SOURCEBOOK ON NATURAL LANDSCAPING FOR LOCAL OFFICIALS

Updated and third printing August 2004

prepared by northeastern illinois planning commission

This project has been funded in part by the United States Environmental Protection Agency under an assistance agreement with the Northeastern Illinois Planning Commission. The contents of this document do not necessarily reflect the views and policies of the United States Environmental Protection Agency or the Northeastern Illinois Planning Commission, nor does the mention of trade names or commercial products constitute endorsement or recommendation for use.

In addition to funding by the United States Environmental Protection Agency, the updated and third printing was funded through a grant program supported by the USDA Forest Service Northeastern Area, State and Private Forestry, and the U.S. Fish & Wildlife Service, in support of Chicago Wilderness. USFWS and USFS grants of federal monies are administered by the Illinois Conservation Foundation.

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ACKNOWLEDGEMENTS:

The 2004 update was completed with guidance and assistance from Danielle Green, Laura Evans and Helen Tsiapis of the U.S. Environmental Protection Agency, Barbara Wood of the Chicago Park District, Jerry Milewski of American Gardens, Jack Pizzo of Pizzo and Associates, Tom Price of Conservation Design Forum, Mike Sands of Prairie Crossing, Jack Broughton formerly of Applied Ecological Services and now with Bielinski Homes, Diane Trgovcich Zacok of Purdue University Calumet, and Clayton Heffter and Mary Beth Falsey of DuPage County.

Updated and third printing August 2004
Second Printing August 1998
May 1997

northeastern illinois planning commission

Table of Contents

PURPOSE OF THIS SOURCE BOOK

Blue Vervain

In recent years, a new look in landscaping, commonly known as natural landscaping, has been gaining enthusiastic acceptance across the country. Natural landscaping is an aesthetically exciting, ever-changing tapestry of hardy, primarily native plantings well adapted to the local climate and soil. It provides a cost effective alternative to conventional turf grass lawns.

Natural landscaping minimizes the environmentally detrimental effects of pesticides and fertilizers, as well as the noise pollution and the emission of air-polluting substances from lawn-maintenance equipment. It virtually eliminates the need to use water for irrigation, as is required for turf grass lawns. While not maintenance free, natural landscaping requires less time and money for ongoing maintenance than conventional landscapes.

Homeowners and developers alike are beginning to appreciate the environmental, economic and aesthetic benefits of natural landscaping.

Local officials are in a position to advocate natural landscaping and bring its benefits to their communities. Local governments demonstrate the benefits by using native plant materials on government owned and managed lands.

Government officials can amend comprehensive plans and adopt ordinances to promote the appreciation and use of natural landscapes. Citizen education about the benefits of natural landscaping can provide a powerful incentive, especially if government officials can point to demonstration projects of their own.

This Source Book will:

* Explain the basic principles and benefits of natural landscaping;
* Demonstrate the feasibility of using natural landscaping successfully in the region;
* Provide information regarding the ways that local officials as community leaders can encourage the use of natural landscaping;
* Identify ways to avoid pitfalls that could result in poorly implemented natural landscaping;
* Describe tools and techniques; and
* Provide direction to other sources of information and expertise.

This guidebook was originally prepared by the Northeastern Illinois Planning Commission (NIPC) for the U.S. Environmental Protection Agency, Region 5 (USEPA). The intended audience is local officials, land owners, and citizens in the greater northeastern Illinois region.

Because regional geological histories and climate vary greatly and are basic to implementing natural landscaping, natural landscaping in other regions must be tailored to those unique conditions. Therefore, landscape planners and ecological restoration practitioners in other regions, and even within this large northeastern

Illinois region, will need to research their own landscape history. They will need to obtain local information in order to understand their specific natural conditions and native vegetation. However, the basic principles and benefits of natural landscaping, as described in this Source Book, should apply anywhere.

CHAPTER 1: NATURAL LANDSCAPING

Rattlesnake Master

I. What is Natural Landscaping?

Natural Landscaping is the physical modification of outdoors to serve the needs of people by planting, altering the contours of the ground, and building structures and amenities such as pedestrian ways, paths and picnic areas.

Native landscaping, Natural landscaping, and Beneficial landscaping

Natural landscaping is a relatively new term. Other terms in current use mean much the same thing and are somewhat interchangeable. The terms are discussed in the context of the Midwestern United States.

Native landscaping refers to the use of plants—for example, prairie, woodland and wetland plants—that flourished in northeastern Illinois prior to its occupation by settlers from eastern North America and Europe.

Natural landscaping implies the use of native plants but has slightly broader implications because it also suggests landscaping to give the "look" of the landscape that existed before the mid-1800s. In addition, there may be an attempt to restore or reconstruct the landscape to look and function more as it did before settlers, other than Native Americans, lived here.

Natural landscaping applies to a wide array of landscaping techniques that help retain natural landscape features, including wetlands, woodlands and natural drainage features. For example, natural landscaping site design incorporates natural drainage features such as swales and vegetated "filter strips" in contrast to storm sewers and artificial drainage channels.

Beneficial landscaping is another term in current use that embraces both native and natural landscaping. The term beneficial landscaping also includes the use of shading and windbreaks, which reduce heating and cooling needs for buildings.

These terms are relatively new and their definitions are somewhat fluid. Questions of terminology should not obscure the basic intent or concepts. The term "natural landscaping" will be used throughout this guide. In **Appendix 1** of this guide is a **glossary** of frequently used terms associated with natural landscaping.

II. The Landscapes of Yesterday and Today

Prairie Planting at Lucent Technologies – Naperville, Illinois

Northeastern Illinois lies along the northeastern edge of the range of the Tall Grass Prairie of the Midwest. The prevailing landscape before European settlement was open prairie. In some areas the prairie was flat, in others rolling. The prairies were regularly interspersed with poorly drained lowland and dry, well-drained uplands. Rainfall flowed from the uplands into lowland wet meadows and marshes.

Throughout the region were small to large tracts of savannas consisting primarily of scattered oak trees interspersed with characteristic grasses and forbs. More heavily forested areas, some covering vast acreages and known to the European settlers as "The Big Woods," grew on the eastern sides of our north-south running rivers, where they were protected from fierce prairie fires. In some places, impenetrable thickets covered sandy areas and low dunes.

Native prairie, woodland and wetland plants of the Chicago region have great beauty and are well adapted to local conditions. Unfortunately, they have been displaced to a large extent by non-native plants that were familiar to the people who first farmed and developed our urban areas. Only in recent years have the beauty and utility of our native plants and plant communities become widely appreciated.

Our predominant landscaping material today, the green grass lawn, is borrowed from the heavily grazed, short grass pastures and formal gardens of Europe, particularly England. In that moist climate, the closely cropped grasses evolved with the grazing sheep, goats and cows. Understandably, pioneers from Europe, used to the short grasses, brought the grasses as well as medicinal and food plants to make the unfamiliar feel familiar.

Unfortunately, the grasses they brought do not thrive as well-kept lawns without a great deal of effort to simulate the conditions under which they evolved in Europe.

Our area of the country, with its harsher climate of extremes of heat and deep freezes, drought and drenching rains, is an inhospitable atmosphere for short-cropped, short-rooted grass. Therefore, the contemporary weed-free lawn is maintained at a high price, not only in terms of dollars but also degraded water and air quality, water consumption, and the peace and quiet of our neighborhoods.

Difficult to maintain conventional landscaping.

Natural landscaping for habitat and reduced maintenance.

We need to assess which parts of our landscapes could be replaced with native plants. In returning to a more natural landscape, we will be returning those plants which evolved under our conditions of climatic stress, which require less maintenance and coddling and provide environmental, economic and aesthetic benefits.

One immediate result of the switch from conventional to native or natural landscaping is that our landscape can thrive under the diverse conditions across the region:

* sandy soils associated with Lake Michigan and its larger predecessors;
* rich lowland forest soils in floodplains along streams and rivers;
* heavy clay soils in low-lying wooded areas;
* wet conditions associated with wetlands, wet prairies, and riparian corridors;
* dry uplands on rolling lands left by glaciers; and
* moderate lands originally covered by tall-grass prairies and groves of oaks and other hardwoods.

Fortunately, there is a selection of native plants that have a wide tolerance for varying conditions and work well in many locations. Where special expertise and resources are available, ambitious natural landscaping projects can attempt to restore the original soil and water conditions.

III. How can Natural Landscaping Be Used?

Almost everyone can use natural landscaping. There is no rigid set of rules that dictates how much or what qualifies as natural landscaping or when it is appropriate. The concept embraces a range of opportunities for property owners, managers and public officials. Any effort that increases the amount of area devoted to natural landscaping will be of some benefit. It will largely be up to property owners, local officials, planners, engineers, and landscape professionals to determine where, what kind, and how much.

Some examples:

New developments of all types can

* preserve and enhance existing natural areas such as prairie, wetland, floodplain and woodland areas as an essential component of site planning;

* cluster homes in order to reserve green areas designed with native plants as a substitute for conventional subdivision design;

* reduce the amount of impervious surfaces by substituting vegetation where appropriate;

* utilize natural drainage approaches such as swales and vegetated filter strips instead of storm sewers.

Existing institutional and commercial complexes can

* create prairie, wetland, and woodland areas as part of government, corporate and institutional campuses, and reduce the area devoted to turf grass;

* design and retrofit stormwater detention basins as natural wetland/prairie systems to enhance water quality and other environmental benefits.

Individuals and groups of homeowners can

* totally or partially replace lawn areas and common areas with native plants and retrofit areas for more natural stormwater detention.

Golf courses can

* reduce the amount of turf by including areas of rough devoted to native plants and natural environments. The Audubon Cooperative Sanctuary Program for Golf Courses encourages golf courses to include wildlife habitat enhancement, establishment of Integrated Pest Management (IPM) programs, and protection of water resources.

Local governmental units can

* incorporate natural areas into non-active areas on most types of public property, as well as use natural landscaping for stormwater management.

Native plants can be used in various ways in the landscape

*Native plants as one part of the landscaping material

Existing or new building sites can use native trees, shrubs and grasses instead of the "exotic" plants typically marketed by nurseries. Native grasses and ground covers may partially replace turf areas. This approach is becoming increasingly popular with homeowners. Natural landscaping on commercial properties provides environmental benefits and a distinctive appearance to the building site. "Ornamental" use of native vegetation in landscape design can create unusual and attractive effects.

* Native plants as the principal landscaping material

With careful planning, native plants can constitute the primary landscaping material in new development sites and sites that are being re-landscaped. This approach may be particularly appropriate for office campuses, public facilities and parks, institutions, and clustered residential development. Using native plants can result in major environmental improvements and cost savings.

* Using more vegetation and less concrete and asphalt

The excessive use of concrete, asphalt and other impervious materials in our landscapes causes several environmental problems. It accelerates stormwater runoff and creates flooding and erosion conditions for communities along streams. It results in higher temperatures in urban environments, making the out-of-doors less pleasant and increasing the need for air conditioning. Increasing the use of vegetation- especially native vegetation- in our landscaping can reduce damage from stormwater runoff, reduce temperatures, reduce energy costs, improve water quality and increase wildlife habitat.

Strategies for increasing the amount of permeable surfaces include: reducing street widths in residential developments, reducing setbacks between buildings and streets, designing smaller parking lots which include island vegetation, and clustering development on part of a site.

Paving in unused paved areas can be removed and natural landscaping installed.

There are several special situations where the natural landscaping approach should be considered:

* To preserve existing native vegetation

Preserving existing natural vegetation is a fundamental purpose of natural landscaping. While very little area within the region has been left in its native state by humans, there are rare and valuable natural area remnants (wetlands, prairies, and woodlands) which should be protected and properly managed. With removal of exotic species, native plants will often re-establish themselves rather quickly.

* To restore ecological systems

Another primary use of natural landscaping involves restoring entire ecosystems with a full complement of native species. These projects include restoration of previously altered hydrology along streams and in wetlands and removal of drain tiles. Intensive design, monitoring and maintenance programs with long-term professional oversight are critical to the success of the restored landscape.

On publicly owned lands, volunteers can help accomplish large scale restorations. Volunteer workers and expert volunteer stewards are already providing experienced stewardship in all Chicago area counties.

* To create greenways

Linear open spaces called "greenways" provide exceptional opportunities for utilizing natural landscaping to protect and restore the region's ecological identity. Many of the region's forest preserves are in greenway corridors and are being managed to maintain their natural character. The Northeastern Illinois Regional Greenways Plan, adopted by the Northeastern Illinois Planning Commission (NIPC) in 1992 and updated in 1997, reflects these regional greenway opportunities.

Local jurisdictions can plan and implement local greenways that connect with the regional greenway network. Greenways are appropriate on both public and private property. Local and regional greenways are excellent and appropriate locations for natural landscaping.

Many greenways contain rivers, streams, or other waterways. In these locations native vegetation in buffer strips adjacent to the stream provides wildlife habitat, bank stabilization, and water quality benefits. These buffer strips protect natural resources from human impacts and filter out pollutants that could flow into streams.

* To stabilize streambanks and shorelines

Native willows, grasses and other plants can be used to stabilize eroding streambanks and shorelines. The techniques that employ native plant materials are collectively called bioengineering. They are more effective, less costly, and provide better wildlife habitat than traditional engineering approaches.

* To manage flood and stormwater

Flooding affects many communities in Northeastern Illinois. Floodplains are regulated so they will be retained in non-intensive, open space uses in order to reduce hazards from flooding. Planting native vegetation in floodplains helps absorb and slow flood waters.

Stormwater drainage facilities and detention basins designed to replicate the natural water purification functions of wetlands also improve water quality and wildlife habitat as well as creating aesthetically pleasing landscapes. Careful design and planting of these facilities allows them to blend more naturally into the landscape than conventional structures.

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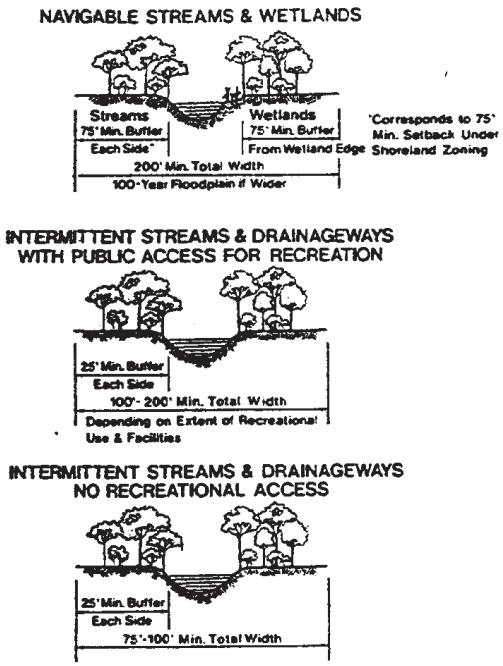


Sample buffer criteria for a stream greenway

For more information about stormwater:

Reducing the Impacts of Urban Runoff. Northeastern Illinois Planning Commission: 1997.

Strategic Plan for Water Resource Management. Northeastern Illinois Planning Commission: 2001.

Prairie Phlox

CHAPTER 2: BENEFITS OF NATURAL LANDSCAPING

I. Economic Benefits

II. Environmental Benefits

III. Educational and Recreational Benefits

The numerous potential benefits of natural landscaping may be divided into economic, environmental and educational/recreational themes. These categories are the focus of this chapter.

I. Economic Benefits

The "bottom line" can be a strong motivation for installing and maintaining natural landscaping instead of a conventional lawn. The savings that can be realized through natural landscaping for municipalities, park districts, school-districts, corporations, and institutional campuses are dramatically illustrated in later examples, where approximately nine-tenths of conventional landscape maintenance costs were eliminated. For some organizations, reducing site maintenance costs may be a significant factor in being able to balance the budget.

Reduced costs of landscape installation and maintenance

There can be a cost savings in the installation of natural landscaping versus conventional landscaping, depending upon materials specified. The cost of seed, whether it is conventional Kentucky Blue Grass seed or native seed, is similar. The installation of sod increases costs, as does the installation of plugs in natural landscaping. The significant savings is in the cost of installing an irrigation system, which is necessary for maintaining a conventional landscape.

Native plant installation costs can often be reduced where the project sponsor or co-sponsor is a public or private entity with plant propagating capabilities. Volunteers are often willing to assist in the installation and maintenance of native landscapes, which further reduces costs.

A major savings of natural landscaping is the lower cost of landscape maintenance over the long-term. The combined costs of installation and maintenance for natural landscape over a ten year period may be one fifth of the costs for conventional landscape maintenance.

Native perennial plants are well adapted to the local soils and to environmental conditions, such as summer heat and drought. The costs of the following maintenance factors are significantly reduced or eliminated through natural landscaping: labor, water, fertilizer, herbicides, insecticides, fungicides, replanting annual flowers, and mowing. In some locations the costs of

water for irrigation can be very high and are avoided by natural landscaping. The reduced consumption of fossil fuel for lawn maintenance equipment is an additional benefit. Typical original maintenance requirements of natural landscapes involve annual mowing or burning and some weed removal (mostly in the few years after installation).

Appendix 8 contains detailed installation and maintenance cost analyses based on the experience of firms that design, install, and maintain natural landscaping projects.

Reduced expense for stormwater management facilities

In many locations, natural landscaping can accommodate storm and flood waters, thereby reducing the need for expensive, "highly engineered" conveyance and detention facilities. Drainage swales in particular cost considerably less to install than storm sewers. Where practical, curbs and gutters can be eliminated, or curbs can be slotted. To the extent that natural drainage measures can increase infiltration of stormwater, they will reduce runoff volumes and costs of downstream conveyance and detention structures.

Detention basins designed with natural landscaping to resemble wetlands or natural lake systems reduce costs over conventional basins. Native wetland and prairie vegetation eliminate the need for expensive riprap stabilization and paved low flow channels. Further, natural vegetation in detention basin bottoms and on side slopes is less expensive to maintain than conventional turf landscaping, in addition to being a more reliable soil stabilizer.

Creation of a distinctive community image that strengthens real estate markets

High quality natural features such as river corridors and woodlands strengthen the identity of a community or neighborhood. Distinctive natural landscaping that preserves the unique characteristics of a community is a unique community asset.

Real estate within a well-designed distinctive landscape setting can possess a marketing edge and positively affect property values. A community that appears to care for a high quality environment establishes a marketing niche that traditional area developments cannot offer.

Natural landscaping projects require materials, labor and professional services that generate income as well as enhance the environment. Nurseries, landscape architects, environmental restoration professionals, environmental groups, and neighborhood organizations are increasingly responding to the market for natural landscaping materials and professional expertise. Some inner-city neighborhood organizations are considering the economic development potential of cultivating native plants and seed products for environmental restoration projects. Sources for natural landscaping materials must be from businesses rather than from the "wild."

Supports the natural landscaping component of the "green industry"

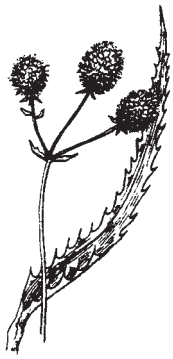
There are many opportunities for creative entrepreneurs in all aspects of natural landscaping.

II. Environmental Benefits

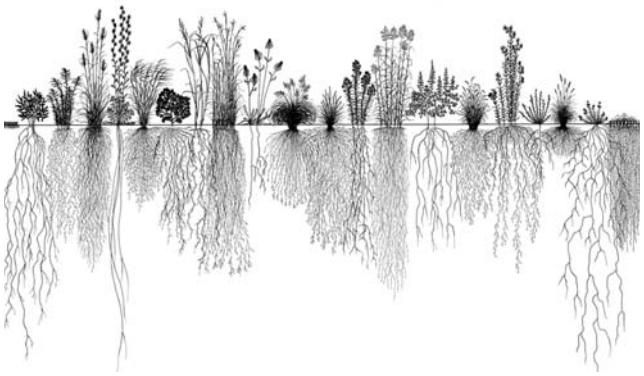
In many ways, natural landscaping reduces the stress that the "weed-free" lawn places on clean air, clean water, soil stability and other environmental qualities of life. Natural landscaping attracts wildlife, such as butterflies and birds, thus increasing biodiversity.

The ***Biodiversity Recovery Plan***, produced by Chicago Wilderness, states that natural landscaping is a way for landowners to increase biodiversity on their property by creating habitats for many species, particularly on properties that are adjacent to natural areas, streams, lakes or wetlands.

C. strigosus



Rattlesnake Master



Deep root systems of native grasses and forbs. Note shallow root system of conventional blue grass turf at far left. Drawing courtesy of Conservation Research Institute, Heidi Natura, 1995.

Reduced soil erosion

Natural landscaping has distinct advantages over conventional turf grasses in stabilizing highly erodible soils. Native plants are particularly effective on steeply sloped sites, stream banks, and in areas where moving water is present. The roots of native prairie plants are very dense, fine, and often very deep (in some cases, 5 to 10 feet in mature plants) and hold soil well. By contrast, typical turf grass root systems are only four to six inches deep.

Wetland vegetation provides effective soil stabilization along streambanks and shorelines by absorbing some of the erosive energy of flowing water and waves.

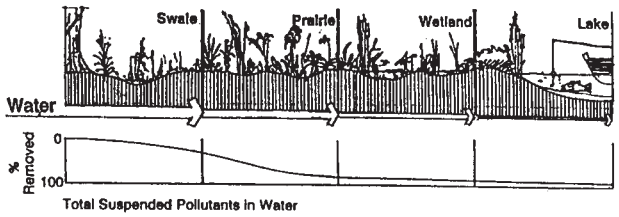
Native vegetation is finding a new use in "bioengineering" approaches to slope stabilization.

