

Mossville Bluffs

Home Owners Guide to



Stormwater Best
Management
Practices

Mossville Bluffs Best Management Practices

The purpose of this best management practices manual is to provide landowners within the Mossville Bluffs Watershed with the information they need to create landscaping that will accomplish zero stormwater runoff. This will reduce erosion in the ravines and help prevent sedimentation of the Illinois River. By implementing the practices encouraged in this manual, every drop of rain that lands on a property can be absorbed and filtered before it hits our stream systems.



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Mossville Bluffs Watershed

A watershed is an area of land where the precipitation drains into a common body of water. Watersheds come in all shapes and sizes. Some are millions of square miles; others are just a few acres. Just as creeks drain into rivers, watersheds are nearly always part of a larger watershed.¹

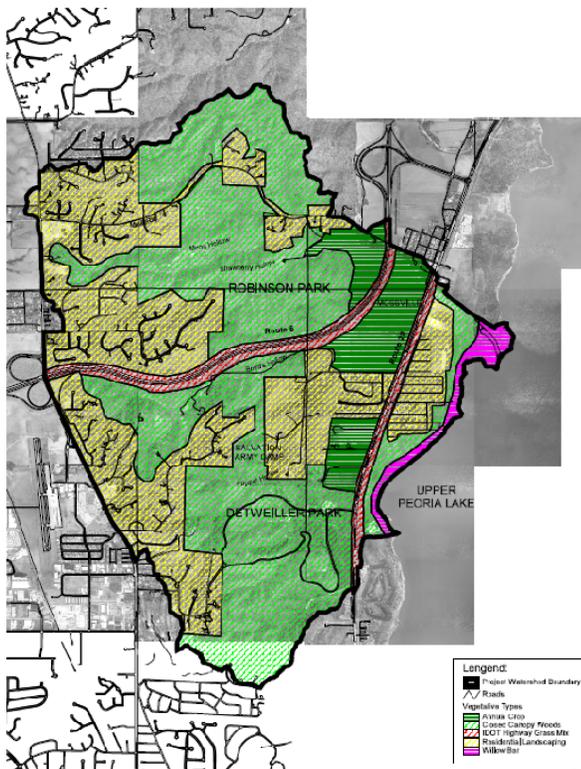
The Mossville Bluffs Watershed is a 3,000 acre area that drains residential, commercial, and natural forest land. Because of urban development, massive amounts of stormwater rip through local ravines in the forested areas. This causes erosion of sensitive bluff soils and contributes thousands of tons of silt each year to the Upper Peoria Lake of the Illinois River.

The sole purpose of the practices recommended in this manual is to soak up (infiltrate) rainwater before it is concentrated and sent screaming down ravine systems where the water causes incredible amounts of damage and collects silt that is distributed to Peoria Lakes. This manual provides homeowners with

sustainable practices to control stormwater runoff through the use of landscaping and other best management practices that will protect and enhance their property.

These practices do not just apply to landowners adjacent to ravines. To be successful in watershed protection everyone should implement the practices recommended in this manual, because every landowner contributes to the high volumes of stormwater runoff.

Mossville Bluffs Area Watershed Plan
Mossville, Illinois



¹ Conservation Technology Information Center, <http://www.conservationinformation.org>

Landscaping for the Purpose of Urban Stormwater Control

A residential landscape contains areas that are impervious to rainfall, such as driveways, roofs, sidewalks and patios. A residential landscape will also contain areas that are pervious to rainfall such as lawns, gardens, landscape beds and natural areas. How one manages and maintains the pervious and impervious areas of a landscape has a significant impact on urban stormwater runoff, in both quantity and quality.

Best Management Practices (BMP's) is a term used to describe specific methods that reduce stormwater runoff and improve water quality, generally by increasing infiltration and storing stormwater. By reducing stormwater runoff in the Mossville Bluffs, erosion can be reduced in and along the steep slopes. This manual will provide a description for several BMP's specific for residential landscapes.

