

LIVING WITH NATURE

A handbook for environmental conservation and living well





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You have chosen to live in a unique new community that, unlike many other developments, has been designed to provide restored, ecologically healthy native plant and animal communities right outside your door. Beautiful homes are designed to be integrated with patches of prairie, wetlands and surrounding woodlands within the hilly landscape of southeastern Wisconsin. In recognition of the priceless value of the natural resources, the following general guidelines have been developed to maximize the health of our surrounding natural environment, and thereby, enhance the quality of life for all homeowners.

Like our human bodies, natural areas can exhibit various degrees of "health". And, again, like our human bodies, the "healthiness" of our natural resources is a result of a whole series of remarkably interrelated internal and external factors.

Just as our human physical strength is a function of genetics, our structural makeup, exercise and nutrition, a strong healthy ecosystem is a function of its genetics, its structure and external forces.

We have gone to great lengths to restore the structure and functions of healthy ecological communities, and now, their continuing health and beauty will depend greatly on the care exercised by the residents of this community who live in and amongst these ecosystems.

The greatest threat to our surrounding natural areas comes from the everyday activities we each engage in -- around the house and in our own yards. It is important that we understand how we impact our environment, and that we think intentionally about our daily activities in order to avoid damaging nearby natural resources with chemicals and pollutant runoff from our yards. These include

yard chemicals (fertilizers, pesticides and herbicides), maintenance fluids (gasoline, oil, etc.) and even include some chemicals that might seem harmless, such as the detergents we might use in the driveway to wash the car.



Of particular concern and sensitivity are the following issues:

1. Types of lawn and shrub fertilizers used
2. Timing and method of application of lawn and shrub fertilizers
3. Use of pesticides
4. Use of herbicides
5. Street and sidewalk de-icing materials
6. Use of landscaping plants that can become an invasive threat to native wildflowers, grasses and plants in the natural areas
7. Automobile fluids and combustion byproducts that wash into ponds, streams or wetlands
8. Problems that cause soil erosion



This booklet offers guidelines on how to live in harmony with our natural environment and reduce the threat of contamination from our everyday activities. By simply adjusting our behaviors slightly, using alternative materials and practicing eco-friendly methods, we can have a tremendously positive effect on our natural environment. Together, we can preserve, protect and cherish the unique ecosystems that make our community such a beautifully attractive, healthy place to live.

Conservation Development: The Concept of Living with Nature

A Conservation Development is a community dedicated to a high quality of life through the intertwined design of natural areas and man-made structures, such as houses and streets. With such close integration, it's clear to see that conservation of the natural environment is essential to the conservation of this quality of life.

First and foremost, the guiding principle of this innovative conservation community is Environmental Protection and Restoration. Unlike other developments, this was designed to integrate natural features (prairies, oak savannas, wetlands, streams, ponds, etc.) with beautiful homes in an attractive neighborhood.

This Conservation Development concept allows you to "live with nature", to enjoy nature up close and personal, just beyond your doorstep. While many Wisconsinites are only able to appreciate nature during an up-north summer vacation or on weekend trips to their closest state park, residents of a conservation development need only step out the back door. Nature is as near as a relaxing stroll through the restored native prairies, woodlands and

wetlands that provide shelter and habitat to birds, butterflies and other interesting wildlife species that make up the web of life.

To make sure these restored natural resources remain healthy and the quality of life here remains exceptional, the following general goals were adopted during the neighborhood design process:

1. Minimize the use of selected chemicals and pollutants (fertilizers, de-icing materials, herbicides, insecticides, etc.) within the development.
2. Protect the natural resource areas within the development; maximize plant and animal diversity; and, preserve the natural ecological processes that regulate the ecological systems which support the plants and animals.
3. Provide access and opportunity for the enjoyment of natural resources, and facilitate the life-long learning of residents who will be responsible to care for those resources.



In this Conservation Development, nature is as near as stepping out the back door for a relaxing stroll through the restored native prairies, woodlands and wetlands that provide shelter and habitat to many types of wildlife species.



Stormwater Runoff - Key to the Ecological Health of Natural Systems

The design of the neighborhood site plan is based upon an innovative approach to controlling stormwater runoff and pollutants which can harm natural areas and downstream water resources. This unique approach uses a series of connected, large-scale native landscapes to slow the flow of stormwater runoff, and to filter pollutants out of it.

Our "Stormwater Treatment Train" is comprised of natural swales to slowly convey stormwater

runoff, upland prairies to absorb or infiltrate stormwater, and wetlands which are able to store runoff while removing certain chemicals contained in the runoff. In combination, these landscape features greatly increase opportunities for "biofiltration" by reducing runoff velocities and helping to remove chemicals, pollutants and sediment.



Plants such as Scirpus validus (Softstem bulrush) help reduce runoff velocities and remove chemicals from stormwater runoff.

The success of this system in controlling pollutants depends in large part on what we do individually to reduce the volume of pollutants - at the source. It is essential that chemicals be used as little as possible; and when they are used, it's important that appropriate "eco-friendly" chemicals be used.

We realize that all of us encounter situations where various chemical materials provide easy solutions. However, due to the direct connection that each house and lot has to our natural areas and downstream water resources, it is important to make careful decisions in our choice of chemicals. Where possible, the use of readily available, alternative chemicals and methods of application can greatly reduce contamination and pollution problems.

The following sections of this Living with Nature handbook provide alternative chemicals and application approaches, as well as a rationale for change.

Lawn Maintenance and the Use of Fertilizers

A basic understanding of lawn plants (grass) - and our goals in fertilizing them - can help us take a more rational, less costly approach to achieving a healthier and more aesthetically pleasing yard and neighborhood environment.

In America, we typically over-fertilize our lawns. This has become common practice in the past half-century as the lawn care industry has successfully promoted its products and services. There also is a pervasive approach in our culture that "more is better"...a green lawn can be made even greener with more frequent application, use of a stronger fertilizer mix, or use of more fertilizer per application.