Demonstration projects for streambank and shoreline stabilization, such as along the Skokie River in the Chicago Botanic Garden, have successfully used native plants such as prairie cordgrass and various willow species.

Improved water quality

Native vegetation in naturalized drainage ways enhances the infiltration of contaminated stormwater. The dense, deep root systems augment the permeability of the soil and help the uptake of certain stormwater pollutants. Native vegetation buffers are particularly effective along the edges of streams, lakes, and wetlands. They can intercept runoff and subsurface water pollutants from urban and agricultural land uses and construction sites. Emergent and submerged wetland vegetation provides an additional benefit along the edges of lakes and streams by serving as a growing surface for microorganisms. These microorganisms break down certain pollutants thereby reducing their harmful effects.

An additional benefit of native vegetation landscaping is its ability to thrive without fertilizers, or heavy use of pesticides and herbicides. Turf grass and other conventional landscapes are heavily dependent on chemical applications, and the excess chemicals inevitably find their way into our waterways where they cause excessive plant growth and toxicity to fish and other aquatic organisms.



Drainage of a site through a natural system, rather than through storm sewers, dramatically reduces pollution levels.

Reduced air pollution

Standard lawn maintenance equipment creates significant amounts of air pollution. Equipment such as lawn mowers , chain saws, leaf vacuums, and other fossil fueled lawn maintenance equipment emit high levels of carbon monoxide, hydrocarbons (VOCs) and nitrogen oxides (NOx), which contribute to the formation of ground level ozone (smog), toxins and other particulates. The USEPA estimates that a gasoline powered lawn mower emits 11 times the air pollution of a new car for each hour of operation. Gasoline lawn and power equipment, on average, produce 5 percent of "smog"- forming VOCs in nonattainment areas (such as the northeastern Illinois region). Smog is a noxious irritant which impairs lung function and inhibits plant growth. In addition, the "driver" of such equipment is typically positioned where exposure to such carbon monoxide and toxic emissions is greatest.

Small gasoline spills evaporate and pollute the air as well. The USEPA estimates that every

summer, the few ounces spilled during each refueling of lawn and garden equipment adds up to 17,000,000 gallons of gasoline nationwide.

Natural landscaping can significantly reduce the need for fossil fueled lawn and garden equipment and this reduces the associated air pollution and health risks. In addition, the native plants themselves can help to improve air quality by reducing particulates and gaseous air pollutants. The Clean Air Counts campaign states that for every 1,000 acres of natural landscaping, 50 tons of VOCs and 5 tons of NOx are avoided per year.

Reduced noise pollution

Noise from lawn and gardening equipment has become a source of increasing dissatisfaction in some communities. The installation of natural landscaping reduces the use of this equipment.

Climatological benefits

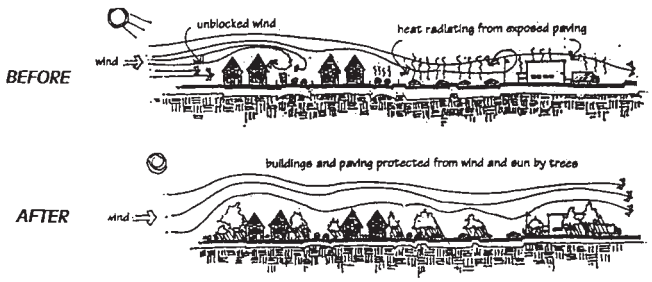
Trees and other vegetation benefit the climate on three levels: human comfort, energy conservation, and urban climates.

Human comfort

Plants intercept infrared radiation directly by providing shade and indirectly by covering surfaces that reflect or reradiate solar energy. Trees and shrubs can channel air movement. Moving air feels cooler. In the winter, windbreaks reduce the wind chill factor.

Energy Conservation

Windbreaks on the north and west sides of buildings reduce winter heating costs. In the summer, trees and other vegetation make non-air-conditioned buildings more comfortable and reduce energy costs for air-conditioned buildings.



Planting of vegetation improves climatological conditions.

Reduced greenhouse effect

Natural vegetation can help to combat global climate change (the "greenhouse effect") by removing carbon dioxide (CO2) from the atmosphere. Plants remove CO2 from the atmosphere and store the carbon in the body of the plant, the root system and the soil.

Planting native plants can facilitate this CO2 removal. The soils beneath the tallgrass prairie can contain an immense amount of organic matter and nitrogen. Studies have indicated that temperate prairie grasslands are superior soil carbon sinks when compared to forests of similar climate. It is the combination of fire, plants,

root depth distributions and microbes that produce the large amount of soil carbon.

Habitat restoration and protection

Due to extensive urban and agricultural development, high quality natural communities cover only .07% of Illinois' land and water, according to the Illinois Natural Areas Inventory. With the decrease in habitats, many plants and animals have lost the special conditions and requirements they need for their survival.

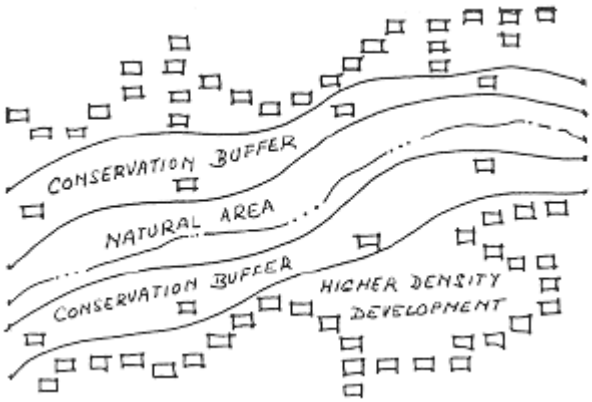
Natural landscaping plays a part in attracting native animals and re-establishing the natural cycles within which they thrive. In addition, natural landscaping can be used to create buffers which reduce urban stresses and proximity of exotic species to high quality natural areas.

When a site is adjacent to a natural area, special care must be taken when considering plant selection. Certain plant species can become invasive and disturb the natural area. It is advisable to treat the landscaped area as an extension of the natural area.

Native insects, including butterflies and moths, attract a wide array of songbirds, who eat the insects and the plant seeds. If a restored prairie is large enough, it might attract nesting grassland birds such as meadowlarks and bobolinks, birds whose habitat is decreasing in most parts of their range in the state. The degree of habitat value in natural landscaping depends on many factors relating to the ability of a site to provide the conditions required by specific plant and animal species. Site planning for natural landscaping should strive to preserve existing wildlife habitats.

As part of planning natural landscaping, it is desirable to complete an inventory of plant and animal species currently using the site be taken. Where desirable species are already using the site for nesting, phasing in a project by keeping enough habitat to protect those species should be considered before forging ahead with replanting the entire site.

Canada geese have become pests in many city and suburban locations where there are turf grass lawns in proximity to open water. A buffer of thick and tall native plantings around the waterbody will discourage geese from grazing, especially during the growing season when the plants are taller.



Conservation buffers can help protect wildlife habitat in a development. (Shaw, et. al., 1986.)

Beautification

Though it is difficult to quantify, beautification is an important reason, sometimes the fundamental reason, for natural landscaping. Many people living or working in natural landscapes appreciate the various textures, colors and shapes of native plants and the dramatic progression of hues throughout the seasons. Wildlife, especially the birds and butterflies attracted to the plants, also enhance the aesthetic appeal of natural landscaping.

III. Educational and Recreational Benefits

There is an old saying:

"People will only conserve what they love; that they will only love what they understand; and they will only understand what they are taught."

Natural landscaping may not be the only way to demonstrate this old adage, but it is a powerful instrument in our tool kit for the future.

Conservation education

Natural landscaping puts people in touch with a variety of beautiful plants, and native plantings enhance the sense of being in a unique and special place. This familiarity can strengthen community support for habitat preservation and restoration, environmental protection, and open space acquisition.

Municipalities, school districts, park districts, and forest preserve districts are critical entities for bringing natural landscaping into the public eye. This can be done through educational programs such as nature walks and talks, exhibits, and volunteer days sponsored by the above organizations. These opportunities provide positive examples of public land management and increase the awareness and understanding of the public about the community which they reside.

Passive recreation opportunities

Natural landscapes provide recreational opportunities such as bird watching and photography. The diverse colors, shapes, sounds, textures, odors, and tastes found in the natural environment provide the observer with sensory experiences not found in more sterile, traditional landscapes. Nature offers both tranquility and excitement. It can serve as a place to relax, a place of diversity and excitement. Incorporating native landscaping throughout the community offers the opportunity for children to experience and learn from nature in their own yard and

community.

Enhanced regional recreational corridors

Popular recreational activities such as walking, running, bicycling and skating are increasingly accommodated by local and regional trails and greenways. Natural landscaping in greenways can help create new attractive recreation areas, rejuvenate others, and provide connecting corridors.

Photo courtesy of the Lake County Forest Preserve District

Scientific Study

Natural landscapes provide scientists (and amateur observers) with numerous opportunities for study. Research can lead to improved propagation techniques in urban settings and improved availability of plant materials. Scientific study can assess the impacts of urban development on native species and the benefits of introducing native species on plant, animal and human communities. Natural greenways provide opportunities for grade school, high school, and community college students to study nature and carry out their own research close to home.

FICTION AND FACT ABOUT NATURAL LANDSCAPES

Fiction: They attract rats.
Fact: Rats are not attracted to natural landscapes. They live primarily in man-made structures and eat garbage.

Fiction: They breed mosquitoes.
Fact: Mosquitoes breed in standing water. Prairies & other natural landscapes absorb more water than conventional lawn, thereby reducing the amount of runoff & standing water. Natural landscapes also increase the populations of mosquito predators, such as birds.

Fiction: They present a fire hazard.
Fact: Properly managed natural landscapes do not present more of a fire hazard than any other type of landscape.

Fiction: They increase pollen & hay fever.
Fact: All flowering plants produce pollen. The most offensive allergens are ragweeds, not plants like goldenrod which are often used in natural plantings.

Fiction: They lower property values.
Fact: Property values are a function of public perception. As natural landscaping has become more accepted, and where it is done well, it is seen as an asset.

Source: Adapted from "To Mow or Grow" by Bret Rappaport in Wildflower, Spring 1996.

For more information about greenways:

Northeastern Illinois Regional Greenways Plan. Northeastern Illinois Planning Commission/Openlands Project: 1992. Updated June 1997.

For more information about biodiversity:

The Biodiversity Recovery Plan. Chicago Wilderness: 1999. Available at

http://www.chicagowilderness.org/pubprod/brp/index.cfm

Nodding Wild Onion

CHAPTER 3: WHAT ARE THE POTENTIAL ROLES FOR LOCAL GOVERNMENT?

I. Opportunities for Government Leadership

II. Regulatory Issues

The officials of local governments, including cities and villages, counties, park districts, conservation and forest preserve districts, and sanitary and school districts can promote and benefit from the use of natural landscaping.

Local officials can play an important role in the encouragement of natural landscaping throughout northeastern Illinois by using such practices on public lands, promoting natural landscaping through public policy, sponsoring demonstration projects and educating the public on the benefits of natural landscaping.

I. What are the Opportunities for Government Leadership?

Landscape public properties "naturally"

Provide leadership by increasing the use of natural landscaping on public properties, including streetscapes:

* Make someone on staff responsible for landscape issues and provide training opportunities relating to natural landscaping.

* Develop a multi-year program for retrofitting natural landscaping on existing sites.

* Use in-house landscape staff or outside professionals to develop plans for new and existing sites.

* Develop policies and specifications for new site planning to encourage the use of natural landscaping.

* Utilize natural landscaping, especially to remedy situations where traditional turf landscaping is causing difficulties (e.g., eroding gullies or stream channels).

Develop a local policy and a legal framework

Adopt or modify local codes and ordinances in order to facilitate the use of natural landscaping on private property. Modify municipal procedures (e.g., planning, public works, public safety, recreation) to accommodate natural landscaping:

* Review and amend or replace the local weed ordinance so that it encourages natural landscaping.

* Adopt a natural landscape ordinance.

* Amend subdivision regulations and other ordinances that govern landscaping of development sites in order to accommodate and encourage natural landscaping. In particular, amend drainage code language that mandates storm sewers to the exclusion of vegetated swales and filter strips.

* Develop and adopt fire department procedures for permitting and overseeing prescribed burns

of natural areas; inform the public of these requirements.

* Include natural landscaping goals and policies in comprehensive plans.

* Designate greenways in comprehensive plans, land use plans and park plans.

* Require natural landscaping for stormwater facilities and stream, lake and wetland buffers.

Promote demonstration projects

Work with school districts, park districts, forest preserve and conservation districts, state and federal agencies, chambers of commerce, residents and environmental groups to support demonstration projects and other educational efforts that will encourage the use of natural landscaping:

* Appoint a public/private task force or commission to develop recommendations for furthering higher standards of landscaping within the community.

* Promote lectures, slide shows, field trips, workshops, exhibits and other special events that help to educate all groups of citizens about natural landscaping.

* Work with neighborhood groups to develop guidelines that will promote distinctive landscapes within selected neighborhoods.

Provide educational materials and information

Inform the general public of the methods and benefits of natural landscaping:

* Provide informative materials on natural landscaping (including plant lists, answers to often asked questions, and sources of other important information); local libraries and park districts are obvious providers of such information.

* Include articles on natural landscaping in the community newsletter.

* Conduct a public relations program in conjunction with natural landscaping on public property; this could involve local radio and TV stations, as well as the print media.

II. What are the Regulatory Issues?

Weed regulations

Due to their competitive nature, "noxious" and "exotic" weeds can be a problem with respect to preserving and restoring native plants. "Exotic" is a term used to describe species that originate from a different geographic area. Some species can become invasive and spread throughout an area, eliminating other species. Exotic species are especially prone to becoming invasive, since there are no natural predators or barriers to curb their growth.

States have established laws to control the further spread of some of these problem plants, and it is illegal for nurseries to sell many of them. Local extension services, arboretums, or landscape professionals and naturalists are available to help identify any possible existing invasive species, and make recommendations for removal.

Illinois Noxious Weed Law

The Illinois Noxious Weed Law (505 ILCS 100/1) is intended to control weeds that are a problem to agriculture, and enforcement of the law is assigned to the Illinois Department of Agriculture. The list of noxious weeds is determined by Director of the Department of Agriculture, the Dean of the College of Agriculture of the University of Illinois, and the Director of the Agricultural Experiment Station at the University of Illinois.

The list of official noxious weeds, updated in 2002, includes:

- marijuana
- giant ragweed
- common ragweed
- kudzu
- Canada thistle
- perennial sow thistle
- musk thistle
- perennial members of the sorghym genus

County boards are defined as the "control authorities" for weed control operating under rules established by the Department of Agriculture. Land owners are responsible for controlling noxious weeds on their property. The control authority can issue notices for such control in order to require compliance.

Local officials could work with county government and the Illinois Department of Agriculture in identifying and eradicating infestations of noxious weeds. Volunteer stewards working with conservation organizations often have experience in the techniques for removing noxious weeds.

Illinois Exotic Weed Act

Another law that addresses weeds is the Illinois Exotic Weed Act of 1972 (525 ILCS 10). This Act tries to avoid spreading non-native invasive plants that degrade natural plant communities, reduce the value of fish and wildlife habitat, or threaten Illinois endangered or threatened species. The Act prohibits the buying, selling, distributing, or planting of seeds or plants of designated exotic weeds.

Designated exotic weeds include:

- Japanese honeysuckle (Lonicera japonica)
- Multiflora rose (Rosa multiflora)
- Purple loosestrife (Lythrum salicaria)

In 2003, the Illinois Exotic Weed Act was amended to include kudzu and invasive species of buckthorn. The buckthorn species are common buckthorn, glossy buckthorn, dahurian buckthorn, saw-toothed buckthorn, Japanese buckthorn and Chinese buckthorn.

Similar laws exist in Wisconsin and Indiana.

A site plan for natural landscaping may necessitate the removal of both noxious and exotic weeds.

Municipal Weed Ordinances:

Municipal weed laws have sometimes become the "lightning rod" for controversy associated

with natural landscaping. Communities adopt weed laws in order to prevent unsightliness from poor property maintenance and to prevent hazards from vermin and fire, which were believed to be caused by unkempt vegetation. The drafting of such laws usually occurred prior to or without knowledge of natural plant communities. Weed laws, if not carefully worded, can equate natural landscaping with unmanaged landscapes. In fact, natural landscaping is managed and does not pose the hazards that weed laws are intended to address.

Community and neighborhood sentiment regarding aesthetics and appearance has sometimes led citizens to look to weed laws as a way of opposing natural landscaping. Courts have determined that concerns about natural landscapes, including vermin, fire hazards, mosquitoes, and allergies are unfounded. A well-crafted ordinance, coupled with public education illustrating the benefits of natural landscaping, should be adequate to provide a local framework to support natural landscaping.

Municipalities have responded to the natural landscaping movement and weed laws in various ways.

Permissive Approach

Madison, Wisconsin was among the first communities to encourage natural landscaping by taking a permitting approach. The ordinance requires homeowners to file an application for natural landscaping and obtain approval from a majority of neighbors.

Improved Weed Laws

More recently enacted weed laws allow natural landscaping "by right" without case by case neighbor or city permission. There are three main approaches to crafting or modifying a weed law:

* Require a setback.
* Include broadly worded exceptions for natural landscaping.
* Encourage natural landscaping.

Require a setback - Weed laws have traditionally regulated height. For example, weeds exceeding 10 inches in height may not be permitted. The newer and more sophisticated weed laws address the appearance issue by requiring that a setback or buffer strip on the periphery of the property be maintained at a maximum height (such as 12 inches). Vegetation behind the setback and within the yard is unregulated except for control of listed noxious weeds.

Setback distances depend on the type of community and size of the typical lot. Communities with homes on large lots could have as much as a twenty-foot setback, while in towns with smaller lots, a two- or three-foot setback would be more suitable.

Setback laws have several advantages and represent a workable compromise between the sometimes diverse interests of the village, natu-

ral landscapers and neighbors. Primarily, setback ordinances allow for the unregulated growing of vegetation on a majority of the lot. Like a frame around an abstract painting, the setback around the perimeter of a natural area creates a tended look that satisfies neighbor and village concerns of conformity and aesthetics. The yard takes on its intended look. A setback also solves the practical problems caused by large plants and grasses lopping over into neighbor yards or across sidewalks. The setback ordinances are also easy to understand and enforce. Both the village and the natural landscaper benefit from a clear and simple law. Neighbor complaints are generally satisfied by such compromise and living in a community makes compromise essential.

A reasonable exception to setback requirements is where adjacent landowners mutually agree to continuous natural landscaping across adjacent property lines.

Include broadly worded exceptions in the weed ordinance for beneficial landscapes - These exceptions may include the following:

Native plantings - the use of native plant species for aesthetic and/or wildlife reasons

Wildlife plantings -the use of native and/or introduced plant species to attract and aid wildlife

Erosion control - to offset and control any soil loss problems both occurring and predicted.

Soil fertility building - the enrichment and eventual stabilization of soil fertility through the use of various plant species.

Governmental programs - any federal, state or local programs which require the unimpaired growth of plants during a majority or all of the growing season.

Educational programs - any areas designated for educational studies.

Cultivation - any plant species or group of plant species native or introduced and grown for consumption, pleasure or business reasons.

Biological control - the planting of a particular plant species or group of species which will effectively out-compete and replace a noxious or troublesome weed species without additional soil disturbance of the site.

Parks and open space - any and all public parks and open space lands whether under the jurisdiction of federal, state, or local agencies including private conservation/preservation organizations.

Stormwater Control – the use of natural landscaping to convey and store stormwater run-off.

Wooded areas - all areas that are predominantly wooded.

Encourage natural landscaping - This approach promotes the use of natural landscaping in its broadest sense.

Long Grove, Illinois is a good example of a com-

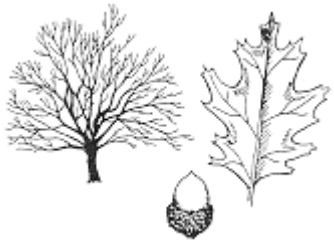
munity that embodies this policy. Long Grove has no law regulating vegetation height. The village requires developers to include scenic easements, at least one hundred feet deep and planted with native plants, wildflowers and grasses between the homes and major streets in their subdivisions. Large portions of the town are designated natural areas as determined by a scientific ecological survey. Long Grove employs a naturalist to advise developers and homeowners on how to cultivate and maintain natural landscapes. Long Grove sells native plants and seed mixes to residents and has a committee that reviews prairie restoration projects within the village.

Schaumburg, Illinois, created its own biodiversity recovery plan for the village. To implement the plan, the Board amended the municipal code with an ordinance for biodiversity regulations. The ordinance requires environmentally beneficial landscaping and sustainable development practices.

Fort Collins, Colorado employs a full time wildlife biologist and has a ten acre nature preserve in the heart of downtown on land that used to be a formal park. There is a city program to identify and certify homeowner's backyard wildlife habitats. To receive this certification, homeowners must let nature reclaim their non-native lawns. Hundred of citizens participate in the program.

