cite the protection of natural areas and wildlife habitat as a goal.

Recognizing this gap in their land use controls, many communities are taking steps to amend their ordinances, codes, and policies to better promote the integrity of natural areas. Figures 6(a) and 6(b) on pp.50-53 offer a sampling of common local land use controls and how they may be adapted for the benefit of natural areas as well as other types of open space. References to actual ordinance language provided in Figure 6 do not necessarily represent ideal language, but may offer an idea of how the issue of protection could be addressed. Note that improvement can often be realized through greater flexibility rather than greater restriction.

Actual protection of specific natural areas, or of a system of interconnecting natural areas, can be effectively accomplished through some variation of zoning. Based on delineated areas that support natural assets, zones are defined within which specified land use controls are enforced. Following are some approaches to zoning that have been implemented by communities in Minnesota and neighboring states. The American Planning Association may be a useful source for additional information on planning issues, practices, and techniques (See Resources, pp.98-99).

Locally enacted preservation overlay zones

Often referred to by different names, a preservation overlay zone is established over a geographic area defined within a city, township, or county. Boundaries of a preservation overlay zone are based on concentrations or complexes of highly valued natural features as identified through a planning process involving extensive natural resource studies.

Communities may select a combination of conservation tools to protect natural features within the zone, including (but not limited to) acquisition of land by a public agency, restrictions on utilities and transportation development, enforcement of specified "best management practices" in use of chemicals and pesticides, more restrictive standards for building on slopes, limitations on development in environmentally sensitive areas, prohibition of extractive activities such as mineral or timber harvesting, density controls, and additional performance standards that must be met for any development which is to be allowed. A preservation overlay zone may have a single standard for protection or may have varying levels of protection afforded to different areas within the zone as appropriate to their relative priority.

A preservation overlay zone may be considered a "layer of controls" placed over one or more existing zones. This overlay zone supplements, rather than replaces, existing zoning. Where provisions of the overlay zone differ from that of the earlier enacted zoning, the more restrictive (protective) of the two generally governs. Existing nonconforming development within the zone may be permitted to remain, or may be subject to a scheduled phaseout over a period of years.

Preservation overlay zones are a flexible tool that may be adapted to serve the unique circumstances and goals of different communities. The city of St. Cloud, Minnesota has drafted and is considering implementing a "sensitive natural areas overlay zone ordinance" to protect the community's native prairies, forests and woodlands, sensitive geological and hydrological features, rare species sites, river corridors, wetlands, wildlife corridors, and other unique and sensitive natural features. While not formally established through zoning, "environmental corridors" have also been incorporated into numerous regional, county, and city planning efforts in Wisconsin. For information, contact: Jay Tappen, Senior Planner, West Central Wisconsin Regional Planning Commission, Tel. (715) 836-2918.

Preservation overlay zones should be carefully designed. If the effect of a preservation overlay zone is to deny all economically beneficial or productive use of an entire parcel of property, there is potential for a claim that its application is a taking of property for which compensation is due [See, e.g., Lucas v. South Carolina Coastal Council, 505 U.S. 1003 (1992)].(See also, Are Your Land Use Regulations Legally Defensible?, Appendix E, p. 126.) A model overlay district ordinance is provided in Appendix F, p. 128.

Establishment of conservation districts

Subject to its zoning authority, a local government may name a conservation (sometimes called "conservancy") district among the basic independent zoning districts it establishes (such as residential, agricultural, commercial, and industrial districts). Boundaries of the district are delineated on a zoning map, with permitted uses described in the ordinance. For example, the zoning ordinance for Washington County, Minnesota identifies a conservancy district, the intent and primary use of which is to "preserve, protect and manage environmentally sensitive areas having wet soils, steep slopes, exposed bedrock, or unique natural and biological characteristics in accordance with compatible uses." Uses which are not permitted in the conservancy district include but are not limited to: antennae or towers over forty-five feet in height, clear-cutting, disposal areas for solid or liquid waste, and feedlots. Other uses are identified as subject to a certificate of compliance (as defined in the ordinance) or a conditional use permit and public hearing. For information, contact the Washington County Land Use and Zoning Office, Tel.(612) 430-6656.

Open space zoning and subdivision requirements

The basic principle of open space zoning is to mandate or encourage protection of large, contiguous (unfragmented) blocks of open space in major (and in some cases, minor) subdivisions by carefully planned siting of structures. As typically configured, an open space zoning ordinance does not reduce the total number of structures that may be constructed on a given property. Rather, it defines an area within the parcel to be preserved as permanent open space, and requires that all structures be built outside the boundaries of this defined area, often clustered together on one part of the property. Subject to the limits of authority granted to local governments, a parkland dedication and provision for its permanent protection from development can be required as part of the subdivision process. Such dedications can serve to protect natural areas when the land is maintained in native vegetation and recreational use is carefully managed.

Protection of this open space area may be provided in various ways: it may be owned in common and administered by a homeowners organization, it may be deeded to a land trust or conservation organization, or it may be deeded to the local unit of government. Conceivably, it may also be comprised of portions of individ-

ually owned lots. In all cases, establishment of a permanent conservation easement on the land is appropriate, if the property meets the criteria outlined by state statute (Chapter 84C). Public access to the open space area is not a requirement, but may be a provision. All dedication requirements must comply with constitutional standards [See, e.g. Dolan v. City of Tigard, 114 S. Ct. 2309 (1994); Nollan v. California Comm'n, 483 U.S. 825 (1987)]. Dedication requirements also must comply with relevant statutory authorization provided by the legislature [See, e.g., Minn. Stat. 462.358, subd. 2b (1996)].

Key provisions of open space zoning include a resource inventory and siting standards that guide location of structures to minimize impacts on natural, scenic, and cultural resources, avoid encroachments on rare plant communities, and minimize fragmentation of open space. Whenever possible, the designated open space on a property is sited to connect with existing or potential open space lands on adjoining properties.

Open space zoning can be useful for the protection of natural areas under the following circumstances:

- When the area defined as open space represents the highest quality natural features of the site (from an ecological perspective), is configured to promote the greatest possible amount of interior environment (see Figure 8, p.80), and is large enough to maintain the processes and functions critical to their integrity to the greatest extent possible. Site selection should take into consideration the condition and use of adjacent lands, where possible abutting areas of native vegetation on neighboring property that has a likelihood of remaining undeveloped
- When a perpetual conservation easement is established to ensure permanent and legally binding restriction from all development in the designated open space area, and such protection is required as a prerequisite for approval of any and all projects approved under open space zoning
- When a management plan is developed for the natural features embodied in the open space area (See Elements of a Management Plan, p. 86).
- When the developed properties are subject to land use controls that minimize negative impacts on the natural area

The city of Marine on St. Croix, MN has adopted a type of open space zoning/cluster housing ordinance that includes provisions for the protection of natural areas (see Appendix G, p.133), and the city of Lake Elmo, MN has adopted an open space preservation zoning district as part of its municipal code.

Performance zoning

Performance zoning is a departure from the application of traditional specification standards for land use. Unlike specification standards, which categorize specific pre-

sent and potential future land use activities as expressly permitted or unpermitted in given zones, performance zoning determines whether a given land use is permitted based on an assessment of its potential impacts on defined values. A community defines a set of key natural functions that it wishes to sustain in a given zone or throughout its jurisdiction. A developer must be able to demonstrate that a proposed development will "perform" in such a way that it does not interfere with these functions, or interferes to an acceptable degree.

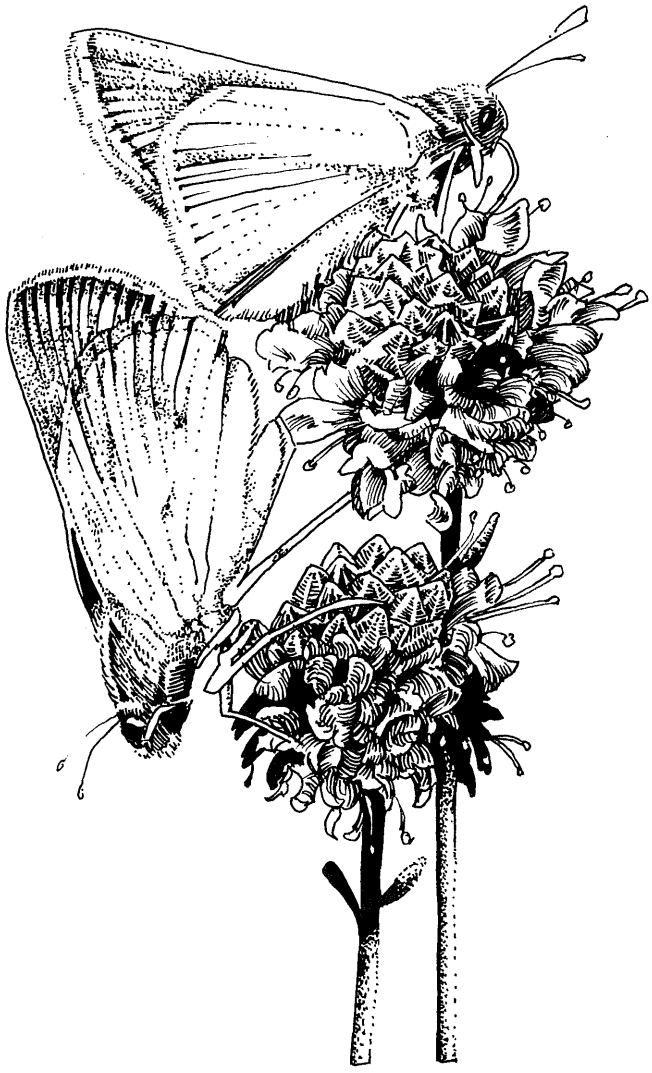
Critical aspects of performance zoning include the selection of the key functions, and the standard by which any impact to them will be measured. Values such as runoff rates, erosion, viewsheds (scenic vistas), and air quality are commonly regulated through performance zoning, in part because they are readily quantifiable, making it a straightforward matter for local officials to assess whether or not a proposed development meets the performance standard or to determine whether a given development is in violation of a standard. It is more challenging, however, to design workable performance standards to accurately express values such as wildlife utilization of habitat or biodiversity in such a way that the impacts of proposed developments can be assessed. While scientific models certainly exist to quantify such values, the time and technical expertise required to do so are beyond the reach of most local governments, especially given the frequency of development proposals put forth for consideration. This does not mean that regulatory controls cannot serve to protect these values, but rather that performance zoning may not be the best tool with which to do so. For this reason, exclusive reliance on performance zoning for protection of natural areas is rare. New Hanover County, North Carolina has incorporated the use of performance standards into its zoning ordinance for lands that fall within an established conservation overlay district (See Appendix H, p.135, for an excerpt).

Urban growth boundaries

The purpose of an urban growth boundary, sometimes referred to as a service area, is to contain development within planned urban areas where basic services, such as sewers, water facilities, and police and fire protection, can be economically provided. In the realm of natural areas protection, it is most useful in urban and developing areas where projected urban expansion threatens the integrity of existing nearby natural areas. Because they do not directly address tools for protecting natural areas, urban growth boundaries are best used in conjunction with the many land use controls and other protection tools listed in this guide that do provide for protection of identified natural areas.

Urban growth boundaries are developed through an agreement between a city and county or a city and surrounding township in which an area of land adjacent to a city is designated for urban-density development. The growth boundary is shown

on a map. The urban growth boundaries can be drawn to specifically keep development out of valued natural areas, and instead concentrate urban growth in areas more conducive to development. For example, Olmsted County has designated urban service areas that consist of municipalities and additional land around each municipality that will accommodate development for the next twenty-five to fifty years. Centralized sanitary sewer and water systems and other centralized services will be provided in the urban service areas. The county has also designated resource protection areas to be used exclusively for resource related use, including "natural resource areas protected by easement or acquisition."



Adapting Ordinances for the Benefit of Natural Areas

Common Ordinance Provision	Maximizing Potential Benefits to Natural Areas
1. Park dedications Requires developer to contribute land or cash in lieu of land to the local government, for purposes of mitigating the loss in open space land due to the development and (in the case of subdivision development) to help provide for increased public park/open space needs due to the increase in population represented by the subdivision's residents.	• Consider broadening beyond park/open space to include mitigation for loss of environmental functions. Accept only contiguous (unfragmented) land as dedication, ideally land with high natural resource value. If no such land exists on the site, require a cash payment. Establish a special account with these funds, at least a portion of which is dedicated exclusively to acquire land or easements to protect priority natural areas elsewhere in the community.
2. Stormwater runoff performance standards Requires that postdevelopment rate and volume of stormwater runoff from a property not exceed predevelopment rates.	• Depending on the use of the land prior to the development, the rate and volume of runoff may already be excessive. When ground cover is already disturbed, set a performance standard that requires a developer to limit stormwater runoff to rates expected if the site were a vegetated meadow.
3. Setback requirements Establishes the minimum distance between a structure and a road, shoreline, slope, or other selected feature, governing the placement of a planned structure on a property. Setback requirements for shorelands or blufflands commonly include restrictions on removal of vegetation.	• Minimum setbacks from roads should be established only as needed for safety. Particularly in large lot zoning (5 acre minimum or greater), long setbacks may preserve the view from the road, but at the expense of natural resource values of the property (See discussion of fragmentation, pp.78-79). Allow for flexibility so landowners may use a shorter road setback if they wish. Maintain setbacks from slopes, shoreland, and other environmentally sensitive features at distances that minimize impacts of development.
4. "Open space" developments The placing of residential units into compact groupings (often called cluster development) or otherwise siting them on a property such that a contiguous block of open space/natural habitat may be preserved. For example, an ordinance may specify that 50-80% of land in a subdivision is to remain undeveloped.	• Permanent protection could be provided to the designated open space in these developments via a conservation easement or other legal device. If these lands are not afforded this protection, the ironic and unfortunate long-term result of an ordinance for open space development could be areas of higher than normal density.

Figure 6(a).

References

• From ordinance of city of Brookfield, WI: *"It is considered fair and equitable that new residential and nonresidential developments in the City make a contribution toward the cost of acquiring and preserving environmental corridors which will enhance the overall character and environment of the City. Accordingly, each subdivider of land...shall...either dedicate park and open space lands...or, where no such lands are directly involved, pay a public park and open space site fee."*

• From model planned residential development ordinance of Bucks County, PA: *"All developments shall limit stormwater runoff so that no more runoff is generated than that of the site in its natural condition. Where farm field or disturbed earth is the existing condition, meadow shall be used as the starting base for such calculations instead of the actual condition. All runoff calculations shall be based on a 100-year, 24-hour storm."*

• From Winona County, MN 1995 Comprehensive Plan: *"Amend current zoning and subdivision ordinances to allow for narrower setbacks and street widths in areas with lower traffic volumes. Such amendments would minimize the amount of vegetation and other physical features that would be removed or impacted during construction in new residential communities. This would also help preserve natural vegetation and open space in these developing areas. Narrower setbacks allow a house to be placed closer to the road so that more land is preserved in the yard behind the house."*

• From municipal code of the city of Lake Elmo, MN: *"The total open space area within the Open Space Preservation District shall be at least fifty (50%) percent of the total buildable land area. ...All open space shall be subject to a conservation easement... . The land shall be (used for purposes) as provided by permanent conservation restrictions (in accordance with MN State Statutes Chapter 84C.01.05), to an acceptable Land Trust as approved by the City."*

Figure 6(a).

Adapting Ordinances for the Benefit of Natural Areas

Common Ordinance Provisions	Maximizing Potential Benefits to Natural Areas
5. Restrictions while approval is pending for development proposals and special use permits: Restrictions prior to project approval are commonly limited to removal of large diameter trees and major excavating/landscaping. Requirements for stabilization and revegetation subsequent to development activities such as road construction, or surface mining for minerals or other materials (e.g. sand, gravel) typically focus on soil conservation, such as specifying sodding and reseeding with erosion retardant seed mixtures and mulches.	• Minimize alterations to physical landscape and native vegetation prior to final project approval. Set design standards for approved projects that require minimal disturbance of native vegetation and natural features. Where potential exists for reasonable restoration, require use of native plants in revegetation, selected for their appropriateness to the natural communities typical of the site and comparable in structure (e.g. relative proportion of trees, shrubs, herbaceous groundcover).
6. Calculation of housing/development density Density is typically specified via zoning ordinance by district (e.g. maximum one building site per forty acres for agricultural zone). Standards for average density to be maintained within jurisdictional boundaries may also be specified, with the average calculated by dividing the total number of building sites into the total area (acreage) of the city/county.	• If density controls are being used in part as a means to maintain natural functions of land (such as stormwater retention, pollution abatement, ability to support a diversity of natural communities, wildlife habitat), it is essential that average density calculations exclude surface area of water bodies. In communities with abundant lakes, failure to do so could result in an overbuilt environment, to the detriment of the many natural functions that are land-based.

Figure 6(b).

References

• From model planned residential development ordinance of Bucks County, PA: *The developer...shall meet the following standards of environmental protection. Site alterations, including regrading the existing topography, filling lakes, ponds, marshes or floodplains, clearing vegetation, or altering watercourses prior to the submission of plans for development, shall be a violation of this ordinance. Where alterations occur, restoration of the site to its original condition shall be required."*

• From Comprehensive Plan, Washington County, MN: *"The average density for each land use district shall be calculated according to the following manner: The total acreage of each zoning district equals the area within the zoning district boundaries excluding public lakes managed by the Department of Natural Resources."*

Figure 6(b).

G. Multilevel Government Partnerships

What it is: Representatives from two or more jurisdictions work cooperatively to make decisions regarding the management and use of a resource such as a watershed, natural area, or system of natural areas in which all jurisdictions share an interest. May be informal (as in a cooperative agreement related to specific project) or formal (as in creation of a permanent special district with an official governing body)

What it accomplishes: Opportunity to incorporate the varied perspectives and interests of the different jurisdictions into the vision for management of a natural asset, to provide a unified approach to management for natural areas or features that cross jurisdictional boundaries, and (in some cases) to create a vehicle for raising and directing funds toward its management and protection

When it may be appropriate:

1) For natural areas in public or private ownership that cross jurisdictional boundaries

2) For adjacent properties owned by differing public entities, such as a parcel of city-owned land adjacent to a parcel of land owned and managed by the county or state

3) To pool resources for a particular land protection project or initiative

Multilevel government partnerships can build foundations for the long-term success of land protection projects, offering a venue in which to resolve conflicting interests, and sharing resources for the most efficient use of public funds. A good demonstration of the value of such partnerships may be found in Crow Wing County, MN, where local officials representing city, township, and state government entered into a Joint Powers Agreement, granting a board the authority to make management decisions about an island in Whitefish Lake (See Case Study, p.54).

H. Special Designation of Public Lands

What it is: The designation of special status to a natural area located on existing publicly owned lands

What it accomplishes: Serves as a basis for the establishment of management and policies that will provide an appropriate level of protection for the site's nat-

(Cont. p. 56)

Case Study

Big Island—Forming Creative Partnerships for Protection

Encircled by the waters of Whitefish Lake, Big Island in northern Crow Wing County was known to locals as a premier camping and picnicking spot. The island's sandy beaches and beautiful shade-filled forest had been enjoyed by the lake's permanent and seasonal residents for generations. But it was more than beauty alone that made the forest remarkable. Big Island's forest was of a type and quality that made it rare in the region: more than thirty-five acres of old-growth maple-basswood forest surviving in a landscape otherwise dominated by pine, aspen, birch, and oak.

Intense public recreation and the preservation of a pristine natural area—how could these seemingly incompatible values be balanced on one small island? Aside from a few acres held by the state, the island was county-owned. Yet the site's unique features and the high level of citizen interest it evoked seemed to call for a unified approach to management of the island, and one that would somehow incorporate the perspectives of local residents. An innovative solution was proposed—the drafting of a Joint Powers Agreement. This agreement outlined the composition of a board that would be assigned the responsibility and authority and to make decisions as necessary to protect both the island's old-growth forest and its recreational values.

The Joint Powers Board, established in 1992, consists of one representative each from the Ideal Township Board, the County Board, the State (a position filled by a Department of Natural Resources staff person), and four citizens.

Working together and changing in composition over time as different people have come to occupy the board positions, the group has devised a workable plan for the island. The old-growth forest has been designated a County Scientific & Natural Area, using the State SNA program as a model. Picnicking and camping continue to be allowed on a defined beach area, though not in the forest. An interpretive trail provides information about the forest to visitors, increasing public understanding and appreciation. A cadre of citizen volunteers helps to monitor public use and gently encourage good stewardship by the island's visitors.

The Big Island project has won federal and state awards for innovation and cooperative partnership in public service. Pam Perry, DNR Nongame Wildlife Specialist stationed in Brainerd, was involved in the process from the start, and is excited by what partnerships can accomplish. "It takes more time, energy, commitment, and a certain amount of compromise from everyone involved," says Perry, " but it's amazing to see the good that can come of it."

ural features, within the broader context of public lands that may be managed for different purposes

When it may be appropriate: To be designated under an existing system (e.g. State Scientific and Natural Areas, see p.99) land must meet the program's established criteria. Local governments may also create their own special designations

State and federal special designation programs are established through legislation, which sets forth the criteria for site selection. The role of local government with jurisdiction over designated land is typically to adopt or amend its ordinances as necessary in order to comply with the standards and criteria of the program. Such is the case, for example, for communities along the St. Croix River, which is one of 154* rivers in the country designated for protection by the National Wild and Scenic Rivers Act.

Local governments may also elect to establish their own special designations to apply to environmentally significant public lands within their jurisdiction. Such designations are most effective when established in conjunction with a perpetual conservation easement, which ensures that the protections afforded by designation will be legally binding and permanent. Officials in Itasca County, MN created a Natural Area Memorial Forest by designating five sites to be preserved in their natural state within public lands owned and managed by the county (Case Study, p.57).