Implement a landscape plan that incorporates BMP's into the landscape. The overall goal is to implement a landscape plan that reduces stormwater runoff and reduces erosion. The following steps will assist you as you identify BMP's that are right for your landscaping plan:

1. Identify areas of pervious and impervious surface in the landscape.
2. Identify the location and direction where rain water runs off of the impervious surfaces.
3. Identify other key areas of the landscape, a particular tree or landscape feature.
4. Identify the grade of the site. Where are the flat areas and steep slopes?
5. Select and size BMP's applicable for the site conditions based on the information gathered in the previous steps.



If every home in the Mossville Bluffs were to implement at least one BMP on their site, the collective impact would reduce erosion in the steep bluffs and the amount of sediment entering the Illinois River.

Native Species Landscaping

Native vegetation and other non-turf grass landscaping techniques produce less runoff than typical turf grasses, and they do not require fertilizer. One benefit in using native plants is that, once they are established, they do not require a lot of maintenance. This is because they are adapted to our local climate and soil conditions. This means fewer or no fertilizer and pesticide applications, less watering, and less time dealing with plant problems!² Almost all plants provide shelter or food in some way for wildlife. However, planting native Illinois plants in your backyard habitat will deliver more benefits to you and wildlife year after year.

Native plants naturally adapt providing shelter and food to native wildlife more consistently, even in the most extreme weather climates including drought or freezing conditions. You will find that planting native flowering species will provide an abundance of nectar, whereas non-native, novelty counterparts do not. Native plants are beautiful, hardy, much less expensive and easier to maintain, as well as beneficial to the environment. Once you have established your native habitat you will save time and money, as well as reduce air pollution by eliminating or significantly reducing the need for fertilizers, pesticides, water, and lawn maintenance equipment.³

Native prairie plantings can be established from seed or young plants, or plugs. Plugs are best for residential areas because they are easier to establish and maintain. Plants can be incorporated into an existing garden bed or a new bed can be made by removing sod and loosening the soil.

In residential areas, it is usually best to use short native plants to create an aesthetically pleasing landscape. Native prairie plants can be located anywhere. They can be intermingled in more formal beds and borders or create a natural prairie garden. A turf border may be left to define the area or provide a path through the plantings.

Choose plants based on site considerations for light, moisture, and soil. Vary plant structure, height, bloom succession, and flower color for seasonal appeal and butterfly habitat. After planting, a shredded wood mulch layer helps establish natives by retaining moisture and discouraging weeds.⁴

Prairie gardens – Prairie grasses and flowers flourish in sunny areas of varying soil types.

Distributors often have specific seed mixes depending on soil type. Plant a prairie garden in any dry, sunny, low traffic area. The more turf grass you convert to prairie, the greater benefit for wildlife and water quality.

Wetland gardens – Do you have an area that collects and holds water for several hours after a rainfall? If so, wetland plants are capable of enduring wet and dry conditions and will help to infiltrate the standing water. These plants are available for a variety of soil types and light conditions.

² <http://www.epa.gov/ecopage/springfieldtwp/Sheet1.pdf>

³ <http://www.chicagowilderness.org/wildchi/landscape/index.cfm>

⁴ <http://www.ia.nrcs.usda.gov/news/brochures>

Woodland gardens – There are several woodland species that will grow in your shaded areas. These low-growing plants come in a variety of colors and are a perfect complement to an area shaded by mature trees.

Buffer strips on slopes – It is imperative that landowners along steep slopes provide a buffer of native vegetation between the urban landscape and the erodible slopes on the bluffs. Plant a minimum five-foot wide strip of prairie or woodland vegetation along the slope ridge.