There are many variations that can be developed to respond to local conditions. A community may want to try a pilot program directed within a selected neighborhood, pertaining to particular land uses such as campus-style uses, or targeted towards less visible locations on sites. See **Appendix 6** for additional information and sample ordinance language.

(This section draws heavily from the John Marshall Law Review, Volume 26, Number 4, Summer 1993, written by Bret Rappaport.)



Black Oak

For more information about updating local ordinances:

Conservation Design Resource Manual, Northeastern Illinois Planning Commission: 2003.

Available at http://www.chicagowilderness.org/pubprod/miscpdf/CD_Resource_Manual.pdf

Arrowhead

CHAPTER 4: THE "HOW TO" OF NATURAL LANDSCAPING

Designing, installing and managing natural landscaping projects will vary in complexity and approach depending upon the nature of the site and the project goals. There are different degrees of natural landscaping, ranging all the way from a small native flower patch, to a full-scale replication of a plant community covering many acres. An otherwise traditionally landscaped site may be installed with a "natural" stormwater pond with a fringe of native wetland plants and upland buffer to trap sediment.

Larger projects have the most at stake, financially and visually. They require a detailed and technical planning process. Some examples of larger scale projects include corporate campuses, university lands and large community parks.

I. Ethics of Using Native Plants

Regardless of the scope or goals of your project, an important ethical consideration is the acquisition seeds or plugs from a reputable supplier. It is inappropriate for amateur gardeners or professionals to collect seeds or plants from "the wild," except by permission of the owner or as part of a restoration program.

Collection of too many plants or seeds can seriously reduce the ability of the plundered site to replenish itself. Seed collecting ethics are rigorously followed by volunteer groups working with forest preserve districts, owners of natural sites, and professionals in the nursery business.

II. Developing an Approach

Planning, even if informal, is a fundamental ingredient for a successful natural landscaping project. The greater the ambition or the shorter the timetable, the more planning and technical expertise will be required. A starting point for any natural landscaping project is to analyze the current amenities, opportunities and limitations of your site and articulate reasonable goals.

A basic underpinning for any natural landscaping project would be an understanding of current soil conditions. This knowledge will assist you with your decision about what you can

plant where, since soil conditions can vary dramatically across a site. Some plants thrive in dry soil conditions, and others require wet soil conditions in order to thrive. A soil scientist, such as your local agent from the U.S. Department of Agriculture's Natural Resources Conservation Service (formerly the Soil Conservation Service) can tell you the type of soil that you have and the kind of material from which it was derived. The more a project is oriented towards restoration, the more it must take factors such as particular soil conditions into account.

Prairie, woodland/savanna, and wetland/riparian projects have different requirements and will be treated separately in this chapter, although all could exist on one site. In addition, this chapter will discuss how to address stormwater management using natural landscaping integrated into a project's overall design.

The complexity of any natural landscaping project will be determined by a variety of considerations.

* Is this a small scale project with very limited budget and limited access to technical services? Or is it a large, well-funded project intended to achieve complex ecological restoration objectives?

* Do you know your soil types, the kind of vegetative community that is appropriate for your site, and your growing season sun and shade patterns?

* Does the vision for the project require the use of plants that are "fussy" about soil, drainage and other conditions? If so, prudence might dictate a look at alternative plants.

* Are professional assistance and field labor available at appropriate skill levels to undertake and maintain a complex project?

* What sources of labor are available for installation and follow-up stewardship?

* What are the local government regulations affecting the use and ongoing management of natural landscaping? Regulations may affect the location of natural landscaping on the site and the types of plants used. You need to know local weed ordinances and/or fire regulations before proceeding.

* What is the project's relationship to adjacent properties? Being a good neighbor is important, so a consideration of adjacent land uses is critical. Natural landscaping adjacent to existing natural open space is obviously much easier than the first introduction into a conventional turf subdivision. Educating adjacent landowners prior to installation is a valuable endeavor. Taking the longer view and adopting a willingness to phase in a project over a few years might be the pragmatic thing to do. It is quite possible, however, that the newly natural landscape will be so attractive that adjacent property owners will want to follow suit.

* Do any nearby or adjacent ecological restoration projects suggest a rationale for installing natural landscaping or have a physical linkage?

III. Natural Landscaping on a Small Scale

Many homeowners are looking for an alternative to the continuing efforts necessary to maintain the bluegrass lawn. They are particularly uncomfortable with the application of costly chemical herbicides and fertilizers. The shift to a more natural, environmentally friendly yard

with groundcovers, shrubs, grasses and colorful forbs is an inviting alternative.

Individuals about to undertake the transition of a turf lawn to a natural landscape will find many helpful resource books in libraries and in larger or specialty bookstores. In addition, local restoration organizations such as the North Branch Restoration Project in the Chicago region, regional nurseries devoted exclusively to native stock, local nurseries that are enlarging their selection of native plants, and professional landscape architects who "design with nature" will readily share their knowledge.

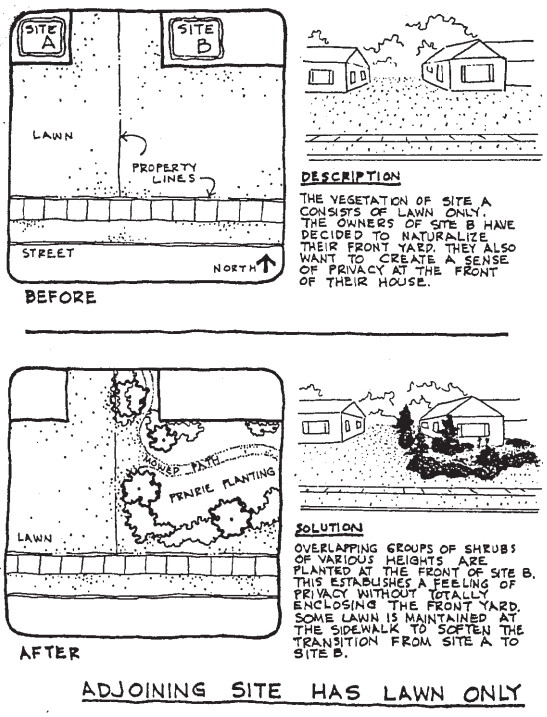
Homeowners can volunteer with restoration organizations to grow native plants in their yards and harvest them, and beautify their yards in the process. It is important, however, that plants producing seeds intended for restoration grow in separate areas from those purchased at nurseries, because it is necessary to keep the native stock to be used for restoration "pure."

Homeowners and owners of small sites who enjoy "digging in the dirt" may find the gradual approach to converting their lawns a less expensive alternative than a one-time project using a professional designer and installer. With this gradual approach comes the delight of experimentation with plants and their habitats. In addition, the maturing converted gardens can serve as plant nurseries for newly dug beds. Plants will teach the gardener where they like to grow and will relocate themselves over the years according to changing conditions of sun and shade. An ecologist who has tended a natural garden in Park Ridge for over 30 years finds that a garden flows like a river; it is ever-changing.

In the natural perennial garden, treasured sentimental favorites, even exotics, can thrive intermixed with native plants to create an aesthetically and personally rewarding landscape. Gardeners can even try incorporating food plants, such as herbs and tomatoes. They can also create a "rain garden" by directing their downspout to a depression planted with native wetland plants.

It is tempting to begin with quick-spreading ground covers and perennials in order to make a beautiful display at the start and prevent soil erosion. Showy plants such as the exotic, early-blooming dame's rocket, and later-blooming native black-eyed susans and purple coneflowers can be used to brighten a garden reliably in its first year. However, it is important to avoid the trap of starting with extremely aggressive perennials and groundcovers that will then require much time and effort to dislodge.

In the first year, generous mulching will keep precious water in the soil and deter weeds and erosion. Eventually, the native flowers and grasses should outcompete the non-natives, which are not so well adapted to the Midwest climate.



IV. Natural Landscaping on a Large Scale

Natural landscaping on medium to larger sites requires considerable advance planning because of the size of the initial investment and the cost implications of making serious mistakes. A rigorous program would include the following tasks, undertaken with the assistance of a qualified professional:

* inventory ecological resources, current site conditions and potential for restoration;
* study site history and review technical literature;
* develop goals and objectives for the overall project (and subareas of the site, as appropriate)
* develop a plan (site design, installation, and management) to accomplish the goals and objectives;
* design a monitoring program to assess project performance;
* implement the project (installation on the site);
* manage the project;
* evaluate the project and report on its progress.

Reputable and experienced guidance is the best insurance for a successful restoration program, whether from a staff manager, consulting ecologist, or other source.

V. Considerations for Installation

Prairie Vegetation

Prairies are open "grasslands"which are fire-climax communities. Historically, whether fires were started by lightning or by man, they beat back any trees and large shrubs which tried to grow and kept them at a low shrubby stage.

Prairies are dominated by perennial grasses and forbs. Soil type and hydrology are probably the primary determinants of different species composition on the prairie.

Site preparation: removal of existing undesirable vegetation

The primary methods of preparing the site include: burning, baking under black plastic, herbicides, tillage, and removal by hand. Local conditions and personnel considerations may call for flexibility and creative approaches. Site

conditions throughout the region have been so disturbed that successful approaches on one site, or one portion of a site, may not work on others.

Often techniques are used in combination. For small areas where appearance is not a factor, covering an area with black plastic for a growing season is a very environmentally safe method of killing turfgrass and other vegetation. This is not as practical with large sites. Here herbicide treatments may need to be conducted twice: once following an initial burn to remove litter and duff, and then several weeks later to eliminate any germinating or resprouting undesirable plants. Use a low toxicity, non-persistent herbicide.

Burning can occur early in the season at a time of low moisture. Tilling can occur as soon as soils thaw in the spring. It makes strategic sense to till after existing vegetation has germinated or sprouted in order to expose it to the stress effects of tilling and warmer weather.

Tillage can bring weed seeds to the soil's surface and create a longer-term weed problem. Where tillage is used, carefully timed repetition over several months, or even for an entire growing season, has been used to control weeds. Cover crops may be used in-between tillage events to stabilize soils. Cover crops can include annual rye grass, barley, oats, and other annual species that grow quickly.

Butterfly Weed *Purple Prairie Clover* *Coneflower*

Site preparation and control of weeds are the most important steps in the restoration process.

Procuring seeds and plants:

Seeds and plants can be acquired from many specialized nurseries. (See **Appendix 4**.) It is most desirable to use local genetic stock from seed collected and propagated within a 150-200 mile radius. (Some restorationists recommend a 15 mile maximum radius.) The seed should be cleaned, should meet high quality seed test requirements, and should be accurately labeled. Locally collected seeds are also useful, (note ethics discussion earlier), but quality control may be a problem if the seeds are not cleaned and tested. More than one project has failed or been seriously delayed because of poor quality seed. Seeds are most economical for larger projects, while plants provide quicker results at a higher cost. A larger project can include strategically placed plantings in combination with larger seeded areas.

Highest priority should be given to creating a matrix of native grasses. Prairie forbs can be installed with the prairie grasses or introduced later. Some restorationists introduce special blends of pioneer grasses and forbs at the begin-

ning and add carefully chosen matrices of more conservative plants over the years as the prairie matures. One common strategy is to include very colorful prairie plants such as black-eyed susans in the beginning. These may be short lived but will provide a highly visible, colorful and very positive initial impression.

Planting:

Planting is largely a late fall or early spring activity. Planting in very hot and dry summer conditions may delay germination and growth or require irrigation. Irrigation of seeded areas, however, is usually not mandatory as native species will usually germinate when conditions are most appropriate. However, as with any planting, watering may be necessary to help a planting that has already germinated but is in early vulnerable growth stages when a drought or heat wave begins. An effective mulching system can usually address moisture retention and greatly help a young planting. As with any large scale agricultural activity, however nature can wreak havoc on even the best planned project.

Sowing can be accomplished by use of tractors and appropriate drills or broadcasters on larger projects while hand broadcasting can often be used in smaller projects. Native plants are installed the same way as any other potted or bare root stock by digging a hole large enough so it will not constrict root systems. Mulching is often necessary to ameliorate soil and moisture conditions and ensure successful seed germination and early growth. Straw, mulches, or alternatively, cover crops including oats, barley, etc., can be seeded simultaneously with the prairie seeds and plants to provide protection against erosion and desiccation, and also to control subsequent weed germination. Cover crop seeding rates should be light to moderate so they do not compete with developing seedlings.

The cost of installation can be reduced by using volunteers who are often eager to be stewards and learn about natural landscaping.

Initial management:

After cover crops (and some inevitable weeds) reach a height of 1-2 feet, usually by late June of the first year of planting, mow the planting to a height of no lower than 6-8 inches. Use a rotary mower that does not leave thick mats of clippings, which smother young prairie seedlings. Noxious weeds such as thistles may need extra attention. Hand removal or direct application by wick treatment with herbicides may be sufficient.

Follow-up maintenance:

Occasional mowing may be necessary for 2-3 years to keep weeds down and prevent them from suppressing young prairie plants. There is no prescribed season or number of times for mowing, but weather will be an important factor in growth of the newly planted prairie and will affect the mowing schedule. The services of a qualified professional will be invaluable in decision making about maintenance during the

first years. In the spring following the first year of planting, prescribed burning can be used to begin the maintenance process. Noxious weed management may also be needed at this time.

Routine maintenance will primarily involve use of prescribed burning. Prescribed burns can be conducted anytime plant fuel is combustible. However, late spring and early to mid-summer burns, alternated with fall burns, have been very useful. Do not be reluctant to burn annually if necessary to accelerate the rate of performance of the prairie during the first 4-6 years.

What to expect for the first 5 years

Expect cover crops and weeds during years 1-3 as the prevailing vegetation. Usually, in years 3-5, native grasses and a series of early successional native flowers (e.g., black-eyed susan and yellow coneflower) will dominate. Depending on the species mix, prairie restorations usually become better, more diverse, and more aesthetic with time. Uniform mowing maintenance as described above not only helps the prairie develop but also improves public relations during the first couple of years of establishment.

Spotted Joe Pye Weed

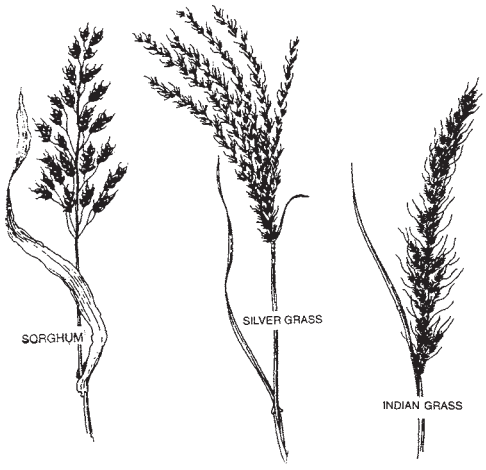
Purple Joe Pye Weed

Strategies for Being a Good Neighbor with Natural Landscaping:

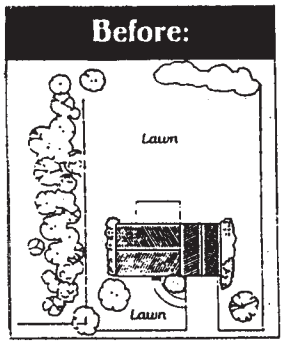
Conflicts with neighbors can be avoided by following a few simple rules:

1. Create a border of lawn, hedge, fence, path, etc. to frame the natural landscape.
2. Recognize the rights of property owners to be different; don't be arrogant about your native plantings.
3. Advertise by educating neighbors about what to expect before you start your project.
4. Start small to develop your learning curve and minimize the rate of change for neighbors.
5. Humanize your landscape with human touches, such as places to sit, bird houses, etc. in order to maximize enjoyment and link people with the landscape.

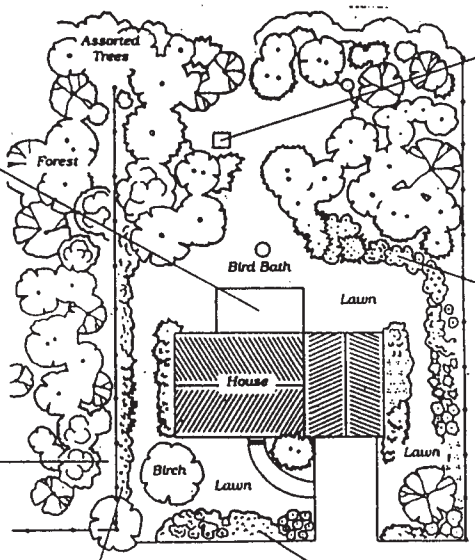
Adapted from: To Mow or Grow," by Bret Rappaport in Wildflower, Spring, 1996.



INTRODUCING NATIVE PLANTS WITH MORE CONVENTIONAL MATERIALS TO CREATE AN AESTHETIC, LOW MAINTENANCE LANDSCAPE WITH FAR LESS LAWN.



Before: ¼ acre of lawn and young birch trees.



The Patio Porch
Unlike most decks that are landscaped with traditional shrubbery, the porch is surrounded by birdhouses, birdbaths, blueberries, and raspberries -- all attractants for feathered friends.

The Compost Pile
A small grass path leads to the compost pile hidden behind clumps of conifers and serviceberry. Consisting of mostly leaves and vegetable scraps, the compost is reintroduced to the perennial beds.

Naturalized Garden
Shade tolerant Solomon's seal and ferns, among others, fill out the area under white birches (normally a difficult place to manuever a lawn mower).

Fencing
A split rail fence is used to define the more "formal" landscape from forest property on the left. Besides providing a backdrop for the perennials, the fence also helps keep the neighborhood kids in check.

Perennial Bed with Year-Round Color
This sunny street-side perennial bed contains a variety of sun-loving plants. Like all perennial beds on the property, this garden is mulched with compost to help retain moisture, squelch weeds, and keep it looking attractive.

Shade-Loving Low Maintenance Groundcovers
Large beds of ferns and other woodland groundcovers border the forest and the fenceline.

VI. Savanna and Woodlands

Woodlands are a major component of the region's natural environment. They originally existed in upland areas in a delicate, see-saw relationship with prairies, and in lowland areas as well. Their location and density depended largely upon climate changes. The Chicago metropolitan area is world renowned for its oak savannas, an open woodland form dominated by oak species such as burr oak.

Dense oak/elm/ash/maple "big woods" contained many fire-intolerant fast-growing tree species with thin bark. This "forest" community probably experienced fire much less often than "oak openings," whose dominant oak tree has thick, fire-resistant bark. Both woodland types share many, but not all, of the same understory plants.

There is considerable academic interest and debate regarding the historical predominance of oak woodlands and relationships with other forest trees such as maple, hickory and elm. The natural transition from one type of vegetation to another in a woodland and in the transition zone between woodland and prairie and savanna is also still being studied.

Much of the remaining oak woodland has been included within the holdings of the forest preserve districts. Other woodlands have become highly desirable locations for subdivisions and estate homes. Oak woodland and conventional turf-dominated landscaping are not compatible, however. In our region the cultivation of turf grass under established oaks, and the soil compaction which accompanies it, results in the slow, but certain, demise of the oak. Therefore, remaining oak groves should be protected and restored. Landowners might even want to begin a woodland "from scratch." The process of woodland restoration is even less well understood and defined than prairie restoration, yet this should not deter the property owner from beginning to grow woodland plants and working towards re-establishing healthy ecosystems.

Installation

Creating a woodland "from scratch" is a long-term, if not multi-generational project. The time required for the maturing of trees, creation of more natural woodland soil conditions, etc. requires patience and vision on the part of the project sponsor. The effect can be enhanced through the strategic introduction of some faster growing but short-lived trees, which can jump start the creation of shaded conditions to support woodland understory vegetation and soil building. These will be replaced later by maturing, oaks, maples, or other species, depending on the type of woodland you are building.

Existing savannas and woodlands throughout the region are often seriously degraded and dominated by such plants as European buckthorn and garlic mustard. Thus, natural landscaping often means taking a highly degraded existing forest remnant, eliminating exotic species and re-introducing species that have

been eliminated.

Oak trees of any species often do not reproduce in their own shade and need openings for sprouting and maturing. Also, ground cover is shade suppressed by European buckthorn and other nonnative and native shrubs and trees. To create the conditions for oak regeneration and the growth of savanna grasses and forbs, both native and nonnative shrubs need to be reduced. The procedure should include manual or machine cutting and treatment of stumps with an herbicide to prevent re-sprouting.

The follow-up can be a wait-and-see-what-comes-up strategy, or the introduction of seeds and plants. Seedbank testing (placing soil samples in a flat and seeing what germinates) will often verify that native species are present and that they will be stimulated to germinate by removal of the shade suppressing shrubs and trees. If the seed bank is depleted, seed purchase or local collection may be required. Using the same guidelines as for procurement of seeds for prairies, appropriate species and quantities should be installed.

Introduction of the herbaceous layer into a woodland or savanna can be by simple hand broadcasting, usually in late fall, winter, or early spring (mid- November through March). In especially bare soil areas that might be erosion prone, light raking of the soil surface may accomplish better seed incorporation required for germination and minimize seed loss to erosion.

It should be noted that nurseries market nonnative trees such as the Norway maple which, with its deep shade, self-propagating vigor and widely-spreading surface roots, eliminate vegetation underneath them. Maples in general have this effect but some of the cultivars are a particular problem and should be avoided. Lack of light beneath them will retard the growth of the understory and promote erosion, loss of topsoil and nutrients.