I. Landowner Registry Programs

What it is: A program by which private landowners make an informal, nonbinding pledge to provide good care and stewardship of their land's environmental values. In turn, the administering agency (a local government unit or nonprofit conservation organization) commonly provides recognition in the form of a plaque or certificate, as well as technical assistance and information which the landowner may make use of at their discretion

What it accomplishes: Registry programs can be an effective way to make contact with landowners interested in natural areas protection, promoting their continued good stewardship (while keeping land on the tax rolls) and building a sense of community among citizens who may at some point wish to become active in other natural areas protection projects in the community

When it may be appropriate:

1) Because registry programs are voluntary and nonbinding, they are best

(Cont. p.58)

* As of the end of the 104th Congress

Case Study

Special Designation of Public Lands: Itasca County's Natural Area Memorial Forest

As early as 1967, Itasca County officially recognized that land preserved in its natural state served the public interest by virtue of its scientific, historical, aesthetic, and spiritual values.

Embodied in a resolution presented by the Grand Rapids Chapter of the Izaac Walton League, approved by the Itasca County Land Commissioner, and adopted by the County Board of Commissioners was the commitment to designate five parcels of tax-forfeited land as a county memorial forest to be called the "Natural Area Memorial Forest." According to the resolution, these lands offered opportunity for scientific study of natural processes undisturbed by external influences, they served as controls useful for comparison in the management of other forest lands, they had historical importance in that they exhibited typical county vegetative and geologic types in their natural state, and they provided natural meditation areas for spiritual renewal. As such, they were to be managed and used exclusively for these purposes rather than for timber harvest or other purposes to which county lands were (and are) commonly put.

The five sites comprising the Natural Area Memorial Forest are scattered throughout the county. They range in size from 160 to more than seven hundred acres, for a combined total of 2,133 acres. Chosen for their outstanding collective diversity and ecological integrity, the sites feature bogs, lake shoreline, bottomland along the Mississippi River, glacial moraine uplands, and all variety of forest community types comprised of combinations of tamarack, cedar, spruce, river maple, boxelder, ash, birch, aspen, pine, oak, and balsam fir, as determined by the natural conditions and history of each site.

Though more than thirty years have passed since the resolution was adopted, the county's commitment to the Natural Area Memorial Forest remains strong. If anything, the sites have gained in significance over time as the land around them has changed. Garret Ous, current Itasca County Land Commissioner, is responsible for coordinating management of all the county's 297,000 acres of public lands, of which the Natural Area Memorial Forest represents less than 1%. In his view, there is value to maintaining some sites in a natural condition; "Within the context of a working forest," explains Ous, "natural areas can serve as a benchmark for what the area would look like without outside influences."

used in addition to land protection methods that provide a greater degree of protection (e.g. zoning, acquisition, easements)

2) Registry programs require ongoing administration and one or more natural resource specialists who are good communicators and are skilled in assessing the composition, structure, and function of natural communities in a field setting. Local governments that do not have such staff available may wish to set up a registry program in partnership with a nonprofit conservation organization or simply promote existing registry programs to their citizenry

Registry programs foster greater appreciation about natural areas and allow landowners to make more informed decisions about their land's management.They build a tradition of good stewardship on a given property that is often sustained through changes in ownership. Elements of a registry program commonly include an initial personal landowner contact, an application for (nonbinding) enrollment which stipulates the basic principles of the registry, and the preparation of a property report (literature that informs the landowner about the particular natural features of the land and their value in a local and regional context, as well as suggestions for appropriate conservation practices). Professional guidance—and in some cases, technical assistance—is provided to landowners who wish to implement conservation practices on enrolled land. A landowner's participation in a registry program does not require public access to the enrolled property. Local government units may opt to start their own registry program, tailoring it to meet specific community goals. A number of nonprofit organizations administer registry programs in Minnesota; the nonprofit citizens group "Friends of the Minnesota Valley" administers a Heritage Registry for landowners in the Lower Minnesota River Valley (See p.97), and The Minnesota Chapter of The Nature Conservancy (See p.98) also administers a registry program.

J. Education

What it is: A coordinated effort to provide landowners, elected officials, community leaders, and local government staff (including natural resource specialists) with an understanding of the value of natural areas in general, the particular features and basic needs of natural communities characteristic of the region, the impacts of varying land uses, optional protection tools, and appropriate conservation practices

What it accomplishes: Enhances the ability of local governments to evaluate different potential courses of action related to land use, and strengthens the effec-

tiveness of community planning efforts. Decision-makers are often more comfortable in their roles when they feel well-informed. Education of private landowners about voluntary conservation practices can result in environmental quality improvements

When it may be appropriate: Ideally, on an ongoing basis. At minimum, an educational phase should be a component of any planning process and decision that potentially impacts natural areas. Public education is a necessary facet of successful bond referenda and other efforts to fund natural areas protection using public funds

While not a protection tool in and of itself, education often leads to positive actions that directly benefit natural areas. Education offers perspective—the ability to more objectively and realistically evaluate the relative merits of different courses of action. If information is considered by all parties to be reliable and unbiased, it can provide a basis for discussions and reasoned debates in local decision-making and planning. Oftentimes, the knowledge gained through a shared education process represents the first common understanding between people of otherwise disparate views.

Landowners and the general public may be informed about issues related to natural areas through a coordinated effort including regular public programs with guest speakers, local media outlets, and one-on-one outreach staffed by trained volunteers, local or state government agencies, or nonprofit conservation organizations. Specific goals and a timeline for public education initiatives should be established, along with assignment of responsibility for their implementation. Topics should be selected that focus on key themes relevant to the natural areas of the region. Landowner Registry programs, which have already been discussed in Section I (see p.56), may be considered one type of educational initiative aimed at increasing public knowledge about the value of natural areas and conservation practices.

Because many local decisions involve consideration of impacts on natural areas and the environment (subdivision ordinance, transportation and utilities development, etc.) local officials also benefit from a basic understanding of the location and biological significance of natural areas within the jurisdictional boundaries of their authority, as well as the key land use issues that affect them. Such efforts should include agency natural resource specialists who may benefit from a broader perspective on topics outside their usual areas of expertise. A good example is the city of Chanhassen (See Case Study, p.28) which incorporated two education phases into a natural resources planning effort. At meetings in the initial stages of a planning process, local natural resource professionals and outside experts gave presentations to the plan's steering committee, which included elected officials, city staff, and local citizens. While not exhaustive in their scope, these presentations served to

familiarize steering committee members with the relevant issues. A second educational phase aims to inform the general public. The city of East Bethel (See Case Study, p.61) offers another good example of the importance of the role of education in a natural resources planning effort.

Whenever possible, educational initiatives should include site visits to those natural areas that are affected by planning and decision-making. The understanding gained from such visits is well worth the time they require, especially when one considers that the overall planning process may be expedited as a result.

Case Study

The East Bethel Project—Education as a Keystone

By Hannah Dunevitz,
Plant Ecologist with the DNR Natural Heritage and Nongame Research Program

This large-scale cooperative project began with a simple request made by the City of East Bethel to the DNR to acquire an 18-acre parcel of tax-forfeit land for a nature preserve. Because there were nearby lands owned by the DNR and others owned by Anoka County, the DNR forester decided to broaden the discussions to include the possibility of cooperative protection and management of the lands. The East Bethel Open Space Task force was formed, comprised of two representatives of each of the three agencies. In addition, a group of DNR natural resource professionals representing various disciplines—including forestry, fisheries, game and nongame wildlife, hydrology, trails, and plant ecology—provided technical expertise to the group.

In the early stages of their planning process, task force members became aware that the DNR was conducting an inventory of natural areas in Anoka County as part of the Minnesota County Biological Survey. This inventory revealed to the task force that the public lands that were the focus of their attention were, in fact, part of a larger, 1,200-acre natural area that also included private lands. Based on this new information, the task force decided to add education of private landowners to their list of goals, in order to improve the chance that the entire natural area would be protected into the future.

The education process began with presentations to groups of private landowners who owned significant parcels. The presentations emphasized the biological significance of the lands and opportunities to voluntarily protect private lands by keeping them natural and possibly placing conservation easements on them. Next, the task force held an open house, with invitations sent out to all landowners within the natural area and notices printed in the local newspapers. Fifty people attended; while they heard brief presentations about the significance of the natural area, they spent most of the evening in an informal setting where there were maps, natural resource displays, and many natural resource professionals available to answer questions.

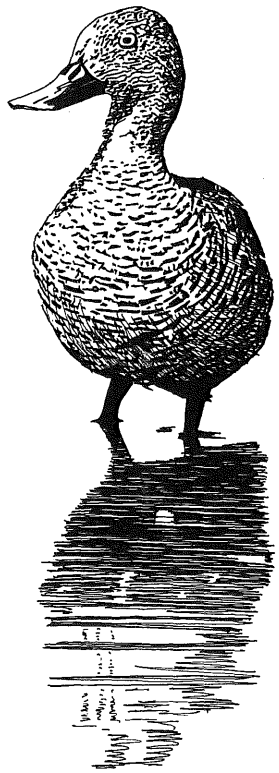
Recognizing that local citizen input would be important to the process, the task force established a steering committee to participate in development of a management plan for the public lands within the natural area. The steering committee was made up of twelve citizen volunteers, many of whom had attended the open house, and who represented a wide array of interests.

The steering committee developed a vision for the natural area for the year 2026 (thirty years hence) that

(Cont. next page)

focused on its continued existence as a "remote area, relatively undisturbed by human activities." In their vision, "the natural communities remain intact, and a diverse array of native plants and animals flourish within them" and the area is "open to the public for educational purposes and low-impact recreation, but the primary goal is to protect the natural vegetation and animals in the area." The group voted to name the public land the Sandhill Crane Natural Area, after the tall, stately, rare bird that makes its home there. They identified specific issues and actions needed to protect the area, including the appointment of an advisory board to carry out these actions in the future.

The success of this kind of venture cannot be measured by the number of acres protected, dollars spent, or even dollars saved. Instead, the project resulted in an extremely important change in the level of awareness and sense of responsibility that local residents share about this significant natural area in their backyards. Lorraine Bonin owns land that is within the East Bethel natural area and is a member of the steering committee. "One result of all those meetings we attended," she says, "is that we all appreciate more what a unique area we have here. We always appreciated it for our own enjoyment without realizing what a unique area it is. One of the biggest benefits I see is that people realize we have something that is worth preserving and taking care of."



5

Financing Acquisition of Land to Protect Natural Areas

When public acquisition has been selected as the most appropriate tool for protection of a valued natural area, the issue of financing quickly becomes paramount. It's often a classic "Catch-22." In undeveloped, sparsely populated areas, there may be abundant quality natural lands available for purchase at relatively reasonable cost, but the modest tax base and limited financial resources of local governments can make the prospect of securing the necessary funding seem remote at best. Conversely, in highly developed areas, there may be a large tax base and comparatively abundant financial resources, but few quality natural lands remain, and those that are left may carry a price tag that seems prohibitively high; especially in those instances involving developable land. In neither scenario is it desirable to delay taking action, since the costs of acquiring the land for protection will inevitably rise over time.

So what is the solution? In truth, there is not a single solution—there are many solutions, all of which are within the authority granted to local governments by state statute as regards the collection and disbursement of public funds. Around the state and across the country, communities have developed creative ways to fund fee simple acquisition (and acquisition of perpetual conservation easements) to protect natural areas. Following is a sampling that includes traditional sources of public financing as well as some innovative funding strategies that have proven successful in a variety of settings, from small rural towns, to suburban communities, to large metropolitan areas. Please note that many of the tools used to finance land acquisition may also be used to finance acquisition of conservation easements.

A. Locally-initiated funding

- **Acquisitions using general funds/cash**

  Expenditures from a local government's general fund are typically outlined in an approved operating budget, with expenditures outside of the budget required to pass through a series of reviews and approvals by various entities (e.g. planning commissions and committees) as defined by local policy. Land acquisitions may be made using appropriations from general funds exclusive-

ly, or (more commonly) using general funds to pay a portion of costs for a project in which part of the funding comes from other sources. An acquisition using general funds may in some cases be structured as a lease-purchase, a financing arrangement which does not require voter approval, as opposed to bonding measures, which do require voter approval. For example, Washington County has entered into a lease-purchase agreement to acquire a 579-acre parcel of land in the St. Croix Valley for a regional park (See Case Study, p.64).)

In Minnesota, the cities of Eden Prairie, Edina, Maplewood, Plymouth, and Maple Grove have all passed successful bonding measures to acquire natural and open space lands.

- **Disbursement from special funds**

  A special fund is a distinct account within a local government unit's operating budget that is earmarked exclusively for a defined purpose. Cash payments made by developers in lieu of dedicating land for parks/open space (to fulfill park dedication requirements of subdivision ordinances) are one example of a funding source that may be used to create a special fund for acquisition of natural areas. Grants with a dedicated purpose may also be used to set up a special fund.

- **Bonding measures**

  Within the context of their authority, local government units may issue bonds to make available the necessary funds for a single acquisition project or for a more extensive land acquisition program. In the broadest sense, a bonding measure may be viewed as a kind of loan, in which a local unit of government "borrows" the funds derived from sale of bonds to investors, and then uses the funds to accomplish a given project (for example, acquire a parcel of land). On a specified schedule, the local government unit must then repay the debt, including the principal as well as the interest owed to investors who purchased the issued bonds. Bond debt may be serviced out of general funds or by a combination of general funds and revenue sources either directly related to the project (e.g. user fees) or indirectly related (e.g. property tax increases to those who benefit from the project).

  Subject to federal requirements and applicable state law, bonds and other traditional debt instruments can be issued on a tax-exempt basis or on a taxable basis. Commonly, local governments will issue tax-exempt bonds, given their appeal to investors, for whom interest earned on their investment is tax-exempt. In the following two instances, however, a local government may choose to issue taxable bonds (or other financing instruments):

  1) when the public sector seeks to finance components of a project which do not have specific tax-exempt authorization under federal tax law (See Appendix I, p. 141), or 2) when, after reviewing various regulations and

(Cont. p.66)

Case Study

St. Croix Bluffs Regional Park—Case Study of a Lease-Purchase

When the 579-acre Ceridian Employee Recreation Area in the St. Croix River Valley became available for sale, it caught the interest of Washington County officials. County Commissioners saw the land, with its three-fourths of a mile of shoreline, as an opportunity to fulfill a need identified in the county's comprehensive plan: the need to increase public access to the river. They were aware of the rarity of such quality parcels along the river's bluffs, as well as the growing need for public parks and open space to balance the escalating rates of population growth and associated development occurring in the county.

The land was significant from an environmental perspective as well, in that it was located in one of twenty-four priority biodiversity protection landscapes in the state identified by The Nature Conservancy and the DNR. The Minnesota County Biological Survey had found that the site hosted two natural communities considered rare in the state—oak forest and bluff (dry) prairie. Kept in its undeveloped state, the land also served to foster protection of the St. Croix River, a designated riverway in the National Wild and Scenic Rivers system.

But county acquisition of the land presented challenges. While the county could conceivably receive funding for acquisition from the Metropolitan Regional Park System, the process would move too slowly to enable the county to act on the purchase in a time frame acceptable to the seller. Purchase via contract for deed was not a viable option either, because state law prohibits a sitting (current) county board from incurring general obligation debt that would obligate a future board without a referendum, a process that would also have taken too long.

In an innovative move, county commissioners opted to utilize a combination of outright purchase and a lease-purchase agreement. In October 1996, the county entered into an agreement with the board of Ceridian Employees Recreational Foundation, Inc., the nonprofit employee benefit group that owned the property. According to the agreement, the county would first acquire a 208-acre parcel outright for $1,128,158. The remaining 371 acres would be subject to a lease-purchase arrangement. An initial lease payment of $137,772 was made, to be followed by ten annual lease payments of $500,000, after which the county would take ownership of the property. The arrangement honors state law, in that it does not legally obligate a future board. If it wished, a future board could break the lease agreement, although doing so would be to forfeit any monies paid out in lease payments to that point.

With the combined outright purchase and the lease payments over time, the county could conceivably own the entire property in ten or fewer years at a cost of $6.3 million. Given that appraisals of the land's value based on different development scenarios ranged from $5.2 million to $11 million, the agreement clearly reflects the desire of Ceridian employees to see the land preserved as a park. It is to these employees, and to the foundation board representing them, that visitors to the newly named "St. Croix Bluffs Regional Park" owe a debt of gratitude. Thanks to their willingness to make the land affordable and to participate in a lease-purchase arrangement, the site will offer opportunities for many to experience the beauty of the St. Croix Valley, and—if managed with care—will continue to serve as a refuge for the state's natural heritage.

*stipulations required to issue tax-exempt obligations, the issuer may determine that it is more cost-effective or expeditious to pay the higher interest costs associated with a taxable financing.**

In Minnesota, successful bonding measures have been passed to acquire natural lands for parks and open space in a number of cities, including Maplewood ($5 million), Eden Prairie ($1.95 million), Plymouth ($2.2 million), Edina ($5.5 million), and Maple Grove ($4 million).

I get my inner peace from these places. When I can, I bring my son along, so he can know it, too.

Dave Engstrom, Washington County Commissioner

There are a number of variations in types of bonds and how they are structured:

Revenue Anticipation Bonds may be issued when a local government unit must act quickly on a project for which funding has been secured (e.g. an approved grant, or anticipated property tax revenues) but is not yet accessible.

Revenue Bonds are issued to enable a purchase or to construct a specific project, and are repaid solely from the income generated as a result of the project. For example, the debt from a revenue bond issued for construction of a bridge could be serviced by revenue generated from tolls. Because revenues from natural areas may in many cases be minimal (e.g. visitor fees, parking fees) to nonexistent, revenue bonds are not commonly issued to fund natural area acquisition except in instances where the natural area is protected in the context of a larger project that incorporates some kind of revenue-generating development or use.

General Obligation Bonds are commonly used to finance acquisition of land. Sometimes called "GO" bonds, they require voter (and often, legislative) approval. A specific parcel or parcels to be acquired may be identified at the time of bond issuance, or alternatively, a local government may issue a bond to address the broad goal of increasing public open space lands, setting in place a system by which sites will be prioritized for acquisition. GO bonds present a low risk to investors, in that they are backed by the "full faith and credit" (which includes the taxing, future borrowing power, plus revenue other than taxes) of the issuer, in this case, a local unit of government. Debt from general obligation bonds is typically repaid with general revenues, and may be supported in part by increased property taxes or other forms of taxation.

- **Special districts**

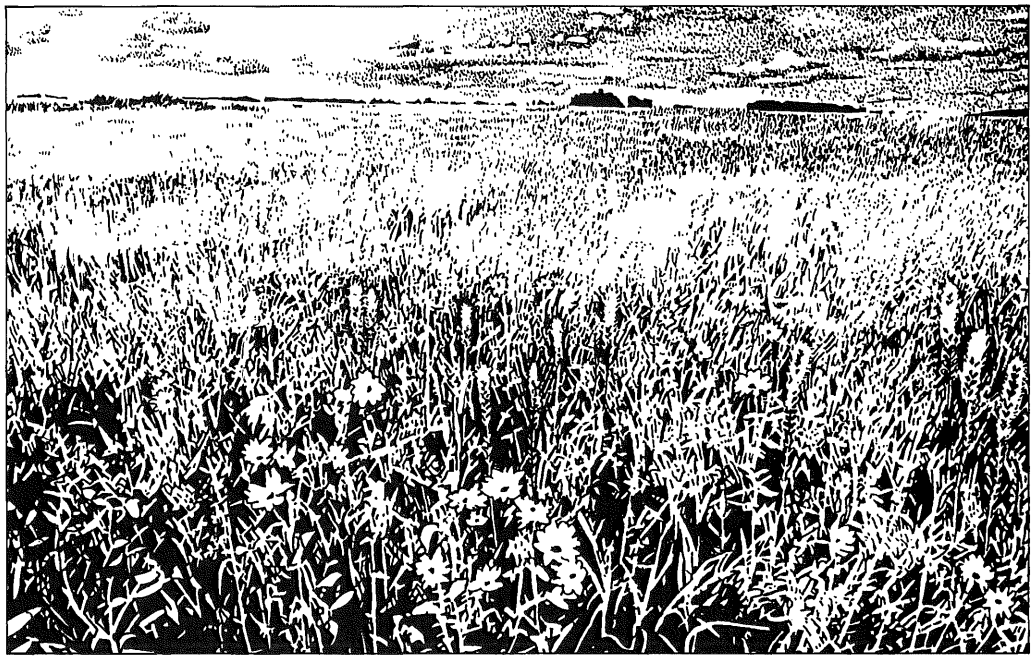
  A special district is a government agency that manages specific resources within defined boundaries. These can be established by local governments or

* Both examples excerpted with permission from "Financing Land Acquisition," (unpublished) by Diane Ostergren, President/CEO of CCS Financial Services, St. Louis, MO.

by voter initiative, depending on state laws and regulations. Depending on its authority, a special district may be able to raise funds through taxes, user fees, or bonds.*

- **Benefit assessment districts**

  A benefit assessment district can provide funding for a small open space acquisition that benefits a limited constituency. Local governments can establish a special assessment district and sell tax-exempt bonds. Within the district, an additional sales or property tax is assessed to pay interest on and repay the principal of the bonds. Benefit assessment districts differ from special districts in that they are funding mechanisms, not governmental bodies, and do not have management responsibilities.*



- **Certificates of participation (COPs)**

  Certificates of participation are debt issues that finance a local government's procurement of capital assets through a lease, installment sales agreement, or loan agreement. They do not qualify as general obligation debt to a local government, and do not require voter approval. Long used by local units of government for capital equipment purchases such as computer and phone systems, COPs can also be used to finance land acquisitions.

* Sections excerpted from the book Doing Deals, with permission from the Land Trust Alliance (LTA), Washington D.C. See full citation, p.103.

To set up financing through COPs, a local government or private organization designates a trustee (qualifying financial institution or government office). The trustee sells certificates to investors, holds the deed to the leased property, collects lease payments from the local government unit, and disperses payments to investors. Interest paid to investors (those who purchase certificates) is tax-exempt, and is typically higher than that paid out for bond issues because COPs are considered to carry a somewhat higher degree of risk, in that they are not backed by the full faith and credit of the issuer.

Local governments unfamiliar with COPs or with the application of COPs programs to land acquisition may wish to enlist the aid of a private organization such as the Trust for Public Land, that is experienced in using COPs for land acquisition projects (See inset, below).