This lawn care practice, however, has contributed dramatically to the pollution of our lakes and rivers. In downstream natural areas, it has encouraged the domination of weeds that thrive on the abundant fertilizer loads. And it has caused a measurable loss of biological diversity in natural systems downstream from lawns that receive heavy doses of fertilizer.



Here's just a bit of the science that you need to be aware of when fertilizing . . .

Lawns are composed of "cool season" grasses. Cool season grasses are grass species, such as Kentucky bluegrass, that are metabolically active in spring and fall but not during the heat of mid-summer.

You will notice this yourself, if you are in charge of mowing a Wisconsin lawn. During periods of summer heat (above 75 degrees F), grass does not grow very much. No amount of fertilizer will offset this suppressed growth. Suppressed growth is a genetic and physiologic mechanism that cool season plants use to protect their energy reserves from the damaging effects of drought. In practical terms, they simply become semi-dormant.

Because of this, fertilizer needs are greatest during spring and late summer/early fall. Application just prior to, or during, the early phases of cool season plant growth are the most effective. Spring and fall fertilizer applications also are the most economically practical because the fertilizer is able to be used by the plants, as shown by their rapid "greenup" response.



The best lawn fertilizers are natural organic, slow release materials that can be applied with the same equipment as inorganic fertilizers.

the plants. Instead, it runs off with the next rain storm into streams, lakes, ponds and wetlands where it feeds the growth of algae. In Wisconsin,

"green lake syndrome" is largely a result of this "nutrient enrichment."

These lawn fertilizers not only contribute to problems in our water bodies but they also favor fast-growing weedy plants that grow in our drier, upland areas before they wash into the lowland aquatic environments. Weeds that grow at the exclusion of less aggressive, more desirable native plants generally harbor insects and other wildlife species that also may be less desirable. Because changes in plant species affect the types and diversity of animals that can utilize an area, weedy areas encouraged by poor fertilizing practices have a negative impact on the overall health of our natural areas.

The type of fertilizers we use also have an effect on our natural areas - either positive or negative. The best fertilizers are natural organic, slow release materials that can be applied with the same equipment as inorganic fertilizers, and are now readily available from many retail outlets that sell lawn care products. These same organic fertilizers can also be used on shrubbery and trees and do not have the problems of over-fertilization that often causes death or yellowing when inorganic fertilizers are used. The Appendix contains a list, with sources, of some of the products that can help solve the problems caused by lawn fertilizing.

Finally, lawn clippings can also be used as fertilizer. They are organic, and provide a source of slowly releasing essential nutrients. Lawn clippings contain 0.2-0.3% nitrogen, 0.5% phosphorus, and 0.1% potassium; NPK - the key ingredients in fertilizers. It helps to use a mulching lawn mower that chops grass clippings very fine. By using this style of mower, clippings fall back into the lawn and provide a natural organic fertilizer, but do not cause an aesthetic problem or upset the soft feel of a fine, healthy lawn.



Using Pesticides and Herbicides

For many reasons - not the least of which is your own health and welfare - our goal is to minimize the use of both herbicides and pesticides.

Most of the readily available pesticides carried by lawn care supply centers and used by landscaping firms are dangerous chemicals. The product safety labels provide clear and convincing evidence of the degree of care needed and the potential problems associated with pesticide use. Justifiably, increasing technical information and concern by the public over the use of these materials has begun to change the way we approach lawn care and the use of chemical agents inside and outside our homes.

Chemicals can have the following effects on ecological systems:

1. *Chemicals may kill or impair the functions of not only the "target" pest organisms but also hundreds of desirable species.*

Because chemicals are non-selective, their destructive capacities are extended to plants and insect life necessary in complete and healthy ecosystems. For example, beautiful and increasingly rare butterflies suffer when we spray our yards for ants or mosquitoes. Wonderful songbirds - many of which eat insects - suffer ill effects; even if they survive, the songbirds are forced to feed elsewhere since the insects that they normally feed upon are destroyed or reduced in population.

Most desirable native plants are chemically sensitive and will not survive the first application of most herbicides and pesticides. Some native plants rely on insects and birds for pollination.



Most desirable native plants are chemically sensitive and will not survive the first application of most herbicides and pesticides.

The loss of plant pollinators depletes the future populations of these plants.

2. *There is no assurance that the weed or pest problem will be addressed by chemical applications.*

In order for pesticides and herbicides to work effectively they have to completely kill the pest species. Surviving individuals can reproduce and instill genetic or behavioral resistance to herbicides and pesticides. This very common result of using pesticides or herbicides (and even some antibiotics) is why the strength of these chemicals must be increased every couple of years. In short, the use of chemicals results in an increased tolerance by the pest species and increases the dangers associated with their use.

3. *Chemicals that kill pest species often represent human health risks.*

Simply read the label...there is ever-increasing evidence that pesticides and herbicides can result in health risks to humans as well as pets and wildlife.



Pesticide and Herbicide Alternatives

Using natural pesticide materials - rather than laboratory synthesized chemicals - and changing the methods of application can greatly reduce the potential for problems. Wild plants and animals have developed strategies to protect themselves from being eaten. They also have developed methods to combat competition for habitat and nutrients from other plants and animals. These strategies for survival and self-defense can be very instructive on how we should design our methods for domestic control of undesirable plants and animals.

Plant species have developed several methods to protect themselves from grazing animals and insects. Some examples are:

- The incorporation of physical protection including spines, thorns, a fuzzy or wooly surface, or rigid leaves that are not easily eaten or palatable.
- The production of chemicals that make the plant taste bad, or chemicals that make plant-eating insects or mammals sick upon eating a plant.
- The production of chemicals that prevent plant-eating insects from growing larger and becoming a more substantial threat.

Some plant-produced, natural pesticides are now commercially available. We recommend these as alternatives to conventional pesticides, however, we also recommend very strict use of these natural pesticide products.



Woolgrass, a fuzzy-headed wetland plant, is more tolerant than most native plants of disturbance and wide-ranging soil and chemical conditions. Most native plants, however, are unable to survive large inputs of herbicides or pesticides in stormwater runoff.