Certain profusely growing, "weedy" native trees, such as box elder, are often considered a detriment to regeneration of desirable plants and are removed. These trees are often valued by the public which often doesn't distinguish among species and which values vegetation largely for scenic buffering and wildlife purposes. Therefore, removal of vegetation should be approached carefully with a regard for adjacent property owners. Education, evaluation of the need for removal, and the phasing of project components can help alleviate problems.

Persimmon Woods, St. Charles, IL

Initial management and follow up

In a woodland or savanna, other than spot removal of noxious weeds (e.g., garlic mustard, Canada thistle and re-sprouting buckthorn, prescribed burning is both the initial and long-term management and maintenance tool. Initially, prescribed burns should be light ground fires.

There are different professional opinions as to whether spring or fall is the best time to burn. The timing of burns can be varied, however, and the results monitored. Often a late spring date (mid April - mid May) is most effective at controlling the noxious weeds that have already leafed out and have minimal root energy reserves. Thus, burning at this time is most stressing to them. There is a perceived conflict with burning at this time; spring ephemeral plants (e.g., trout lilies, spring beauties, mayapples and trillium) are often in bloom. Burning will of course initially set these species back. However, most will immediately re-grow, and all will bloom the following year with apparent indifference to fire. A burn plan can divide the project into thirds. Subsequent burn rotations every third year will provide cover for wildlife escaping the fire.

Expectations for the first five years

Savanna and woodland sites with an intact seed bank will respond very quickly to management. A lush native grass, sedge and wildflower cover is the ultimate goal in conjunction with regenerating oaks, hickories, and other native trees and shrubs. In most degraded sites, all native trees are of a single age; expect saplings, young and middle age trees in the future rather than just the older existing trees. These varying age classes will scatter throughout and contribute to a parkland aspect as times goes on.

Repeated removal of re-sprouting buckthorn and other undesirable shrubs and trees should be expected management challenges during the first five years. Once a ground cover sedge and grass layer is present, the aesthetic will increase substantially, and the management requirements will diminish.

VII. Wetland, Stream and Lakeshore Habitats

Wetlands, streams and lakes can be important amenities on a development site. Waterfront (or riparian) property, in particular, can substantially enhance real estate values. Natural landscaping is particularly applicable in the vicinity of wetlands and waterbodies for the following reasons: 1) Natural landscaping can enhance degraded conditions which commonly exist prior to development; 2) Natural landscaping can protect existing high quality wetland and water amenities; 3) Natural landscaping techniques can be used to “fix” problems in these areas (e.g., shoreline erosion) more cost effectively than conventional approaches. Each of these natural landscaping opportunities is discussed in the following pages.

Natural landscaping for enhancement of wetlands and riparian zones

Over time, many of our wetland, streamside, and lake shore environments have become degraded by human-induced disturbances which not only affect their natural functions but also reduce their aesthetic value. One such disturbance is the introduction of invasive non-native plants, including reed canary grass, purple loosestrife, European fragile willows, and buckthorn. Such species reduce habitat value, contribute to an unkempt, weedy appearance, and obscure the waterbody from view. Wetlands and waterbodies also may be disturbed by land development activities in adjacent areas and in upland areas within the watershed. These disturbances, resulting in sediment deposition, nutrient enrichment, and increased stormwater flows, present a landscaping challenge in wetland and riparian environments.

Natural landscaping to enhance degraded conditions in wetlands and riparian environments should focus on two zones.

Upland transitional zone

Land that is adjacent to the normally wet or inundated area is a critical upland transitional zone. This transitional zone is extremely important to the health, function, and appearance of the wetland or waterbody. Natural landscaping in this transitional zone should be based on the same principles and techniques previously described for prairies and savanna/woodlands. An assessment of early surveyors' data may provide a good indication of the type of plant community to strive for in this zone.

While description of the techniques for prairie and savanna/woodland landscaping will not be repeated here, one particular consideration is worth mentioning. Most of the existing stream and river environments in northeastern Illinois bear little resemblance to the natural conditions which existed prior to settlement in the mid-1800's. The typical stream is now densely tree-lined (commonly with European buckthorn, box elder, and other invasive species). Not only do these trees often completely obscure the stream from view, they also shade out understory plants which are important for soil stabilization, pollutant filtering, and aquatic habitat. Part of the natural landscaping challenge in these areas is to develop acceptance of a new aesthetic for riparian areas and dispel the notion that the removal or thinning of trees along streams is undesirable. Fortunately, there are some high visibility restoration projects in the region, notably the Skokie River restoration at the Chicago Botanic Garden in Glencoe and the Des Plaines River Demonstration Project in Wadsworth, which effectively convey the beauty and functionality of rivers meandering through prairie and open savanna landscapes.

There are varying recommendations for the width of riparian buffer zones. Standards adopted by some northeastern Illinois communities range from about 25 to 50 feet on both sides, although narrower widths may be appro-

priate adjacent to intermittent streams or small wetlands. Buffers will be discussed at greater length later in this section.

Wetland/open water zone

Wetland and open water zones range from having saturated soil below the ground surface (such as in a wet meadow) to being completely inundated with water (such as a lake shoreline or a streambank). These areas can support a range of wetland plant species ranging from various sedges and shrubs which are intolerant of inundation, to emergent species, to submerged or floating leaved plants. Some of the basic principles of wetland landscaping, such as the importance of determining site history and previous vegetation, are similar to prairie and woodland principles, but many other factors are unique to wetlands.

The most important consideration in wetland landscaping is hydrology. Hydrology defines the presence of water in a wetland, including such factors as average and maximum depth, duration of inundation, and degree of soil saturation. Hydrology establishes the soil and plant conditions which distinguish different wetland type sand streambank and shoreline environments.

It should be noted that certain types of activities in wetlands, lakes and streams require a Section 404 permit from the Army Corps of Engineers. (The Corps' Chicago District regulates activities in the six-county northeastern Illinois region.) Regulated activities include filling, draining, and regrading. Most natural landscaping activities which are limited to vegetation management are not subject to a Corps permit. If a permit is needed, formal wetland delineation also will be required and more explicit mitigation criteria must be met. Wetland mitigation guidance is beyond the scope of this Source Book. You should check with the U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, or Natural Resources Conservation Service to determine possible permitting and mitigation requirements. (See **Appendix 4** for more information.) If the wetlands are designated as isolated, and are no longer protected by federal regulations, local governments—specifically county stormwater agencies—have or are developing regulations for protection.

Restoration of degraded plant communities

In dealing with existing wetlands with degraded plant communities, reduction of nonnative vegetation can best be addressed by using the techniques presented for prairie, savanna and woodland systems. Once undesirable species are under control, wetland enhancement may require temporary cover crops, modest species enrichment, or in extreme cases, complete reseeding or replanting. Most wetland sites have a seedbank (both native and nonnative) that will respond once weeds are reduced. However, if deep sediment burial has occurred, seed banks may not be present. Understanding the history of sediment burial is a key to deter-

mining the regenerative capability of the existing site. In some cases, it may be desirable and feasible to remove accumulated sediments to expose the seedbank and to create depressions and open water zones. This type of restoration can enhance the aesthetics and marketability of the new development. (The project designer can find assistance from the Natural Resource Conservation Service or a consulting wetland or soil scientist regarding appropriate restoration techniques.)

Restoration of drained wetlands

Another important consideration in wetland landscaping is an appreciation of the fact that extensive draining of naturally wet (or hydric) soils was done to accommodate intensive agriculture. Hydric soils are often found on farmland that has been (or is about to be) converted to urban uses. One of the simplest ways to "create" (or expand) a wetland landscape is to identify the location of hydric soils and the presence of drain tile systems or surface drainage ditches. Restoration of wetland hydrology can be accomplished by breaking up or plugging the drain tile or eliminating the ditch. This method is fairly reliable and is less expensive than excavating a wetland depression. Good technical planning is essential so that neighboring properties are not adversely affected with undesired nuisance wetness. Once the hydrology is restored, wetland plants are likely to reappear. Supplemental seeding or planting may be appropriate if greater diversity is desired.

Restoration of channelized streams

A natural landscaping opportunity for stream corridors is the restoration of meandered channels to replace artificially straightened channels. There are numerous opportunities for this type of restoration in northeastern Illinois since over 40 percent of the existing stream miles have been straightened or ditched. Several recent residential developments have incorporated stream channel restoration into their site plans to enhance the aesthetics and marketability of their projects. Once the natural contours have been restored, native wetland and prairie plants are planted on the streambanks to provide soil stabilization and aquatic habitat benefits.

Enhancement of streambanks and lake shores

Natural landscaping of streambanks or lake shores typically begins with the elimination of invasive overstory plants which shade out native wetland species. In many cases, emergent wetland plants will then propagate on their own. If not, planting of live plugs or tubers is recommended. Native wetland and prairie plants are much more protective of waterbody edges than conventional turf grass which is intolerant of extended inundation. While wetland plants are expected in many streambank and lake shore settings, there are some locations where wetland plants will not grow. For example, rocky substrates or large river/lake systems with large fluctuations in water levels may not support wetland plants.

An additional consideration for natural wetland landscaping, particularly near open water, is the need to protect plantings from geese. If geese are likely to be present, special "goose cages" should be provided to protect new plantings. Once the plantings are well established, they will be able to withstand predation.

Plant species selection

Selection of plants for wetland, streambank, and lake shore zones is closely tied to the hydrology of the site, particularly water depths and flood durations. Other factors such as shading and water clarity also must be taken into account. Planting in open water areas typically involves the use of tubers, plugs, and potted plants. Planting in non-ponded wetland zones often involves both seeds and live plants. You need to learn your plants and their hydrologic and soil requirements to choose species that will work. Field tests may be useful for delineating planting zones on a site which contains a range of wetness regimes.

Restoration of Coffee Creek, Chesterton, Indiana

It is important to get a desirable mix, or diversity, of wetland plants and not a monotypic stand of reed or cattails. Certain aggressive species which are very easy to establish, such as non-native reed canary grass, should not be planted. Extremely aggressive wetland plants will outcompete and eventually dominate less robust colonizers. (See **Appendix 3** for plant lists and other sources of information.)

Initial and long-term management and maintenance

Noxious weed control is needed in wetland areas, as in other natural landscapes. Prescribed burning is a commonly used technique for wetlands as well as natural streambanks and shorelines. Timing is important as these areas burn well only at very specific times of the year. Fires in wetland areas can be very intense, especially where cattails and giant reed grass (Phragmites communis) are present. Therefore, extra care is warranted. A two to three year rotation is generally appropriate for wetland burning.

Chemical weed control also may be needed, especially for species (e.g., purple loosestrife and reed canary grass) which are difficult to eliminate. Herbicide techniques are different from upland sites primarily because herbicides have to be licensed for use in or near waterbod-

ies, wetlands and other aquatic systems. Read the product labels, and make sure that only a licensed herbicide applicator conducts this work.

What to expect

If hydrologic and soil conditions are conducive, wetland plantings often respond very rapidly. Extensive cover of native plants often can be achieved during the first growing season. Often, noxious weed control via herbicides, mowing, or pruning is necessary during the first several years. Some replanting also may be necessary. A stable, diverse, and aesthetic wetland/riparian landscape may take three to five years to achieve.

Hoary Cress

Purple loosestrife is a particularly aggressive, noxious wetland weed and merits special attention here. If it gets out of control, the landscaping project may be in trouble. When the weed is present in a limited area, it may respond to hand pulling or to several doses of herbicides. It is important to attack before it goes to seed. Recently, biological controls for purple loosestrife have been introduced in Illinois. Information on the European beetles of the Galurecella sp. which damage purple loosestrife is available through the Illinois Department of Natural Resources, Natural Heritage Division, as well as county forest preserve districts (see **Appendix 4** for details).

Natural landscaping buffers to protect high quality wetlands and waterbodies

Wetlands, streams and lakes do not exist in isolation. Their long term health is heavily dependent on the management of adjacent landscapes as well as upland areas in upstream watersheds. Native vegetation can be used to establish buffers along wetlands, stream edges and lake shores, known as riparian zones. Native vegetation buffers help to stabilize streambanks and shorelines, filter out sediment and other runoff pollutants from adjacent developments, protect the habitat in sensitive nearshore areas, preserve aesthetic values, and provide access for maintenance and/or trails.

Design guidance

Natural landscaping buffers are recommended on all sites containing wetlands, streams, or lakes. The design and management of riparian buffers should follow these general criteria:

*The minimum buffer width should be 25 feet. Wider buffers (e.g., 50-100 feet) should be established for larger or more sensitive streams, lakes or wetlands.

*Buffers should be planted using native vegetation indigenous to the riparian zone (See **Appendix 3** for plant lists).

* Applications of fertilizers or pesticides should be avoided once the buffer is established. Maintenance should be limited to occasional mowing or controlled burns necessary to control weeds and maintain native plant diversity. If certain noxious weeds need additional control, limited use of approved herbicides may be appropriate in localized areas.

NIPC has published a Model Stream and Wetland Protection Ordinance that may be used by municipalities to protect stream corridors.

Streambank and shoreline stabilization techniques

Conventional landscaping, particularly turf grass, is generally unsuitable for most streambank and shoreline applications. Turf grass is very shallow-rooted and is intolerant of extended inundation which is common in low-lying areas. As a consequence, bare soil and erosion are common occurrences on conventionally landscaped lake shores and streambanks. Native vegetation is increasingly being utilized as a low-cost alternative for restoring and stabilizing these areas. It provides several important advantages over conventional landscaping.

* Appropriate native vegetation is tolerant of inundation, even surviving extended floods.

*The deep, dense root systems of native plants hold the soil firmly in place.

*Native plants dissipate wave and current energy and protect erodible banks.

In addition to these advantages, native vegetation also has several advantages over conventional engineering solutions, such as riprap or steel pilings, which have been traditionally used to stabilize eroding streambanks and shorelines. It enhances aquatic habitat and aesthetics. It provides shading for nearshore areas. Once root systems become established, the ability to stabilize erosive banks increases over time.

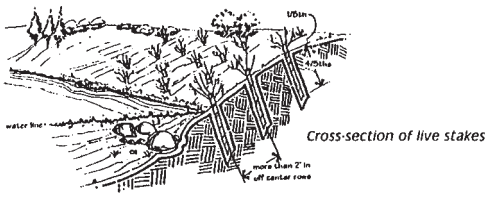
Native plants can be used alone or in combination with other materials in what are commonly called bioengineering methods. Several common bioengineering methods are described as follows:

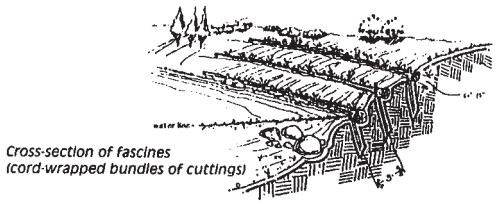
Vegetative stabilization

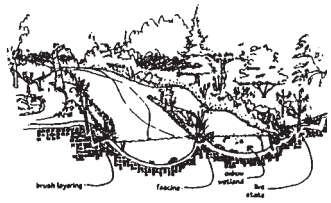
Native prairie, wetland or woodland vegetation can be planted as seeds, dormant cuttings or plant plugs. Planting generally follows removal or thinning of non-native trees or shrubs. Common plantings include prairie grass plugs or dormant willow poles on streambanks, or emergent wetland plants on lake shores. These approaches work best where bank slopes are moderate (e.g., 1:1 or flatter) and erosive velocities are not severe.

Brush layering/branchpacking

These methods utilize layers of dormant tree or shrub branches, typically willow or dogwood species, alternating with layers of soil. The protruding ends of the branches physically deflect erosive flows and the brush roots eventually stabilize erodible soils. These methods can be applied to a range of slopes and velocities.







Fiber rolls

Fiber rolls are constructed of coconut fibers which are densely packed into a cylindrical shape and wrapped with a polypropylene mesh. Fiber rolls are partially submerged at the toe of an eroding streambank or shoreline and secured with construction stakes. Native vegetation is planted into the fiber roll and on the slope above it. This method is most appropriate in low to moderate velocity zones where the toe of the slope is eroding.

A-Jacks and lunkers

These techniques rely on hard-edged materials to stabilize the toe of the slope in combination with native vegetation planted on the upper banks. Concrete A-Jacks structures, resembling children's jacks, are placed in a linear nested arrangement along an eroding bank or shoreline, backfilled with soil, and planted with stabilizing vegetation such as willow poles. Lunkers are rectangular boxes constructed of wood or plastic lumber and built into the toe of the bank. Both of these techniques are effective in stabilizing the toe of an eroding slope and should be integrated with native plants.

An excellent description of alternative stabilization techniques has been developed by DuPage County Department of Environmental Concerns. Its Streambank Stabilization Program report (1995) describes the advantages, disadvantages, and installation techniques of a range of natural vegetation and bioengineering approaches.

VIII. Natural Landscaping for Improved Stormwater Management

As previously described, natural landscaping provides an environmentally conscious alternative to conventional methods of addressing stormwater management and other water resources concerns. This section describes the implementation of several natural landscaping techniques for conveying and storing stormwater runoff in a more environmentally conscious and cost effective manner.

On an undisturbed site, there is very little surface runoff. Most precipitation infiltrates into the ground and slowly recharges underground aquifers or moves laterally to recharge streams,

lakes and wetlands. When surface runoff does occur, it moves slowly across the vegetated landscape, through natural depressions, and via swales into larger streams.

In contrast, the developed site produces dramatically more surface runoff due to impervious surfaces and soil compaction. Conventional drainage relies upon curbs, gutters, channels and sewers to quickly convey the water away. As a consequence, pollutants in stormwater runoff are flushed downstream and the pulsating flows contribute to increased flooding and destabilization of downstream channel systems.

Natural drainage designs attempt to replicate elements of the pre-development drainage scheme by:

*minimizing disturbances of the original drainage network and the area of impervious surfaces and

*maximizing opportunities to infiltrate surface runoff, to hold runoff water in natural depressions, and to release it slowly through surface swales and drainageways.

While it will be impossible to replicate completely the pre-development hydrologic conditions of a site, studies estimate that natural drainage designs can substantially reduce both surface runoff volumes and pollutant loads compared to conventional drainage designs. For example, for a clustered, naturally drained residential development in Grayslake, Illinois, estimates suggest a 65 percent reduction of surface runoff. Recommended elements of a natural drainage approach, or runoff reduction hierarchy, are described below.

Preserve natural drainage systems

Existing swales, depressions, wetlands and stream corridors should be preserved in the site plan wherever possible. In some cases this will require clustering the development around these important features. By siting the buildings, homes or other structures on only a portion of the total site, clustering has the added benefits of reducing the total impervious area associated with roadways and minimizing soil compaction associated with mass grading activities.

Utilize vegetated filter strips

A critical consideration in designing a natural drainage plan is to identify opportunities to disperse runoff from impervious surfaces — rooftops, streets and parking lots—onto the pervious, vegetated areas of the site. These vegetated areas, or filter strips, allow runoff to infiltrate into the ground before it is conveyed to swales or other conveyance devices. Runoff is directed to filter strips in several ways. It can be conveyed from rooftops via downspouts. From roads, driveways or parking lots, runoff is directed to filter strips as sheet flow or through slotted curbs.

Applicability

Filter strips are suitable on most types of development but are probably most effective in set-

tings where there are relatively wide expanses of pervious area adjacent to impervious surfaces. Filter strips are readily accommodated in the following development situations:

*residential

*office and industrial campuses

*expressways and rural roadways (where right-of-way is adequate)

* buffer zones adjacent to sensitive environments

Design guidance

There are several basic design considerations for filter strips which will maximize their performance and reliability:

* A robust stand of vegetation should be established.

* Ground slope should ideally be relatively flat (i.e., preferably less than 5-10 percent slope).

*A width of at least 10-20 feet is recommended.

* Runoff onto the strip should be evenly dispersed.

*Contributing drainage areas should be relatively small (less than five to ten acres.)

Healthy vegetation is important to minimize erosion and to improve the filtering of pollutants in the runoff water. Where high concentrations of salt are expected due to roadway deicing, salt tolerant vegetation should be planted. Native prairie vegetation is ideal in most filter strip applications (choose salt-tolerant species where necessary). Its deep root zones and extensive biomass give it performance advantages over turf grass. Forested filter strips also can be effective because of their ability to take up certain pollutants from the root zone and store them in their biomass.

Utilize vegetated swales

Swales function much like filter strips except that their purpose is to convey concentrated flow. Unlike conventional storm sewers, swales move water more slowly and allow a portion of the runoff to infiltrate the ground.

Applicability

Swales are suitable alternatives to storm sewers for many types of development , particularly where the number of driveway crossings is not large. Swales are easily implemented on the rolling to gently rolling topography which is common in northeastern Illinois. Swales are strongly recommended in the following development situations.

*large lot residential sites (e.g., 1/2 to 1 acre or larger)

*office and industrial campuses

*roadways where right-of-way widths are adequate

*parking lot medians and edges

Where feasible, runoff should be routed into swales from filter strips. Runoff also can be directly conveyed from parking lots or roadways via sheet flow or through slotted curbs. Swales in parking lot medians represent a departure from the conventional design which

elevates landscaped islands or medians above the pavement. It is recommended instead that medians be excavated to collect runoff. Parking lot swales also are useful for the disposal of plowed snow.

Design guidance

The design guidance for vegetated swales is similar to the criteria for filter strips.

*Slopes should be adequate to minimize nuisance ponding — roughly 1-2 percent as a minimum.