A Model COPs Program:
The Trust for Public Land's Certificate of Participation Program for public financing of open space acquisitions

At the request of a local public agency such as a city parks department, the Trust for Public Land (TPL) obtains an option to purchase a threatened open space parcel. The public agency would acquire the land by executing a lease-purchase with TPL which enables the public agency to purchase the property over a five to fifteen year period. Simultaneously with the lease execution, TPL assigns the property and lease to a trustee bank, which issues certificates of participation (COPs) in the lease to investors and monitors annual lease payments from the public agency. Proceeds from the sale of the COPs are then used by TPL to purchase the property from the private landowner, who receives the total purchase price in one lump sum. Lease payments are passed through by the trustee bank to investors as principal and interest on the COPs, providing investors a tax-exempt return on their investment.

For information, contact TPL's Midwest Regional Office at: (612) 338-8494.

- **Grassroots/citizen fundraising initiatives**

  Citizen-run initiatives can be a vital component of major funding campaigns for natural area acquisitions. In addition to the funds they contribute directly, the demonstration of community support and related publicity are important factors in generating interest in a project from corporate donors and other major funders. (See Case Studies featuring Red Wing, p.72, and Rice County Wilderness Area, p.35.)

- **Acquisition of tax forfeiture lands**

  When local governments undertake a planning process that includes documentation and mapping of natural areas, it may be discovered that some high quality sites are located on tax forfeiture property. In some cases, tax forfeiture property may be available to local governments for purchase, offering a relatively low-cost opportunity for acquisition of important community natural areas. Communities interested in acquiring land for natural areas may wish to be attentive to the availability of tax forfeiture lands on an ongoing basis.

- **Acquisition via bargain sales**

  A local government can make an acquisition more affordable by working with the seller to reduce the price of a property in a bargain sale arrangement. What is the incentive for a seller to reduce the asking price for a property? When land is sold to a public agency (or to a qualifying private nonprofit organization) for an amount that is less than its appraised market value, the difference between the market value and the price paid is viewed by the Internal Revenue Service as a charitable contribution made by the seller. Subject to tax law, the seller may claim the donation as a deduction on his or her income taxes. The combination of this tax deduction and the reduced capital gains tax that must be paid on the proceeds from the sale of the property can make a bargain sale an attractive option for a seller, especially when he or she is enthusiastic about the prospect of the land being protected as a natural area.

The process of financing will be made far easier if protection of natural areas is specifically cited as a goal in an official local government document, such as a comprehensive plan, open space plan, or parks plan. These documents serve to establish need and to demonstrate community support, both of which are of interest to potential funders.

B. Twin Cities Metro Area Funding Sources

- **Metropolitan Regional Parks System**

  Communities in the seven-county Twin Cities metropolitan area (Dakota, Scott, Carver, Hennepin, Ramsey, Anoka and Washington Counties) may be eligible for regional funding for the acquisition of land for a natural area that meets the Metropolitan Council's guidelines for inclusion in the Regional Parks System. In its Recreation Open Space Development Guide, the Metropolitan Council cites qualities that make land desirable for inclusion in the system from a natural resources standpoint, including "good quality lakes, rivers and streams, undulating topography, gorges, rock outcrops, cliff areas, heavy stands of timber, interesting clusters of wild plants and flowers, and known habitats of native birds and animals." While the outdoor recreation emphasis of regional parks may not be appropriate for all fragile or environ-

mentally sensitive natural areas, it is feasible that such sites may be protected within the context of a larger park area through selective management and public use policy. Implementing agencies (typically counties) prepare master plans for sites proposed for inclusion in the system. Master plans must be approved by the Metropolitan Council, as advised by the Metropolitan Parks and Open Space Commission. Following master plan approval, the project "gets in line" with other projects as prioritized by the Metropolitan Council's capital improvement program. As regional funds become available, grants are made to the implementing agencies to purchase the land. Inquiries may be made to: Metropolitan Council, Mears Park Centre, 230 E. Fifth St., St. Paul, MN 55101, Tel. (612) 602-1000.

- **Livable Communities Demonstration Program**

  The Metropolitan Livable Communities Act (Minn. Stat. Ch. 473.25) authorizes the Metropolitan Council to establish the Livable Communities Demonstration Account, and to make grants or loans to communities participating in the Local Housing Incentives Program (Ch. 473.254) or to metropolitan counties for projects in eligible communities.The goal of the program is to provide incentives for and test the market feasibility of livable, compact, and efficient development that links jobs, transportation, and housing. Projects eligible for funding in new growth and redevelopment areas include those that can serve as a model for developments elsewhere in the region, that incorporate characteristics that help create a sense of place and a sense of community, and that address the principle of "design for people," which includes—among other things—the provision of parkland open spaces. For example, this program provided support for a project in St. Paul, MN, removing a declining shopping center in order to restore a wetland that had historically occupied the site. For qualifying criteria and applications, call or write: Metropolitan Council, Mears Park Centre, 230 East Fifth St., St. Paul, MN, 55101.Questions may be directed to Joanne Barron, Tel. (612) 602-1385.

- **Twin Cities Water Quality Initiative (TCQI) Grant Program**

  This program awards grants to projects that foster prevention and reduction in nonpoint pollution of the Metropolitan Area river system. As generally defined, "nonpoint" pollution includes inorganic and organic material that enters waterways via runoff from widely dispersed sources such as farm fields, urban areas, lawns, feedlots, on-site sewage systems, and erosion from disturbed or poorly vegetated slopes—in contrast to so-called "point" pollution from a distinct and identifiable source, such as a pipe emitting industrial waste. Grant-supported projects have included technical improvement

projects, public education initiatives, as well as acquisition of land and easements that serve as a buffer to prevent nonpoint pollution from entering waterways. Examples include awards of $100,000 each to the City of Chanhassen to help the city implement a plan to protect the Bluff Creek Watershed, and to the Scott County Soil and Water Conservation District to purchase easements on floodplains and shorelines in the Minnesota River Valley. Eligible recipients for TCQI grants include local units of government, watershed management organizations, nonprofit and trade organizations, and private property owners. Program grants support up to 75% of the cost of eligible projects (applicants must provide 25%), with a cap of $100,000 in support provided to a project in any one grant period. For qualifying criteria and applications, call or write: Metropolitan Council, Mears Park Centre, 230 East Fifth St., St. Paul, MN, 55101. Questions may be directed to Joe Mulcahy, Tel.(612) 602-1104.

C. State Funding Sources: A Sampling of Grants & Programs

The following state programs fall in one of two broadly defined categories: they either 1) assist local governments with acquisitions of land or easements, or they 2) provide funds directly to landowners so that protection is accomplished without the direct involvement of (or expenditure of funds by) a local government. In the case of the latter, the role of government can be to inform landowners of these voluntary options. (See also, Note to Readers, p.75, for additional resources regarding state funding sources.)

- **Natural and Scenic Area Grant Program**

  A matching grant program administered by the MN Department of Natural Resources, the Natural and Scenic Area Grant Program provides grants to local units of government, providing up to 50% of the cost of fee title acquisition, perpetual conservation easements, and betterment of natural and scenic areas. Proposals must have a minimum total project cost of $10,000. Maximum grant is $200,000. Cities, counties, townships and school districts are eligible.

  This grant program has helped make it possible for many communities to acquire important local natural areas.The city of Eden Prairie in Hennepin County received a grant of $145,000 to put toward the purchase of 15.8 acres of bluff land along the Minnesota River that is host to dry prairie, big

(Cont. p.73)

Case Study

A Showcase for Creative Financing—The City of Red Wing Acquires a Natural Area

Red Wing is a river city, its main street just a few blocks from the Mississippi, and its neighborhoods cradled in the valleys between dramatic sandstone and dolomite bluffs. It is a city that knows the importance of protecting its blufflands: for their rugged beauty, their sensitivity to erosion and related impact on water quality, their appeal to visitors and residents, and the natural communities they support. Preservation of open space in general, and of the blufflands in particular, is cited as a goal in the City's Comprehensive Plan.

Accordingly, when the opportunity arose to protect a major portion of the 180-acre bluff known as Coon—as in raccoon—Hill, residents and city officials went into action. Nearly half the hill was already in public ownership, owned by the local school district. The remainder was in private ownership. The owner of the largest privately-held parcel, a 72-acre property, already had an offer pending on the property from a developer. But she was willing to consider other alternatives, including the possibility that the City might acquire the land to protect it as a community natural area.

That the City was eventually successful in acquiring the property is a great accomplishment in itself, in that a future is now secured for the bluff's oak forest and prairie, wildlife, rare plants, and other natural features. But the success takes on even greater meaning when one considers how it was accomplished. Of the total funding package put together for the project, $15,000 was raised by a grassroots citizen initiative.Organized as the "Coon Hill Preservation Project," the group launched a community-wide appeal, engendering donations from local businesses, civic and sportsmens' groups, and individuals, including $11.05 raised by a childrens' lemonade stand. The Red Wing Wildlife League donated a piece of property with the understanding that it would be sold and the resulting $27,000 put toward the Coon Hill effort. The City applied for—and received—a $45,750 Natural and Scenic Area Grant from the Local Grants Program of the Department of Natural Resources (DNR). The landowner decided to donate twenty of her seventy-two acres, and three adjacent landowners donated an additional seven acres to extend the preserve area. Pro bono legal services were provided by a private attorney. The Minnesota DNR gave technical support and information about the site's natural features as requested by City staff and the citizens group. The private nonprofit Minnesota Land Trust (MLT) helped facilitate the process, serving as fiscal agent, exercising the option on the land, and transferring title to the City. After these collective efforts, less than $24,000 remained of the total project cost of $142,000, which the Red Wing City Council readily agreed to pay out of the City's general fund.

The project serves as a model for creative financing and for how a city can provide an appropriate level of protection to an important natural area. A perpetual conservation easement has been established on the land with the help of the MLT, defining legally-binding limitations on the site's development and use, and terms that will guide future management. "It's a definite 'win-win' outcome," says Red Wing Community Development Director Brian Peterson, "with none of the conflict that can arise with regulatory controls. The landowners are happy and the City met its objectives, thanks in good part to citizen actions. We're all pleased that a site of this value, that means so much to so many people, has been protected."

woods, and oak savanna communities, as well as a state-endangered plant species. Nicollet County also used $35,000 from this program to enable it to acquire twenty-five acres of land forested in mixed hardwoods (maple, basswood, red oak, and elm) to prevent future development that would negatively impact the viewshed of a scenic roadway and the integrity of the adjacent Seven Mile Creek Park. The City of Red Wing was also a recipient of a Natural and Scenic Area Grant for the Coon Hill project (See case study, p. 72).

For information, contact: Local Grants Program, Dept. of Natural Resources, Office of Planning, Box 10, 500 Lafayette Rd., St. Paul, MN, 55155-4010, Tel. (612) 296-1567.

- **Minnesota Environment and Natural Resources Trust Fund, Future Resources Fund and Great Lakes Protection Account**

  Minnesota's Environment and Natural Resources Trust Fund derives its funding from a constitutionally dedicated portion (40%) of the net proceeds from the state lottery, or roughly 7¢ of each dollar spent on lottery tickets. Invested in bonds and stocks, the interest and earnings from the fund are used to support an array of grant programs and projects that promote a quality natural environment in the state. The Future Resources Fund is from a portion of the cigarette tax, and supports new, innovative or accelerative natural resource projects designed to help maintain and enhance the state's natural resources. The Great Lakes Protection Account is derived from the state's contribution to the Great Lakes Protection Fund, and is designated for programs that protect water quality in the Great Lakes.

  Recommendations on allocations from these funds are made to the state legislature by the Legislative Commission on Minnesota Resources (LCMR), a bipartisan joint legislative committee. Project proposals may be submitted by public or private entities (for example, state and local units of government, universities, conservation groups, individuals) working independently or—more commonly—organized as coalitions working in partnerships on a given project. Proposals are accepted in alternate years. Projects recommended by the LCMR are forwarded to the state legislature to be considered for passage and appropriation of funds.

  Through this process, applicants have received funding support for a broad spectrum of projects, including the acquisition of land and easements. In 1996, for example, the LCMR recommended legislative appropriations of $75,000 for a project that will result in acquisition of easements to protect up to 250 acres in the Cannon River Watershed near Faribault, MN, and $396,000 to fund acquisition of up to 800 acres of prairie grasslands and

wetlands in the state. For proposal guidelines and current funding priorities (which vary each funding cycle), contact: LCMR, 100 Constitution Ave., Rm. 65, State Office Bldg., St. Paul, MN, 55155, Tel. (612) 296-2406.

- **Minnesota Native Prairie Bank Program**

  The Minnesota Native Prairie Bank Program is used to acquire conservation easements from landowners for land covered in native prairie vegetation. Local governments in parts of the state that host native prairie vegetation may wish to inform private landowners of this voluntary option.

  Priority is given to perpetual (permanent) easements. Land must meet certain specifications to be eligible, and funding is limited. Payment to the landowner for permanent easements may equal more than half of the estimated market value of the land. The Minnesota Native Prairie Bank Program is one of a suite of programs that receives its funding from the Reinvest in Minnesota Resources Fund (RIM).This legislatively appropriated fund supports an array of conservation activities, with private lands programs administered by the Board of Water and Soil Resources and public lands programs administered by the Minnesota DNR. For information on the Minnesota Native Prairie Bank Program, contact: Prairie Biologist, DNR Scientific and Natural Areas Program, 1221 East Fir Avenue, Fergus Falls, MN, 56537.

D. Federal Programs

- **Intermodal Surface Transportation Efficiency Act (ISTEA)**

  Federal ISTEA funds are allocated to states for the purpose of enhancing the nation's transportation system, which can include the acquisition of land and easements that protect scenic and natural areas located within broadly defined transportation corridors. Minnesota acquisition projects that have utilized ISTEA funds include Cedar Lake Park, Minneapolis, and a natural area/scenic overlook in the Mississippi bluffland region of Winona County. ISTEA will finance up to 80% of a project, with the remaining 20% financed by the state or local sponsors. For information, contact: Surface Transportation Policy Project, 1100 17th St. N.W., 10th Fl., Washington, D.C., 20036, Tel. (202) 466-2636.

- **Wetland Acquisition Program**

  The Wetland Acquisition Program provides funds with which the U.S. Fish and Wildlife Service may purchase fee titles or permanent easements on critical wetlands and adjacent uplands, with a primary emphasis on prairie wetlands that provide waterfowl habitat. Both public and private lands are eligi-

ble. For information contact: Regional FWS Headquarters, Federal Building, Fort Snelling, MN, 55111. Tel. (612) 725-3564.

- **Wetland Reserve Program**

  This U.S. Department of Agriculture program offers cash payments to private landowners who establish conservation easements on eligible wetlands, with 75-100% cost-share for permanent easements and 50-75% cost-share for 30-year easements. Information on this program is available through Natural Resources Conservation Service (NRCS) offices throughout the state.

Note to Readers:

The potential funding sources listed in this section represent only a sampling of those that exist to aid local governments in acquisition of land and easements, and do not include the many funding opportunities that can help communities protect natural lands through habitat enhancement and restoration projects, land retirement programs, and technical assistance programs. Readers interested in more comprehensive information about conservation programs may wish to obtain the following publications:

Minnesota's Natural Resource Conservation Programs. Free 11-page pamphlet available from the MN Extension Service, Tel. (612) 624-4900 if calling from withinin the Twin Cities metro area or 1-(800) 876-8636 if calling from outside the Twin Cities metro area. Specify Item FO-5946.

1997-1999 Financial Assistance Directory. Free from the Office of Planning, MN Department of Natural Resources, 500 Lafayette Rd., St. Paul, MN, 55155.

Guide to Minnesota and Corporate Giving Programs. Available for purchase from the Minnesota Council on Foundations, Tel. (612) 338-1989.*

Environmental Grantmaking Foundations. A national guide available for purchase from Resources for Global Sustainability, Tel. 1-(800) 724-1857.*

* Also available in reference sections of major public libraries.

Making it Work

In Minnesota and around the country, local governments are finding ways to finance land acquisition for parks and natural areas. The following examples of successful funding initiatives were reported in 1994-96 issues of GREENSENSE, a report on state and local land conservation finance published semiannually by the Trust for Public Land (TPL), a national land conservation organization.

• **Bath, OH:** Residents approved a .98 mill increase for a $3.8 million bond to purchase 1,510 acres of bogs, wetlands, and natural ponds. Note: a mill is one-tenth of a cent, and is the unit of measure used in levying property taxes against assessed value. In this instance, the mill increase amounts to $30 per $100,000 market value of a home each year for 20 years. (Vol. 2, No. 2, '96)

• **San Antonio, TX:** Residents approved a $41.6 million park acquisition and rehabilitation bond marketed as a "quality of life investment." (Vol. 1, No. 1, '94)

• **Eden Prairie, MN:** Residents approved a $1.95 million bond, financed by a small property tax increase, to buy ninety-six acres in the MN River Valley. (Vol. 1, No. 1, '94)

• **Evergreen, CO:** Residents approved a $700,000 bond to help purchase approximately four hundred acres of elk habitat. (Vol. 1, No. 1, '94)

• **Scottsdale, AZ:** Voters approved a .2 percent 30-year sales tax increase, which in its first year will provide $8 million toward the cost of establishing the 2,860-acre McDowell Sonoran Preserve, a mountain vista visible from the city. (Vol. 1, No. 3, '95)

• **Maplewood, MN:** Voters approved a $5 million bond to buy open space land with important natural resources, as prioritized by a citizens' commission. (Vol. 1, No. 1, '94)

• **Spokane County, WA:** A conservation futures tax approved by county commissioners was used to acquire forest lands along a creek, and add buffer lands to two parks. The tax assesses property owners about $6 annually on a $100,000 home. (Vol. 1, No. 3, '95)

• **Calvert County, MD:** Calvert County set up a revolving loan fund to help nonprofits buy recreational and natural land, park buffers, and historic sites. (Vol. 1, No. 2, '95)

Phyllis Myers, GREENSENSE's editor, is President of State Resource Strategies and a conservation policy consultant in Washington, D.C. For a free subscription to GREENSENSE, write: TPL, 116 New Montgomery Street, Fourth Floor, San Francisco, CA, 94105, or call 1-800-714-LAND or visit TPL's web site at http:/www.tpl.org./tpl. For editorial queries, e-mail Myers at greensense@igc.org or call (202) 797-5402.

Figure 7.

6

Management Considerations for Natural Areas on Public & Private Lands

The highest priority of natural areas management is to promote ecological integrity. This requires not only a quantitative, but also a qualitative, perspective. A manager must be concerned with maintaining a site's optimal composition, structure, and ability to function.

As was stated earlier, a site with ecological integrity will exhibit an assembly of native species in naturally occurring patterns as determined by the unique characteristics and history of a site. For a benchmark as to optimal conditions, management relies on the body of information available about the state's natural communities prior to European settlement, complemented by modern-day studies in botany, biogeography, and landscape ecology.

Understanding how a natural area works is a critical aspect of management, but what are managers to do with this understanding? At a time in the history of the state when protected natural areas were surrounded by similarly undeveloped land, it may have been possible for managers to follow a policy of "letting nature take its course." But today's natural area managers must take an active role, identifying existing and potential threats to a site's biological integrity, and then taking the necessary actions to remedy and prevent them as needed.

Degradation in a natural system is often subtle. Dramatic loss in ecological integrity can occur with little visible change in the general appearance of a site. Changes in the chemical composition of soil or water, for example, or imbalances in populations of native species, can seriously diminish the productivity and vitality of a natural community. A good management plan must be sensitive and responsive to such changes, taking steps to prevent unnatural alterations to a site's character before they become catastrophic.

Of course, natural areas today are found in a range of conditions, from large sites in remote wilderness areas to small sites within urban and suburban areas. The following general guidelines will be applicable in most instances.

A. General Guidelines for Site-based Management Planning

When planning for management of natural areas, it is helpful to seek the advice of natural resource professionals from natural resource agencies and educational institutions. They can provide information crucial to ensuring that critical features within natural areas are adequately protected. Ideally, this information is included in a management plan for each natural area. Each site is unique, requiring special consideration of the component natural communities, plants, and animals within it.

Development of a preliminary management plan may be necessary before a property is protected, to provide important baseline information during the period when a property is being considered for protection or when a development proposal is before local officials for consideration. If and when a property is acquired by a public agency for protection, a more detailed management plan may then be created and approved before any changes to the site are made (for example, landscaping, vegetation removal, trail construction, clearing of dead or downed wood). A management plan is also appropriate for properties to be protected by means of a conservation easement, in which case the plan should complement and abide by the terms of the easement.

A listing of the ideal components of a plan is provided on p. 86. It is recognized that staff and financial resources will limit the amount of planning that is possible, but these are elements to include when resources are available. It would be ideal to write a management plan for each natural area to ensure that critical features are adequately protected. These plans should be "adaptive," which means they are revised on an ongoing basis as new information about management techniques becomes available, and as research and monitoring demonstrate the most effective techniques. It may be useful to look at some actual management plans that have been prepared for natural areas. The DNR's Scientific and Natural Areas Program can provide sample plans (See Resources, p.99). See also references to the management plan for the Sandhill Crane Natural Area and the "Natural Resources Restoration and Management Plan" developed for natural resource areas in the City of Minnetonka, both of which are provided in the Notes section, p.105.

B. General Guidelines for Management of Natural Areas

• Avoid fragmentation

Fragmentation, in this context, refers to the division of a previously uninterrupted expanse of natural land into two or more sections, each a fragment of the original. Fragmentation can be caused by linear dividers (roads, trails, utilities corridors) or

by a patchwork pattern of development. Fragmentation of natural areas can create barriers to dispersal and recolonization of wildlife, create opportunities for undesirable and invasive exotic species, and even alter the local climate conditions by introducing greater exposure to sun and wind, causing a ripple effect of change throughout natural communities.

When fragmentation occurs, an artificial "edge" is created where a natural area meets a disturbed area. This increase of edge environments in a fragmented natural area may occur at the expense of species that require interior environments for territory or successful breeding. Many migratory songbirds, for example, require large uninterrupted blocks of forest in order to breed successfully, due in part to the increased number of predator species associated with edge environments.