Recommended pesticide products include the following:

- Pyrethrin - an insecticide that is very useful for regulation of insects that infest fruit trees
- BT - a bacteria called *Bacillus thuringiensis*, which is available in a clean white powder that can be dusted on plants with caterpillar infestations, such as cabbage, broccoli, brussel sprouts, or other related garden plants. This product is also available as a "dunk" for floating in ponds to kill mosquito larvae.
- Rotenone - a root derivative from a semitropical plant that is useful for reducing insect problems around flowers, gardens, and within a household.

Few alternatives to herbicides are available. All herbicides (typically thought of as weed killers) are potentially dangerous chemicals. Changes in the herbicide used and the methods of application provide the best way to reduce the potential risk of herbicide damage. The conventional method of herbicide application is spraying. Spraying of herbicides is very wasteful, and over-spray occurs frequently. Contamination from the disposal of

product containers and wash-water also results from the use of sprayer units. These represent the primary ways these chemicals become potential problems for nearby ecological systems.

If you determine that an herbicide is required, we recommend using Rodeo™ near and over water bodies such as wetlands and ponds, and using Roundup™ for



general weed control on the upland areas of your yard. The use of a direct application technique that applies herbicide directly to the target plant is the preferred method. Wick application and brush application techniques are very efficient and safer methods of application. Although actual tools (such as wick applicators) are commercially available, application can be effectively accomplished with the use of rubber gloves, skin and eye protection, and a household sponge or small paintbrush. In this way, the herbicides are quickly absorbed by plants and are readily decomposed by soil organisms without moving long distances from the point of application.

We recommend that, where possible, weeds be pulled rather than poisoned. Weed pulling is the most environmentally sensitive method of weed control available. If you must use herbicides you should be very careful to read all precautionary labels on the herbicide container in addition to having the nearest poison control center/emergency room telephone number readily accessible.

De-Icing Materials

Every winter, millions of pounds of salts, dispersal agents, dyes, and associated contaminants (including heavy metals) are spread on our roadways, driveways, and walkways to keep us from slipping or sliding out of control. Now, no one wants to spin off the road or slam an elbow on the ground, and we're not suggesting that we need to take unnecessary risks. But we do need to be aware of the effects of these materials on our natural environment, and we need to take steps to minimize the damage these materials cause to our natural world.

De-icing materials are very water-soluble. They quickly dissolve and run off the land into the nearest lake, pond, or river, and the toxicity of common de-icing salts is very high. Many species of wildlife suffer toxic effects if these salts are

eaten directly. Salt also changes the chemistry of ponds, lakes, rivers, and wetlands water and soil. The resulting changes are devastating to soft-bodied invertebrates (insects, aquatic snails, daphnia, copepods, etc.) and vertebrates (tadpoles, frogs, toads, salamanders, etc.).

When populations of these organisms decline, other wildlife species such as mammals and birds, also decline. Healthy wildlife population habitats require a healthy level of soft-bodied invertebrates and vertebrates.

Because wetlands and natural areas are very sensitive to salt pollution, residents are asked to refrain from using salt products for de-icing. The good news is that there are safe alternatives to salt, such as sand and sand-cinder mixes. These are as easy to apply as salt and also cheaper. Local garden stores and hardware stores are a reliable source for sand. One good idea is to keep a bag of sand inside the door of your garage close to where it is used most - along the driveway, near the garage, and on the adjacent walkways and doorsteps. After the spring melt, you can even sweep up sand or sand-cinder mixtures to use the following winter.

Several new chemical alternatives to salt have also recently become available on the market. Most of these products were designed to reduce the potential for causing corrosion on automobiles rather than to address their ecological toxicity.



Every winter, millions of pounds of salts and other contaminants are spread on our roadways, driveways and walkways.



Some products appear to be less toxic than common salt, but they still exhibit some toxicity and can result in environmental contamination. One

product, Icemelt™, is far less toxic than conventional salt. However, an unwanted side effect is that it has been found to be a growth stimulant for algae. Therefore, using this product may encourage algae growth in the ponds and water bodies downstream.

Regular shoveling and plowing of snow and/or ice greatly reduces the need for chemical de-icing products. If you must use a de-icing product,

use it sparingly, mix it with sand to reduce the total quantity of salt used, and use alternative products such as Icemelt™.

Travel speeds on the streets and driveways within the subdivision should be slow. Take your time and enjoy the view of the natural surroundings. If you slow down in your neighborhood, far less salt and other de-icing materials will be necessary for safe driving.

Landscaping with Nature

The beauty of your property is important to you and your neighborhood. The way you approach landscaping also has very important ecological implications for the adjacent natural areas and open spaces within the development.

The Origin of "Lawn"

In a typical urban yard, we plant a turfgrass lawn as the major component. A lawn is high maintenance and costly; it goes dormant and brown without irrigation during dry periods; it requires fertilizer and tends to become infested with weedy plants like dandelions, crabgrass, etc.

The term "lawn" was derived from Celtic and Germanic words that meant "in the absence of forest." Essentially, it is synonymous with "in the absence of diverse and useful natural resources." In other words, in Europe, lawns were the "ecosystem" that resulted where humans over-exploited forest resources. Consequently, the term "lawn" historically had a derogatory connotation. Although lawns can serve the useful functions of stabilizing soil, providing aesthetically pleasing greenery, and providing a turf surface for some outdoor activities, they do little else - especially in terms of providing habitat for wildlife or other ecological values or functions.

Landscape Planning Concepts

Landscape planning is often a difficult process for those with little experience in it. Far too often we hire someone else to do the design work, which results in a professional projecting his or her preconceptions for your residence. But "amateurs" can and do have important ideas for their landscapes, and, as with many other disciplines, they are most successful when they're based on sound principles. The principals of planning apply to landscape design as to any other planning process.



Some de-icing products appear to be less toxic than salt, but may encourage algae growth in ponds and streams.