*Where existing gradients are steep (e.g., greater than 5-10 percent) and erosion is a concern, the effective slope of swales can be reduced through the use of drop structures.

*Swales should be wide and shallow with side slopes no steeper than 3 horizontal to 1 vertical.

*Swales can be vegetated with turf, prairie or wetland vegetation as appropriate. If high salt concentrations are expected in runoff, salt-tolerant plant species should be utilized.

Utilize natural detention basin designs

Before runoff leaves the development site, it should be routed through a detention basin to further slow the peak flow rates and to provide an opportunity to remove runoff contaminants. While most northeastern Illinois communities require detention via subdivision ordinances, most conventional basins are very "engineered" in appearance, with hard edges or concrete channels. Natural landscaping of detention basins incorporates native plants and gradual side slopes to enhance the removal of stormwater pollutants, improve aesthetic appearance, and reduce maintenance needs.

There are two recommended natural detention basin types. A wet bottom basin has a large, deep permanent pool in the basin bottom. A wetland basin contains smaller deep pools near the outlet and/or inlets. The remainder of the basin bottom, which either has very shallow ponding or is dry between storm events, is vegetated primarily with wetland plants, sometimes in combination with prairie vegetation or turf grass.

Design guidance

The basic philosophy of natural detention designs is to replicate the components of natural lake and wetland systems. The following design considerations are important.

*Shoreline slopes of open water areas should be relatively flat (e.g., 5:1 to 10:1).

*Shoreline zones and frequently flooded areas should be planted with native wetland vegetation.

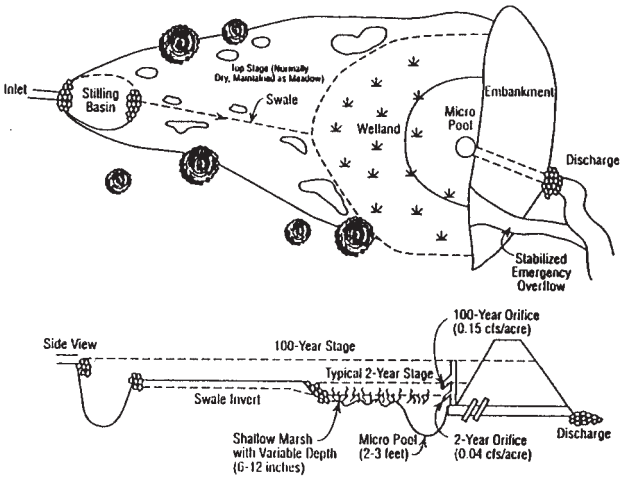
*Where feasible, basin side slopes should be vegetated with prairie grasses and forbs.

*Basin shapes and open water contours should be irregular to enhance appearance.

An important caution

Because natural wetlands are often in the lowest spot in the landscape, there is sometimes a temptation to convert them to detention basins. This generally should be avoided, particularly

for wetlands containing sensitive habitats or diverse plant communities, because the subsequent changes in water levels and pollutant loadings associated with urban runoff will hasten their degradation.



A natural approach to retention basin design

For more information about stormwater management:

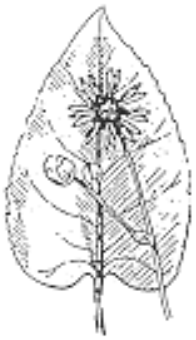
Best Management Practice Guidebook for Urban Development, Northeastern Illinois Planning Commission: 1992.

For more information about stream protection:

Restoring and Managing Stream Greenways: A Landowner's Handbook, Northeastern Illinois Planning Commission: 1998.

For more information on plant material:

Native Plant Guide for Streams and Stormwater Facilities in Northeastern Illinois, USDA Natural Resources Conservation Service's Chicago Metro Urban and Community Assistance Office: 1997.



Prairie Dock

CHAPTER 5: CASE STUDIES IN NATURAL LANDSCAPING

I. An Innovative Planned Development

II. Natural Landscaping for Urban Lots

III. Natural Landscaping for Corporate Office Campuses

IV. Natural Landscaping for an Industrial Park

V. Public Parks and Citizen Involvement

VI. Natural Landscaping for a School

VII. Natural Landscaping for a Government Complex

VIII. Natural Landscaping in a Right-of-Way

IX. Golf Courses as Opportunities

X. Natural Landscaping Along a Shoreline

The upper midwest, including northeastern Illinois, is an excellent location to see a wide variety of applications of natural landscaping. The natural landscaping "movement" is relatively new. These projects displayed, even at their earlier stages, the multiple benefits of the natural landscaping approach.

A selection of natural landscaping projects, demonstrating a wide variety of land uses, site area, habitat type, and sponsor are briefly described below. Most of these case study examples are visible from public areas. Interested parties who wish additional information or want a closer look should contact the property owner or manager. There are many other demonstrations of natural landscaping in the northeastern Illinois area. These are only a few, selected to illustrate the wide range of natural landscaping applications.

I. An Innovative Planned Development

Prairie Crossing

Illinois Rt. 45 and Casey Road
Grayslake, Lake County, Illinois
www.prairiecrossing.com

Prairie Crossing, located in northern Lake County, is an innovative large scale clustered residential development which includes preserved open space and agricultural areas, as well as multi-use development adjacent to commuter rail stations. The Prairie Crossing plan is designed to achieve comprehensive natural resource management objectives while creating a highly marketable residential environment. Natural landscaping is a concept inherent in the philosophy and concept of this project.

Prairie Crossing is a 678 acre residential development with 362 mostly clustered homes. Mindful of cultural as well as natural heritage, Prairie Crossing integrates existing farm fields with a natural landscape of restored prairies, wetlands, meadows and lakes.

Nearly 197 acres of native prairies and wetlands

have been restored through and around the residential areas of the development. These areas, in addition to their habitat and aesthetic benefits, serve as part of an alternative stormwater management system. The system utilizes a "stormwater treatment train" which is a sequenced series of native landscape units including vegetated swales that surround all home clusters. These swales convey the water to expansive prairies in which most of the water quality enhancement and management occurs. Some contaminants are removed within the upland prairies. Water that does not infiltrate or evaporate flows slowly from the 175 acres of prairies into 22 acres of created wetlands, and ultimately into 27 acres of created lakes.

The use of natural landscaping and ecological restoration in this project not only integrates the development by its presence everywhere, but also serves this vital water management function.

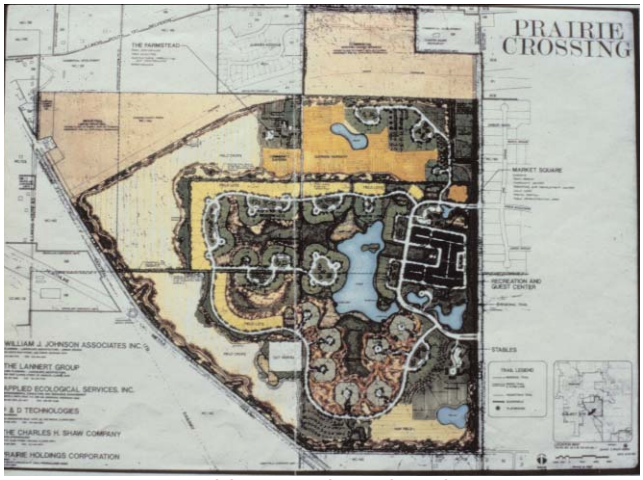
Immediate aesthetic benefits on the large acreage of prairie was achieved through use of a cover cropping system (Barley and winter rye). The extensive fields looked like grain fields during the first year. The Prairie Crossing project demonstrates its deep commitment to public education during the home sales process and afterward by providing a handbook on "Living with Nature" and numerous educational opportunities for residents throughout the year. Homeowners are educated regarding the environmentally progressive aspects of the development and are encouraged to minimize use of chemicals, plant native plants and minimize lawn area. A community supported garden program provides additional opportunities to involve homeowners with natural resources and develop a greater understanding and appreciation for natural landscaping.

Use of natural landscaping for water conveyance and management saved several million dollars in stormwater piping and installation. When compared to conventional lawns, the natural landscaping is much less expensive in terms of costs of initial installation and long-term maintenance. In addition, stabilization of the lake and pond on the site are achieved entirely through the use of native plants and natural materials. This reduces costs of shoreline maintenance by controlling shoreline erosion.

Appreciation of the natural landscaping has been demonstrated by higher than average home values, by resident involvement, including many homeowners now naturalizing their yards, and the unprecedented local and national media attention the project has garnered. In addition, wildlife use of the open spaces and restored landscapes has been exceptional and greatly appreciated within the community.

Zoning and regulatory approval for the project was greatly expedited by the overall conservation focus. Although many construction details and plans, including the stormwater management scheme, required long and arduous negotiations, the local community and public officials were supportive and encouraged alterna-

tive strategies for landscaping and stormwater management.



Prairie Crossing Site Plan

II. Natural Landscaping for Urban Lots

200 Block North Elmwood
Oak Park, Illinois

Visitors to the 200 block of north Elmwood in Oak Park, Illinois will notice a significant trend towards the use of natural landscaping on relatively small urban single family lots. One of the best examples is where two adjacent homeowners have collaborated in the development of a wildflower garden which fills their adjacent side yards and portions of the front yards. This project was based upon a shared interest in reducing the amount of turf grass and associated use of herbicides and pesticides. The owners were interested in a more diverse landscape and the ability of the garden to attract butterflies.

The garden area was initially tilled and planted with annuals and perennials. Perennials now occupy 3/4 of the area. There is an emphasis on prairie plants although the garden is not a strict prairie restoration and contains many other flowering plants.

Costs of this garden have been exceptionally low. The original tilling was labor intensive. Ongoing maintenance falls into the realm of hobby rather than labor. Many of the plants have been obtained from other gardens. The owners feel that overall the garden is less work than lawn maintenance. The planting of annuals is an ongoing but not excessive cost, given that they only occupy 1/4 of the garden. An inexpensive weeping hose system has been installed for watering, the need for which is reduced through the use of compost and mulch.

This Oak Park home features natural landscaping

Each owner maintains her half of the garden. The owners had no initial contact with local government regarding installation of the garden. There have not been complaints and the

garden won the "Garden of the Year" award.

Other homeowners in the neighborhood have undertaken similar projects. It is estimated that at least 30 to 40 natural gardens have "sprouted" in Oak Park.

III. Natural Landscaping for Corporate Office Campuses

Sears Corporate Headquarters

Prairie Stone Business Park
Higgins and Beverly Road
Hoffman Estates, Illinois

The Sears corporate headquarters and business park (Prairie Stone) is located on 780 acres adjacent to Interstate 90. The project was conceived as an integrated land planning process which recognizes natural systems and relationships between the built and natural environments.

Sears Corporate Headquarters, Hoffman Estates, IL

Native plants have been incorporated into the landscape in ornamental as well as functional ways.

Areas near the primary structures are landscaped with a combination of traditional landscaping and the ornamental use of native plants and stone. Water features have been created that extensively use limestone slabs over which water flows into naturalized ponds surrounded by native vegetation. Native plants have been incorporated into key entrance and other highly visible locations in order to carry out the theme of natural landscaping.

The overall plan called for the preservation and enhancement of existing wetlands and the creation of new wetland systems as part of the site's stormwater management plan. The landscaping therefore reduces the amount of surface water runoff, and what runoff there is is treated by filtering through vegetated filter strips and swales and a series of naturalized retention and detention basins connected by the vegetated swales.

Lucent Technologies
Bell Labs Innovations

2600 Warrenville Road
(Warrenville Road east of Naperville Road)
Lisle, Illinois

and

Warrenville Road and Naperville Road
Naperville, Illinois

In the 1990's, what was then AT&T's Network Software division was mandated by the national

headquarters to find ways to reduce or eliminate the costly annual replacement of bluegrass turf caused by severe erosion, disease and nuisance goose population. Motivated by an employee-organized ecology club, AT&T initiated the conversion of 18 acres of bluegrass turf to native prairie forbs and grasses. After developing a comprehensive master plan, the problem turf areas were tilled under and reseeded using the disk method followed by broadcast seeding.

As a result of the success of the Lisle program, an additional 30 acres of AT&T's nearby Lucent Technologies campus in Naperville were converted in the summer of 1994.

Lucent Technologies' Corporate Campus

Both projects used the same seed mix which was tailored for varying conditions on the sites, i.e. mesic prairie, savanna understory, wet prairie, etc. Both seed mixes included annual and short-lived perennials for ground cover and immediate visual effect. The colorful display from dames rocket and poppy helped create the extremely positive popular response. These were gradually replaced by the more dominant and longer-lived prairie flowers that were included in the planting mix.

In the late nineties, new research facilities built on each campus reduced the acreage devoted to natural landscaping.

IV. Natural Landscaping for an Industrial Park

Lakeview Industrial Park
Pleasant Prairie, Wisconsin

Lakeview Industrial Park is a 1500 acre development between Chicago and Milwaukee, near Pleasant Prairie, Wisconsin. The project goal was to integrate expansive native landscapes within an industrial park design. Nearly 500 acres of the Park have been included in a large dedicated Natural Area along the Des Plaines River. The Des Plaines River bisects the development, which includes extensive floodplain wetlands, oak savannas, prairies, and the riverine system. Wisconsin's second largest population of the Federal and State Endangered White Fringed Prairie orchid, rare fishes, rare birds, and rare snakes are also present in or immediately adjacent to the property.

Coordination with the Wisconsin chapter of The Nature Conservancy resulted in the gifting of this large area and additional areas of created wetland and prairies within the industrial park. In addition, coordination with the local township and community has resulted in the addition of over 100 acres of open space and co-

development of a new park with a high quality oak savanna, additional floodplain areas including very high quality wetlands, and a 120 acre created lake (a former gravel quarry). Uplands around this lake, and other areas including the lake system, are treated in part by natural landscaping.

A new access road created to service the development impacted 31 acres of floodplain wetlands. To compensate for this, several large farm fields were converted to wetlands through excavation and removal of farm drain tiles. In addition, significant upland buffers around these wetlands have been restored to prairies. The created wetland systems are connected to flood events in the adjacent Des Plaines river. The result has been fish spawning opportunities, including use of the areas by rare fishes, and the presence of numerous rare birds.

Throughout the regulatory and local approval processes, this project encountered no problems with its use of native landscaping, a significant protection plan, and restoration program. Prescribed burning is used frequently, and with local approval, although at times it is difficult to obtain the fire department's permission unless meteorological conditions meet their standards.

The project has won wide acclaim for its innovative address of ecological resources and was one of The Nature Conservancy's very first projects which involved the wetland mitigation process. The positive feedback has forged an important conservation partnership between the industry and conservation groups.

The natural landscaping and ecological restoration in this project provided the basis for success in a number of ways. The industry has saved significant sums of money through use of native landscaping and by conveyance of valuable property.

The ecological benefits of this project have exceeded expectations. Rare species, including an endangered orchid, were not known to be present at the time of the agreement on the conveyance and landscaping plans for the land and are now found on the property. This underscores the importance of large projects which can offer protection, native landscaping, and ecosystem management strategies.

V. Public Parks and Citizen Involvement

Gompers Park
Chicago Park District
Foster and Pulaski
Chicago, Illinois

In 1995, the Chicago Park District undertook the restoration of a small wetland in the floodplain of the North Branch of the Chicago River on Chicago's northwest side. The two acre site, located in Gompers Park, had been filled in the 1960s, altering the site's hydrology, causing flooding of adjacent park areas and nearly eliminating the indigenous wetland plant community. The three main goals of the project were to:

*Restore the function of the wetland's flood-water

retention capability, re-establish the physical connection between the wetland and the Chicago River and bring back the appropriate plant and animal communities.

*Facilitate a resource for education, scientific study and community stewardship to a multi-generational, community-based population, education and training in wetland ecology, restoration, monitoring and management and provide, for that population.

*Establish a model of local and federal government agencies, community groups and not-for-profit organizations working cooperatively and in collaboration as a team in the restoration of a significant ecological system in an urban context.

The total cost of Gompers Park Project was $90,000, the majority of which was spent removing two feet of fill over the two acre site, regrading and installing a dike and water control structure. The remainder of the project cost went for plant material, signage and educational programming in conjunction with the project.

After construction was complete, the site was seeded with a cover crop of annual rye for temporary soil stability, then drill-seeded with a diverse mixture of appropriate native perennial grasses, sedges and forbs. An experienced planting contractor installed plugged plant materials in the submergent, emergent and sedge-meadow planting zones. Volunteers completed the planting, installing more than 2500 plant plugs into the wet and mesic prairie zones during the weekend work events during the spring and summer of 1995 and 1996.

Volunteers continue to help with the wetland's management, participating in weeding sessions and keeping the area free of litter and trash. A qualified contractor burns the site every year to encourage the native Midwestern plants which are adapted to seasonal burning and to discourage invasive weed species.

Gompers Park in Chicago, IL

In the years since the completion of the wetland project, other natural areas at Gompers Park have been developed and expanded, including restoration of the fishing lagoon and enlargement of the native plantings adjacent to the wetland. Additionally, the Chicago Park District has built upon the knowledge and experience gained from the Gompers Park project. To date, more than 50 natural areas throughout the city have been rehabilitated through the Park District's Natural Areas Program.

This initiative, to develop new natural areas and enhance existing significant or sensitive sites, includes a wide range of projects. The program includes the restoration of riparian systems and wetland habitat associated with Chicago's

lagoons, river edges and lake shore and the establishment and enhancement of other native habitats, such as woodlands, savannas, prairies and dunes, as well as the development of nature gardens and the improvement of lakefront bird habitat.

The Natural Areas Program is augmented and supported by the Park District's Urban Stewardship Program, which enlists public participation in the monitoring and maintenance of the natural areas. The Audubon Certification of Park District golf course program, which involves the conversion of out-of-play areas to natural habitat, is being pursued. Additionally, the Park District is involved in the Urban Monitoring program, tracking the population characteristics of five significant natural area indicators, including frogs, butterflies, dragonflies, birds and threatened and endangered plants.

VI. Natural Landscaping for a School

Wheaton Warrenville South High School
1920 South Wiesbrook Road
Wheaton, Illinois

Addressing many issues simultaneously, Wheaton Warrenville South High School began incorporating native landscape treatments into their school grounds in 1995. The school had several goals: to reduce maintenance on unused lawn areas and time demands on limited staff, improve overall aesthetics, restore native habitats, and more important, create a living laboratory for hands-on environmental education. The project consultant developed a master plan which identified appropriate zones for the reintroduction of various prairie community types and incorporated requested outdoor classroom elements.

During Earth Day week in April 1995, students installed the first phase of the master plan, approximately 2.5 acres of upland mesic and wet prairie plantings.

Wheaton Warrenville South High School Campus

VII. Natural Landscaping for a Government Complex

DuPage Government Center
East Campus Detention Basin
County Farm Rd. and Manchester Rd.
Wheaton, Illinois

When developing the 57-acre Government Center, DuPage County looked to incorporate natural landscapes into the site through native plantings within compensatory water storage

areas. The East detention basin was modeled after the West Basin, which was previously planted with native vegetation but is currently under construction.

In 2003, DuPage County has been working to incorporate native wetland and prairie vegetation into the landscape design for the East Basin. Native prairie grasses, herbaceous plants, trees, and shrubs surround the basin. Emergent and floating aquatic vegetation enhance the wetter bottom of the basin. These wetland plants act naturally to filter water and improve flood control capabilities.

Another benefit of the natural landscaping in the East detention basin is that it can be a deterrent to Canada geese. The geese have been a problem in this area for years. Not only are they an overcrowded, nuisance species, but they can cause ecological problems, such as E.coli bacteria, to water bodies as well. Tall vegetation around a pond or basin discourages the geese from inhabiting or feeding in the area. DuPage County hopes to maximize all the benefits of natural landscaping as a part of the Government Complex.

West Basin at the DuPage Government Center

Third Avenue Drainage Project

State Route 83 and Byron Avenue
DuPage County, Illinois

In the fall of 2002, DuPage County completed a drainage project that encompasses water storage and native landscaping. Drainage problems in the area required a 3-acre detention basin to be built. The county used this project as an opportunity to incorporate native plantings into a detention basin project.

The native plantings function to improve water quality for the on site wetlands and, on a larger scale, the Salt Creek watershed. Water entering the site is runoff from roads and residential areas. This water is likely to be contaminated with lawn pesticides and other pollutants. Plant selection for the detention basin has emphasized the use of species tolerant to such conditions. The plantings give the basin aesthetic appeal as well. Over 50 different wetland and prairie species were planted in and around the basin. The overall effect of the project is that it simultaneously performs flood control functions, water filtration, and habitat for wetland species.

VIII. Natural Landscaping for a Right-of-Way

Among the significant landowners in metropolitan areas are the owners of roadways and utility right-of-ways. The interconnected, linear nature of these extensive ownerships creates opportunities for a highly visible use of natural landscaping. In addition, natural landscaping in these corridors can help provide continuity of habitat and habitat linkages that are important for species propagation and survival.

Illinois Department of Transportation

Natural landscaping along I-55 near Springfield, IL

The Illinois Department of Transportation has a program of planting native plants and wildflowers along Illinois state highways. Travelers to Springfield are aware of the extensive use of prairie grasses in the Interstate 55 right-of-way as one approaches the state capitol.

In recent years IDOT has been using native plantings more extensively in the Chicago metropolitan area. Segments of right-of-way that are being managed for native vegetation are designated by signs and are not subject to conventional mowing routines.