Fragmentation may be avoided or minimized by restricting roads, trails, utilities corridors and other development in natural areas. In many cases, careful placement of developments can vastly reduce their negative impacts: a road or trail can be routed along the perimeter of a natural area rather than through the center. Similarly, structures may be located at the margins or clustered in one corner of a natural area rather than dispersed throughout. If fragmentation has already occurred, corridors of native vegetation—sometimes referred to as wildlife corridors—can in some cases be used effectively to link isolated natural areas. (See Wildlife Corridors, p.88.)

• Maximize interior environments

If feasible, configure natural area boundaries and direct protection efforts to create the largest possible interior core areas where disturbance of valued features can be expected to be minimal. Note in the second example on Figure 8, p.80, the difference in proportion of interior environment in three preserves with the same total area but with varying shapes. In the case of (b) and (c), most points within the preserves are relatively close to an edge, and are thus more subject to disturbance. Of course, in some instances the natural features will determine the appropriate configuration of a protected area; bluffs and river corridors, for example, are naturally linear.

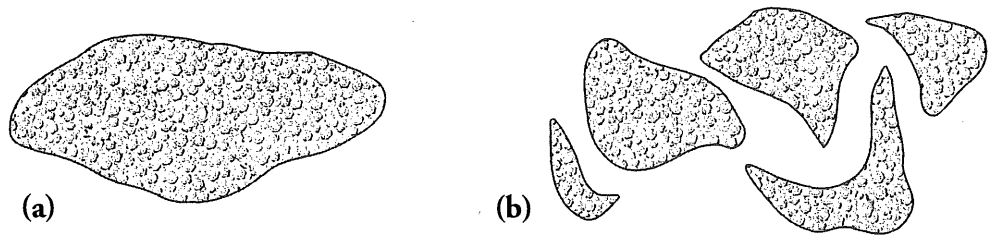
• Control exotic (non-native) species

Exotic plant and animal species are those that enter an ecosystem beyond their historic range, often as a direct or indirect result of human actions. While not inherently bad, these "out of place" species may cause great harm to natural communities by destroying or displacing native species. The damage wrought by harmful exotic species is particularly insidious, because areas degraded by exotics may retain many qualities (scenic beauty, expanses of green vegetation, colorful and showy blooming flowers) that an uneducated eye might perceive as signs of a healthy natural community. Many people would be surprised to find that a site they consider beautiful could, from a biological viewpoint, be highly degraded. *(Cont. p.81)*

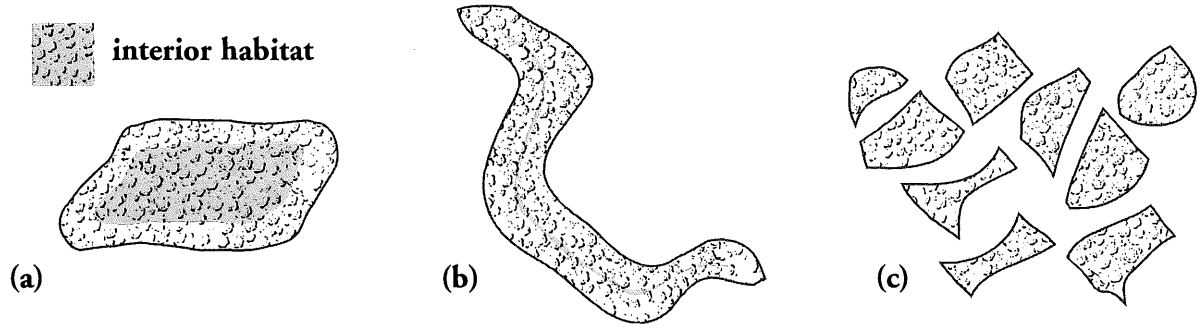
General Guidelines for Designing Natural Areas

Graphics by Tom Klein

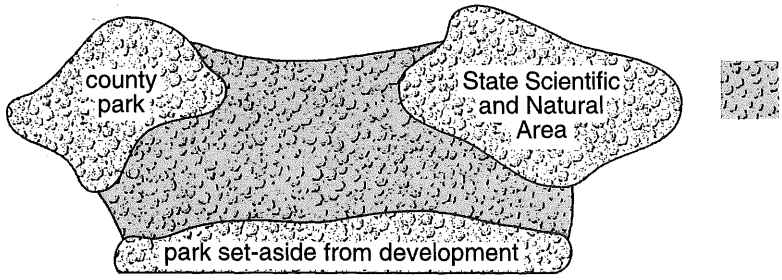
1. Maximize size of natural areas. In general, one large preserve (a) will function better than many small ones (b)



2. Maximize interior habitats (area 100 feet or more away from any edge). Note the varying amounts of interior habitat in each of the three differently configured examples, all with the same total area.



3. Promote continuous connections of native natural vegetation between natural areas.



Area kept in native vegetation, sheltered from development by conservation easement, zoning, or volunteer registry programs

4. Minimize unnatural edge habitat. Avoid fragmentation of natural areas by trails, roads, and recreational development. Site any necessary development along perimeter of natural areas.

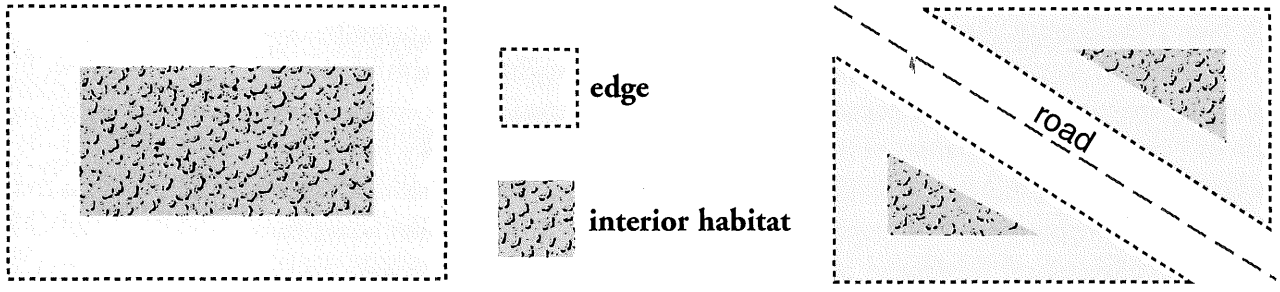


Figure 8.

A single invasive exotic species often displaces many native species, greatly reducing a natural area's overall diversity. A chain reaction can occur as loss of one native species brings about the loss of those native species that were dependent upon it, until the naturally-evolved system fails to function and can no longer be sustained. For example, purple loosestrife is a plant from Europe and Asia that invades marshes and lakeshores. First introduced into North America in the 1800s, it was later distributed as an ornamental because of its attractive flowers. It now occurs in wetlands in all Canadian border provinces and in forty states in the U.S., where it often forms dense, impenetrable thickets that replace a diverse array of native wetland plants that would otherwise provide food, cover, and nesting sites for many native wetland animals.

Management to prevent spread of exotic species will vary according to the type of natural communities present on a site. General guidelines would include:

1) Prohibit all planting of non-native species within the boundaries of natural areas and established buffer zones around natural areas.

2) Minimize planting and spread of non-native species on land adjacent to natural areas; encourage voluntary conservation practices through landowner education and/or attaining easements that keep adjacent lands in a cover of native species.

3) Limit or prohibit travel corridors and developments that disturb the ground and invite spread of exotic species.

4) Actively eradicate exotics through cutting, digging, careful and conservative use of herbicides, prescribed burning, and other legal control measures.

5) Maximize the health and vigor of populations of native species through sound management practices, in order to enhance their ability to compete with exotic species.

• Promote natural disturbance regimes

Many natural "disturbances" such as wind storms, lightning strikes, grazing by wildlife, episodes of fire or drought, or flooding are instruments of change that offer important—often essential—benefits to natural communities. In forest environments that have an unbroken canopy of trees, for example, the occasional downing of isolated trees due to storm winds provides clearings that allow sunlight to reach the forest floor, thus giving shade-intolerant saplings the boost of energy they need to grow, allowing for regeneration of the forest.

Analysis of the natural disturbance regime (the collective natural disturbances characteristic of a given site) can be very subjective, in that it is not always clear whether

the changes brought about by a natural disturbance are positive or negative. In general, a natural disturbance may be viewed as positive when it directly or indirectly contributes to conditions that

1) Maintain the mosaic of natural communities present at a site

2) Promote the vitality of highly valued natural community types or species that are rare or threatened in a given region, and/or

3) Allow communities to change in composition and structure over time at a rate consistent with the site's history (as opposed to the accelerated rates of change brought about by human-induced changes to the landscape)

Determinations must be made on a site by site basis. Short-term loss of individuals or decline in populations of species present at a site is not in itself sufficient cause to intervene with a natural disturbance if the disturbance is seen to bring overall benefits to the natural system over the long term. However, a manager might elect to intervene when the timing or scope of a natural disturbance pose a serious threat to a critical population (e.g. the short-term suppression of fire in an oak savanna until the population of a rare butterfly has completed its breeding cycle, or the placement of protective barriers around white pine seedlings in an old-growth stand of white pines in order to prevent overgrazing by white-tailed deer).

Promotion of natural disturbances may require prevention of non-natural disturbances, such as limiting the effects of dams and other controls that would interfere with natural water level fluctuations in a floodplain forest. Where fragmentation of natural areas or other alterations in the landscape have disrupted natural disturbance regimes, managers should seek restoration of the natural processes. If it is not feasible or practical to do so, management may seek to replicate necessary functions through stewardship practices. For example, the mechanical removal of brush or prescribed burns (the controlled use of fire) may be appropriate in some instances in order to replicate the natural lightning-set fires, fires intentionally set by indigenous people, and grazing by bison that once sustained the openness of prairie environments.

• Seek compatible use of adjacent land

On a map, a natural area typically is depicted as having discrete boundaries. If a natural area is acquired for protection, especially when the land is then formally designated as a preserve or park, these boundaries are then reinforced, often with the legal descriptions on a land's title. But in reality, natural areas rarely have precise boundaries. The component parts of natural areas (wildlife, plants, waterways, etc) actively interact with and are affected by the characteristics and use of adjacent lands. The surrounding land may be host to a wide range of landscape features. It

may include natural communities of a quality similar to those found within the natural areas boundary, often in combination with land developed for agriculture with features such as grazed woodlands, cultivated fields, planted windbreaks, and lowlands that host seasonal ponds. Land that is zoned low-density, rural residential, may retain small areas of native vegetation, while high-density development will include features such as mown grass, pavement, and the occasional garden planted with exotic species. Many of the same tools used to protect natural areas (see Chapter 4) can be used to promote compatible use of adjacent lands.

• Carefully guide public recreational use and related development

All but the most fragile and environmentally sensitive natural areas can accommodate some level of public use. Public use policies should reflect the primary goal of maintaining biological integrity, in that the allowable level and type of use be governed by the imperative to reduce negative impacts on the site.

Some sensitive and fragile sites are best managed exclusively as scientific study areas, with a permit required for access, and access carefully limited to those uses that will not degrade site integrity. Sensitive sites may include but are not limited to: areas dominated by steep and unstable slopes, habitats that support populations of easily disturbed rare plant and animal species (especially breeding grounds), and groundwater recharge areas. For other sites, a good strategy may be to permit public access, but elect not to encourage excessive public use through the development of trails, parking lots, large-scale signage, or other public facilities. Such developments, while appropriate for recreation-intensive parks, can have unacceptable impacts on the biological integrity of natural areas. Construction, existence, and use of trails, for example, may have the following repercussions:

- Reduced reproductive success of wildlife populations due to corridors of disturbance along trails
- Replacement of native species by invasive exotic species, which compete better in disturbed sites
- Soil compaction that interferes with plant growth and/or channelizes runoff, resulting in erosion that can increase sedimentation of waterways and destroy plant habitat
- Changes in microclimate (local temperature and humidity) that represent unfavorable conditions for natural communities and native species
- In forests in already fragmented landscapes, loss of habitat for interior habitat species, for which trails represent edges that bring increased threat from predators and competition from edge-associated species for food and nesting sites
- Increased wildlife mortality in seasons of stress (late winter), when fleeing from disturbance can use critical energy reserves.

Because of these potential impacts, the appropriateness of trails for a given natural area warrants careful consideration by managers (See Figure 9, p.85). If trails are considered a necessary element, managers can design routes and establish trail specifications that minimize negative impacts and help to accomplish management objectives such as guiding public use to less sensitive areas of a site.

Appropriate public use policies will be guided by the particular characteristics of a site and other factors such as the level of public use it may be expected to receive. For instance, seasonal closing of all or part of a natural area may be prudent during critical periods, such as the breeding/nesting season of a rare species known to utilize a site. Ongoing monitoring of the site will be important in order to assess impacts of public use and revise policy as needed. Educational outreach to neighbors, community residents, and site visitors will go a long way toward engendering public support for protective management of natural areas.

A copy of Minnesota's Native Vegetation: A Key to Natural Communities may be obtained by writing the Natural Heritage and Nongame Research Program, Minnesota DNR, Box 25, 500 Lafayette Rd., St. Paul, MN 55155-4007.

• Tailoring Management to Natural Communities

Aside from observing the general guidelines to promote biological integrity, management should be tailored to address the particular needs of natural communities present on a given site. The Minnesota Department of Natural Resources' Natural Heritage and Nongame Research Program and Minnesota County Biological Survey use a classification system for identification of natural communities. This system is detailed in Minnesota's Native Vegetation: A Key to Natural Communities, Version 1.5, available from the Natural Heritage and Nongame Research Program (see left). This system recognizes over fifty types of natural communities in the state, using vegetation as the primary distinguishing feature, but also considering topography, hydrology, landforms, substrates, soils, and natural disturbance regimes. Examples of natural communities include: dry oak savanna, northern conifer woodland, black spruce bog, floodplain forest, cattail marsh, wet prairie, and river beach. Natural resource specialists with ecological expertise should be consulted to develop management guidelines for specific natural communities.

Trails

The following planning model may prove useful as a guide when considering the use of trails in natural areas. For more comprehensive information about the relationships between trails and natural resources, consult the following sources: *Wildlife and Recreationists: Coexistence Through Management and Research,* ed. Richard L. Knight and Kevin. J. Gutzwiller (Island Press, 1995) and *Ecology of Greenways: Design and Function of Linear Conservation Areas* by Daniel S. Smith and Paul C. Hellmund (University of Minnesota Press, 1993).

Are trails really necessary? →

⬇

Trails are not a prerequisite for public access, and development of trails may in some instances increase public use to levels inappropriate for a sensitive natural area. Trails may be appropriate for high use sites to direct impact to those areas of a site that are best able to handle it. If sites are remote, can be expected to be exposed to minimal public use, or are of a nature that expected use will not damage site, managers may wish to consider maintaining without trails, monitoring regularly for changing site conditions and/or use patterns that may warrant trails.

If yes, how can they be routed to minimize negative impacts? →

⬇

Limit extent and number of trails. Leave extensive areas of site unfragmented by trails. To the extent possible, route trails away from steep slopes, seasonally wet soils, rare plants, known dens/nesting sites of wildlife, and waterways. When necessary, opt to run trails across rivers and streams rather than parallel along shorelines. Discourage travel to fragile areas by restricting trails or by limiting access to spur (dead-end) trails off of main routes.

What construction design standards will minimize negative impacts? →

⬇

Build trails narrow enough that they accommodate hikers traveling single-file, and clear vegetation only enough to allow passage. If trail surfacing is necessary to reduce erosion or runoff, surface with wood chips or gravel (rather than concrete or asphalt). Install water-control devices as needed to guide runoff so that alterations to local natural hydrology are minimal.

What management actions and public policies may be appropriate? →

Restrict or carefully control motorized vehicle use. Adopt a "no pets" policy, or require that pets be leashed. Consider closing portions of trails seasonally as needed to protect key wildlife nesting areas, den sites, feeding areas, and rare plants. Avoid construction of maintenance roads where practical. Monitor regularly. Educate visitors about how they can enjoy the site without causing harm.

Figure 9.

C. Elements of a Site-based Management Plan

Purpose

Describes values that were the rationale for the site's protection and defines the primary aim of management (e.g. to maintain the site's diversity of natural communities and its value as habitat for wildlife).

Summary

Overview of management plan, not to exceed two pages in length.

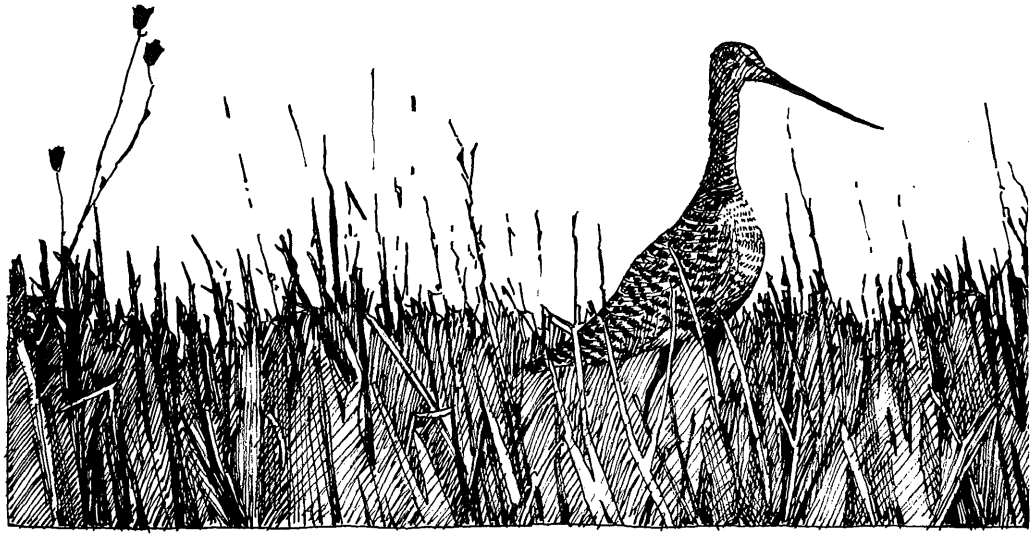
Property report

Describes current land uses, ownership, legal description of property.

Resource inventory

Assesses natural features in as comprehensive a manner as is reasonably possible. May include:

•significant landforms • bedrock and surficial geology • soil types• hydrology, water quality/character (e.g. dissolved oxygen, pollutants, and temperature) • natural communities • rare species occurrences • other native plant and animal species



Historical context

Includes a literature search and personal interviews to assemble information on a site's natural history and natural disturbance patterns as evidenced in presettlement surveys, pollen studies, and other available resources. Documents land use history.

Status analysis

A qualitative assessment in which the manager or team of natural resources specialists rank the importance of site features according to defined values. The ranking of features according to these values provides the basis for management goals and objectives. Values may include (but are not limited to) connectivity to other sites, degree of naturalness, rarity in a local or regional or state context, viability.

Management goals and objectives

Includes goals and objectives for a site's natural features (e.g. increase area of oak savanna by 50%), its level of development (e.g. maintain roadless conditions), and use (e.g. allow specified uses in some areas while establishing no-access areas as necessary to protect fragile/environmentally sensitive features).

Action plan

States specific actions to be taken to achieve objectives, with a timeline for implementation. Details any projects to restore degraded areas, practices to maintain or improve the quality of natural communities, methods to control spread of exotic species, and actions to minimize threats to natural features. If applicable, outlines public use policy (interpretive services, permitted and unpermitted uses).

Monitoring plan

Designed to help managers to measure the effectiveness of management techniques and evaluate the health of natural communities, plants, animals, and natural processes in a site. Details how monitoring will be accomplished and how the results of monitoring will be incorporated into management and protection planning. Natural resource specialists from agencies and universities can provide recommendations about the best monitoring techniques for each kind of site.

Budget

Outlines staffing requirements, equipment, and other projected expenses associated with performing the activities in the action plan. May identify source of funds.

Appendices

May include maps (depicting natural communities, ownership of natural area and surrounding land, rare species locations, visual representation of what the action plan is intended to achieve, use of adjacent lands), aerial photographs, species lists, bibliography of references used in plan preparation, reference to public policy (ordinances, codes) that affect the natural resource values of the site, glossary.

Wildlife Corridors

Definition:

A wildlife corridor may be defined as: 1) an area of continuous native vegetation designed to promote movement of wildlife between isolated natural areas, and/or 2) a series of patches of natural vegetation that may serve as "stepping stones" that provide cover and promote movement of wildlife between natural areas.

Benefits to wildlife:

A well-designed wildlife corridor will accommodate the necessary movements of resident and seasonal wildlife species in order to meet their basic habitat requirements for feeding, breeding, and resting. Corridors between natural areas can offer opportunity for dispersal of individuals when a natural area has reached its carrying capacity, and the recolonization of natural areas following local declines in populations related to catastrophic natural disturbances and disease. Provided that animals do in fact utilize the corridors and that the natural areas that they connect represent good quality habitat, corridors may prevent many of the hazards experienced by isolated populations, including:

- Diminished population health/vitality due to inbreeding and decline in genetic variability
- Local extinction of species
- Degradation of habitat due to overpopulation
- Lack of reproductive success due to unavailability of potential breeders and/or inappropriate habitat for nesting/raising young
- Mortality during seasons of stress (winter, drought) as a result of inability to make seasonal movements to appropriate habitat for food, cover.
- Inability of species to make natural expansions in range

Although wildlife corridors should not be considered a substitute for the protection of large natural areas, if a corridor is sufficiently wide, it may offer habitat for some species in addition to serving as a conduit for movement between natural areas.

Design considerations:

1). Native plant communities should be a major component of wildlife corridors. To a great extent, vegetation determines the suitability of an area for wildlife. Whenever possible, corridors should contain native plant species in a structure characteristic of the natural areas to be connected, and should be consistent with natural vegetation of the region determined by present-day inventories and historical data. The design of wildlife corridors should promote the ecological integrity of native plant communities and minimize spread of exotic species.

2). One cannot assume in designing corridors that "If you build it they will come." It is important to take into account the specific habitat requirements, known behavior, and existing and historic travel patterns of resident and seasonal wildlife species that inhabit the natural areas to be connected by a corridor. The corridor width and other specifications should be designed to accommodate the needs of the most sensitive species (those that are least tolerant of edge environments and most vulnerable to disturbance) and those species considered to be priorities. The proven effectiveness of various designs should be investigated before constructing any projects such as highway underpasses intended to serve as passages for wildlife.