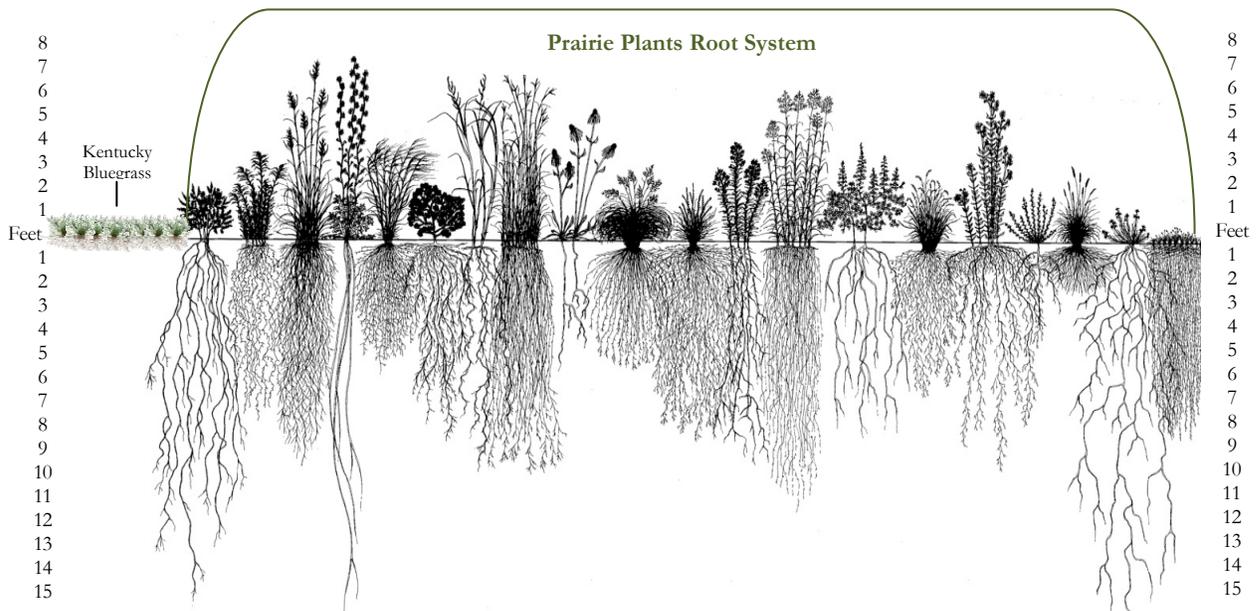
Swales – The next time it rains, observe where water concentrates and flows on your property. These areas are ideal locations for native plantings. As stormwater flows through this often meandering, linear garden, it is absorbed into the ground before it exits your property.

Border plantings – Planting natives along the border of your property, particularly where turf meets the curb, is a good way to intercept and infiltrate runoff before it exists your property. An added bonus is that a passerby can appreciate the diverse color and butterflies in your garden!

Use shrubs – Shrubs are woody plants that provide structure for your garden as well as food for wildlife. Use 1-3 shrubs in small gardens.

Root Systems of Prairie Plants

The fundamental basis for encouraging use of native plant species for improved soil erosion control in streams and stormwater facilities lies in the fact that native plants have extensive root systems which improve the ability of the soil to infiltrate water and withstand wet or erosive conditions. Native plant species, like those listed in this manual, often have greater biomass below the surface. In this illustration, note the Kentucky Bluegrass shown on the far left, which, when compared to native grass exhibits a shallow root system.⁵



⁵ <http://www.il.nrcs.usda.gov>

Diverse Assortment

No matter which habitat types you decide to integrate into your landscaping, be sure to have a diverse assortment of plants in each garden. Gardens with one flower or grass type are generally not sustainable and are susceptible to diseases and predatory insects.

Facts and Myths about Native Plants

Facts

Using native plants in your landscape will bring you many benefits, including the following:

- 👉 Using native plants promotes biodiversity. Planting a small meadow that once was lawn replaces one plant species with many, increasing the opportunities for beneficial wildlife and insects to live.
- 👉 Native plants attract our native songbirds and butterflies. Just as the plants have evolved and adapted to our area over time, the local wildlife has evolved along side them, depending on these plants for food and shelter.
- 👉 Natives reduce air pollution, improve water quality and reduce soil erosion. Using native vegetation, unlike cultivated landscapes, does not require the use of lawn maintenance equipment, a major contributor to air pollution. They improve water quality by filtering contaminated stormwater, and reduce soil erosion by stabilizing soils with their deep root systems.
- 👉 They are well-adapted to local conditions, therefore requiring little maintenance once established. Native plants eliminate or significantly reduce the need for fertilizers, pesticides, water and lawn maintenance equipment. They also often attract beneficial insects, which prey upon pests, decreasing the need for pesticides.
- 👉 Native plants are less expensive to maintain. U.S. EPA reports that a prairie or wetland costs approximately \$150 a year per acre to maintain, while the same amount of lawn costs \$1,000 per year per acre to maintain.
- 👉 Most native species are perennial, or self-seeding biennial plants.
- 👉 The use of native plants in low traffic areas and as borders reduce the amount of impervious surface
- 👉 Natives maintain our natural heritage and our community's character.
- 👉 Native plants are beautiful, providing an entirely new palate of plants to a traditional landscape.