Commonwealth Edison

Commonwealth Edison has initiated the use of native landscaping as part of its land management and environmental programs. Commonwealth Edison has completed a number of prairie plantings in their right-of-way in the Chicago metropolitan area. This is being done for environmental, economic and aesthetic reasons.

Native landscaping on Commonwealth Edison right-of-ways

One location for viewing Commonwealth Edison's work is at the Power House energy museum in Zion, Illinois. Commonwealth Edison also has a voluntary stewardship program which encourages Commonwealth Edison employees, families and friends to participate in prairie restoration efforts.

IX. Golf Courses as Opportunities

Olympia Fields Country Club

2800 Country Club Drive
near Vollmer Rd. and Western Ave.
Olympia Fields, Illinois

Golf courses are a major land use in metropolitan areas where conversion from traditional to natural landscaping can have very positive and highly visible impacts. The Olympia Fields Country Club has been participating in the New York Audubon Society Cooperative Sanctuary Program since 1992 and became fully certified in February of 1996. Certification areas include: environmental planning, wildlife cover enhancement, water conservation, and water quality management.

Olympia Fields Country Club blends two championship 18-hole golf courses into a unique natural setting of native woodlands and rolling topography with large oak trees lining the fairways. Butterfield Creek winds through the property. Numerous areas on both courses are ideal for enhancing the existing vegetation and habitat and re-introducing vegetation types that had been eliminated from the property over time. Planting native trees and woody understory from locally collected seed, removal of invasive non-native species, re-establishing prairie and savanna vegetation, prescribed burning of prairie and savanna areas, and the control of water feature erosion with native vegetation are some of the programs in progress.

A significant portion of both golf courses was constructed in native oak/hickory woodlands. Through the years, many of the native trees have died and been replaced with non-native species. Out-of-play areas and hillsides were mowed, precluding the natural growth of new oak trees and understory plants. In order to restore the original nature of the land, an extensive planting program was initiated with the planting of native trees supplied by a local nursery. All of the plants are grown from locally collected seed (some seed is collected from plants at the country club). Plants range in size from 6" caliper trees in strategic, highly visible locations to one year old seedlings in wooded areas that are no longer mowed. Of equal importance to the planting is the removal of invasive non-native plants which compete with the native plants.

Other areas of the property were originally prairie and were farmed prior to construction of the golf course. Where appropriate, prairie vegetation is being re-established. A 1 3/4 acre demonstration area has been reseeded to prairie vegetation. Initially, 7 grasses and over 25 forbs were re-introduced. As in all of the planting programs, care is taken to match the plant to its site, taking into account soil type, moisture requirements, sunlight needs, etc. Prescribed burning and hand weeding are used to keep non-native plants out of the prairie areas. In one area of the North Course, prairie vegetation has begun to re-establish on a site that had been mowed for over 70 years. Also, prairie grasses and forbs are used in various landscape situa-

tions on the golf course and around the clubhouse. Several savanna remnants still are evident on the South Course. Those areas were burned to eliminate some non-natives and stimulate the dormant seed bank. Results after the first year were encouraging.

A program of erosion control, using native vegetation, had been initiated along Butterfield Creek and lake shorelines. In previous years, riprap was placed on the creek banks to control erosion. Grass was mowed to the water's edge along streambanks and shorelines. Vegetative buffers were established where practical, and vegetation such as rushes, iris and cordgrass have been planted to protect the soil on the banks. This program will be expanded in future years.

The Olympia Fields Country Club Grounds Department practices an environmentally sensitive fertilizer and pesticide program. An extensive Integrated Pest Management program is in place utilizing scouting, threshold levels, curative disease control, least toxic chemicals, organic fertilizer and biological control. No-spray buffer zones have been established around environmentally sensitive areas such as water features. Many weeds, such as crabgrass and dandelions, are controlled through hand picking on the fairway, greens and tees. Fewer chemicals are used on the 36 holes than are used on many 18 hole facilities.

Member and non-member awareness of the environmental programs are important aspects of the Cooperative Sanctuary Program. The club newsletter is used on a monthly basis to inform the membership of ongoing environmental programs. Also, the grounds superintendent has made presentations to local superintendent groups and local environmental and social groups on the Olympia Fields Country Club environmental program.

Olympia Fields County Club, Olympia Fields, IL

X. Natural Landscaping Along a Shoreline

Frankfort Prairie Park

Connects with Old Plank Road Trail, east of White Street
Frankfort, Illinois

The Village of Frankfort created the Frankfort Prairie Park on a vacant parcel that includes a high-quality natural area containing over 40 species of prairie plants. The Village had three objectives in developing the park: the park must preserve and protect the native prairie species of plants; demonstrate environmental conservation

practices and educate visitors; and provide outdoor recreational opportunities.

The park contains a lake fed by a drainage way that conveys surface runoff from the downtown and historic districts. The lake is edged by wetland plants and rock outcroppings for public access. Though most people see only the beautiful naturalized park, the lake is part of a treatment system for the storm water runoff. The storm water first enters a separator basin and rock creek that collects heavy solids. The water then travels to a stilling pool that is planted with wetland plants to filter additional solids. A water pump helps to maintain a flow of water in a rocky stream that, in turn, helps to aerate the water. The stream then flows into the lake for storm water storage. The lake is stocked with native game fish. From the lake, water flows into a wet prairie and a bioswale, where hydrocarbons, nutrients and other contaminants are absorbed by native plants.

The park provides a connection to Old Plank Road Trail, and educational markers describe the flora and fauna on the site.

Frankfort Prairie Park, Frankfort, IL

APPENDIX 1: GLOSSARY

Annual: A plant that lives for one year or one growing season.

Beneficial Landscaping: Using different landscaping techniques to achieve all kind of benefits (e.g., decrease of maintenance costs, reduction of stormwater runoff, beautification of the landscape, preservation of endangered species, etc.).

Biennial: A plant that grows from seed and produces leafy growth the first year. In the second year, the plant produces flowers, sets seed and dies.

Biodiversity: A measurement of the number of species and the variety of life and its processes in an area.

Bioengineering: The use of vegetation for civil engineering purposes like slope stabilization, water erosion control, shoreline protection, barriers for noise reduction, etc.

Bog: Found almost exclusively in glaciated depressions, soils are highly acidic, have low nutrient levels, and are saturated throughout the growing season. Vegetation consists of a variety of emergents, carnivorous plants such as sundew and pitcher plants, and shrubs or small trees occurring on consolidated peat. Bogs usually have an area of open water called the "eye."

Buffer/Buffer Strip: A management area closest to a sensitive environmental site (e.g., wetland, waterbody, etc.) in which human activities are prohibited or limited in order to minimize the negative impacts from adjacent land uses (like erosion, filter runoff pollutants, disturbances of wildlife) affecting the sensitive environmental site.

Clustered Development: Accumulation of development onto only a portion of a site, thereby allowing sensitive areas to be protected with no loss in the number of lots and maintaining the gross density of the site.

Ecosystem: A community of plants and animals interacting with each other and their physical/chemical environment.

Emergent: Pertaining to aquatic plants which have some portion of the plant extended out of the water.

Exotic Species: A non-native plant or animal introduced from another geographic area.

Forest: Plant communities which exist along floodplains or on the eastern side of rivers where they were protected from fires. They are dominated by trees that are intolerant of fire and can grow in poorly drained soils, although bur oak trees can be a part of this community. In Northeastern Illinois, the word "forest" is often used interchangeably with "woodland" or "woods," as in the "Big Woods."

Fen: A type of wet meadow with highly alkaline soil. Vegetation is primarily composed of herbaceous species, encircled by zones of plants of increasing height and woodiness.

Forb: Any herbaceous plant that is not a grass.

Greenway: A greenway is a corridor of open land that provides one or more of the following bene-

fits: (1) protection and management of natural and cultural resources; (2) provision of recreational opportunities; and (3) enhancement of the quality of life and the aesthetic appeal of neighborhoods and communities.

Habitat: The physical, chemical, and biological environment in which an organism lives.

Herbaceous plant: Any plant that is not woody.

Landscaping: The design of outdoor space to serve the needs of people by planting, altering the contours of the ground and/or building structures like pedestrian ways, paths, picnic areas, etc.

Mesic: Soil condition that is medium-wet.

Native Landscaping: Landscaping only by using native plants.

Native Species: A plant or animal that originally occurred in an area. Also referred to as Indigenous Species.

Natural Landscaping: Landscaping in a way that tries to capture the character and spirit of nature in a designed landscape by arranging plants in a community context similar to their arrangement in nature. May be planted exclusively with native plants or incorporate some small percent of exotics.

Noxious Weed: Any plant which is determined by the Director, the Dean of the College of Agriculture of the University of Illinois and the Director of the Agricultural Experiment Station at the University of Illinois, to be injurious to public health, crops, livestock, land or other property (Illinois Noxious Weed Law; 505 ILCS 100.)

Oak Savanna: A transitional community between prairie and forest, sustained by fires, characterized by scattered, open-grown oak and hickory trees and grasses and forbs which flourish in partly shady conditions. These savannas were often called "oak openings" by the pioneers. Definitions of density of trees vary widely, from a few scattered trees to an almost closed canopy.

Perennial Plant: A plant which lives for more than two years.

Prairie: A plant community dominated by a diversity of perennial herbaceous plants growing between a majority of grasses, and forming a dry flammable turf in autumn. Prairie communities are categorized by soil conditions into dry (sandy or shallow hilltop soils), mesic (medium wetness) and wet prairies (poorly drained soils). Often characterized by very deep rooted plants, prairie vegetation also consists of shallow-rooted species, some with widely spreading root systems.

Prescribed Burn: Controlled application of fire to naturally occurring vegetative fuels under specified environmental conditions and following appropriate precautionary measures, which causes the fire to be confined to a predetermined area and accomplish the planned land management objectives.

Sedge: A plant that resembles a grass, but is part of a distinct plant family that typically grows in damp, wet, or marshy habitats.

Setback: Area between intensive development (e.g., structures) and a protected area (e.g., waterbody or wetland).

Stormwater Detention Basin: A waterbody designed to detain stormwater runoff and reduce flooding.

Submergent: Aquatic plants that live and grow entirely below the water surface.

Weed: Any undesirable or troublesome plant, especially one that grows profusely where it is not wanted.

APPENDIX 2: SELECTING ASSISTANCE FOR YOUR NATURAL LANDSCAPING PROJECT

Checklist for landowner

For your project, have you considered?:

__ The type of project (e.g., noise or privacy buffer, butterfly garden, large restoration of plant communities)

__ Other goals (e.g., reduction of chemical and water use)

__ Appearance desired (e.g., low "designed" look, wild prairie, ground cover)

__ "Fit" with other neighborhood landscapes (discussions with neighbors?)

__ Project size and scope

__ Project time-line (e.g., phasing in slowly instead of planting your entire site at one time)

__ Cost parameters (installation and future maintenance)

__ Maintenance level desired (e.g., minimum, or backyard hobby garden)

__ Existing amenities to be retained (e.g., specimen trees)

__ Existing and proposed habitat attractive to wildlife (e.g., current nesting bird census and impact of the project on them)

__ Type of plant materials desired (e.g., completely native?)

__ Advantages/disadvantages of the site or parts of the site for natural gardening

__ Site problems to be addressed/solved (e.g., drainage problems, poor or compacted soil, salt-tolerant species required in some locations)

__ Soil type(s)

__ Sun/shade patterns over the growing season

__ Natural landscape history of your site

__ Pertinent local laws and regulations

__ Rights-of-way and property lines (e.g., plat of survey)

__ Location of utility lines (in Northeastern Illinois, call JULIE) 1-800-892-0123

Background Questions for Consultant or Supplier

__ Scope of services? (Designing, installing, maintaining)

__ Plant materials provided by other landscape contractors or "home-grown"

__ Training, experience, knowledge

__ Projects managed; Role in those projects

__ Landscape specialty

__ Where can completed and in-process projects be seen

__ References

__ Major influences on professional direction

__ Any work performed as a volunteer design professional

__ Insurance coverage

__ Guarantees

Details for your project

__ Cost estimate

__ Timeline

__ Maintenance required

__ Justification for plant selections and locations

__ Drawings/site plan

__ Source of landscape materials

__ Terms and conditions of payment

__ Contract including all of the above

APPENDIX 3: PLANT LISTS

The plant lists include some of the species that are commonly available in nurseries and are relatively easy to grow, yet it lists only a very small percentage of the plants in those categories. It is directed towards the novice and the home gardener who is doing a modest first planting. Gardeners with experience with natural landscaping and maturing landscapes will go way beyond this list. Large projects, which can accommodate a wide variety of species, will undoubtedly be led by a consultant and will also go well beyond the confines of this list.

Relatively few plants grow exclusively in one community type. The species listed below as characterizing one type of woodland community are often also found in different community types. Let it be said that selecting representative plants from among the over 15,000 plants found in a region with one of the richest and most varied matrix of land forms and floristic communities is a daunting task. The lists must be taken as only the barest token selection.

The herbaceous plant lists are divided into plants which thrive in full sun, partial sun and shade. A very general rule of thumb is that prairie species need full sun; savanna species will grow in partial shade and many will grow as well (or better) in full sun; and shade species will grow in woodlands. It is very important to check catalogs and nursery information before you buy, because plants also vary in their need for moisture. Where species need particular states of dryness, that information is noted on this list. It is also important to understand that many plants have a "wide ecological amplitude," that is, they are not extremely picky about where they grow, while others have more exacting requirements. In any garden, the plants will sort themselves out according to their needs and the conditions with which they are presented. Plant catalogs are often listed according to conditions of sun and shade, or in alphabetical order by Latin, or scientific name. This list is alphabetical by Latin name within categories.

Herbaceous Plants for Full Sun:

<u>Forbs:</u>

Lead Plant	(Amorpha canescens)
Pasque Flower	(Anemone patens)
Heath Aster	(Aster ericoides)
Silky Aster	(Aster sericeus)
Cream Wild Indigo	(Baptisia leucophaea)
Sand Coreopsis	(Coreopsis lanceolata)
Prairie Coreopsis	(Coreopsis palmata)
Pale Purple Coneflower	(Echinacea pallida)
Rattlesnake Master	(Eryngium yuccifolium)

Prairie Smoke	(Geum triflorum)
Western (Naked) Sunflower	(Helianthus occidentalis)
False Boneset	(Kuhnia eupatorioides)
Round Headed Bush Clover	(Lespedeza capitata)
Rough Blazing Star	(Liatris aspera)
Cylindrical Blazing Star	(Liatris cylindracea)
Pale Spiked Lobelia	(Lobelia spicata)
Wild Quinine	(Parthenium integrifolium)
Prairie Cinquefoil	(Potentilla arguta)
Deam's Rosin Weed	(Silphium integrifolium)
Gray Goldenrod	(Solidago nemoralis)
Riddell's Goldenrod	(Solidago reddellii)
Golden Alexanders	(Zizia aurea)

Grasses:

Big BluestemGrass	(Andropogon gerardii)
Little Bluestem Grass (dry prairie)	(Andropogon scoparius)
Sideoats Grama (dry prairie)	(Bouteloua curtipendula)
Purple Love Grass	(Eragrostis spectabilis)
June Grass	(Kohleria cristata)
Switch Grass	(Panicum virgatum)
Porcupine Grass	(Stipa spartea)
Indian Grass	(Sorghastrum nutans)
Prairie Dropseed	(Sporobolus heterolopis)
Prairie Cord Grass (wet prairie)	(Spartina pectinata)

Herbaceous Plants for Full Sun-Part Shade

Forbs:

Nodding Wild Onion	(Allium cernuum)
Prairie Thimbleweed	(Anemone cylindrica)
Butterfly Weed	(Asclepias tuberosa)
Smooth Blue Aster	(Aster azureaus)
Sky blue aster	(Aster laevis)
New England Aster	(Aster novae-angliae)
White Wild Indigo	(Baptisia leucantha)
Showy Tick Trefoil	(Desmodium canadense)
Shooting Star	(Dodecatheon meadia)
Purple Coneflower	(Echinacea purpurea)
Wild Bergamot	(Monarda fistulosa)

Foxglove Beard Tongue (Penstamon digitalis)

Obedient Plant (Physostegia virginiana)

Black-eyed Susan (Rudbeckia hirta)

Ohio Goldenrod (Solidago ohiensis)

Spiderwort (Tradescantia ohioensis)

Heart-Leaved Meadow Parsnip (Zizia aptera)

Grasses:

Common wood reed (Cinna arundinacea)

Canada Wild Rye (Elymus canadensis)

Virginia Wild Rye (Elymus virginicus)

Fowl Meadow (Manna) Grass (Glyceria striata)

Bottlebrush Grass (Hystrix patula)

Herbaceous Plants for Shaded Areas (closed savanna & woodland communities):

Forbs:

Wild columbine (Aquilegia canadensis)

Jack-in-the-pulpit (Arisaema atrorubens)

Wild Ginger (Asarum canadense)

Dutchman's breeches (Dicentra cucullaria)

Yellow Trout Lily (Erythronium americanum)

Wild Geranium (Geranium maculatum)

Virginia Waterleaf (Hydrophyllum virginianum)

Virginia Bluebells (Mertensia virginica)

May Apple (Podophyllum peltatum)

Solomon's Seal (Polygonatum canaliculatum)

Bloodroot (Sanguinaria canadensis)

Trillium (Trillium spp.)

Grasses:

Ear-leaved Brome (Bromus latiglumis)

Woodland Brome (Bromus pubescens)

Silky Wild Rye (Elymus villosus)

Beak Grass (Diarrhena americana)

Sedges:

Plantain-leaved Wood Sedge (Carex plantaginea)

Broad-leaved Wood Sedge (Carex platyphylla)

Common Oak Sedge (Carex pensylvanica)

Curly-styled Wood Sedge	(Carex rosea)

Trees and Shrubs for Woodland Communities

Oak Savanna:

Trees

Shagbark Hickory	(Carya ovata)
White Oak	(Quercus alba)
Bur Oak	(Quercus macrocarpa)
Black Oak	(Quercus velutina)

Shrubs:

New Jersey Tea	(Ceanothus americanus)
American Hazelnut	(Corylus americana)

Floodplain Forest:

Trees:

Silver Maple	(Acer saccharinum)
Hackberry	(Celtis occidentalis)
Green Ash	(Fraxinus pennsylvanica subintegerrima)

Shrubs:

Spicebush	(Lindera benzoin)
Elderberry	(Sambucus canadensis)

Mesic Woodlands
(Savanna grasses are often part of this community)

Trees:

Sugar Maple	(Acer saccharum)
Shagbark Hickory	(Carya ovata)
Green Ash	(Fraxinus pennsylvanica subintegerrima)
White Oak	(Quercus alba)
Swamp White Oak	(Quercus bicolor)
Bur Oak	(Quercus macrocarpa)
Red Oak	(Quercus rubra)
Basswood (American Linden)	(Tilia americana)
American Elm	(Ulmus americana)

(found less frequently today due to Dutch Elm Disease)

Shrubs:

Grey Dogwood	(Cornus racemosa)
Elderberry	(Sambucus canadensis)
Nannyberry	(Viburnum lentago)

Plants for Generally Wet Conditions

Marsh:

Swamp Milkweed	(Asclepias incarnata)
Blue Joint Grass	(Calamagrostis canadensis)
Common Lake Sedge	(Carex lacustris)
Sedges	(Carex sp.)
Spotted Joe Pye Weed	(Eupatorium maculatum)
Common Boneset	(Eupatorium perfoliatum)
Rice Cut Grass	(Leersia oryzoides)
Common Water Horehound	(Lycopus americanus)
Common Cattail	(Typha latifolia)
Dark Green Rush	(Scirpus atrovirens)
Great Bulrush	(Scirpus validus)
Prairie cordgrass	(Spartina pectinata)

Calcareous wet soil communities (fens)

Great Angelica	(Angelica atropurpurea)
New England Aster	(Aster novae-angliae)
Marsh Marigold	(Caltha palustris)
Porcupine Sedge	(Carex hystericina)
Turtlehead	(Chelone glabra)
Fen Thistle	(Cirsium muticum)
Fowl Meadow Grass	(Glyceria striata)
Narrow-Leaved Loosestrife	(Lysimachia quadriflora)

Lake and Pond Communities

Great Spike Rush	(Eleocharis palustris)
Common Rush	(Juncus effusus)
Rice Cut Grass	(Leersia oryzoides)
Pickerel Weed	(Pontederia cordata)
Swamp Dock	(Rumex verticillatus)
Common Arrowhead	(Sagittaria latifolia)

APPENDIX 4: SOURCES OF INFORMATION AND ASSISTANCE

American Society of Landscape Architects
Illinois Chapter
P. O. Box 4566
Oak Brook, IL 60522
(630) 833-4516
http://www.il-asla.org
To request an Illinois Landscape Architecture Firms directory

Audubon Society of New York State, Inc.
46 Rarick Road
Selkirk, NY 12158
(518) 767-9051
(Cooperative Sanctuary Programs for Golf Courses and Schools)
http://www.audubonintl.org

Chicago Botanic Garden
1000 Lake Cook Road
P.O. Box 400
Glencoe, IL 60022-0400
(847) 835-5440
http://www.chicago-botanic.org

City of Chicago Department of Environment
30 N. La Salle St. Suite 2500
Chicago, IL 60602
(312) 744-7606
http://www.cityofchicago.org