3). While the word "corridor" suggests a linear configuration (an area contained within two parallel lines), a wildlife corridor can in fact be any shape. Corridor dimensions should promote the maximum possible degree of connectivity between natural areas.

4). Where recreational use of wildlife corridors is desirable, accommodations for passive recreation, such as narrow hiking trails, are most compatible with wildlife habitat needs (See Trails, p.85). While greenways along trails do provide benefits to wildlife that represent an improvement over many other types of development, it is generally inappropriate to refer to a trail greenway as a wildlife corridor unless the trail represents only a small portion of the area protected, is minimally developed, and receives only occasional use.

5). The appropriate size of a wildlife corridor is contextual—that is, it depends upon the specific circumstances of the situation. Determinants include the species of wildlife intended to use the corridor, the purposes that the corridor will serve for these species, the level of development and character of the surrounding landscape, and the natural community types involved (e.g. prairie, woodland, wetland). The help of specialists familiar with the wildlife and natural communities characteristic of the region should be sought when planning the optimal dimensions and location of wildlife corridors.

6). Protection of existing areas of natural vegetation is much easier and more cost-effective than restoration of disturbed sites; thus, early planning to protect corridors should be done before habitats are fragmented whenever possible.

Although no one formula can reliably be applied in all situations, the findings of studies of wildlife use of corridors offer interesting and important perspective into the varying tolerances of different species. In *Ecology of Greenways* (fully cited on p.106) Reed F. Noss relates the findings of a Virginia study on selected forest-interior birds: "Forest interior birds, which often avoid habitat edges, require wide forested corridors. In a study of bird use of remnant hardwood strips in pine plantations in Virginia (Tassone 1981), interior species usually occurred only in corridors at least 165 feet wide...pileated woodpeckers required minimum strip widths of 165-200 feet, and the parula warbler was generally restricted to strips 265 feet or wider." In *A Citizen's Guide to Conserving Riparian Forests* by Susan C. Peterson and Kenneth D. Kimball (fully cited on p.105) the authors cite studies in Vermont, Maine, and Pennsylvania related to the width of riparian corridors used by various wildlife species: "Reptiles and amphibians, of which the latter group has many species that require open water for part of their life cycle, generally use riparian forest buffers that are 100 to 200 feet in width in the Northeast (United States)...A study in Maine found 85% of the furbearers including species like the otter and mink are typically found within 330 feet of the waterfront...The width requirement for large mammals like coyotes, bobcats, red fox and fisher which use frozen streams and the close protected cover of riparian forests when traveling in their home range can extend outward to 400 feet...The width of riparian forest buffers needed to meet breeding songbird requirements varies. Studies in Pennsylvania suggest minimum corridor widths of 100 feet; in Vermont the recommendations vary from 250 to 575 feet; and in Maine from 200 to 330 feet. Raptors such as the Coopers, sharp-shinned and red shouldered hawk, osprey and bald eagle show a disproportionate use of riparian habitat in the first 330 feet back from the water."

Glossary

(See Notes for full citations of references used.)

best management practices (BMPs)

A practice or combination of practices determined by a state or designated areawide planning agency, after problem assessment, examination of alternative practices and appropriate public participation, to be the most effective, practicable means of preventing or reducing the amount of pollution generated by nonpoint sources, thus maintaining a level compatible with water quality goals. The term is also sometimes used to describe practices that achieve other natural resource goals such as scenic quality or wildlife habitat improvement. (adapted from *Protecting Water Quality and Wetlands in Forest Management: Best Management Practices in Minnesota*, Div. of Forestry, Minnesota DNR)

biological diversity (also, biodiversity)

The variety of life and its processes; it includes the variety of living organisms, the genetic differences among them, the communities and ecosystems in which they occur, and the ecological and evolutionary processes that keep them functioning, yet ever changing and adapting. (from *Saving Nature's Legacy*, R. Noss and A. Cooperrider)

buffer zone

A defined area of land that surrounds or borders a given natural feature (such as a river, designated natural area, or bluff) within which specified protections are established to minimize threats to the ecological integrity of the natural feature.

canopy

The upper layer of a forest, consisting of branches and leaves of taller trees. (from MN DNR *Woodland Stewardship Plan*)

carrying capacity

The population (of a given species) that an area will support without undergoing deterioration. (from Webster's *New Collegiate Dictionary*)

dispersal

The movement of organisms away from their point of origin; this may result in extending the range on the margin of an existing population by the colonization of new habitat within the range of the population or by the colonization of a distant location across a major physical barrier or unfavorable habitat. (from *Biogeography*, J. Brown and A. Gibson)

ecology

The study of the relationships between living organisms and their physical (nonliving) environment. In its broadest sense, ecology is the study of organisms as they exist in their natural environment. (from Harper Collins' *Environmental Science Dictionary*)

ecological integrity

Refers to a system's wholeness, including presence of all appropriate elements and occurrence of all natural processes at appropriate rates. A landscape or area with high ecological integrity reflects natural evolutionary processes. (adapted from Angermeir and Karr in *"Biological Integrity versus Biological Diversity as Policy Directives"*)

ecosystem

A dynamic complex of plant, animal, fungal, and microorganism communities and their associated nonliving environment interacting as an ecological unit. (from *Saving Nature's Legacy*, R. Noss and A. Cooperrider)

edge

The zone where two different habitat types meet. It can range from an abrupt change from one to the other (hard edge) to a gradual integration of the two (soft edge). An edge can be of natural origin (such as the area where a grassland meets a woodland) or man-made origin (such as the area where a roadway clearing meets a woodland). See also edge effects. (adapted from *Wisconsin's Biodiversity as a Management Issue*, WI DNR.)

edge effects

The ecological changes that occur at the boundaries of ecosystems; these include changes in species composition, gradients of moisture, sunlight, soil and air temperature, wind speed, etc. Many edge effects have negative consequences. For example, forest-interior species have their populations reduced by edge effects. (from *Saving Nature's Legacy*, R. Noss and A. Cooperrider)

environmentally sensitive area

Commonly used to describe areas whose destruction or disturbance will negatively affect the life or economic interests of a community by causing haz-

ards such as flooding, landslides, and pollution of groundwater and surface waters; or by causing loss of topsoil or property due to accelerated erosion. Also used to describe areas that: 1) possess ecological functions or natural elements that are known to be fragile and vulnerable to disruption or disturbance, 2) serve as habitat for rare species or threatened natural communities, or 3) possess other conservation values identified as important to a community, such as scenic beauty and wildlife breeding/nesting areas. (adapted from *Performance Controls for Sensitive Lands*, C. Thurow et. al.)

exotic (non-native) species

Any species or other biological material that enters an ecosystem beyond its historic range, including any such organism transferred from one country or state to another. See also: harmful exotic species. (from MN Statutes Chapter 84D.01, Subd.5)

fragmentation

The disruption of extensive habitats into isolated and small patches. Fragmentation has two primary negative components for living things: loss of total habitat area, and smaller, more isolated remaining habitat patches. (adapted from *Principles of Conservation Biology*, G. Meffe and C. Carrol et. al.)

groundwater

Water that occupies the pore spaces, the layers between boundaries of sedimentary rock strata (bedding planes), and joints of rocks, and originates from two main sources: as hot mineral water rising from deep within the earth, or as water resulting from percolation of precipitation and meltwater from the surface. Groundwater may return to the surface by seepage or through springs, or may be artificially withdrawn through the use of wells. (adapted from Harper Collins' *Environmental Science Dictionary*)

habitat

The place where an organism lives and its surrounding environment, including its biotic (living) and abiotic (nonliving) components. Habitat includes everything that an organism needs to survive. (adapted from *Wisconsin's Biodiversity as a Management Issue*, WI DNR.)

harmful exotic species

Any exotic species that can naturalize and either: (1) causes or may cause displacement of, or otherwise threaten, native species in their natural communities; or (2) threaten or may threaten natural resources or their use in the state. (from MN Statutes 84D.01, Subd.7.)

hydrological cycle

The cyclical movement of water from the ocean to the atmosphere, through rain to the surface, through runoff and groundwater to streams, and back to the sea. (from *Earth*, F. Press and R. Siever)

hydrology

The science of that part of the hydrologic cycle between rain and return to the sea; the study of water on and within the land. (from *Earth*, F. Press and R. Siever)

impervious surface

Generally used in reference to water, an impervious surface is one (e.g. pavement, asphalt, roofing material) through which water cannot drain. The existence of impervious surfaces is linked to increased rates and speed of runoff from an area, in that they prevent water from draining into the soil.

indicator species

A species used as a gauge for the condition of a particular habitat, community, or ecosystem. (from *Principles of Conservation Biology*, G. Meffe and C. Carrol et al)

interior species

A species adapted to the conditions of a forest interior. Populations of interior species may decline or cease to thrive if subjected to edge environments. (adapted from *Ecology of Greenways*, J. Thorne)

local government unit

A unit of government at the township, city, or county level.

native species

An animal or plant species, naturally present and reproducing within the state or that naturally expands from its historic range into the state. (from MN Statutes, Chapter 84.D.01, Subd.11)

natural area

A site largely unaltered by modern human activity, where native vegetation is distributed in naturally occurring patterns. See also, expanded definition, p.?

natural community

A group of native plants and animals that interact with each other and their abiotic (nonliving) environment in ways not greatly altered by modern human activity or by introduced organisms. (adapted from Minnesota's Native Vegetation: A Key to Natural Communities, Minnesota DNR)

natural disturbance events

Recurring perturbations (such as lightning-caused fires, high winds, storms, floods, insect outbreaks) that occur in ecosystems without human intervention. (from *Saving Nature's Legacy*, R. Noss and A. Cooperrider)

natural succession

The natural, sequential change of species composition of a community in a given area. (from *Principles of Conservation Biology*, G. Meffe and C. Carrol et. al.)

old-growth forest

A forest characterized by growth displaying successional stages that occur only after a relatively long period of time without a catastrophic disturbance. In Minnesota, old-growth forests probably develop after 125-150 years without a catastrophic disturbance. (adapted from *Old-growth Forests in Minnesota: A Preliminary Report*, Minnesota DNR Natural Heritage Program)

open space

Land that is largely free of man-made structures, where ground cover is such that rain may enter the soil to replenish groundwater. May include but is not limited to natural areas, parks, and agricultural lands. (adapted from *Land Protection Options*, L. Allmann)

population

In biology, any group of organisms belonging to the same species at the same time and place. (from *Saving Nature's Legacy*, R. Noss and A. Cooperrider)

prescribed burn

The intentional and carefully controlled use of fire as a management tool by trained conservation professionals. Prescribed burns are a management tool commonly used in the management of native grasslands, to replicate the ecological conditions that would typically occur as a result of natural (lightning-set) fires.

riparian

Relating to or living or located on the bank of a natural watercourse (as a river) or sometimes of a lake. (adapted from Webster's *New Collegiate Dictionary*)

understory

The vegetation that occurs below the canopy in a plant community. See canopy. (from *Minnesota's St. Croix River Valley and Anoka Sandplain*, D. Wovcha et. al.)

watershed

The region or area drained by a river, stream, etc.; drainage area. (from Random House *Dictionary of the English Language*)

wildlife corridor

1) an area of continuous native vegetation designed to promote connectivity and movement of wildlife between isolated natural areas, or 2) a series of patches of natural vegetation that may serve as "stepping stones" that promote connectivity and movement of wildlife between natural areas. (adapted from *Ecology of Greenways*, Smith et.al.)

Resources

The following private organizations and government agencies are especially good resources for assistance with natural areas information and protection. Other sources of information related to various aspects of natural areas protection are too numerous to list here, but include other government agencies, other programs within the Minnesota Department of Natural Resources, museums, public libraries, and universities.

FOR NATURAL FEATURES INFORMATION:

Natural Heritage and Nongame Research Program (NHNRP)
Minnesota County Biological Survey (MCBS)
Section of Ecological Services, Division of Fish and Wildlife
MN Dept. of Natural Resources
500 Lafayette Road, Box 25
St. Paul, MN 55155-4007
Tel.: (612) 296-8319 or 296-8324.
The NHNRP and MCBS are two programs of the Minnesota Department of Natural Resources that can provide information to local governments on known locations of rare and/or significant natural features in the state. Information may be useful for local governments involved in land conservation programs, environmental reviews, planning, management, research, and education.

FOR LAND PROTECTION TOOLS AND METHODS:

Friends of the Minnesota Valley
3815 East 80th Street
Bloomington, MN 55425-1600
Tel.: (612) 854-5900
Fax: (612) 725-3279
Friends of the Minnesota Valley is a nonprofit citizens group devoted to conserving the natural and cultural resources of the Minnesota Valley, and to promoting environmental education. Local governments may contact Friends of the Minnesota

Valley for information about the organization's Heritage Registry (a program that encourages landowners to voluntarily preserve the natural qualities of their property), and for help with informing their citizens about conservation practices along the Minnesota River and its tributaries.

Minnesota Land Trust (MLT)
70 North 22nd Avenue
Mpls., MN 55411-2237
Tel.: (612) 522-3743
The Minnesota Land Trust is a private, nonprofit organization that promotes the protection and enhancement of open space, including farmland, wetlands, woodlands, bluff lands, wildlife habitat, and scenic areas in Minnesota. MLT specializes in working with private citizens and public agencies (including local governments) that wish to establish perpetual conservation easements on qualifying land.

The Nature Conservancy (TNC), Minnesota Chapter
1313 Fifth Street Southeast, Suite 320
Mpls., MN 55414-1588
Tel.: (612) 331-0750
The Nature Conservancy is an international, private nonprofit organization. With priorities guided by science and ecological research, TNC protects land through acquisitions, gifts of land, management agreements, conservation easements, cooperation with state and local units of government, and enrollment of private landowners in a volunteer registry program.

Land Stewardship Project (LSP)
2200 Fourth St.
White Bear Lake, MN 55110
Tel.: (612) 653-0618
The Land Stewardship Project is a private, nonprofit membership organization that advocates for thoughtful community development that conserves farmland, forests, and natural resources. LSP fosters information exchange through workshops, videos and publications, partnerships with local governments, community groups and other organizations, and serves as a resource and referral center for information related to sustainable development issues, including such land protection tools as transfer and purchase of development rights programs.

FOR ASSISTANCE WITH PLANNING:

American Planning Association (APA)
122 S. Michigan Ave., Suite 1600
Chicago, IL 60603
Tel.: (312) 431-9100

The American Planning Association is a national nonprofit, public interest, and research organization with a membership of over 30,000 planners, elected and appointed officials, and citizens concerned about urban and rural development issues. Minnesota's APA Chapter publishes a monthly newsletter, sponsors professional development programs, conducts an annual meeting and offers networking opportunities for anyone with an interest in planning. Members have access to an advisory service that provides information on planning-related issues.

FOR STATE ACQUISITION AND/OR DEDICATION OF NATURAL AREAS:

Scientific and Natural Areas (SNA) Program
Section of Ecological Services, Division of Fish and Wildlife
MN Dept. of Natural Resources
500 Lafayette Road, Box 25
St. Paul, MN 55155-4007
Tel.: (612) 297-2357
The Scientific and Natural Areas Program selectively acquires and manages land throughout the state that hosts exceptional natural features such as undisturbed natural communities, rare or endangered species habitat, geologic formations, and seasonal habitat for concentrations of birds and other wildlife. Local governments may wish to contact the SNA Program to inquire about the potential for SNA designation of natural areas on existing public lands, or the protection of natural areas on private lands through acquisition from willing sellers.

FOR ASSISTANCE WITH FINANCING AND LAND TRANSACTIONS INVOLVING CONSERVATION REAL ESTATE:

The Trust for Public Land (TPL)
420 North 5th St., Suite 865
Mpls., MN 55401
Tel.: (612) 338-8494
The Trust for Public Land is a national nonprofit conservation organization with its Midwest Regional Office in the Twin Cities. TPL specializes in the purchase of properties from willing sellers, with subsequent resale of the land to public agencies or nonprofit organizations for public open space use. TPL can assist local governments with identification of potential funding sources and financing for land acquisitions, can serve as interim title holder while a public agency procures the funds necessary for a purchase, and can help local governments and community groups to implement campaigns to mobilize support for natural areas and open space projects and their funding.

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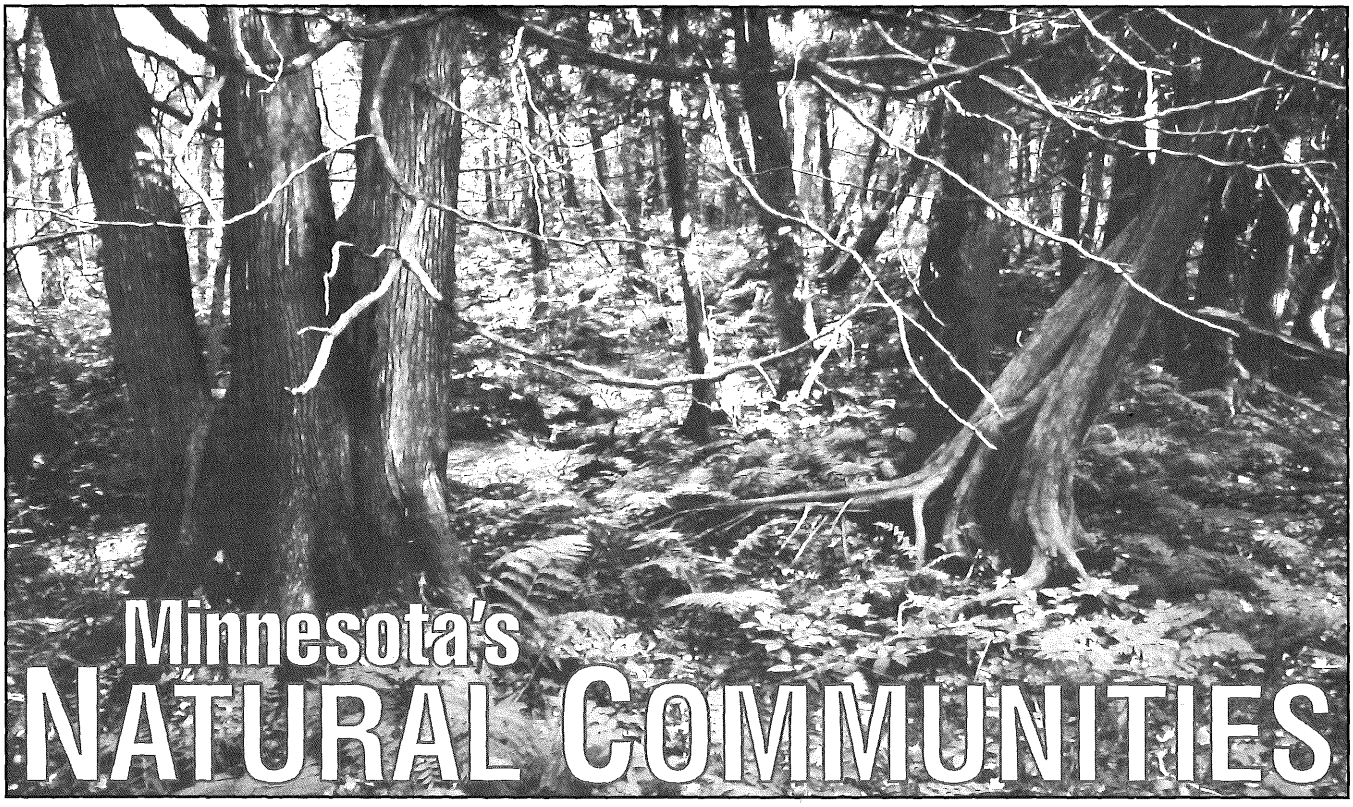
Appendices

APPENDIX A



Minnesota's NATURAL COMMUNITIES

The white cedar swamp is a natural community found primarily in the northern coniferous forest in Minnesota in low wet areas protected from fire.

The term "natural community" is being used by more and more people. Many wonder what natural communities are and why they are important. This fact sheet was written to answer basic questions about natural communities, their value to current and future generations of Minnesotans, and how citizens can help to protect these areas.

What is a natural community?

A natural community is a group of native plants and animals that interact with each other and their environment in ways not greatly altered by modern human activity. On the presettlement landscape, they were distributed according to climate, soil, and landform patterns. Natural disturbances such as wildfires, severe drought, windstorms, and floods helped to shape them.

Sometimes referred to as native habitats, natural communities are named for the dominant plant species within them or for characteristic environmental features. Examples of Minnesota's natural communities include dry oak savanna, upland white cedar forest, floodplain forest, wet meadow, and moist cliff.

There are several kinds of vegetated areas that are not natural communities. They include places where native species have largely been replaced by exotic species such as smooth brome grass, buckthorn, and purple loosestrife, and planted areas such as orchards, pine plantations, golf courses, and lawns. Other areas not considered to be natural communities include areas where modern human activities like farming, overgrazing, intensive logging, and development have destroyed or greatly altered the vegetation.

Where do they occur?

Three of North America's major biomes meet in Minnesota: the tallgrass prairie, the northern coniferous forest, and the eastern deciduous forest. When Euro-American settlers first arrived in Minnesota, the natural communities that defined these biomes occurred in complex patterns across the entire landscape. However, after more than a century of extensive settlement and development, the vast majority of natural communities in the state have been destroyed or substantially altered.

For example, of the 18 million acres of prairie that once covered one-third of the state, less than one percent remains. The great stands of pine forest that once defined the northern coniferous forest have been replaced by younger forests of aspen and birch. More than nine million acres of Minnesota's wetlands (over half) have been drained or filled.

While it is true that natural community remnants can still be found throughout the state in every county, these remnants make up a small proportion of the total landscape. In the 6 counties making up the northern metropolitan Twin Cities area, for example, less than 7% of the original natural community acreage remains.

A mesic prairie (left) and a hypothetical cross-section of a mesic prairie (below). Prairies once covered one third of the state. Today, less than 1% of the original extent of native prairie remains in Minnesota.

Why are natural communities important?