The first step is to identify the uses and goals for your yard. Goals may include having areas for flower gardening or a gathering place to sit and view a beautiful shrub and flower planting. Some people use parts of their yards for vegetable and fruit gardening. Others may want to dedicate turf areas for recreational activities.

Features that are becoming more popular in urban yards include bird feeding stations, butterfly gardens, wildflower gardens, rock gardens, storage spaces for firewood, compost bins and or a small shed for lawn, garden, or recreational equipment. A major intended use of most yards is for rest and relaxation; however, the reality of conventional landscapes is that they require considerable maintenance, which often demands more time than is left for enjoying the property.

After thinking about your landscape uses and goals, a person can begin identifying locations to satisfy the spatial needs for each use. Some people prepare maps or "plans" depicting potential layouts. *(See Appendix for a Sample Natural Landscape Plan.)*

Most plans involve perimeter plantings often along fences, an area of activity around a patio, and decorative shrub and ground cover plantings tastefully designed around entryways and other high visibility areas in the front, sides, or back of a house. The typical plan usually results in a large central area of lawn. This result is often by default; there is a desire to have an open area but little thought is given to the appropriate size, shape, and intended uses. Landscape planners usually provide this plan because it is conventional, easily communicated and relatively inexpensive to install.

Designing to work with nature, however, instead of against it, can change the entire planning approach. For example, areas for which you do not have an immediate goal or planned use do not

have to be lawn. Instead of lawn with shrub and ground cover plantings around the perimeter, consider small corridors of lawn broken by tastefully planted drifts of native prairie grasses and wildflowers. Consider butterfly gardens using native flowering species (e.g., butterfly milkweed, prairie blazing star, and purple coneflower) designed to present flowers that are the right color to attract butterflies.

How about a hummingbird garden with rosy, spring-blooming columbine, scarlet and lavender wild bergamot, or cardinal flowers? An adjacent tastefully shaped and pruned ironwood sapling could provide a resting perch for hummingbirds. Formal mulched flowerbeds using native perennial flowers and grasses can be used in perimeter locations and in artfully designed sinuous beds anywhere in your yard.



Designing to work with nature, instead of against it, can change your entire planning approach to landscape design.

Rain gardens have been gaining much attention and popularity in recent years. These attractive landscape features are designed with water-loving plants that receive downspout runoff from roofs,



or outflow from sump pumps, providing an aesthetically pleasing method of capturing and filtering rainwater before it leaves your yard. If you choose not to use rain gardens, direct roof downspouts onto your lawn where some filtering and infiltration of rainwater can occur. Maintaining clean gutters helps achieve healthy rain gardens and keeps excessive organic materials (leaves, seeds, etc.) from entering the nearby pond and wetlands.

In your “conservation neighborhood,” we have installed native plantings in open space areas in the development. Native seeding and plantings are designed for installation along road margins and around the woodlands and wetlands. The largest area that could be similarly treated is found in the yards of the homeowners. A greater good could be derived from individual landowners having similar natural landscaping aspirations.

Planting native species and naturalizing land that would otherwise be lawn will increase the natural complexity and attractiveness of your landscape, and will become an appreciated asset. These natural landscaping treatments can greatly enhance bird, butterfly and wildlife populations, which will be enjoyed by homeowners and neighbors. Native landscaping also helps the environment since fewer herbicides and pesticides will be used, lawn mowing will be reduced (reducing gasoline consumption and combustion byproducts), and other stressors on the natural environment will be



Many wildlife species still use this development because of the conservation design which includes maintaining and restoring some of the open space and natural habitats.

minimized. This approach will also save money and labor associated with installation and maintenance of conventional landscaping.

Landscaping for Wildlife

Before this neighborhood was developed, the non-farmed land harbored several species of wildlife. Many of these species still use the development because of the conservation design, which includes maintaining and restoring some of the open space and natural habitats. The way you landscape your yard can assist desirable native wildlife.

A conventional suburban yard dominated by lawn and shrubs may contain 20-40 species of plants. In comparison, a typical acre of prairie, wetland, or healthy oak savanna may harbor 100 to 300 species of plants including flowers, grasses, shrubs, mosses, lichens, liverworts, ferns, aquatic plants, and other specialized species. These diverse natural systems provide substantially more habitat for birds, butterflies, and other desirable wildlife species than the conventional suburban yard.

And they are beautiful! Once you have developed an appreciation for natural systems, you are likely to find a very costly urban landscaping plan to be far less appealing than your natural landscape. Natural systems are alive. Different species of plants bloom regularly throughout the season; associated colorful insects begin the process of pollination as the plants bloom. Migratory and resident birds use the natural systems. Warblers,



hummingbirds, flycatchers, and others will seldom use a typical urban yard but are found in profusion in natural areas.

You can bring some of the vitality of the natural world onto your property as a part of your landscaping plan. Butterflies and birds will visit. So will fireflies on a summer evening.

You will not only contribute to the total habitat for wildlife in the neighborhood (and regionally, since so much habitat has been lost in recent years), but you will also plant for yourself what will lead to a great deal of pleasure. Several wonderful publications are available to assist you with native landscaping (*see Appendix for Information Resources*).

Problematic Landscaping Species and Designs

Some of the plants used in conventional landscaping can spread into adjacent natural areas and become a significant nuisance problem. Some of the most undesirable plants are those introduced years ago for landscaping or agricultural purposes (for example, European buckthorn and reed canary grass). Other undesirable plants such as dandelions, chicory, and purple loosestrife were once intentionally planted as landscape beauties. Most of these plants are originally from Europe and/or Asia, and they grow very aggressively to out-compete native wildflowers, grasses, and other more desirable plants.

Many undesirable plants invade natural areas when their attractive berries are eaten and dispersed by birds, when their seeds flow along surface water drainages, and when tiny, dust-like seeds are disseminated by the wind. Some plants, such as the familiar burdock, have seeds that stick like Velcro to clothing and animal fur, and thus are continually spread into natural areas by humans and animals.