Chicago Wilderness
8 South Michigan Avenue, Suite 900
Chicago, IL 60603
(312) 580 - 2137
http://www.chicagowilderness.org

Chicagoland Environmental Network
Brookfield Zoo
3300 Golf Rd. Brookfield, IL 60513
(708) 485-0263, ext. 396
http://www.cen.nidus.net

Clean Air Counts
53 West Jackson Boulevard, Suite 230
Chicago, IL 60604
(312) 554 -0900
http://www.cleanaircounts.org

Cooperative Extension Service of the University of Illinois at Urbana-Champaign: Master Gardeners

Chicago North Unit:
(773) 292 - 4444

Cook County-North Suburban:
(847) 298 -3502

Cook County-South Suburban:
(708) 532 -3337

DuPage Unit: (630) 653 - 4114

Kane County: (630) 584 -6166

Lake County: (847) 223 - 8627

McHenry County: (815) 338 - 4747

Will County: (815) 727- 9296

Illinois Department of
Natural Resources
One Natural Resources Way
Springfield, IL 62702
(217) 785-5500
http://dnr.state.il.us/

Illinois Department of
Natural Resources
Division of Natural Heritage, Region II
2050 W. Stearns Road
Bartlett, IL 60103
(847) 608-3100

Illinois Native Plant Society
Forest Glen Preserve
20301 East 900 North Road
Westville, IL 61883
(217) 662-2142

Madison Arboretum
University of Wisconsin
1207 Seminole Highway
Madison, WI 53711
(608) 263 -7888
http://wiscinfo.doit.wisc.edu/arboretum/

The Morton Arboretum Library
4100 IL Route 53
Lisle, IL 60532
(630) 719 -7932
http://www.mortonarb.org

National Wildflower Research Center
4801LaCrosse Avenue
Austin, TX 78739
(512) 292-4200
http://www.wildflower.org

The Nature Conservancy
IL Field Office
8 South Michigan Avenue, Suite 900
Chicago, IL 60603
(312) 346-8166
http://www.nature.org

Northeastern Illinois Planning Commission
(NIPC)
222 South Riverside Plaza, Suite 1800
Chicago, IL 60606
(312) 454-0400
Environment and Natural Resources
Department
http://www.nipc.org

US Army Corps of Engineers
Permit Evaluation Section Chief
US Army Corps of Engineers
Regulatory Branch
111 N. Canal St.
Chicago, IL 60606
(312) 353-6400, x 4028 (for information about
wetlands regulations)
http://www.usage.army.mil/lrc

USDA: Natural Resources Conservation Service
(formerly the Soil Conservation Service):
http://www.nrcs.usda.ga

Chicago:
NRCS
Chicago Metro Urban & Community Assistance
Office
313 W. Naperville Road, Suite J
Plainfield, IL 60544
815 - 577-3597

DuPage and Kane Counties:
NRCS and Kane-DuPage Soil & Water Conservation District St. Charles Field Office
545 Randall Rd.
St. Charles, IL 60174
(630) 584-9534 (NRCS)
(630) 584-7961(SWCD)

Lake County:
NRCS and Lake County Soil & Water Conservation District
100 N. Atkinson Rd, Suite 102-A
Grayslake, IL 60030-7805
(847) 223-1056

McHenry County:
NRCS and McHenry County Soil & Water Conservation District
Woodstock Field Office
1143 N. Seminary, P.O. Box 168
Woodstock, IL 60098
(815) 338-0049 (NRCS)
(815) 338-0099 (SWCD)

North Cook County:
NRCS and North Cook Soil & Water Conservation District
Address: P.O. Box 407, Streamwood, IL 60107
Location: 899 Jay Street, Elgin, IL 60120
(847) 468-0071 (NRCS)
(847) 991-4330 (SWCD)

South Cook and Will Counties:
NRCS and Will-S. Cook Soil & Water Conservation DistrictJoliet Field Office
1201 Gouger Rd. New Lenox, IL 60451
(815) 462-3106 (NRCS)
(815) 462-3151 (SWCD)

United States Environmental Protection Agency
77 West Jackson Boulevard
Chicago, Illinois 60604
(800) 621-8431
http://www.epa.gov/greenacres/

Wild Ones - Natural Landscapers, Ltd.
PO Box 1274
Appleton, WI 54912-1274
(877) 394-9453 (toll free)
(920)730-3986 (local)
http://www.for-wild.org

Sources of Native Seeds, Plants and Garden Catalogs

Company names mentioned on the following pages are presented strictly for informational purposes; there is no implied endorsement or recommendation. Other companies provide materials for natural landscaping. An exhaustive listing is not possible for this type of publication.

Illinois
Berthold Nursery
434 E. Devon
Elk Grove Village, IL 60007
(847) 439-2600

Blazing Star
2107 Edgewood Dr.
Woodstock, IL 60098
(815) 338-4716
http://www.blazing-star.com

Bluestem Prairie Nursery
Route 2, Box 92
Hillsboro, IL 62049
(217) 532-6344 (retail only)

Enders Greenhouse
104 Enders Drive
Cherry Valley, IL 61016
(815) 332-5255

Genesis Nursery
23200 Hurd Road
Tampico, IL 61283
(815) 438-2220
(plants for a variety of restoration activities, including wetlands)

LaFayette Home Nursery, Inc.
Rt. 1, Box 1A
LaFayette, IL 61449
(309) 995-3311

Lee's Gardens
PO Box 5
25986 Sauder Road
Tremont, IL 61568
(309) 925-5262
(Woodland native plants, retail only)

Possibility Place Nursery
7548 W. Monee Road
Monee, IL 60449
(708) 534-3988
http://www.possibilityplace.com

Spring Bluff Nursery
41 W. 130 Norris Road
Sugar Grove, IL 60554
(708) 466-4278
(retail only)

The Natural Garden
38 W. 443 Hwy 64
St. Charles, IL 60175
(630) 584-0150

The Prairie Garden
705 South Kenilworth
Oak Park, IL 60304
(708) 386-7495

Windsong Prairie Nursery
5412 N Ridgeway Road
Ringwood, IL 60072
(815) 653-6936
(seeds only)

Wisconsin
Applied Ecological and Taylor Creek Restoration Nurseries
P.O. Box 256
17921 Smith Road
Brodhead, WI 53520
(608) 897-8641
http://www.appliedec.com

Johnson's Nursery
W 180 N 6275 Marcy Road
Menomonee Falls, WI 53051
(414) 252-4988

Milaeger's Gardens
4838 Douglass Ave.
Racine, WI 53402-2498
(414) 639-2371

Prairie Future Seed Company
PO Box 644
Menomonee Falls, WI 53052-0644
(414) 491-0685

Prairie Nursery
PO Box 306
Westfield, WI 53964
(608) 296-3679
Prairie Ridge Nursery
9738 Overland Road
Mt. Horeb, WI 53572
(608) 437-5245
http://www.prairieridgenursery.com

Reeseville Ridge Nursery
PO Box 171
309 S. Main Street
Reeseville, WI 53579
(414) 927-3291

Indiana
Gardens on the Prairie
3242 W. 169th Street
Lowell, IN 46356
(219) 690-0911

JF New Native Plant Nursery
128 Sunset Dr.
Walkerton, IN 46574
(574) 586-2412
http://www.jfnewnursery.com

Plant Sales held by Not-for-Profit Organizations:

Illinois
Wildflower Preservation and Propagation Committee (McHenry County Defenders)
Held annually the first Sunday of May
(815) 338-0393

Chicago Botanic Garden
A Bloomin Sale
1000 Lake cook Road
Glencoe, IL 60022-0440
(847) 835-5440
http://www.chicago-botanic.org
Held annually in May; check for dates

Indiana
Friends of the Indiana Dunes
Native Plant Sale
Indiana Dunes National Lakeshore
1100 N. Mineral Spring Road
Porter, IN 46304
(219)926-7561, ext. 225
http://www.nps.gov/indu/events/

Gibson Woods Wild Ones
Native Plant Sale
Gibson Woods Nature Preserve
6201 Parrish Avenue
Hammond, IN 4632-1266
(219) 844-3188
http://www.lakecountyparks.com
Held annually in April; check for dates

APPENDIX 5
FACT SHEET: WHAT IS NATURAL LANDSCAPING AND WHY IS IT BENEFICIAL?

What is Natural Landscaping?

Natural landscaping is the design, construction, and maintenance of landscapes which provide the beneficial natural functions that are lost through cultivation of conventional lawns. Natural landscaping stresses the preservation and reintroduction of plants native to our area. The native plants used in natural landscaping are hardy and attractive. They can be used to stabilize soil, reduce flooding, absorb pollutants, and sustain wildlife.

Conventional turf, composed of cool season grasses (e.g. Kentucky blue grass), is costly to maintain; dependent upon environmentally damaging chemicals; non-supportive of the diversity of organisms that are characteristic of a healthy environment; and lacking in visual interest.

Why is Natural Landscaping Beneficial?

Economic Benefits

Reduced Costs of Landscape Installation and Maintenance

Natural landscapes do not require irrigation; they need no or infrequent mowing; lawn maintenance services are not needed.

Reduced Costs of Stormwater Management

Natural landscaping reduces the amount of stormwater runoff, thereby reducing infrastructure costs. Stormwater conveyance and detention facilities that replicate natural systems are less expensive to build and maintain.

Creation of Distinctive and Attractive Properties

The visual interest and diversity of natural landscapes are assets to property owners and communities. Natural landscapes are a part of high quality design and environmental stewardship.

Support of the "Green Industry"

Natural landscaping is an increasingly important segment of the green industry. There are opportunities for business development, especially in relation to landscape design and the propagation and installation of plant materials.

Environmental Benefits

Reduced Soil Erosion

Native plants appropriately used on sloped sites, stream banks, drainage ways, and shorelines can effectively hold the soil and reduce erosion.

Improved Water Quality

Native vegetation in naturalized drainage ways enhances the infiltration of contaminated stormwater. The root systems improve soil permeability and help the uptake of pollutants.

Vegetated buffers along streambanks and shorelines intercept surface runoff and subsurface water pollutants. The avoidance of fertilizers and other chemicals is also a big factor in protecting water quality.

Reduced Air and Noise Pollution

Lawn mowing equipment is a heavy air polluter and is noisy. Natural landscaping requires little or no mowing.

Climatological Benefits

Native plants store large amounts of carbon which would otherwise exist in the atmosphere as carbon dioxide and contribute to global warming. Natural landscaping can provide shade and windbreaks to reduce costs of air conditioning and heating.

Habitat Restoration and Protection

Natural landscaping protects and restores habitats for wildlife. The introduction of native plants can enhance the populations of birds, insects, and animals which are essential components of healthy ecosystems.

Beautification

Natural landscaping can provide a diversity of color and texture throughout the year which significantly contributes to the beauty of sites and communities.

Educational and Recreational Benefits

Conservation Education

Natural landscaping puts people in touch with nature. Municipalities, school districts, park districts, forest preserve and conservation districts, as well as private educational organizations, can use natural landscaping as an educational tool.

Recreation

Natural landscapes are ideal locations for bird watching, photography, walking and hiking, and simply enjoying the quiet and beauty of nature.

Scientific Study

Natural landscapes provide professional scientists and science students with outdoor laboratories for studying nature.

Who Should Use Natural Landscaping?

Natural landscaping should be considered where the ground surface is not required to bear intense usage. Wherever there is conventional lawn there is potential for small or large scale conversion to natural landscaping. New development projects should consider natural landscaping at the site design stage. Natural landscaping is especially appropriate for:

*home sites and planned developments

*governmental properties: civic building sites, schools, and libraries

*corporate and office campuses

*institutional sites

*golf courses

*parks

*roadway right of way and utility corridors

*stormwater conveyance and detention areas

What Can I Do in my Community to Promote the Use of Natural Landscaping?

As a property owner you can install natural landscaping on your own land and encourage other property owners to do likewise.

As a public official you can install natural landscaping on new and existing public sites. You can adopt or amend the local weed ordinances and development regulations so as to encourage natural landscaping. You can provide information about natural landscaping to residents, developers, and civic organizations. You can identify natural areas within the community that need to be preserved or restored. You can sponsor demonstration projects and award creative efforts.

As a volunteer you can assist in the installation and monitoring of natural landscaping projects. You can work with local officials and conservation organizations to promote natural landscaping.

As a developer you can include natural landscaping as a component of new development projects.

Where can I go for Additional Information?

United States Environmental Protection Agency
77 West Jackson Boulevard
Chicago, Illinois 60604
(800) 621-8431
http://www.epa.gov/greenacres/

Northeastern Illinois Planning Commission
222 South Riverside Plaza, Suite 1800
Chicago, Illinois 60606
(312) 454-0400
http://www.nipc.org

APPENDIX 6: SAMPLE LOCAL ORDINANCES

Chapter 4 discusses the role of local government in encouraging the use of natural landscaping and describes a range of regulatory approaches that help eliminate local weed ordinances as a deterrent to natural landscaping.

The text of natural landscaping ordinances is too voluminous to include in this document. Instead, several municipal ordinance sources are identified here and full text can be found on the USEPA web page:
http://www.epa.gov/greenacres/

The Madison, Wisconsin natural lawn ordinance exemplifies the permit approach:

> "Any owner or operator of land in the City of Madison may apply for approval of a land management plan for a natural lawn, one where the grasses exceed eight (8) inches in height, with the inspection unit of the department of planning and develop ment."

The City of Madison has published "An Introduction to Naturalized Landscapes: A Guide to Madison Natural Lawn Ordinance," which provides excellent supportive information, including sketches illustrating various approaches to using natural landscaping in residential lots. There are tips on how to sustain compatibility with neighbors who do not use natural landscaping.

Harvard, Illinois takes a similar approach within its weed ordinance by providing for exceptions and a permit process for natural landscaping. Exceptions are for native planting, wildlife plantings, erosion control, soil fertility building, government programs, educational programs, cultivation, biological control, parks and open space, and wooded areas.

A model ordinance included in Bret Rappaport's John Marshall Law Review article (Volume 26, Summer 1993, Number 4) takes the approach of providing for a setback:

1. Prohibition: untended, rank and undamaged growth of vegetation on any property within the city which is visible from any public way, street, sidewalk or alley is declared to be a public nuisance and may be abated in accordance with the procedures set forth in articles 2-3 of the ordinance. This prohibition shall not apply to vegetation native to [state or region], provided there is a setback of not less than four (4) feet from the front line of vegetation not in excess of eighteen (18) includes exclusive of trees and shrubs.

2. Procedure: the city shall issue a written citation to a landowner whose property is in violation of article 1 of this ordinance. This citation shall inform said landowner of the basis of the citation and shall include the following information: 1) the date of any inspection and the name of the inspector; and 2) the names and addresses of any neighbor(s) of the landowner or other

person(s) who contacted the city or was contacted by the city regarding the alleged violation of article 1 of this ordinance. The citation shall be adjudicated in accordance with art. ___, of the municipal code relating to adjudication of [traffic offenses].

3. Abatement and penalty: upon a finding of guilty in accordance with article 2 of this ordinance, the landowner shall have twenty-eight (28) calendar days in which to abate the nuisance. If he/she does not so act, the city may take whatever reasonable action is necessary to abate the nuisance. The costs of such abatement shall be assessed against the landowner and shall constitute a fine, the collection of which may be made pursuant to the provisions of art. ___[relating to imposing a lien on the property].

Long Grove, Illinois, a low-density conservation conscious community takes a comprehensive approach involving the creation of upland and lowland conservancy districts, as well as scenic corridor districts. The municipality works directly with the Illinois EPA to regulate burning. The village has a conservancy/scenic corridor committee and an application and review process for residents wanting to make landscaping improvements within the conservancy districts. Residents are also provided with plant lists and lists of seed and plant sources.

The Milwaukee Audubon Society has promulgated a model natural landscaping ordinance which establishes the right to landscape naturally provided the natural heritage or ornamental garden does not encroach upon property ownership lines or right-of-way, and the owner/occupier complies with notice provisions:

"Section 1. Natural heritage and ornamental gardens. Not withstanding any provision of any other ordinance, an owner or occupier, who has written authorization of the owner, of residential property may establish and maintain a natural heritage or ornamental garden, provided that:

a) Such a garden, or any portion thereof, does not encroach any property ownership line or public right-of-way: and, b). the owner or occupier complies with the notice provision of Section 2.

Section 2. Notice if any natural heritage or ornamental garden, or the combination thereof, occupies an area in excess of fifty percent of the surface area of the property, not otherwise occupied by buildings, structures, or improvements, the owner or occupier shall file a notice with _____. Such notice shall contain: a). The name and address of the owner or occupier filing the notice; b). A drawing or sketch that depicts the area of the garden ... c). In the case of a natural heritage garden, the drawing shall identify the type of natural community which is intended to be simulated."

An ordinance proposed for Appleton, Wisconsin reads, in part, as follows:

"The ordinance recognizes the fundamental right of every landowner to develop and main-

tain his landscape in the manner of his choosing, insofar as it is not in a state of neglect, nor presents a hazard to the public health or safety, or to the agricultural environment.

(a) every landowner possessing lawns of the conventional bluegrass type shall be responsible for maintaining them at a height not to exceed eight inches.

(b) every landowner shall be responsible for the destruction of all weeds on every parcel of land which he shall own or control.

The city acknowledges the desirability of permitting and encouraging the preservation and restoration of natural plant communities within its boundaries. It acknowledges its citizens' rights to enjoy and benefit from the variety, beauty, and other values of natural landscaping, including freedom from toxic chemicals, and it seeks to guarantee citizens the freedom to pursue restoration projects as viable and desirable alternatives to other conventional modes of landscaping. In such cases, the city encourages, but does not require, landowners to discuss their intentions with the weed commissioner before undertaking such endeavors."

A proposed natural landscape ordinance from the national wildflower research center in Austin, Texas provides a broad legislative purpose to support natural landscaping and then establishes the right to landscape naturally:

"It shall be lawful to grow native plants, including ferns, grasses, forbs, shrubs, and trees, in a managed landscape design when said plants were obtained not in violation of local, state or federal laws. No commissioner or other agent of the [town, city, village, county, etc.] may undertake to damage, remove, burn, or cut vegetation on a preservation or restoration project or in any other landscape incorporating native plants, except those specifically prohibited herein, and except on order of a court of record following a hearing at which it is established (1) that noxious weeds specifically named in the weed ordinance exist in such preservation or restoration projects and that a condition creating a clear and present hazard to public health or safety has arisen or (2) that the project is a threat to the agricultural economy. An action for a court order under this subsection shall be maintained as an action to enjoin a public nuisance. A court order under this subsection shall provide that the destruction, cutting or removal of vegetation shall be selective unless general cutting, destruction, or removal is necessary to eliminate the offending condition."

A 1996 proposal to amend the city and village powers in the state of Nebraska contained language pertaining to the weed control powers of local government, with the specific provision that:

"For purposes of this section, herbaceous vegetation that endangers the public health, safety, and welfare does not include native grasses and plants indigenous to Nebraska that are (a) planted and maintained as part of a garden or for landscaping purposes or (b) planted and maintained for erosion control, weed control, or des-

ignated wildlife areas."

Lisle, Illinois rewrote its weed ordinance, giving exception to native prairie grasses defining them as such:

8-4-1: DEFINITIONS:

NATIVE ILLINOIS PRAIRIE GRASSES: Plants accepted as native in the tallgrass prairies of the Midwestern United States and described as such in the publication Plants of the Chicago Region, by Floyd Swink and Gerould Wilhelm (1994), or in subsequent editions of said publication.

The ordinance continues with requirements as follows:

8-4-5: NATIVE ILLINOIS PRAIRIE GRASSES:

(A) Management; Nuisance: The Village hereby declares that it shall be a nuisance if native Illinois prairie grasses are allowed to grow uncontrolled, without limitation, and without proper management/maintenance and it shall be unlawful for any person owning or controlling land to permit native Illinois prairie grasses to grow or to remain on any lot, tract, or parcel under that person's ownership or control if the plants are grown:

1. In excess of a height exceeding twelve inches (12") on lots, tracts or parcels of land with a permanent structure erected or in the process of being erected thereon, or contiguous thereto; or

2. In excess of a height exceeding eighteen inches (18") on all other lots, tracts or parcels of land. (Ord. 95-2650, 5-15-1995)

(B) Controlled Burns:

1. Controlled open burning of landscape areas and landscape waste is permitted, in nonresidential areas of the Village but only if:

(a) A waiver is granted by the Vice President and Board of Trustees pursuant to ordinance; and

(b) The petitioner has complied with all requirements and conditions as stated in the "Village of Lisle Policies and Procedures Requesting Granting of a Waiver from the Village Code Open Burning Prohibitions February 7, 1995", as amended from time to time.

2. Controlled burns shall not be conducted at anytime on land zoned in any residential district. (Ord. 98-2960, 2-16-1998)

(C) Requirements; Exceptions: The provisions of subsection (A) of this Section shall not apply provided the person owning or controlling the land adheres to the following conditions continuously and simultaneously:

1. Management/Maintenance Plan: All native Illinois prairie grasses shall be mowed or cut down to the height set forth for the weeds and turf grasses in Sections 8-4-3 and 8-4-4 of this Chapter no less than once every twelve (12) months. 2. Setback Requirements: The aforementioned height restriction shall not apply if

the person owning the property or controlling the property provides the required basic lot line setbacks, structural setbacks, and graduated setbacks as follows:

(a) Minimum Basic Setbacks:

(1) A minimum basic lot line setback of five feet (5') from the perimeter of a lot, tract or parcel of land must be provided for native Illinois prairie grasses grown up to two feet (2') in height.