Natural communities are home to a large variety of native plants and animals that have resided in this part of North America for thousands of years. Many of these species are completely dependent on the continued health of natural communities for their survival. Natural communities also provide a connection to Minnesota's past, offering a glimpse of what the landscape looked like before it was extensively altered. In addition to these natural heritage values, natural communities are often scenic areas, providing wild places for hunting, fishing, hiking, and nature observation.

Who can help protect natural communities?

The probability that the state's remaining natural communities will still exist for future generations is greatly increased when all Minnesotans take on the responsibility of maintaining them. The key to protecting natural communities is for people to know they exist, to recognize their value, and to find ways to avoid destroying them. With this kind of understanding, wise decisions regarding development and economic growth can be made at the same time that steps are being taken to protect natural communities.

What does a natural community look like?

Several books and guides explain how to identify natural communities in Minnesota. People interested in recognizing and protecting these remnants of the state's natural heritage will find much useful information in the following publications:

Available from the Minnesota Department of Natural Resources, Natural Heritage Program, Box 25, 500 Lafayette Road, St. Paul, MN 55155. (612) 296-8319:

Minnesota's Native Vegetation: A Key to Natural Communities. Version 1.5. Minnesota Natural Heritage Program, 1993. Biological Report 20, Minnesota Department of Natural Resources. 110 pp.

Natural Vegetation of Minnesota at the Time of the Public Land Survey, 1847-1907. Biological Report 1, Minnesota Department of Natural Resources. 6 pp.

Available from the University of Minnesota Press, 111 Third Avenue South, Suite 290, Minneapolis, MN 55401. (612) 297-3000 or 1-800-657-3757:

Minnesota's St. Croix River Valley and Anoka Sandplain: A Guide to Native Habitats. By Daniel Wovcha, Barbara Delaney, and Gerda Nordquist. 1995. 234 pp.

Minnesota's Natural Heritage: An Ecological Perspective. By John Tester. 1995. 332 pp.

Minnesota
DEPARTMENT OF NATURAL RESOURCES

MINNESOTA
NATURAL HERITAGE
PROGRAM

APPENDIX B

THE NATURAL HERITAGE INFORMATION SYSTEM: A SOURCE FOR NATURAL AREAS AND RARE FEATURES INFORMATION

By Hannah Dunevitz, Plant Ecologist
DNR Natural Heritage and Nongame Research Program

Where to find natural area and rare features information

One of the most important steps in the process of protecting natural areas is to find out where they occur. This information can be obtained from the Natural Heritage Information System, housed in the Minnesota Department of Natural Resources' Section of Ecological Services. This system consists of over 20 computerized databases that contain information on the state's biological diversity.

The most complete information available comes from the Minnesota County Biological Survey (MCBS), one of the most detailed and sophisticated biological surveys in the nation. This systematic survey has been completed in 29 counties as of January 1997 (Figure 10). With continued funding, the entire state will eventually be surveyed. The goal of MCBS is to gather information on significant natural communities and rare plant and animal species on a county-by-county basis. When the survey has been completed in a county, the best natural areas and all known rare species locations are documented and recorded into the Natural Heritage Information System.

How is the Minnesota County Biological Survey done?

To begin with, aerial photographs and existing vegetation inventory data are reviewed to select areas that appear to have natural vegetation and/or rare species habitat. Next, plant ecologists visit many of the sites and examine the vegetation, rank the quality of the natural communities, and document rare plant occurrences. Characteristics used to determine natural community quality ranks include amount of past disturbance, presence of exotic invasive plants, and native plant diversity. Zoologists then visit sites with potential rare animal habitat and document rare birds, reptiles, amphibians, and mammals. They also collect some information about more common animals in selected sites.

All data are then entered into the Natural Heritage Information System, which includes the mapping capabilities of an ARC/INFO Geographic Information System. Natural communities that are relatively high quality and good-sized are mapped. (Specific criteria have been developed to determine what constitutes sufficient size and quality for each natural community to be mapped.) Each site is given a "biodiversity significance" rank of high, moderate, modest, or below the minimum biodiversity threshold. This ranking allows the user to evaluate the relative conservation importance of each site and determine which areas contain the most biological diversity. Highly ranked sites are those with healthy populations of very rare species, a high concentration of rare species, high quality rare natural communities, or large landscapes composed of good quality natural communities.

How to get natural area and rare features information

For many counties in which the Minnesota County Biological Survey has been completed, there are free maps available showing the locations of natural communities and the general locations of rare species. This information is available in electronic format as well, contingent on the signing of a cooperative agreement between the local government receiving the data and the DNR.

Whether or not the Minnesota County Biological Survey has been completed in a given county, rare features information is available in the form of a printout indicating known locations of natural communities and rare species. To obtain this information, users may submit a Natural Heritage Information System Data Request Form, obtained from the Natural Heritage and Nongame Research Program (see address and phone numbers on p.114). Requests are most frequently based on particular geographic areas (a city, county, or legal description).

Interpreting information from the Natural Heritage Information System

Once a list or map is obtained, it is important to understand the context of the information. There are various federal, state, and local legal protections that may apply to natural communities and rare species. Some of these legal protections include, but are not necessarily limited to, endangered species laws and wetland conservation laws. In addition, general environmental laws such as the Minnesota Environmental Policy Act (Minn. Stat. ch. 116D) and the Minnesota Environmental Rights Act (Minn. Stat. ch. 116B) protect natural resources from "pollution, impairment, or destruction" and may be applicable. In particular circumstances, it may be helpful to obtain legal advice on the extent to which any natural community or rare feature is legally protected.

Aside from legal protection, it is helpful to know the range and overall rarity of natural communities and species. For example, the state endangered plant kittentails is endemic to the midwestern United States, meaning it occurs nowhere else in the world except the midwest. It is confined to prairies and oak savannas, habitats that are now extremely rare in Minnesota. Whether kittentails are rare or common in a given site, it helps to understand the broader context of the species to know why every population is significant.

Obtaining information on other natural resource areas

In the process of conducting biological surveys, some areas identified by MCBS ecologists initially from aerial photographs turn out to be too disturbed to be mapped as natural communities with statewide significance. However, some of these areas, together with other vegetation providing natural resource functions, are locally very significant. For example, an old field can provide important habitat for nesting turtles or small mammals, but would not be mapped by MCBS as a natural community. Similarly, a forest that has been heavily grazed in the past and has been invaded by a non-native invasive plant species like European buckthorn may provide the only forest songbird habitat in a particular city, but be too disturbed to be mapped as a natural community by MCBS.

Many municipalities have taken steps to determine the locations of local lands that provide important wildlife habitat and other natural resource functions. This information is then added to rare features information from the Natural Heritage Information System in order to determine overall land protection strategies. Ideally, this is done using a Geographic Information Systems format. ARC/INFO is the most widely

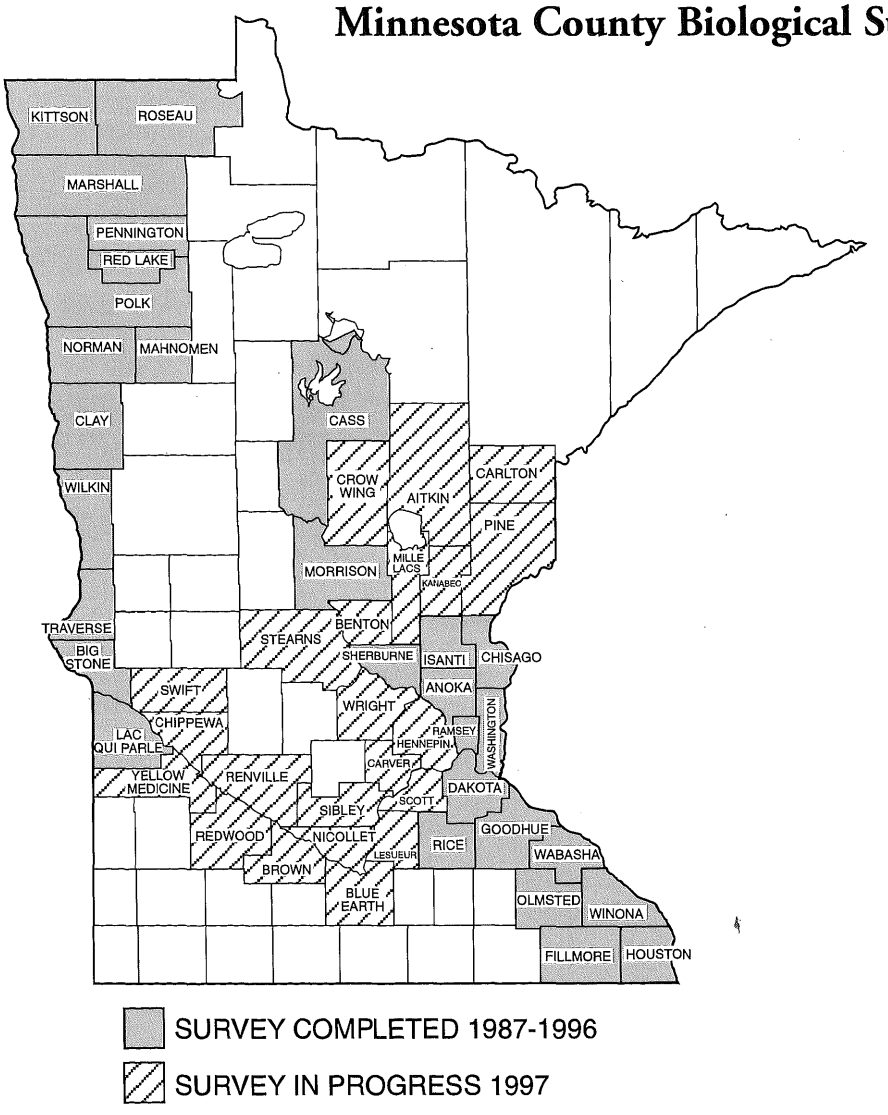
used system. Minnesota local governments that have worked to incorporate information about natural areas and other natural resource sites into their comprehensive plans using ARC/INFO include Dakota County, Olmsted County, and the cities of Red Wing and Chanhassen.

To obtain information about the Natural Heritage Information System or the Minnesota County Biological Survey, contact:

Natural Heritage and Nongame Research Program
Minnesota DNR
Box 25, 500 Lafayette Road
St. Paul, MN 55155-4007
(612) 296-8319 or 296-8324

Figure 10.

Minnesota County Biological Survey



APPENDIX C

MAPLEWOOD RANKS ITS OPEN SPACE

City of Maplewood Open Space Committee Critera for Rating Conservation Open Space

Definition

Open Space areas for the purpose of this criteria are defined as undeveloped lands or natural landscape features with scenic, esthetic, or conservation value, including woodlands, grasslands and wetlands, intended to be preserved in their natural undeveloped state.

Location

1. Distance to other Open space (more than half mile)—Nearest other designated open space area (city or county) is more than a half mile away.
2. Distance to other Open Space (more than one mile)—Nearest other designated open space area (city or county) is more than a mile away.
3. Early acquisition—The proposed site is one which involves early acquisition of conservation open space in an area where long range neighborhood residential development is anticipated and where no public ownership exists.
4. Last Suitable Site—The proposed site will preserve the last remnant of land suitable for preservation as open space. (Last suitable in terms of Maplewood neighborhoods as defined in the land use plan).
5. Danger of Loss—The proposed site is in imminent danger of loss to development. (Imminent danger of loss—development of the area is under consideration by the planning commission).

Linear Corridor/Linkage

6. Linear Open Space Corridor—The proposed site encompasses a linear open space corridor that promotes linkage of existing open space elements.
7. Adjacent to designated open space (city or county).
8. Adjacent to City or County Park.

Number of Residents in Immediate Area

9. Serves High Density Neighborhood (RH, RM)—The proposed site is in a neighborhood with a land use classification of RH or RM.
10. Rapid Population Growth—The proposed site is in a service area with evidence of —or projections for—rapid population growth (development) and there is an existing deficiency of conservation open space in the area.
11. Number of People Served—The proposed site serves, or will serve, a large number of residential units (more than 20) immediately adjacent to the area. This is meant to be a measure of total people served. Thus, the assumption is made that the residential units immediately adjacent to the area reflect the nature of the neighborhood served.
12. Site Size—The site on which the Open Space Area is located is of adequate size (greater than 1 acre) to include reasonable consolidated physiographic units to permit adequate maintenance.

Aesthetic Value

The area should have an aesthetic/visual value which enhances the site and the neighborhood where it is located.

13. Vista—The site provides an interesting vista out from the open space.
14. Vista of open space—The site provides a vista of the open space itself.
15. Overall unity, detailed diversity—There is an overall unity to the site that is pleasing to the eye but provides a visual diversity of nature on a detail level.
16. Color and texture year round—The site provides seasonal color and texture to the neighbor due to the presence of trees and plants that provide a diversity of color during the four seasons of the year. For example, a site may contain evergreens, birch trees, and sumac.
17. Running water—The site contains clean, running water.
18. Bluff or rock formations—The site contains a bluff or interesting rock formations.

Ecological Factors

19. Ecological Sensitivity—The vegetation and wildlife, or other ecological factors on the site where the Open Space Area is located CANNOT tolerate the proposed site development, and development cannot be planned and carried out so as to keep disturbance of such natural factors at a minimum. The primary example of this would be a stand of mature oaks on a slope of 30 degrees or greater, with sandy soil.
20. Not suitable for development—The soil, topography, and drainage characteristics of the site on which the Open Space Area is located are NOT suitable for development without excessive grading, foundation work, or future high maintenance costs.
21. Endangered Species—Area contains plants, animals, or birds that are included in the DNR's list of Minnesota endangered, threatened or special interest species.
22. Habitat for rare birds or animals—Area serves as habitat for rare or uncommon birds or animals, including migratory.
23. Special geological significance—Area has special geologic significance which serves as a valuable example of land formations not preserved elsewhere in Maplewood.

Unique Natural Resource

The natural resource embodied should be unique. The proposed site should provide protection of areas which contain unique or scarce natural resources or an especially good example of a certain resource unit.

A valuable example of a certain cover type or wetland type is defined as an example in which that cover type meets one of the descriptions given below, still remains undisturbed by surrounding development, and is mostly if not completely within the open space area under consideration, so that preservation of that area would assure long term protection of the cover type.

24. Valuable example of Oak cover type—These stands would have red, white or bur oak as the major species and most often in combination. Numerous other tree species and shrubs would also be present in lesser amounts. These areas are valuable for both development and wild habitat. As wild habitat they are used by a wide variety of birds and animals as well as being aesthetically pleasing.

Oak is very sensitive to damage from human activities such as soil compacting, sudden exposure to excess sunlight and physical damage to the tree. Red oak is most susceptible to oak wilt with the other two relatively resistant. Bur oak is the least sensitive to construction damage. All are very valuable food producers for wildlife and also provide long term cavities for cavity dwellers. Undisturbed oak stands are rare in this part of the state, but stands may exist. Forest grown trees are not particularly desirable for yard trees because they have long trunks without branches and a small crown at the top. Open grown trees such as one would find in a pasture or Savannah have a spreading character and are more picturesque. These open grown trees are less affected by development than trees that are in the dense forest. Oak is not a climax forest in this area and has a tendency to evolve into a maple-basswood forest that is self sustaining.

25. Valuable example of lowland hardwoods—This represents a further successional stage of wetland ecology. Species common to these sites are green or black ash, cottonwood, silver maple, and black willow. All of these trees have developed shallow root systems to stay above the saturated part of the soil. Tree roots cannot grow in saturated soil because oxygen is not present and roots need oxygen to carry on their normal functions. The trees help to keep these soils from being overly wet through evapo-transpiration. It is not uncommon to see lowland hardwood areas that become too wet for trees after the original forest was cut off. These sites should be left as is except to monitor disease and insect problems. Wildlife is a major user of these sites and they can also be used for winter-time trail types of recreation.

25a. Valuable example of mixed hardwoods—These wooded areas have the greatest diversity of species that will be found and no one species has a predominant presence. Species that may be present include red oak, white oak, bur oak, blackberry, basswood, and paper birch. This association of species will usually occur on sites that are moister and more fertile than sites that have oak as the predominant species. The greater diversity of species makes the area less susceptible to severe insect and disease problems. Most insect and disease problems are fairly specific to a certain tree species so it is unlikely that a single problem would have a highly visible impact. The more shade tolerant species will increase in numbers if the area is not disturbed. The more shade tolerant species are green ash, hickory, basswood, elm, black cherry, and red maple. The great diversity of species also makes these areas very good wildlife habitat.

26. Valuable example of upland brush—These sites contain a wide variety of woody species that do not reach tree size. Often there are many seedlings and saplings of trees mixed into the brush as part of the natural successional chain of events. It would be quite rare for these areas to remain in brush for a long time as this is a transitional stage between grass and woodland. If left undisturbed these areas will gradually turn into oak forests. A good example of this type may be a good educational tool for demonstrating natural succession.

27. Valuable example of upland grass (possible prairie)—The grass areas will be old fields and pastures that have not reverted to brush or woodlands. The most valuable example of a grassland would be native prairie.

28. Area contains a valuable example of Type 2, 3 or 4 wetland.Type 2 wetland—Inland fresh meadow—Occurs along the shallow edges of lakes, marshes and flood plains, or in perched depressions. Soil is usually without standing water during much of the growing season, but is waterlogged

within at least a few inches of the surface. Vegetation includes grasses, sedges, rushes and various herbaceous plants. Type 3 wetland—Inland shallow fresh marsh—Soil is usually waterlogged during the growing season, often covered with as much as six inches or more of water. Vegetation includes grasses, bulrushes, cattails, arrowheads, smartweeds and other emergent aquatic vegetation. Type 4 wetland —Inland deep fresh marsh—Soil covered with six inches to three feet or more of water during the growing season. Vegetation includes cattails, reeds, bulrushes and wild rice. Open water areas may contain pondweeds, naiads, coontails, water milfoils and other submergent aquatic vegetation.

29. Area contains a valuable example of a Type 5 wetland—Inland open fresh water (shallow ponds) — Water is usually less than 10 feet deep and is fringed by a border of emergent vegetation. Vegetation includes pondweeds, naiads, coontails, water milfoils and other submergent aquatic vegetation.
30. Area contains a valuable example of a Type 6 or 7 wetland. Type 6 wetland—Inland shrub swamp—Occurs along sluggish streams or on flood plains. The soil is usually waterlogged during the growing season, and is often covered with as much as six inches of water. Vegetation includes alder, willow and dogwood. Type 7 wetland—Wooded swamps—Occur along sluggish streams, on flood plains, on flat perched depressions and in shallow lake basins. The soil is waterlogged to within a few inches of the surface during the growing season and is often covered with as much as a foot of water. Vegetation typical to this wetland type includes tamarack, white cedar, black spruce, balsam fir, red maple and black ash.
31. Area contains a valuable example of a Type 8 wetland—Bogs—Occur along sluggish streams, on flat perched depressions and shallow lake basins. The soil is waterlogged and supports a spongy covering or mosses. Vegetation typical to this area includes sphagnum moss, heath shrubs and sedges. Minnesota bogs contain leatherleaf, Labrador tea, cranberries and pitcher plants. Scattered stunted black spruce and tamarack also are common features of bogs.
32. Moving water—Valuable example of an ecosystem that contains moving water.
33. Edges (more than 1)—The value of a site to wildlife is enhanced by edges (transition areas). This site has greater than one clearly defined transition area.
34. Edges (more than 3)—This site has greater than three clearly defined transition areas.
35. Unique Natural Process—The proposed site encompasses an area which portrays some specific natural process or ecological relationship so dramatically as to be unique or of sufficient importance to be of area-wide significance.
36. Historical Significance—Area is of special historic significance to Maplewood due to events that occurred at this location in the past.

Public Action Necessary

37. Public Action Required—The proposed site can be conserved/protected only through public acquisition or regulation, and will not be accomplished through private efforts.

Harmony with City Comprehensive Plans

The proposed site should encourage/promulgate a desired urban development pattern. The Open Space Area, in and of itself, can be termed an urban shaper at large scale, by either protecting areas unsuited for

other forms of urban development, providing buffers for incompatible land use, or becoming part of a greenbelt used to shape urban form at a city or neighborhood level. A site could involve underdeveloped or predominantly undeveloped land, which, if withheld from commercial, industrial, and residential development, would have special significance in helping to shape desired urban patterns. Therefore the proposed site will be in harmony with either the city's comprehensive development plan, city financial plans, or neighborhood sketch plans.

38. Separates residential from other uses—The site separates residential from other uses.
39. Screens less than beautiful areas—The site serves to screen less than beautiful areas.
40. Defines neighborhood boundaries—The site serves to define neighborhood (as defined in the Comprehensive Land Use Plan) boundaries.
41. Satisfy Land Deficiencies—The proposed site will satisfy (or help to satisfy) open space land deficiencies for a specific use existing at the city or neighborhood level as determined by the Maplewood Comprehensive Land Use Plan. (Not currently applicable, but would be used during reevaluation after an Open Space Plan is approved).
42. Currently planned for Open Space—Property is currently identified as Open Space in the Maplewood Comprehensive Land Use Plan.

Special Opportunities

43. Special Circumstances—The proposed site involves taking advantage of special circumstances such as availability of committed non-city funds for the specific area, or potential for economic contributions from: adjacent homeowners, developers, public agencies, etc.—makes it especially advantageous for the public to act.
44. Intergovernmental Cooperation—The proposed site demonstrates intergovernmental or interagency cooperation in terms of acquisition, development, or maintenance. Either through planning, financing, staffing, or programming.

Public Access

45. Safe and Easy Access—The potential neighborhood users of the proposed site do not have to cross either natural or man-made barriers or hazards which would limit safe access for all users to the site.
46. Accessibility (Roads and Highways)—The proposed site should have access by means of an arterial or collector street which is of sufficient width and has been properly developed to standard so that the user traffic is not an intrusion on local streets and residential areas.
47. Parking—Parking is available in the area.

Multiple Open Space Use

48. Multiple Use—The site on which the Open Space Area is located can serve multiple open space uses. It has the potential of providing a variety of open space uses including recreation, conservation/protection of natural resource elements, or shaping urban form. Note—Since the primary use of the proposed site is conservation/protection of natural resource areas the recreational use should be the sort that will not destroy or impair the natural features and values which are being preserved.