If you choose to plant seed-producing species that may escape into the adjacent natural areas, please consider the following precautions:

- Remove seed heads and flowers shortly after flowering so that seeds do not mature and become disseminated. Dispose of the seed materials by composting, burning, or bagging.
- Plant these species close to your house and on the opposite side from any frontage on the natural areas.



Wherever possible, consider using native wildflowers and prairie plants in your landscaping designs to complement the adjacent natural habitats.

- "Hide" plants that produce these seeds and fruits by inter-planting them with other more conspicuous plant species that will reduce access by disseminating animals.

Many landscaping plants have brightly colored flowers that bloom for a longer period of time than their wild counterparts in the natural areas. Because of the importance of pollinators (e.g., hummingbirds, moths, and butterflies) to the wildflowers in natural areas, disruption of the natural pollination of native species can occur. Avoid this by placing your attractive brightly colored



bedding plants on the opposite side of the house from the natural areas.

Wherever possible, consider using native wildflowers and prairie plants in your landscaping. Seed and plants from local nurseries can be used to grow your own little nature area that will beautifully complement adjacent natural habitats. Once established, wildflower plantings are low maintenance, do not require watering (even during drought years), and are not vulnerable to most pests. Carefully designed wildflower beds in your yard can provide years of pleasure at very low cost compared to conventional landscaping.

Because of the importance of this issue, please do not plant the following groups or species of plants:

Trees/Shrubs:

- Buckthorn (members of the genus *Rhamnus*)
- Barberry (*Berberis thunbergii* or related)
- Multiflora rose (*Rosa multiflora*)
- Bittersweet (*Euonymus* or *Celastrus* species)
- Black locust (*Robinia pseudo-acacia*)
- Norway maple (*Acer platanoides*)
- Amur maple (*Acer ginnala*)
- Siberian peashrub (*Caragana arborescens*)
- Russian olive (*Eleagnus angustifolia*)
- Tatarian honeysuckle (*Lonicera tatarica*)
- Privet (*Ligustrum* species)
- High bush cranberry (*Viburnum opulus*) an alternative to this is the native *V. acerifolium*



There are hundreds of beautiful native wildflowers, grasses, trees and shrubs that can be selected to create beautiful landscapes that grow easily without a great deal of maintenance.

Grasses and Flowering Plants:

- Cattail (*Typha* sp.)
- Purple loosestrife (*Lythrum salicaria*)
- Reed canary grass (*Phalaris arundinacea*)
- Smooth brome (*Bromus inermis*)
- Silver banner grass (*Miscanthus sinensis*)
- Yellow water iris (*Iris pseudacorus*)
- Flowering rush (*Butomus umbellatus*)
- Ornamental water lilies (various species)
- Crown vetch (*Coronilla varia*)
- Queen Anne's lace (*Daucus carota*)
- Leafy spurge (*Euphorbia esula*)
- Bird's-foot trefoil (*Lotus corniculatus*)
- White and yellow sweet clover (*Melilotus alba* and *M. officinalis*)

In addition, do not plant any species listed as noxious in state or federal listings.



Alternatively, there are hundreds of beautiful native wildflowers, grasses, trees and shrubs that can be selected to create beautiful landscapes that grow easily without a great deal of maintenance.

Listings of these can be found in some of the reference books shown in the Appendix or through the native nurseries and landscapers listed in the Appendix.

Problematic Wildlife

Because of regional land-use changes, some species of wildlife are becoming problematic in this region. High populations of white-tail deer and Canada geese are quickly becoming significant urban problems. Deer-car collisions, deer and goose destruction to landscaping, health risks to humans and pets by fecal contamination of yards, parks, etc. are becoming increasingly well-documented.

We're concerned about the impacts of unnaturally high populations of these destructive wildlife species on the restored natural areas. Desirable native plants that have been established during restoration activities can be threatened by high deer populations.

Although deer range freely, they are habitual in their patterns of use within a localized area. They continually use trails and browse through the same areas. Deer may be attracted to the the development's natural areas because the restoration practices will result in better

growth of more palatable and nutritious flowers, sedges, and grasses.

The problems can quickly grow worse if residents and adjoining neighborhoods do not follow some simple advice:

- 1) Do not feed Canada geese. This will entice geese to stay and rest or feed. It will ultimately result in the rapid development of a large, year round population.
- 2) Do not feed deer for the same reasons.
- 3) Do not plant landscaping plants that deer relish. For example, planting any species of the yew shrub (*Taxus* sp.) may result in heavy deer-use of your yard and loss or damage to your valuable landscaping plants.



Please do not feed Canada geese. This will entice geese to stay and rest or feed, and will ultimately result in the rapid development of a large, year-round population.



Appendix A

Suggested Reading List

Books, Meredith. Step-by-Step Wildflowers and Native Plants. Better Homes & Gardens, 1996.

Daniels, Steve. The Wild Lawn Handbook: Alternatives to the Traditional Front Lawn. Hungry Minds, Inc. 1995.

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Marshall, Nina T. The Gardener's Guide to Plant Conservation. World Wildlife Fund, 1993.

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Resources for Native Plant Information

Books

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University of Wisconsin Herbarium: <http://www.botany.wisc.edu/wisflora/>

Lady Bird Johnson Wildflower Center:
http://wildflower.avatartech.com/Plants_Online/Suppliers/suppliers.html

Taylor Creek Restoration Nurseries/Applied Ecological Services: <http://www.appliedeco.com>

Possibility Place: <http://www.possibilityplace.com>

Morton Arboretum: <http://www.mortonarb.org/>

Ion Exchange: <http://www.ionxchange.com/>





Appendix B

Environmentally Friendly Lawn Care Products and Suppliers

Following is a list of some recommended lawn care products, as well as suppliers who can provide native landscape design and installation services.

Product: Milorganite

Description: Natural organic fertilizer, 6-2-0 + 4% iron, ideal for lawns, trees, shrubs, flowers, seeding and new sod establishment. Non-burning, low salt index, non-leaching, 4% iron-naturally chelated, long lasting, no excessive growth.