(2) A minimum basic structural setback of five feet (5') from the foundation of all buildings and from the edge of all decks and other structures must be provided for native Illinois prairie grasses grown up to two feet (2') in height.

(b) Graduated Setbacks: A minimum one foot (1') of lot line setback and one foot (1') of structural setback, in excess of the basic lot line and structural setbacks required above, must be provided for each additional foot of height of native Illinois prairie grasses grown in excess of grasses grown to two feet (2') in height. (Ord. 95-2650, 5-15-1995)

Highland Park included a similar amendment to their weed ordinance, and it reads as follows:

All areas shall be kept free from weeds or plant growth in excess of 10 inches (254 mm). Weeds shall be defined as all grasses, annual plants and vegetation other than trees or shrubs provided, however, this term shall not include cultivated flowers and gardens, including but not limited to native plantings used for aesthetic and/or wildlife promotion, to attract and aid wildlife, and/or to offset and control any soil loss problems either occurring or predicted. It shall be the duty of any person owning, leasing, occupying, or controlling any plot of ground in the jurisdiction to prevent the growth of noxious weeds such as cockleburs, thistles, ragweed, burdock, and wild lettuce thereon.

In Orland Park, Illinois, special criteria are listed to promote the use of natural landscaping and include bonuses in the form of reduction in meeting other requirements for the builder. Some of the criteria include:

*Landscaping should be designed to be natural looking while having proportion, balance, unity, variety of species, and variety of color throughout the seasons.

*Landscaping materials that are native to the area should be selected wherever feasible.

* Landscaping should provide massings of natural colors and shapes to offset the mass of a building and to provide a visual relief to the straight lines of building architecture, parking lots and other man-made features.

* Landscaping should provide a natural habitat for birds and other animal life, and should preserve existing natural vegetation and other natural fea tures of a site so as to enhance overall site design and protect animal population and other ecological systems.

*Landscaping should be innovative and creative, and should ensure the proper long term maintenance and replacement of landscaping as needed.

In Schaumburg, Illinois, an extensive biodiversity ordinance was created, based on the development of their biodiversity recovery plan. Their general requirements for landscaping include:

Landscaping and Screening

(A) Purpose. The landscaping and screening requirements specified herein are intended to foster aesthetically pleasing, environmentally beneficial, and sustainable development that will protect and preserve the appearance, character, general health, safety and welfare of the community. Specifically, these regulations are intended to increase the compatibility of adjacent uses requiring a buffer or screen between uses, and in doing so, minimize the harmful impact of noise, dust and other debris, motor vehicle headlight glare or other artificial light intrusions and other objectionable activities or impacts conducted or created by an adjoining or nearby use.

Requirements for detention and retention basins are as follows:

(F) Detention and retention facilities. Landscaping shall be required around the perimeter of all retention and detention basins. Such landscaping shall consist of trees, shrubs, and emergent plantings in a quantity, species, and arrangement that will create an aesthetically pleasing and ecologically functional environment. Such landscaping shall be in conformance with best management practices (BMPs) as determined by the Village of Schaumburg as part of the NPDES program. Retention and detention basins should be designed to resemble natural land forms, whenever possible. Trees, shrubs, turf and prairie plantings should be located below the normal water line. Refer to the Village of Schaumburg Subdivision Control Ordinance, Section 151.09, for grading, seeding and sodding requirements on different slopes.

Appendix 7: Illinois EPA Burning Permit Information

This Agency is authorized to require this information under Illinois Revised Statutes, 1979, Chapter 111 1/2, Section 1039. Disclosure of this information is required under that Section. Failure to do so may prevent this form from being processed and could result in your application being denied. This form has been approved by the Forms Management Center.

STATE OF ILLINOIS
ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL
P. O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

For Agency Use Only
I.D._____
Permit_____

APPLICATION FOR OPEN BURNING PERMIT

1. APPLICANT
Name:_____
Address:_____ Zip Code:_____
Contact Person:_____ Phone:____/____/_____

2. TYPE OF PERMIT APPLICATION
__Firefighting Instruction/Research __Prairie or Forest Ecology Management
__Disaster Waste __Landscape Waste, With Air Curtain Destructor
__Other(Specify):_____

3. GENERAL JUSTIFICATION FOR OPEN BURNING
Reasons why alternatives to open burning are not available:_____
_____
_____
Reasons why such burning is in the public interest:_____
_____
_____

4. SITE
Address:_____
County:_____ Township:_____

Attach to this application (1) a sketch of the immediate vicinity of the site, and (2) a printed map of the general area with the site and nearby features marked. Together these maps must describe the site and provide the distance to nearby features, including adjacent structures, residences, populated areas, roadways, airports, lakes and waterways, hospitals, nursing homes and schools.

5. DURATION AND SCHEDULE
Estimated duration of Open Burning: _____ Total Hours
If Open Burning will occur over more than one day: _____ Hours/Day
Scheduled Date(s): _____ Alternate Date(s): _____
Name of individual to contact on-site to verify date(s) for Open Burning: _____
_____ Phone: ____/____/_____

IL 532-0301
APC 325 Rev. 11/99

Page 1 of 4

6. MATERIALS TO BE BURNED

Item	Amount/Size	Composition/Description/Contents
_____	_____	_____
		_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Specify total amounts of material to burned at the site. Include material(s) used to start the fire and any supplemental material(s) used to maintain the fire. Describe items in appropriate terms, that is

Prairies: Acres - Type and extent of vegetation
Chemicals: Volume or weight - chemical constituents
Buildings: Stories, rooms, square feet - type of construction, state of deterioration, roofing & siding materials, remaining furnishings, other contents

7. CONTAMINANT EMISSIONS

__Particulate Matter _____LB __Sulfur Dioxide _____LB __Nitrogen Oxide _____LB __Organic Material _____LB __Carbon Monoxide _____LB __Other(_____) _____LB

Attach calculations or other means by which the above data was obtained. (This Section need not be completed for burning of vegetation, landscpae waste, building debris, and agricultural waste. If the materials are adequately described in Section 6).

8. RESIDUE DISPOSAL

Method to be used to dispose of the residue from Open Burning:_____

_____

9. ABATEMENT

Steps taken in planning for Open Burning to minimize emissions and air quality impacts:

__Amount of Material __Scheduling __Site Selection __Other(_____)

Explanation:_____

_____

_____

Methods used during Open Burning to reduce contaminant emissions and minimize impact on air quality:

__Water-Fog Curtain __Controlled Burn __Other(_____)

Explanation:_____

_____

10. NOTIFICATION

Have individuals living or working near the site been notified of the proposed Open Burning?

___Yes ___No If "Yes", explain method of notice and any additional measures to be taken to respond to concerns:

_____

_____

_____

11. ADDITIONAL INFORMATION -LANDSCAPE WASTE DISPOSAL ONLY!

Name of air curtain destructor or comparable device:_____

Manufacturer:_____ Model No.:_____

Attach a copy of the manufacturer's written instructions for use of the device to the application. A copy of these instructions should be available at the Open Burning site.

12. ADDITIONAL INFORMATION - DISASTER WASTE DISPOSAL ONLY!

Type of Disaster: __Tornado __Ice Storm __Flood __Other(Specify):_____

_____

Disaster Declared By: __Governor Of Illinois __President Of The United States
Will material other than clean wooden building debris, landscape waste or agricultural waste, caused by the disaster, be burned? __Yes __No

13. ADDITIONAL INFORMATION -FIREFIGHTING INSTRUCTION/RESEARCH ONLY!

Participation in the excercise:	Organizations or Departments	Estimated Number of participants
	_____	_____
	_____	_____
	_____	_____

Scope of Training Excercise: __Use Of Extinguishers __Forceable Entry
__Rescue Techniques __Use of Smoke Masks and Breathing Apparatus __Other(Specify):

_____

Description of Open Burning as related to the training excercise (plan of fire, phases of training, methods of ignition, extinguishment methods, etc.):_____

_____

_____

_____

_____

Attach written plan for excercise or similar excercise, if available

List of other training activities in the last 12 months including all Open Burning excercises:

_____

_____

_____

_____

AUTHORIZED SIGNATURE

The undersigned hereby makes application for an Open Burning Permit and certifies that the statements contained herein are true and correct.

Signature:_____ **Date:**_____

Typed Or Printed Name Of Signer:_____

Title Of Signer:_____

Additional Comments:

Page 4 of 4

Appendix 8: Examples of Natural Landscaping Installation and Maintenance Costs

The following tables represent 2003 costs. Costs vary among different firms, but overall savings are similar.

Turf Grass Lawn with an Irrigation System vs. Native Prairie; from Seed

Estimated Annual Cost Per Acre; for a Five-Acre Planting Project

Turf Grass Lawn

	Year One	Year Two	Year Three	Year Four	Year Five	Annual Thereafter
Installing Seed, Mulch and Fertilizer	$ 2,770.00					
Mowing	$ 2,400.00	$ 2,500.00	$ 2,600.00	$ 2,750.00	$ 2,900.00	$ 3,000.00
Fertilizer Application		$ 750.00	$ 765.00	$ 770.00	$ 780.00	$ 790.00
Irrigation System	$ 4,000.00	$ 400.00	$ 500.00	$ 500.00	$ 600.00	$ 750.00
Municipal Water	$ 1,500.00	$ 800.00	$ 800.00	$ 800.00	$ 800.00	$ 800.00
Aerating/De-thatching		$ 850.00		$ 875.00		$ 1,115.00
Annual Expense	$ 10,670.00	$ 5,300.00	$ 4,665.00	$ 5,695.00	$ 5,080.00	$ 6,455.00

Total Cost After Five Years ***$ 31,410.00***

Native Prairie

	Year One	Year Two	Year Three	Year Four	Year Five	Annual Thereafter
Installing Seed and 2-1/2" Plugs	$ 4,300.00					
Mulching	$ 675.00					
Mowing	$ 800.00	$ 400.00				
Spot Herbicide Treatment	$ 200.00	$ 500.00	$ 500.00	$ 330.00	$ 200.00	$ 150.00
Prescribed Burn		$ 2,125.00	$ 2,150.00		$ 2,200.00	$ 550.00
Annual Expense	$ 5,975.00	$ 3,025.00	$ 2,650.00	$ 330.00	$ 2,400.00	$ 700.00

Total Cost After Five Years ***$ 14,380.00***

Notes:

1 Project size is 5 acres, continguous; costs are per acre for a project of this size
2 Prairie installation includes seeding 20 species and planting 500 2-1/2" plugs
3 Prairie burn cost is based on one prescribed burn every four years
4 Figures are not adjusted for inflation
5 To compare turf grass lawn without irrigation, simply subtract irrigation system from turfgrass cost
6. Prairie seed and plug installation can be made less expensive by including fewer species and fewer or no plugs

Total Annual Cost		
	Turf	**Prairie**
Year One	$10,670	$5,975
Year Two	5,300	3,025
Year Three	4,665	2,650
Year Four	5,695	330
Year Five	5,080	2,400
Five Year Total	**31,410**	**14,380**

Source: Applied Ecological Services, Inc.

Cost Comparison of turf and native landscape treatments (per acre costs)

	Turf Grass		Prairie Grasses and Forbs	
Installation and Seed Costs	Cost	Notes	Cost	Notes
Seed & Installation	$2,600	1	$2,600	4
Irrigation system	$3,000	2		
Ground preparation	$1,300	3	$800	5
Irrigation related to installation	$900			
	$7,800		$3,400	
Annual Maintenance costs				
mowing & trimming	$2,500			
Core aeration	$250	6		
Weed control and fertiliza tion	$1,600	7		
Irrigation (moderate to heavy)	$1,200	8		
Mow management (years 1 - 2)			$2,000	
Herbicide & burn management (years 3 - 5)			$1,900	
Annual burning (years 5 - ~)			$1,200	9
	$5,550		$1,600	10

Notes
1 - Tractor installed seed
2 - Inground irrigation system
3 - Finish grade establishment
4 - All seed, no plugs
5 - herbiciding and/or ground breakup
6 - May not be necessary every year and/or on every site
7 - 4 applications per year
8 - includes maintenance & operation or irrigation system and water
9 - Assumes weeds under control & only burn management required
10 - 10 year average

Above costs are typical averages for a small site

Costs will vary depending on site conditions, size of site, level of ground preparation, seeding rate, and desired appearance

Source: Conservation Design Forum

10-year Cost Comparison of Turn to Native Prairie Grasses and Forbs
(Based on 25-acre site)

Year	Turf Grass Cost	Prairie Grasses & Forbs Cost	Savings
1	$298,000	$135,000	$163,000
2	$75,000	$5,000	$70,000
3	$75,000	$25,000	$50,000
4	$35,000	$25,000	$10,000
5	$35,000	$25,000	$10,000
6	$35,000	$3,500	$31,500
7	$35,000	$3,500	$31,500
8	$35,000	$3,500	$31,500
9	$35,000	$3,500	$31,500
10	$35,000	$3,500	$31,500
Total	$693,000	$232,500	$460,500

Notes:
Cost of burning substantially reduced due to 25 -acre site

Source: Conservation Design Forum

PIZZO & ASSOCIATES, LTD.
ECOLOGICAL RESTORATION

10729 Pine Road, Leland, IL 60531 (815) 495-2300

Cost Comparison

Turf Grass Lawn from Seed with a Sprinkler System vs. Natural Area from Seed.

Year	1	2	3	4	5	10
Turf with a Sprinkler System						
Install	$5,200.00					
Mow	$3,500.00	$3,500.00	$3,605.00	$3,713.15	$3,824.54	$4,433.69
Fertilizer	$525.00	$525.00	$540.75	$566.97	$583.98	$676.99
Irrigation	$5,600.00	$500.00	$515.00	$530.00	$545.90	$632.85
Overseeding / Aerating		$900.00		$927.00		$1,075.00
Annual Expense	$14,825.00	$5,425.00	$4,660.75	$5,727.57	$4,954.52	$6,818.53
Total Turf Expenses to Date	**$14,825.00**	**$20,250.00**	**$24,910.75**	**$30,638.32**	**$35,592.84**	**$64,710.64**
Native - Prairie, Savanna or Wetland						
Install	$3,500.00					
Herbicide (Pre-planting)	$330.00	$198.00				
Weed Control	$2,000.00	$2,250.00	$2,317.50	$500.00		
Burn Management		$500.00	$515.00	$530.45	$546.36	$633.38
Annual Expense	$5,830.00	$2,948.00	$2,832.50	$1,030.45	$546.36	$633.38
Total Native Expenses to Date	**$5,830.00**	**$8,778.00**	**$11,610.50**	**$12,640.95**	**$13,187.31**	**$16,175.03**
Savings	**$8,995.00**	**$11,472.00**	**$13,300.25**	**$17,997.32**	**$22,405.43**	**$48,535.61**
Percentage Savings	61%	57%	53%	59%	63%	75%

Assumptions

Total Project Area <1 Acre
Inflation Factor - 3%
Labor Rate - Non Prevailing Wage
Water Cost Not Calculated
Irrigation - System Installation & Maintenance
Professional Landscape Maintenance Company Hired to Maintain Lawn.

PIZZO & ASSOCIATES, LTD.
ECOLOGICAL RESTORATION

10729 Pine Road, Leland, IL 60531 (815) 495-2300

Cost Comparison

Golf Course Mowing (Rough & Non-Play) vs. Wildflower plus Short Grasses

Year	1	2	3	4	5	10	20
Mowing							
Mow	$2,000.00	$2,060.00	$2,121.80	$2,185.45	$2,251.02	$2,609.55	$3,507.01
Fertilizer & Herbicide	$250.00	$257.50	$265.23	$273.18	$281.38	$326.19	$438.38
Annual Expense	$2,250.00	$4,567.50	$2,387.03	$2,458.64	$2,532.39	$2,935.74	$3,945.39
Total Turf Expenses to Date	**$2,250.00**	**$4,567.50**	**$6,954.53**	**$9,413.16**	**$11,945.56**	**$25,793.73**	**$60,458.34**
Wildflower + Short Grass Planting							
Install	$3,500.00						
Herbicide to Kill Lawn	$350.00						
Weed Control - by owner	$200.00	$220.00	$226.60				
Burn Management		$1,000.00	$500.00	$515.00	$530.45	$614.94	$826.42
Annual Expense	$4,050.00	$1,220.00	$726.60	$515.00	$530.45	$614.94	$826.42
Total Native Expenses to Date	**$4,050.00**	**$5,270.00**	**$5,996.60**	**$6,511.60**	**$7,042.05**	**$9,942.77**	**$17,203.82**
Savings	**-$1,800.00**	**-$702.50**	**$957.92**	**$2,901.56**	**$4,903.51**	**$15,850.96**	**$43,254.52**
Percentage Savings	-80%	-15%	14%	31%	41%	61%	72%

Assumptions

Total Project Area >1 Acre
Inflation Factor - 3%
Owner Maintenance

Appendix 9: President's Executive Order on Beneficial Landscaping

Executive Order 13148 of April 21, 2000

Greening the Government Through Leadership in Environmental Management

By the authority vested in me as President by the Constitution and the laws of the United States of America, including the Emergency Planning and Community Right-to-Know Act of 1986 (42 U.S.C. 11001-11050) (EPCRA), the Pollution Prevention Act of 1990 (42 U.S.C. 13101-13109) (PPA), the Clean Air Act (42 U.S.C. 7401-7671q) (CAA), and section 301 of title 3, United States Code, it is hereby ordered as follows:

PART 1—PREAMBLE

Section 101. Federal Environmental Leadership. The head of each Federal agency is responsible for ensuring that all necessary actions are taken to integrate environmental accountability into agency day-to-day decision-making and long-term planning processes, across all agency missions, activities, and functions. Consequently, environmental management considerations must be a fundamental and integral component of Federal Government policies, operations, planning, and management. The head of each Federal agency is responsible for meeting the goals and requirements of this order.

PART 6—LANDSCAPING MANAGEMENT PRACTICES

Sec. 601. Implementation.

a. Within 12 months from the date of this order, each agency shall incorporate the Guidance for Presidential Memorandum on Environmentally and Economically Beneficial Landscape Practices on Federal Landscaped Grounds (60 Fed. Reg. 40837) developed by the FEE into landscaping programs, policies, and practices.

b. Within 12 months of the date of this order, the FEE shall form a workgroup of appropriate Federal agency representatives to review and update the guidance in subsection (a) of this section, as appropriate.

c. Each agency providing funding for nonfederal projects involving landscaping projects shall furnish funding recipients with information on environmentally and economically beneficial landscaping practices and work with the recipients to support and encourage application of such practices on Federally funded projects.

Sec. 602. Technical Assistance and Outreach. The EPA, the General Services Administration (GSA), and the USDA shall provide technical assistance in accordance with their respective authorities on environmentally and economically beneficial landscaping practices to agencies and their facilities.

PART 10—DEFINITIONS

For purposes of this order:

Sec. 1001. General. Terms that are not defined in this part but that are defined in Executive Orders 13101 and 13123 have the meaning given in those Executive orders. For the purposes of Part 5 of this order all definitions in EPCRA and PPA and implementing regulations at 40 CFR Parts 370 and 372 apply.

Sec. 1002. "Administrator" means the Administrator of the EPA.

Sec. 1003. "Environmental cost accounting" means the modification of cost attribution systems and financial analysis practices specifically to directly track environmental costs that are traditionally hidden in overhead accounts to the responsible products, processes, facilities or activities.

Sec. 1004. "Facility" means any building, installation, structure, land, and other property owned or operated by, or constructed or manufactured and leased to, the Federal Government, where the Federal Government is formally accountable for compliance under environmental regulation (e.g., permits, reports/ records and/or planning requirements) with requirements pertaining to discharge, emission, release, spill, or management of any waste, contaminant, hazardous chemical, or pollutant. This term includes a group of facilities at a single location managed as an integrated operation, as well as government owned contractor operated facilities.

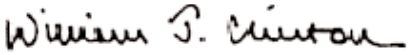
Sec. 1005. "Environmentally benign pressure sensitive adhesives" means adhesives for stamps, labels, and other paper products that can be easily treated and removed during the paper recycling process.

Sec. 1006. "Ozone-depleting substance" means any substance designated as a Class I or Class II substance by EPA in 40 CFR Part 82.

Sec. 1007. "Pollution prevention" means "source reduction," as defined in the PPA, and other practices that reduce or eliminate the creation of pollutants through: (a) increased efficiency in the use of raw materials, energy, water, or other resources; or (b) protection of natural resources by conservation.

Sec. 1008. "Greening the Government Executive orders" means this order and the series of orders on greening the government including Executive Order 13101 of September 14, 1998, Executive Order 13123 of June 3, 1999, Executive Order 13134 of August 12, 1999, and other future orders as appropriate.

Sec. 1009. "Environmental aspects" means the elements of an organization's activities, products, or services that can interact with the environment.



THE WHITE HOUSE,

April 21, 2000.

APPENDIX 10: SELECTED BIBLIOGRAPHY

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Note: An increasing selection of books on this subject is coming onto the market. The gardening section of most larger bookstores and libraries will have many titles from which to choose.

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