49. Near Public Schools—The proposed site is located near a public school, and could be used for educational purposes.

Suitability of Trails

50. Public trail system—Area can be or is part of a public trail system.
51. Year-Round Recreation—The proposed site will provide recreational open space opportunities (hiking, cross country skiing, snow shoeing) on a year-round basis as opposed to a seasonal use.

Maintenance

52. Maintenance cost to city—The maintenance cost to the city, of the proposed site, is in line with other conservation open space areas in the city. (i.e. area does not have problems with diseased trees, or erosion).
53. Potential maintenance agreements—Potential exists for an agreement for maintenance of this area (by schools, clubs, scouts, etc.).

Community Participation

54. Neighborhood Participation—There is evidence that the proposed site has the support of the residents in the neighborhood in which it is located.

Maplewood Open Space Committee Rating Form

Identification Number: _____

Location: _____

_____

Owner: _____ Phone: _____ Contacted: _____

Owners Response: _____

Approximate Value: _____ Acreage: _____

CRITERIA (criteria starred with (*) to be completed in the field, all others may be completed as data becomes available)

	Possible Points	Points Given
LOCATION		
1. Distance to other Open space (more than half mile)	1	____
2. Distance to other Open space (more than one mile)	1	____
3. Early acquisition	2	____
4. Last Suitable Site	3	____
5. Danger of Loss	3	____
LINEAR CORRIDOR/LINKAGE		
6. Linear Open Space Corridor	2	____*
7. Adjacent to designated open space (city or county)	1	____
8. Adjacent to City or County Park	1	____
NUMBER OF RESIDENCES IN IMMEDIATE AREA		
9. Serves High Density Neighborhood (RH, RM)	1	____
10. Rapid Population Growth	1	____
11. Number of People Served	1	____
12. Site Size (greater than 1 acre)	1	____
AESTHETIC VALUE		
13. Vista	1	____*
14. Vista of open space	1	____*
15. Overall unity, detailed diversity	2	____*
16. Color and texture year round	1	____*
17. Running water	2	____*
18. Bluff or rock formations	2	____*
ECOLOGICAL FACTORS		
19. Ecological Sensitivity	2	____*
20. Not suitable for development	1	____*
21. Endangered Species	3	____*
22. Habitat for rare birds or animals	3	____*
23. Special geological significance	3	____*
UNIQUE NATURAL RESOURCE		
24. Valuable example of Oak cover type	2	____*
25. Valuable example of lowland hardwoods	2	____*
26. Valuable example of upland brush	2	____*

27. Valuable example of upland grass (possible prairie)	2	____*
28. Type 2, 3, or 4 wetland	2	____*
29. Type 5 wetland	2	____*
30. Type 6 or 7 wetland	2	____*
31. Type 8 wetland	2	____*
32. Moving water	2	____*
33. Edges (more than 1)	2	____*
34. Edges (more than 3)	2	____*
35. Unique Natural Process	2	____*
36. Historical Significance	2	____*
PUBLIC ACTION NECESSARY		
37. Public Action Required	1	____
HARMONY WITH CITY COMPREHENSIVE PLANS		
38. Separates residential from other uses	1	____
39. Screens less than beautiful areas	1	____*
40. Defines neighborhood boundaries	1	____
41. Satisfy Land Deficiencies	1	____
42. Currently planned for Open Space	1	____
SPECIAL OPPORTUNITIES		
43. Special Circumstances	2	____
44. Intergovernmental Cooperation	1	____
PUBLIC ACCESS		
45. Safe and Easy Access	1	____*
46. Accessibility (Roads and Highways)	1	____*
47. Parking	1	____*
MULTIPLE OPEN SPACE USE		
48. Multiple Use	2	____*
49. Near Public Schools	2	____
SUITABILITY OF TRAILS		
50. Public trail system	1	____*
51. Year-Round Recreation	1	____*
MAINTENANCE		
52. Maintenance cost to city	1	____*
53. Potential maintenance agreements	1	____
COMMUNITY PARTICIPATION		
54. Neighborhood Participation	2	____

TOTAL

Notes:

	Identification Number Neighborhood Number	
	Criteria #	weight
	1	1
	2	1
	3	2
	4	2
	5	2
	6	2
	7	1
	8	1
	9	1
	10	1
	11	1
	12	1
	13	1
	14	1
	15	2
	16	1
	17	2
	18	2
	19	2
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	46	1
	47	1
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	49	2
	50	1
	51	1
	52	1
	53	1
	54	2

APPENDIX D

CHAPTER 84C, MINNESOTA STATE STATUTES

Conservation Easements

84C.01 DEFINITIONS.

As used in this chapter, unless the context otherwise requires:

(1) "Conservation easement" means a nonpossessory interest of a holder in real property imposing limitations or affirmative obligations the purposes of which include retaining or protecting natural, scenic, or open-space values of real property, assuring its availability for agricultural, forest, recreational, or open-space use, protecting natural resources, maintaining or enhancing air or water quality, or preserving the historical, architectural, archaeological, or cultural aspects of real property.

(2) "Holder" means:

(i) a governmental body empowered to hold an interest in real property under the laws of this state or the United States; or

(ii) a charitable corporation, charitable association, or charitable trust, the purposes or powers of which include retaining or protecting the natural, scenic, or open space values of real property, assuring the availability of real property for agricultural, forest, recreational, or open-space use, protecting natural resources, maintaining or enhancing air or water quality, or preserving the historical, architectural, archaeological, or cultural aspects of real property.

(3) "Third-party right of enforcement" means a right provided in a conservation easement to enforce any of its terms granted to a governmental body, charitable corporation, charitable association, or charitable trust, which, although eligible to be a holder, is not a holder.

History: 1985 c 232 s 1

84C.02 CREATION, CONVEYANCE, ACCEPTANCE, AND DURATION.

(a) Except as otherwise provided in this chapter, a conservation easement may be created, conveyed, recorded, assigned, released, modified, terminated, or otherwise altered or affected in the same manner as other easements.

(b) No right or duty in favor of or against a holder and no right in favor of a person having a third-party right of enforcement arises under a conservation easement before its acceptance by the holder and a recordation of the acceptance.

(c) Except as provided in section 84C.03, clause (b), a conservation easement is unlimited in duration unless the instrument creating it otherwise provides.

(d) An interest in real property in existence at the time a conservation easement is created is

not impaired by it unless the owner of the interest is a party to the conservation easement or consents to it.

History: 1985 c 232 s 2

84C.03 JUDICIAL ACTIONS.

(a) An action affecting a conservation easement may be brought by:

(1) an owner of an interest in the real property burdened by the easement;

(2) a holder of the easement;

(3) a person having a third-party right of enforcement; or

(4) a person authorized by other law.

(b) This chapter does not affect the power of a court to modify or terminate a conservation easement in accordance with the principles of law and equity.

History: 1985 c 232 s 3

84C.04 VALIDITY.

A conservation easement is valid even though:

(1) it is not appurtenant to an interest in real property;

(2) it can be or has been assigned to another holder;

(3) it is not of a character that has been recognized traditionally at common law;

(4) it imposes a negative burden;

(5) it imposes affirmative obligations upon the owner of an interest in the burdened property or upon the holder;

(6) the benefit does not touch or concern real property; or

(7) there is no privity of estate or of contract.

History: 1985 c 232 s 4

84C.05 APPLICABILITY.

(a) This chapter applies to any interest created after August 1, 1985, which complies with this chapter, whether designated as a conservation easement or as a covenant, equitable servitude, restriction, easement, or otherwise.

(b) This chapter applies to any interest created before August 1, 1985, if it would have been enforceable had it been created after August 1, 1985, unless retroactive application contravenes the constitution or laws of this state or the United States.

(c) This chapter does not invalidate any interest, whether designated as a conservation or preservation easement or as a covenant, equitable servitude, restriction, easement, or otherwise, that is enforceable under other laws of this state.

History: 1985 c 232 s 5

APPENDIX E

ARE YOUR LAND USE REGULATIONS LEGALLY DEFENSIBLE?

Note: What guidelines can local governments follow to craft land use controls that are respectful of the rights of citizens, and do not constitute a "taking" as regards the just compensation clause of the Fifth Amendment to the U.S. Constitution? The following text may provide useful tips. It is excerpted from Takings Law, by Christopher J. Duerksen and Richard J. Roddewig, printed 1995, produced for the American Resources Information Network. Used by permission.

Recent cases from the Supreme Court and the states show a continuing expansion of what are considered permissible public goals for land-use and environmental regulations. These goals include open-space and agricultural protection, landmark preservation and design controls, and protection of environmentally sensitive areas such as wetlands and floodplains, all of which reflect society's growing concern about the impact of people's activities on our air, water, and land—and a determination to bequeath a healthy, livable environment to our children.

Highlights

- No one has an absolute right to use his land in a way that may harm the public health or welfare, or that damages the quality of life of neighboring landowners, or of the community as a whole.

- Historical precedent and recent case law make clear that reasonable land use and environmental regulations will have little trouble withstanding constitutional scrutiny in the vast majority of cases. Only in rare instances will such regulations be deemed so onerous as to effect a "taking" under the Fifth Amendment to the U.S. Constitution, which holds that private property shall not be taken for public use without just compensation.

- Courts have outlined several broad factors to be considered on a case-by-case basis in determining if a taking has occurred, including: the economic impact of the regulation on the property owner; the public purpose for which the regulation was adopted; and the character of the government action. Generally, a regulation will be upheld if it (1) furthers a valid public purpose; and (2) leaves a property owner with some viable economic use of the property.

- Property owners have a right to a reasonable return on use of their land, but the U.S. Constitution does not guarantee the most profitable use.

- Courts have upheld a wide variety of purposes as valid reasons for enacting environmental and land use regulations—including pollution prevention, resource protection, historic preservation, design controls, and scenic view protection.

✑ Communities can legitimately insist that development pays its own way. Land dedications or mandatory exactions are valid, assuming that they are adopted to respond to the demands created by the project.

✑ Before a landowner or developer can bring a lawsuit to claim a taking, a development plan must be submitted for review and all administrative avenues of relief must be exhausted.

✑ The focus of the takings inquiry continues to be on the entire property interest. A severe adverse impact of a regulation on one portion of the property or ownership interest will not amount to a taking if the property as a whole continues to have a reasonable economic use.

✑ On the rare occasion that a taking is found to have occurred, the community does not have to buy the entire property. Damages are payable only for a temporary taking for the period in which regulations were in effect. Generally, the measure of damages will take into account the difference in value of the property without the offending regulations in place and with them, an appropriate interest rate to be applied for the temporary loss of value, and the length of time the regulations were in effect.

✑ As part of legislation, lawmakers should include an administrative process that allows those who administer the law to consider the specific effect of the law on an individual landowner, and—consistent with the interest of the public being protected—afford an administrative relief process for undue economic hardship.

A Practical Guide for Responding to the Takings Issue

There are a number of different ways in which communities concerned about fairness and balance for all citizens in addressing the takings issue can protect themselves against potential takings claims.

1. Establish a sound basis for land-use and environmental regulations through thorough comprehensive planning and background studies.

2. Institute an administrative process that gives decision-makers adequate information to apply the takings balancing test by requiring property owners to produce evidence of undue economic impact on the subject property prior to filing a legal action.

3. Establish an economic hardship variance and similar administrative relief provisions that allow the possibility of some legitimate economically beneficial use of the property in situations where regulations may have an extreme result.

4. Make development pay its fair share, but establish a rational, equitable basis for calculating the type of any exaction, or the amount of any impact fee.

5. Avoid any government incentives, subsidies, or insurance programs that encourage development in sensitive areas such as steep slopes, floodplains, and other high hazard areas.

APPENDIX F

MODEL ORDINANCE: UNIQUE HABITAT OVERLAY DISTRICT

Note: The following model ordinance can be used as is or can be adapted by local governments for use as a preservation overlay zone (see description in the body of this Sourcebook on page 45). It was taken from a larger document titled *Environmental Protection: Model Ordinances for Use by Local Governments**, which also provides model ordinances for Conservation Districts, Wetlands Overlay Districts, Agricultural Land Preservation, and other aspects of natural resource protection. With the exception of the elimination of some footnotes that are not applicable, the model ordinance below is identical to the one that appears in the original document. Ideally, language would be added to this ordinance identifying natural areas identified by the Minnesota County Biological Survey, together with other areas of value identified by the municipality, as those that would be protected by this ordinance. For explanation of parenthesized italic numbers found throughout the model ordinance, please refer to notes on p. 132.

UNIQUE HABITAT OVERLAY DISTRICT

4.1 Legislative Findings and Purpose

1. The _____ of _____*(1)* finds that within the _____*(1)* there are areas which contain unique natural resources and/or endangered species or animals; that existing and potential development within the _____*(1)* and the Metropolitan Area if unplanned may have the impact of despoiling or eliminating these resources which, if preserved and properly managed will provide educational, recreational, scientific, aesthetic and conservation benefits for existing and future residents of the _____*(1)*. Therefore, the purposes of this overlay district are:

2. To promote the health, safety and general welfare of the citizens of _____*(1)* by protecting, preserving and properly managing unique resource areas and unique and/or endangered species of plants or animals which populate these areas from the impact of unplanned development; and to manage said areas and species for educational, recreational, scientific, aesthetic and conservation purposes.

4.2 District Boundaries

This overlay zoning ordinance shall apply to Habitat Districts which are specifically delineated on the official zoning map of the _____*(1)*. For purposes of determining the application of this ordinance to any particular parcel of land or water, the above referenced map shall be on file in the office of the _____*(6)* administrator and shall be available for inspection and copying.

Unique habitat areas are extremely rare within the Metropolitan Region. This ordinance is vulnerable to constitutional challenge if applied too broadly. Consequently, care should be taken when identifying districts and establishing boundaries.

* Full citation: Hoeft, John, Dick Nowlin, and Marcel Jouseau, Metropolitan Council of the Twin Cities. March 1977. *Environmental Protection: Model Ordinances for Use by Local Governments.* Available from the Metropolitan Council, St. Paul, MN.

4.3 Definitions

a. Development—the construction, installation or alteration of any structure, the extraction, clearing or other alteration of terrestrial or aquatic vegetation, land or the course current or cross section of any water body or water course or the division of land into two or more parcels.

b. Dimensional Requirement—minimum and maximum setbacks, yard requirements, or structure height or size restrictions established in zoning ordinance No. ____*(3)*.

c. Structure— anything manufactured, constructed or erected which is normally attached to or positioned on land, including portable structures.

4.4 Habitat Permit

a. Except as hereinafter provided in this ordinance, no person shall perform any development in a Habitat Overlay District without first having obtained a Habitat Permit (hereinafter referred to as Permit) from the _____*(1)*.

4.5 Exceptions

The permit requirements established by this overlay shall not apply to:

1. Emergency work necessary to preserve life or property. When emergency work is performed under this section, the person performing it shall report the pertinent facts relating to the work to the _____*(6)* (or administrator) prior to the commencement of the work. The _____*(6)* administrator, following review, shall determine whether an emergency exists and shall by written memorandum authorize the commencement of the emergency exception. A person commencing emergency work shall, within ten days following the commencement of that activity, apply for the issuance of a permit and on the issuance thereof may be required to perform such work as is determined to be reasonably necessary to correct any impairment, or detriment to the natural area occasioned by such work.

2. Work consisting of the alteration, repair or maintenance of any lawful use of land existing at the date of adoption of this ordinance.

4.6 Application for and Processing of Permit *(21)*

a. A separate application for a permit shall be made to the _____*(1)* for each development except that only one application need be made for two or more such acts which are to be done contemporaneously on the same parcel. The application shall include a map of the site and a plan and cost estimate of the proposed development and other engineering data, surveys and other information and materials as the _____*(1)* may require in order to determine the effects of such development on the affected land, water, plants and animals. When proposed work includes construction or alterations of structures, ____ set of plans and specifications for such work shall be submitted with the application.

b. The permit application shall be processed in accordance with procedures specified for the processing of conditional or special use permits and the permit may be processed at the same time and in

connection with the processing of an application for a building permit or any other permit required to be granted by ordinance of _____ _____*(1)*.

4.7 Permit Standards *(22)*

No permit shall be issued unless the _____*(1)* finds and determines that the proposed development complies with the following standards:

1. Structures, including utilities and roadways shall be sited so as to minimize the impact on natural areas and unique plant and animal species within the district.

2. No substantial alteration of the natural environment or removal of vegetation may be permitted, when such alteration or removal would significantly diminish the scientific, historical, educational, recreational, or aesthetic value of the resource or where the alteration or removal would remove a unique or endangered plant species or the supporting environment or critical habitat of a unique or endangered animal species, or where such activities would have a significant detrimental impact upon the food supply, security and reproductive cycle of the species.

3. The noise level during and following development may not exceed the State of Minnesota standards for nature exhibits set forth in Minnesota Regulations NPC-1, 2 which are hereby incorporated herein by reference.

4. The vibration level, including the generation of vibrations during construction, shall not be allowed to reach a level which would endanger fragile resources including geological features.

5. Public access to historically significant natural resource areas or unique and endangered species of plants and animals should be controlled and limited so as to minimize the intrusion and impact upon the resources.

6. No uses likely to generate air pollution which will be toxic to plants or animals or otherwise detrimental to the resource shall be allowed.

7. Development shall not detrimentally affect the existing water quality including the chemical, biological and turbidity characteristics of any water body or water course.

8. Development shall not cause extreme fluctuations of water levels or unnatural changes in water temperature or changes in water currents or movements which may have significant impact on endangered or unique species of the natural resource area.

4.8 Conditions *(23)*

A permit may be approved subject to compliance with reasonable conditions which are specifically set forth in the permit and are necessary to insure compliance with the requirements contained in this ordinance. Such conditions may, among other matters, limit the size, kind or character of the proposed work, require the construction of other structures, require replacement of vegetation, establish required monitoring procedures, require the staging of the work over time, require the alteration of the site design to insure buffer-

ing, require the provision of a performance bond, and/or require the conveyance to the _____*(1)* or other public entity of certain lands or interest therein. The dimensional requirements of the underlying zoning district(s) may be modified in furtherance of the purpose of this ordinance by express condition contained in the permit.

4.9 Time of Permit—Extensions; Renewals *(24)*

a. A permittee shall begin the work authorized by the permit within sixty (60) days from the date of issuance of the permit unless a different date of the commencement of work is set forth in the permit. The permittee shall complete the work authorized by the permit within the time limits specified in the permit which in no event shall exceed more than twelve months from the date of issuance. The permittee shall notify the _____*(6)* administrator at least twenty-four hours prior to the commencement of work. Should the work not be commenced as specified herein, then the permit shall become void; provided, however, that if prior to the date established for commencement of work, the permittee makes written request to the _____*(6)* administrator for an extension of time to commence the work, setting forth the reasons for the required extension, the administrator may grant such extension. A permit which has become void may be renewed at the discretion of the _____*(1)* upon payment of renewal fee. If the _____*(1)* does not grant such renewal, a permit for such work may be granted only upon compliance with the procedures herein established for an original application.

b. Notice of Completion:The permittee shall notify the _____*(6)* administrator in writing of the finishing of the work authorized and no work shall be deemed to have been completed until approved in writing by the administrator following such written notification.

c. Inspection: The administrator may cause inspections of the work to be made periodically during the course thereof by himself or a member of the _____*(1)* staff and shall cause a final inspection to be made following the completion of the work. The permittee shall assist the administrator in making such inspections.

4.10 Responsibility; Effect *(25)*

a. Responsibility. Neither the issuance of a permit nor compliance with the conditions thereof, nor with the provisions of this ordinance shall relieve any person from any responsibility otherwise imposed by law for damage to persons or property; nor shall the issuance of any permit hereunder serve to impose any liability on the _____ of _____*(1)* or its officers or employees for injury or damage to persons or property. A permit issued pursuant to this ordinance shall not relieve the permittee of the responsibility for securing and complying with any other requirements established by law, regulation, or ordinance.

b. Penalty. Any person who violates the provisions of this ordinance shall be guilty of a misdemeanor and may be fined in such amount as is authorized by ordinance number _____ of _____*(3)*.

c. Severability. If any part of this ordinance is held to be unconstitutional or otherwise illegal, the remainder of this ordinance shall be deemed and held to be valid and remain in force and effect as if

such portion had not been included herein. If this ordinance or any provision herein is held to be inapplicable to any person, property or work, such holding shall not affect the applicability hereof to any other person's property or work.

d. Variance. The _____ may authorize in specific cases following appeal and hearing a variance from the provisions of this ordinance where the literal application of the ordinance would result in a substantial inequitable hardship to an applicant property owner. In assessing hardship, the _____ shall balance the severity of the physical, social and economic effects of the literal application against the interests of the _____ in affecting the purposes of this ordinance as expressed above. Economic considerations alone shall not constitute a hardship if a reasonable use for the property exists under the terms of the ordinance. No variance may be granted which would allow any use that is prohibited in the zoning district in which the subject property is located. A variance shall be granted in writing accompanied by specific findings of fact as to the necessity for the grant of the variance and its specific provisions.

Notes:

(1). These model ordinances have been drafted for use by municipalities, townships, and counties. Many blanks have therefore been left in the text which should be filled in with the name of the local governmental unit adopting the ordinance, or simply the word "municipality", "county", or "township".

(3). Fill this blank in with the ordinance number and date of adoption of your currrent zoning ordinance.

(6). This blank should be filled in with the title of the local official who is responsible for administering the zoning ordinance.

*(21).*Information which may be required in order to properly evaluate permit applications include: 1) relationship of the project to the feature being protected, 2) an inventory of plant and animal species, 3) a description of existing hydrologic characteristics, 4) a description of the location of the proposed development in relation to feeding, nesting and breeding areas and movement corridors of animal species.

*(22).*The standards set forth in this section attempt to direct a local governmental unit to examine the impact of the proposed development on the feature to be protected.

*(23).*Most permitted development will have to meet certain conditions in order to be acceptable. Such conditions should be set forth specifically in the permit by the local governmental unit.