Suppliers: Multiple retail outlets in nearly every city in Wisconsin. See website for list of retailers: www.milorganite.com. Click on "About Milorganite" and then click on "Milorganite Retailers."

Product: WOW (WithOut Weeds)

Description: A series of WOW products control dandelions, crabgrass, creeping bentgrass, foxtail, lambs' quarters, purslane and many other weeds, with no lingering synthetic chemicals. Made from a corn by-product, WOW products let your family, friends and pets enjoy your lawn right after you apply it.

Supplier: Mail order, or order electronically or by phone from the website: www.gardensalive.com, or by phone 812-537-8650, or by fax 812-537-5108. Website contains dozens of earth-friendly products including household cleaners, pest control, pet care products, tools, etc.



Native Landscapes by AES
Brodhead, WI
608-897-8641
www.appliedeco.com

Ecologically-driven natural landscape design and installation services that use native species for formal/informal yard landscapes and subdivision open spaces.

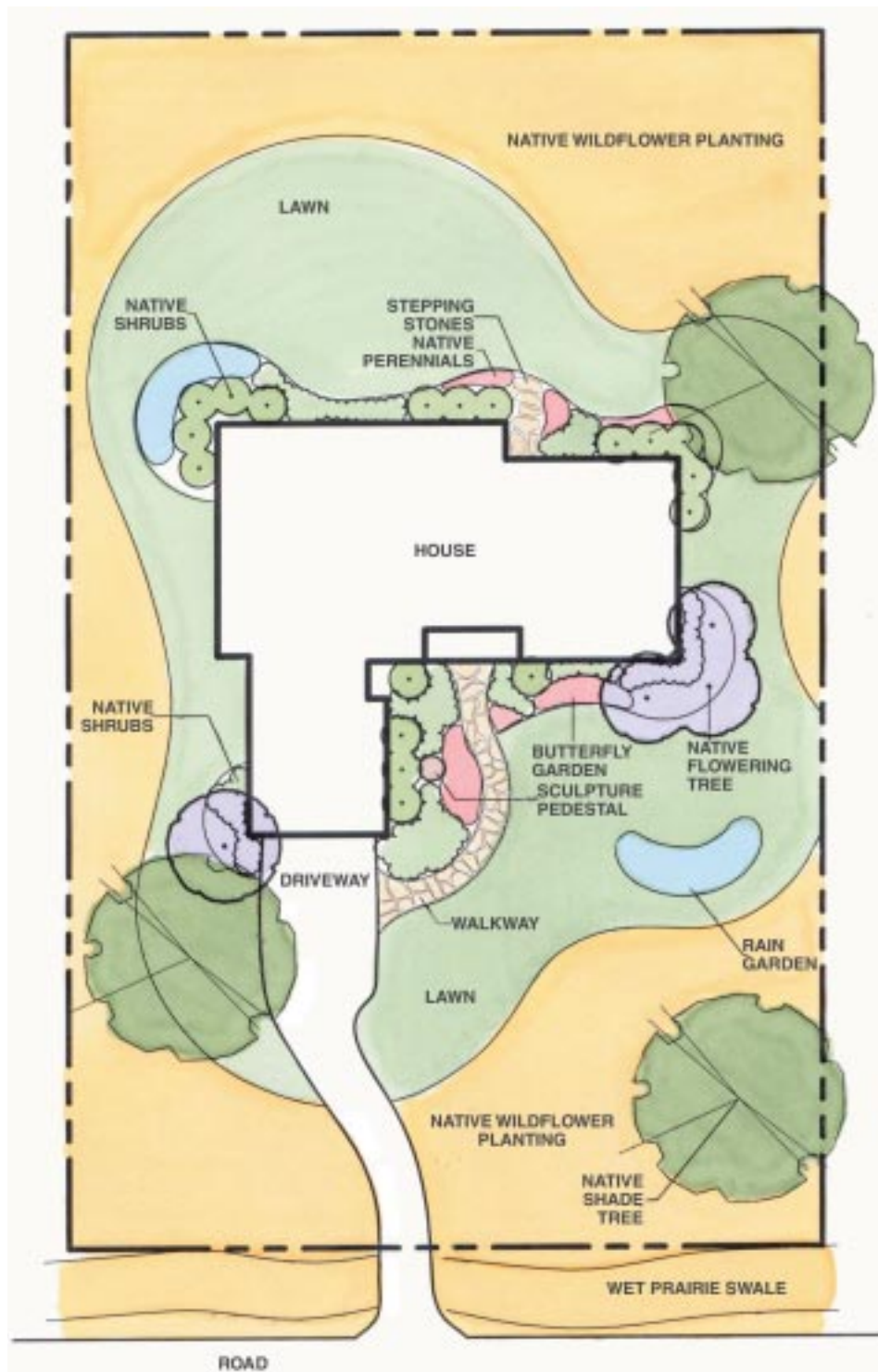
Kettle Moraine Natural Landscaping
Campbellsport, WI
920-533-8939

Consulting and supply landscaping with native wildflowers.



Appendix C

Sample Natural Landscape for a Residential Yard





Build your own
RAIN GARDEN

Appendix D



*What is
a Rain
Garden?*

A "Rain Garden" is simply a shallow depression in your yard that's planted with native wetland or wet prairie wildflowers and grasses.



Trust the experts!
*Authentic native plants
and seed from —*





What is a Rain Garden?



The Rain Garden is one of the most popular new perennial garden designs for three reasons:

1. Rain Gardens make good use of rainwater runoff, thus conserving precious water supplies and helping protect the water quality of downstream lakes and rivers.
2. Rain Gardens are planted with native wetland and prairie wildflowers and grasses. These perennial

plants naturally grew here when the first pioneers rolled across our land — so they're hardy and low-maintenance, not to mention beautiful!

3. Rain Gardens provide food and shelter for many interesting birds, butterflies and beneficial insects — such as dragonflies, which eat mosquitoes! — and they'll provide you with many hours of enjoyable bird and butterfly watching.

Rain Gardens meet the Dragonfly Seal of Approval!

How do I make a Rain Garden?

It's not complicated.

Just follow these easy steps:

1. Dig a shallow depression, as large in circumference as you'd like.
2. Direct your downspout or sump pump outlet to your Rain Garden depression, either by digging a shallow swale for water to run into the depression, or by piping the runoff through a buried 4-inch black plastic drain tile available at any home center.
3. Plant the native plants recommended in this design sheet.
4. Water your planting every other day for the first two weeks or so, until they show that they are growing and well-established.



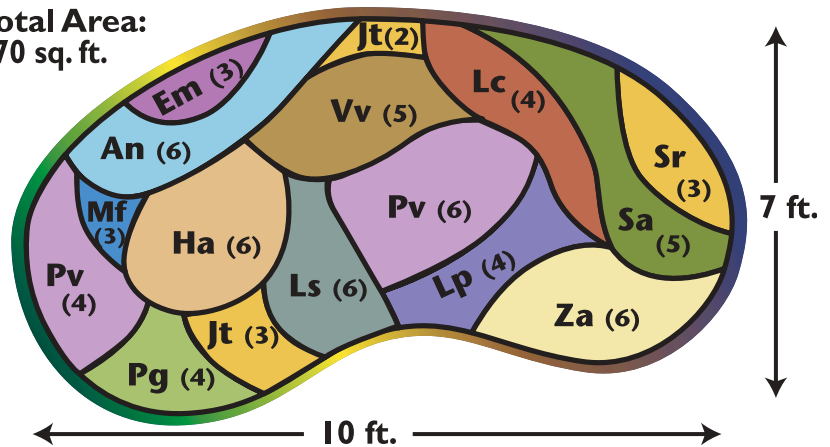
Once your native Rain Garden plants are established, they'll thrive without additional watering. Fertilizers are not necessary. And only minimal weeding will be needed once the initial weeds that appear when you disturb your ground have been removed.

Shown here are two suggested Rain Garden layouts, depending upon your soil type. The abbreviation of each species name is followed (in parentheses) by a recommended quantity you should install for best results. As you purchase your native plants, check (✓) the boxes provided below to be sure you've got them all for maximum Rain Garden beauty!

RAIN GARDEN: Well-Drained to Sandy Soils



Total Area:
70 sq. ft.



Abbrev.	Common Name	Species Name	No. of Plants	Shopping List	Abbrev.	Common Name	Species Name	No. of Plants	Shopping List
An	New England aster	<i>Aster novae-angliae</i>	6	<input type="checkbox"/>	Pg	Marsh phlox	<i>Phlox glaberrima</i>	4	<input type="checkbox"/>
Em	Spotted Joe-Pye weed	<i>Eupatorium maculatum</i>	3	<input type="checkbox"/>	Pv	Mountain mint	<i>Pycnanthemum virginianum</i>	10	<input type="checkbox"/>
Ha	Sneezeweed	<i>Helenium autumnale</i>	6	<input type="checkbox"/>	Sa	Green bulrush	<i>Scirpus atrovirens</i>	5	<input type="checkbox"/>
Jt	Torrey's rush	<i>Juncus torreyi</i>	5	<input type="checkbox"/>	Sr	Stiff goldenrod	<i>Solidago rigida</i>	3	<input type="checkbox"/>
Lp	Prairie blazing star	<i>Liatris pycnostachya</i>	4	<input type="checkbox"/>	Vv	Culver's root	<i>Veronicastrum virginicum</i>	5	<input type="checkbox"/>
Lc	Cardinal flower	<i>Lobelia cardinalis</i>	4	<input type="checkbox"/>	Za	Golden Alexander	<i>Zizia aurea</i>	6	<input type="checkbox"/>
Ls	Great blue lobelia	<i>Lobelia siphilitica</i>	6	<input type="checkbox"/>					
Mf	Wild bergamot	<i>Monarda fistulosa</i>	3	<input type="checkbox"/>					
								Total Plants Needed	70



Where should I put my Rain Garden?

Keep it at least 10 feet away from your house. Other than that, you should pick a naturally low spot in your yard, and direct water from your downspout or sump pump into it. It's best to choose a location with full sun, but if that's not possible, make sure it gets at least a half-day of sunlight.

Also, during heavy rains, your depression will fill up and overflow. Make sure this overflow drainage follows the drainage pattern originally designed for your lot. Test this by filling your depression with a garden hose and watching the overflow. After all, you certainly don't want to flood your neighbor's yard. If you need to, dig a shallow swale to direct overflow water toward the street or other downhill areas away from buildings.

How deep should I make my Rain Garden?

A depression of two to six inches will suffice if you don't want standing water. If you *do* want standing water, dig your depression deeper, perhaps down to 18 inches in the deepest spot. Slope the sides gradually from the edge to the deepest area. If you have heavy clay soil, it may well hold water without a liner. You can test this with your garden hose, too. If your soil won't hold water, purchase a plastic liner to hold the water in deeper areas, and install your plants around the edges of the liner.

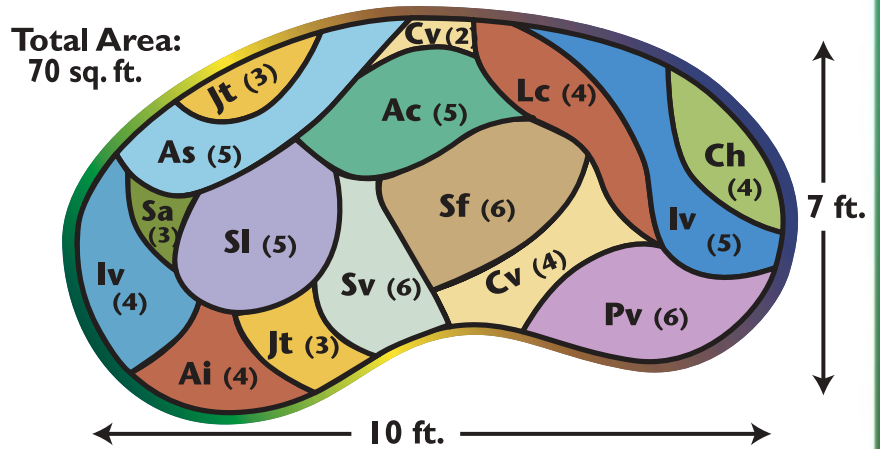
RAIN GARDEN: Clay Soils



Anything else?