*(24).*The permit should be issued for a set period of time and provision made for renewal and extension. This language is suggested; however, the local governmental unit can alter it as it sees fit. It is expected that the local governmental unit would prefer to be notified when the authorized work is completed and would like the option of making inspections periodically. This section provides such options.

*(25).*This section clarifies that permit holders must meet other requirements established by law, regulation or ordinance, and sets forth the penalties for violation.

APPENDIX G

OPEN SPACE ZONING

Performance Standards for Single Family Rural District,
City of Marine on St. Croix Development Code
Ordinance Number 89

603.6 Open Space Performance Standards

A. It is the intention of this Ordinance to promote common open space development which provides a unified landscape for the use and enjoyment of the neighborhood community. Evaluation and subdivision approval by the City Council shall be subject to demonstration by the applicant that the proposed development plan provides common open space in a site design appropriate to the location of the building lots.

B. Area Regulations.

1. A minimum of fifty (50) percent of land subdivided for development shall be dedicated to open space consisting of natural habitat, neighborhood recreation, and/or pedestrian corridor open space, as defined in Section 302.
2. All designated open space shall be platted as outlot parcels held as open space in perpetuity.
3. Each open space outlot shall be classified as natural habitat, neighborhood recreation, or pedestrian corridor open space, and shall conform to the type of use, location criteria, and deed restrictions of that classification.

C. Location Criteria. Open space outlots shall be located on the development site according to the following locational criteria:

1. Viewsheds. The open space outlots shall preserve the maximum quantity of viewshed open space for the anticipated homesite lots on the development tracts.
2. Natural Habitat. The development shall preserve the maximum quantity of natural habitat open spaces in a contiguous, connected configuration. Natural habitat open spaces may include, but are not limited to fields, wetlands, slopes, bluffs, dense woods, lakes, ponds, streams, shorelands, and other environmentally sensitive areas or desirable viewsheds.
3. Pedestrian Corridors. The development shall locate pedestrian corridor open spaces in strategic places such that larger open space outlots and designated places of destination both on the development tract and adjacent tracts are connected with one another. Pedestrian corridor open spaces may include, but are not limited to established regional trails, local pathways, paved walkways, and shorelines. Pedestrian corridor outlots shall be a minimum of twenty (20) feet in width.
4. Neighborhood Recreation.The development shall locate neighborhood recreation open spaces such that they are an integral part of the neighborhood of surrounding homesites, at an elevation appropriate to their intended recreational use, defined by coherent boundaries, and accessible to all neighborhood residents. Neighborhood recreation open spaces may include, but are not limited to greens, commons, playgrounds, ball fields, gardens, or other recreational areas.

D. Accessibility. Open spaces shall be accessible to pedestrians at no less than one thousand two hundred (1,200) foot intervals along public roadways. Where necessary, pedestrian access corridor outlots between private lots shall be at least twenty (20) feet in width.

E. Deed Restrictions. Each open space outlot shall conform to the deed restrictions associated with its open space classification.

1. Natural habitat open spaces shall be considered conservation easements and are for the responsible use and enjoyment by adults and children. Construction in these areas shall be limited to trails (paved or unpaved), open air shelters, bridges, benches, bird houses, wood fencing, and communal drainfields.
2. Neighborhood recreation open spaces shall be used for active or passive recreational purposes, including gardening. Construction in these areas shall be limited to gravel or paved walkways, open air shelters, bird houses, garden storage sheds no larger than one hundred twenty (120) square feet, wood fencing, landscape planting, play equipment, outdoor furniture, and facilities for active recreation.
3. Pedestrian corridor open space shall be used for pedestrian, bicycle, and/or equestrian travel. Motorized vehicles shall be prohibited. Construction in these areas shall be limited to gravel or paved pathways, wood fencing, and landscape planting.
4. Habitable structures shall not be permitted in any open space outlot.

F. Ownership and Management. Each designated open space outlot shall be owned and managed according to one of the following means, subject to City Council approval.

1. Open space may be owned in common by the property owners created through subdivision of the original tract. Management shall be the responsibility of that subdivision's homeowner association. In the case where at least one (1) outlot of open space is held in common ownership, a homeowner association shall be established for that subdivision and membership in the association by all property owners in the subdivision shall be mandatory.
2. Open space may be deeded to an established land trust. Management shall be the responsibility of the land trust. Maintenance may be performed by the neighborhood homeowner association, through written agreement between the association and the land trust.
3. Open space may be deeded to the City of Marine on St. Croix. Management shall be the responsibility of the City.
4. Open Space may be protected by establishing conservation restrictions in perpetuity in favor of the City as provided in Minnesota Statutes 84.64-84.65. Unless the document establishing the restrictions specifically provides to the contrary, the City shall have no responsibility for the maintenance or management of the area subject to the restrictions. The form and content or the deed or other instrument establishing the restrictions must be approved by the City prior to the execution and delivery thereof. Notwithstanding any provision of this Ordinance to the contrary, the City may, in cases where conservation restrictions are utilized to meet open space dedication requirements of this ordinance, waive the requirement that the area subject to the restrictions be platted as a separate outlot.

APPENDIX H

CONSERVATION OVERLAY DISTRICT

New Hanover County, North Carolina Zoning Ordinance

Note: Portions of the ordinance are included below by permission. For a copy of the full ordinance, contact the New Hanover County Planning Department, 414 Chestnut Street, Wilmington, NC 28401.

Section 59.4: Conservation Overlay District

59.4-1 Purpose

The purpose of the Conservation Overlay District (COD) for conservation resources is to protect important environmental and cultural resources within the County. Protection of these resources is necessary to maintain the County's diverse and ecologically important natural systems, to preserve the County's estuarine systems important for finfishing and shellfishing; to provide open space; and to retain the County's archaeological and historical heritage. These COD's shall be in addition to any other zoning districts where applied so that any parcel of land lying in a COD may also lie in one or more of the zoning districts provided for by this Ordinance. The development of all uses permitted by right or by special use permit in the underlying district, if any, shall be subject to the requirements of both the COD and the underlying district, if any. In the event that the COD requirements conflict with the underlying district requirements, the requirements of the COD shall take precedence. If requirements for a particular item are not specified in the COD but are specified by the underlying district, then the requirements of the underlying district shall be followed.

59.4-2 Applicability

The development and improvement of property, including the subdivision of land, shall be subject to these performance controls if the parcel of record is located wholly or partially within a COD and if conservation resources, as specified in Section 59.4-3, are associated with the parcel on record as of December 1, 1984, the effective date of this ordinance. The following uses, however, are exempted from these controls:

(1) The development of one single family home detached structure, one residential duplex, or the location of two or fewer mobile homes on a parcel or lot.

(2) Commercial, industrial, office or institutional development involving a land disturbance of less than 1 (one) acre in area.

(3) The development or subdivision of a parcel that meets both of the following conditions:

(A) No part of the development or subdivision shall be located within a distance equal to or less than the setback distance (specified in Section 59.4-5) of any conservation resource or space existing on the parcel or on a contiguous parcel of record.

(B) No part of the development or subdivision shall be located on any portion of the parcel that is part of the upper drainage basin for any conservation resource or space on the parcel or within the specified setback on a contiguous parcel of record.

59.4-3 Conservation Resources

If a parcel on record as of December 1, 1984, the effective date of this ordinance, is associated with any one of the conservation resources having the minimum distinct areas listed below then the parcel shall be subject to the following performance controls. Official maps of and information concerning these resources shall be maintained by and shall be available for review at the County Planning Department. These maps shall be updated as needed by the County Planning Department and shall serve as the official source by which to determine if a parcel is associated with Conservation Resources. A parcel is considered to be associated with a conservation resource if either the resource is contained partially or wholly on the parcel or if the resource is located next to a parcel such that the resource setback specified in Section 59.4-5 extends into the parcel.

(1) Ecological Resources	Minimum distinct area
1. Swamp forest	2.5 acres
2. Pocosin	2.5 acres
3. Savanna	2.5 acres
4. Natural ponds	0.1 acre
5. Freshwater marsh	0.1 acre
6. Brackish marsh	0.1 acre
7. Primary nursery areas	0.1 acre
8. Barrier island-beach complex (including dunes)	0.1 acre
9. Maritime shrub thickets	1.0 acre
10. Salt Marsh	0.1 acre
11. Animal and Plant Natural Areas of Special Significance	no limit
(2) Archeological/Historical Resources	no limit

59.4-4 General Performance Controls for Conservation Space

The following general performance controls for conservation space apply to all uses within a COD that are subject to controls as determined by Section 59.4-2 and Section 59.4-3.

(1) Required amounts of Conservation Space

(A) Conservation space is defined as that portion of the conservation resource that shall be preserved, as determined by this Section.

(B) Conservation space may not be reserved provided the development or subdivision of the parcel meets the condition specified in Section 59.4-2(3) (a).

If the development or subdivision does not meet the condition specified in Section 59.4-2(3) (b), then, the development or subdivision shall meet applicable drainage and setback regulations specified in Sections 59.4-4(5) and 59.4-5.

WORKTABLE FOR DETERMINING REQUIRED
CONSERVATION SPACE AND DEVELOPABLE LAND

CONSERVATION RESOURCE (Importance Value)	ACREAGE OF RESOURCE ON PARCEL (times)	CONSERVATION SPACE FACTOR (equals)	MINIMUM CONSERVATION SPACE
Swamp Forest (5) (Min. 5 acres)		.5	
Pocosin (5) (Min. 5 acres)		.5	
Savannah (3) (Min. 5 acres)		.5	
Natural Pond (8)		1.0	
Fresh Marsh (6) (Min. one acre)		.8	
Brackish Marsh (9)		1.0	
Primary Nursery Area (13)		1.0	
Barrier Island-Beach (11) Complex		.9	
Maritime Shrub (10) Thickets		.7	
Salt Marsh (12)		1.0	
Important Historical (7) Archaeological Site		.9	
Animal & Plant Areas (10) of Special Significance		.9	

TOTAL MINIMUM CONSERVATION SPACE _____
TOTAL PARCEL ACREAGE _____
MINUS TOTAL MINIMUM CONSERVATION SPACE _____
EQUALS MAXIMUM DEVELOPABLE LAND _____

(C) Conservation space shall not be required to be reserved for the following resources unless the total acreage of minimum distinct areas on the parcel of record exceeds the following minimum:

Resource	**Total Aggregate Minimum Acreage**
Swamp Forest	5 acres
Pocosin	5 acres
Savannah	5 acres

Step One: List in column 2 the acreage of land occupied by each conservation resource named in column 1. If part of the parcel is occupied by more than one resource, list the acreage occupied only by the resource with the highest ranking. Rankings are listed in column 1 in parenthesis next to the resource name.

Step Two: Multiply each of the listed acreage in column 2 by factors listed in column 3. Place each answer in column 4.

Step Three: Add the acreage in column 4 to determine total minimum conservation space required.

Step Four: Subtract the total minimum conservation space from the total gross parcel to determine the maximum amount of developable land.

The total amount of conservation space that shall be reserved shall be equal to or exceed the total minimum conservation space calculated in step three. The total minimum conservation space shall be allocated to and reserved for conservation resource areas in acreage equal to or exceeding the minimum acreage calculated for the resources in column 4.

Conservation space shall be reserved in contiguous blocks or in close proximity to the greatest extent possible in order to prevent the scattering of such space and to increase effectiveness in their management.

(2) Transfer of Conservation Space Requirements Between Resource Conservation Areas

In order to provide flexibility in site design, the minimum acreage of conservation space required in column 4 for any one conservation resource area may be reduced in column 4 for any one conservation resource area may be reduced by any desired amount provided, however, that the minimum conservation space required for a different conservation resource area with an equal or higher ranking is increased by an equal or higher amount. For instance, assume that a parcel within a COD has ten acres of swamp forest and fifteen acres of fresh marsh. According to the worktable, swamp forest has a conservation factor of .5 and fresh marsh as a conservation of .8. Therefore, at least 5 acres of swamp forest must be reserved as conservation space (10 acres x .5 = 5), and at least twelve acres of fresh marsh must be reserved (15 acres x .8 = 12.0 acres). If the developer, however, wishes to develop seven acres of swamp forest, he may transfer two acres of the conservation space requirement for swamp forest to the fresh marsh because fresh marsh has a higher importance value (6) than does swamp forest (5). As a result of the transfer, therefore, all fourteen acres of the fresh marsh would be required to be preserved as conservation space while only three acres of swamp forest would be required to be preserved.

(3) Improvements

Conservation space shall not be cleared of vegetation, shall not have its natural drainage system significantly altered, and shall not be developed in any manner that would negatively impact the conservation resource, with the following exceptions:

(A) Improvements that would either protect or enhance the enjoyment of the conservation resource. Such measures not causing significant impact include, but are not limited to, walkways, self-guided trails, protective fences, docks and boat ramps.
(B) Access to other parts of the parcel. If a part of the parcel may be developed but is inaccessible due to the existence of a conservation resource area, a road and/or utilities may be constructed through the conservation resource area. The road and/or utilities, however, shall be designed to the greatest extent practical to minimize impact to the conservation resource.
(C) Access to the waterfront. If the entire waterfront along a parcel is inaccessible due to the existence of required conservation space, a boat ramp, dock, or pier may be built for boating facilities in the conservation space, subject to relevant State and Federal permits. The facilities, however, shall be designed to the greatest extent practical to minimize impact to the conservation resource.

(4) Methods of Conservation Space Preservation

(A) Conservation space may be preserved by any of the following means:

1. Dedication of the conservation space or of a conservation easement in perpetuity to and acceptance by the County for use as parks, recreation areas, or other suitable public purposes, or

2. Dedication for suitable public purpose of the conservation space or of a conservation easement in perpetuity to and acceptance by State or Federal agency or by a private, nonprofit charitable organization qualified to accept such dedications in accordance with the Federal Internal Revenue Code.

3. The owner of the parcel on record may retain sole ownership of the conservation space. The conservation space shall not be subdivided.

4. The conservation space may become the property of a homeowner's association under the following conditions:

   (a) Such conservation space shall remain undivided and no lot or unit owner or any other person shall bring any action for partition or division of any part thereof except as provided in Chapter 47A (Unit Ownership Act) of the General Statutes. Each lot or unit owner's undivided interest shall be preserved through covenants running with

the land. Title to such areas shall be encumbered for the perpetual benefit of the public generally or the private properties in the development, and all future use shall be consistent with the conservation space requirements.

(b) All lots or units within the development shall have direct access to all conservation space as provided, by means of public streets or dedicated walkways or by the fact of physical contiguity to other public land or lands in common ownership of all residents. The developer shall not place age, race, creed, sex or economic restrictions (other than maintenance assessments) upon lot or unit owners for the use of said conservation space. Land which is restricted in any way so as to be for the use, benefit or enjoyment of a select group within the development shall not qualify as conservation space.

(1) The Homeowner's Association or the nonprofit organization shall be established before any lots are sold;
(2) Membership shall be mandatory for each lot buyer, and any successive buyer;
(3) The association shall provide for liability insurance, any taxes and the maintenance of all grounds and facilities;
(4) Any sums levied by the association that remain unpaid shall become a lien upon the lot owner's property.

(5) Design Storm

Stormwater runoff for the entire parcel will be managed by structures appropriately sized such that the peak rate of discharge from the site after completion of development for any storm up to and including the specified design storm, shall not exceed the peak rate of discharge from the site in its previous natural condition for the specified design storm. The design storm is specified as occurring once every 10 years and lasting for 24 hours. Industrial, commercial, office or institutional development on a parcel one acre or less in size and with a maximum impervious to gross site area ratio of less than .2 shall be exempt from this control. Discharge of runoff from impervious surfaces for the entire parcel directly into natural waterbodies shall not be allowed. Runoff shall be routed along vegetated swales, through filter media of vegetation, gravel, sand, or other media, or to detention ponds for purposes of increasing percolation, settling and filtering out of non-point pollutants and decreasing discharge velocity.

(6) Buffer strip

Buffer strip, if required in accordance with Section 67, shall not be extended through conservation space areas. (5/6/85)

APPENDIX I

FEDERAL TAX LAW CONSIDERATIONS REGARDING FINANCING LAND ACQUISITION THROUGH ISSUANCE OF SECURITIES BY LOCAL GOVERNMENTS

By Diane J. Ostergren, President/CEO of CCS Financial Services, Inc., Springfield, MO.

The Internal Revenue Code of 1986, as amended, (the "Code"), established certain requirements that must be met subsequent to the issuance and delivery of any debt obligations in order that interest on the debt obligations be and remain excludable from gross income (referred to as "Tax-Exempt") under Section 103 and related sections of the Code. Noncompliance with such requirements may cause interest on the debt obligations to become includable in gross income (referred to as "Taxable") for purposes of Federal and State income taxation retroactive to their date of original issue, irrespective in some cases of the date on which such noncompliance is ascertained.

The Code provides for two categories of securities which may be issued by state and local governments—"governmental purpose" or "qualified private purpose" bonds. The interest on all governmental purpose and qualified private purpose bonds may be exempt from federal income taxation so long as the bonds adhere to the strict requirements of the Code. Governmental purpose bonds and private activity bonds are generally described as follows:

Governmental Purpose Bonds

Generally, bonds issued for the purpose of acquiring land may be treated as "governmental use bonds" so long as they do not meet the conditions of a private activity bond, including:

1. no more than ten percent of the proceeds of the bonds are to be used for any private business use (the "Private Use Test"), which is defined as use (directly or indirectly) in a trade or business of any person (including certain not-for-profit or "501(c)(3)" organizations) other than a State or local government unit, ***and***

the payments of the principal of, or the interest on the issue (directly or indirectly), made with respect to, or secured by, any private business use property does not exceed ten percent of the proceeds of the bonds (the "Private Security or Payment Test"); ***or***

2. the amount of the proceeds of the bonds used (directly or indirectly) to make or finance loans (other than loans to enable the borrower to finance any governmental tax or assessment of general application for a specific essential governmental function, such as special assessment bonds to any person other than a State or local government unit does not exceed the lesser of $5,000,000 or five (5) percent of the proceeds of the bonds (the "Private Loan Financing Test").

In general, bonds issued for traditional water, sewer and electric systems, schools, roads, public buildings,

parks, curb, gutter and sidewalk and other public projects will be governmental use bonds. Interest on governmental use bonds is tax-exempt so long as the issuer complies with the limitations in the Code on private business use of a bond-financed facility and the other requirements of the Code and the bonds are issued in accordance with state and local law.

Private Activity Bonds (Qualified Private Purpose Bonds)

Qualified private purposes as described above and as stated in the Code are either "exempt facilities" or a "qualified" activity. If an issue constitutes a private activity bond, the interest thereon will not be tax-exempt unless the private activity bond qualifies under the Code as an "exempt facility" or "qualified" activity, as either (a) an exempt facility bond; (b) a qualified mortgage bond; (c) a qualified veterans' mortgage bond; (d) a qualified small issue bond; (e)) a qualified student loan bond; (f) a qualified redevelopment bond; or (g) a qualified 501(c)(3) bond.

Land acquisition can be funded from the proceeds of qualified tax-exempt debt obligations ("private activity bonds"), however, there are restrictions as to the amount of proceeds which can be used for the purpose of land acquisition.

> Section 147 of the Code sets limitations on the use of proceeds for land acquisition for "qualified bonds". Subsection (c) paragraph (1) states that a bond "shall not be a qualified bond if —(A) it is issued as part of an issue and 25 percent or more of the net proceeds of such issue are to be used (directly or indirectly) for the acquisition of land (or an interest therein)...".
>
> Subsection (c) paragraph (3) provides an exception for certain land acquired for environmental purposes, to include land acquired in connection with an "airport, mass commuting facility, high-speed intercity rail facility, dock, or wharf, if —A) such land is acquired for noise abatement or wetland preservation, or for future use as an airport, and (B) there is not other significant use of such land.

This section of the Code clearly limits the amount of proceeds of Private Activity Bonds which can be used for the acquisition of land, unless the purchase of land falls into an exception such as stated in subsection (c) paragraph (3) as described above. In addition, Subsection (h) provides an exception for qualified 501 (c)(3) bonds, which is described below.

501(c)(3) Bonds

Bonds issued to finance projects, including land acquisition, used by Section 501(c)(3) organizations are taxable unless they are "qualified 501(c)(3) bonds. Qualified 501(c)(3) bonds are private activity bonds but are not subject to many of the onerous rules generally applied to private activity bonds. Although qualified 501(c)(3) bonds are subject to arbitrage restrictions, the private use test and limitations on financed costs of issuance, they are exempt from some of the other limitations, including those on land acquisition.

A qualified 501(c)(3) bond is defined as a private activity bond if:

1. all property which is to be financed is owned by a Section 501(c)(3) organization or a governmental unit and
2. 95% of the net proceeds are used with respect to the exempt purpose of the Section 501(c)(3) orga-

nization and not in an unrelated trade or business and
3. no more than 5% of the principal or interest on the bonds is secured or paid by payments made with respect to property used in a private or unrelated trade or business.

Subsection (h) of Section 147 provides that "certain rules" do not apply to "qualified 501(c)(3) bonds". Paragraph (2) of this subsection states that limitations on land acquisition "shall not apply to any qualified 501(c)(3) bond... . The issuance of qualified 501(c)(3) bonds are however subject to certain other requirements as set forth in the Code, including certain of those applicable to other Private Activity Bonds.

If a Section 501(c)(3) organization is also a governmental unit with borrowing power, it may issue governmental bonds rather than qualified 501(c)(3) bonds.

INDEX

About the Author

Laurie Allmann is a freelance writer and public speaker specializing in environmental topics. Recent publications she has authored include *Far From Tame* (a collection of natural history essays published by the University of Minnesota Press) and *Land Protection Options* (jointly published by The Nature Conservancy, the Minnesota Department of Natural Resources, The Trust for Public Land, and the Minnesota Land Trust). Allmann lives and works in the St. Croix Valley.

About the Artist

In recent years, Chris Baird's focus has been on making painted wood sculpture, which she shows at Vern Carver and Beard Galleries in Minneapolis. She takes time out from sculpting for other projects, including illustration, and design and painting of murals and sets. Baird lives and works in Minneapolis.