A few more tips . . .

- Try not to spread or spray lawn fertilizers too close to the Rain Garden. Fertilizers will actually stimulate weeds and create competition for the native plants.
- Don't worry about mosquitoes. Dragonflies, swallows and purple martins will take care of them. If they do become a problem, however, you can buy a "mosquito dunk" (containing organic bacteria Bt) to kill mosquito larvae in your areas of standing water.
- In the winter, the dead vegetation in your Rain Garden will catch snowflakes and frost, providing additional interest as a beautifully textured winter landscape.
- Come spring, mow and remove dead vegetation. Or if you can, burn it off. Native plants are adapted to the historic fires of the American prairie region and it won't hurt them at all. Check your local ordinances, or call your fire department for regulations.
- To attract birds, place a purple martin house nearby.
- Put a comfortable bench nearby so you can relax with a friend while watching the birds and butterflies.
- Place natural rocks or other garden ornaments in and around your Rain Garden — be creative! You'll learn and have fun while designing your own backyard landscape.



Abbrev.	Common Name	Species Name	No. of Plants	Shopping List	Abbrev.	Common Name	Species Name	No. of Plants	Shopping List
Ac	Sweet flag	<i>Acorus calamus</i>	5	<input type="checkbox"/>	Jt	Torrey's rush	<i>Juncus torreyi</i>	6	<input type="checkbox"/>
Ai	Swamp milkweed	<i>Asclepias incarnata</i>	4	<input type="checkbox"/>	Lc	Cardinal flower	<i>Lobelia cardinalis</i>	4	<input type="checkbox"/>
As	Water plantain	<i>Alisma subcordatum</i>	5	<input type="checkbox"/>	Pv	False dragon's head	<i>Physostegia virginiana</i>	6	<input type="checkbox"/>
Ch	Bottle brush sedge	<i>Carex hystericina</i>	4	<input type="checkbox"/>	Sl	Arrowhead	<i>Sagittaria latifolia</i>	5	<input type="checkbox"/>
Cv	Fox sedge	<i>Carex vulpinoidea</i>	6	<input type="checkbox"/>	Sa	Green bulrush	<i>Scirpus atrovirens</i>	3	<input type="checkbox"/>
Iv	Wild blue flag iris	<i>Iris virginica shrevei</i>	9	<input type="checkbox"/>	Sf	River bulrush	<i>Scirpus fluviatilis</i>	6	<input type="checkbox"/>
					Sv	Soft-stemmed bulrush	<i>Scirpus validus</i>	6	<input type="checkbox"/>
Total Plants Needed								69	



RAIN GARDEN PLANTS

(Listed in alphabetical order by common names)



Arrowhead
Sagittaria latifolia
(1-3' High, Blooms: July-Sept.)



Bottlebrush sedge
Carex hystericina
(1-3' High, Blooms: May-July)



Cardinal flower
Lobelia cardinalis
(2-4' High, Blooms: July-Sept.)



Culver's root
Veronicastrum virginicum
(3-5' High, Blooms: July-Aug.)



False Dragon's Head
Physostegia virginiana
(1-4' High, Blooms: July-Sept.)



Fox sedge
Carex vulpinoidea
(1-3' High, Blooms: June-Aug.)



Golden Alexander
Zizia aurea
(1-2' High, Blooms: May-June)



Great blue lobelia
Lobelia siphilitica
(1-4' High, Blooms: Aug-Sept.)



Green bulrush
Scirpus atrovirens
(2-4' High, Blooms: May-July)



Marsh phlox
Phlox glaberrima
(2-4' High, Blooms: June-July)



Mountain mint
Pycnanthemum virginianum
(1-4' High, Blooms: July-Sept.)



New England aster
Aster novae-angliae
(1-4' High, Blooms: Aug.-Oct.)



Prairie blazing star
Liatris pycnostachya
(2-4' High, Blooms: July-Sept.)



River bulrush
Scirpus fluviatilis
(3-5' High, Blooms: June-Aug.)



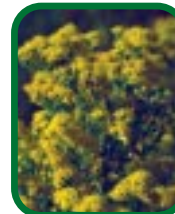
Sneezeweed
Helenium autumnale
(2-4' High, Blooms: Aug.-Oct.)



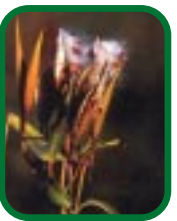
Soft-stemmed bulrush
Scirpus validus
(3-9' High, Blooms: May-July)



Spotted Joe-pye weed
Eupatorium maculatum
(2-5' High, Blooms: July-Sept.)



Stiff goldenrod
Solidago rigida
(1-4' High, Blooms: July-Oct.)



Swamp milkweed
Asclepias incarnata
(2-4' High, Blooms: July-Aug.)



Sweet flag
Acorus calamus
(1-3' High, Blooms: May-June)



Torrey's rush
Juncus torreyi
(1-3' High, Blooms: June-July)



Water plantain
Alisma subcordatum
(1-3' High, Blooms: June-Sept.)



Wild bergamot
Monarda fistulosa
(2-4' High, Blooms: July-Aug.)



Wild blue flag iris
iris virginica shrevei
(1-3' High, Blooms: May-July)

Want more information? Contact Taylor Creek Restoration Nurseries or Native Landscapes by AES at 608-897-8641, or by e-mail at info@appliedeco.com. We'll be glad to answer your questions.



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Professional native landscape services are available; please call 608-897-8641.

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