Myths

Anything unknown often comes with its share of myths. Listed are several well-known myths about using native plants, and the facts that dispel them.

☞ Tall grasses attract rats. Rats are attracted by extreme concentrations of food such as grain elevators and garbage. Tall grasses do not themselves attract this rodent. Because of the dense root system they are unable to burrow and would rather be under ornamental shrubs.

- ☞ What about mosquitoes? Mosquitoes need standing water for at least 10 days to breed. Landscapes with native plants do not create standing water or have more insect pests than a traditionally landscaped home.
- ☞ My yard will look like a weed patch. Native plants are amazingly diverse and beautiful with some maintenance, and can be used in the garden in many ways. They can be important components of a perennial border, butterfly garden, shade garden or any other landscape style you desire. They can be used as you would use any other ornamental tree, shrub or perennial.
- ☞ Prairie grasses are a fire hazard. As described in *An Introduction to Naturalized Landscapes*, published by the City of Madison, Wisconsin, dry prairie grasses can be ignited. However, alone, they are insubstantial and have less potential for igniting structures than the dry needles around the base of the commonly used foundation plants such as yews (*Taxus* spp.) and junipers (*Juniperus* spp.) If planting larger areas of prairie grasses, make sure you understand and follow safe methods of prairie installation and management.
- ☞ Native plants cause allergies. Allergies are aggravated by wind-borne pollen. Many native plants, including goldenrod, are insect-pollinated, not wind-pollinated. In fact, nonnative grasses, such as Kentucky Blue Grass and Bermuda Grass, are responsible for much of the pollen in the air. (Just a note: Ragweed, a wind-pollinated native, blooms at the same time as goldenrod, but ragweed's flowers are inconspicuous, so goldenrod's showy flowers get the blame!)

Resists The Urge To Till!

Tilling encourages weed growth by bringing dormant weed seeds to the surface where they will sprout. Tilling destroys soil structure and promotes erosion by pulverizing soil into a fine substance that more easily washes away. If the tilled area becomes overly saturated, it may develop a surface crust which impedes water infiltration and seed emergence. Tilling destroys organic matter that would otherwise improve soil structure, soak up and retain both moisture and vital plant nutrients, and provide a rich source of plant nutrients. Tilling also disrupts the ecology of the soil, like earthworms, which are important for maintaining a porous soil structure and mixing organic matter from the soil surface into the soil.

No-Till Garden

The overall design of the no-till garden is a low-lying compost bin, with a planting area of rich soil in the middle. Here's how to put it together:

- Pick your spot. Since the quality of the underlying soil doesn't matter, focus on sunlight, drainage and convenience when picking your no-till plot.
- Put down an organic weed barrier, such as, newspapers. Separate out the newsprint sections from a newspaper; the glossy color insert do not work as well for this purpose. Soak the newsprint sheets with water and spread them out. Place about six sheets down as a weed barrier, overlapping the sheets by 2-3 inches. Water the newspaper layer again before adding the next layer.
- Now, you're ready to layer your composting materials. Make each layer about 2 inches thick, and remember to water every layer.
- Spread a layer of compost manure over the newspaper layer. This will attract earthworms, which will speed the composting process along. Water the manure.
- Add a 2-inch layer of mulch or untreated chipped wood. Water the layer.
- Add and water a layer of fresh grass clippings.
- Add and water a layer of straw, shredded paper or a combination of the two.
- Add a final layer of fresh grass clippings and water the layer.
- To plant, dig down to the compost layer and fill the hole with rich soil. Add plants and water as needed.

Congratulations!

You've created a perfect garden bed for herbs, vegetables or flowers that will stay season after season.



Mulch is an essential part of no-till gardening. A thick layer of mulch will keep the soil from drying out and crusting over, which restricts nutrient and water flow to the subsoil. It also reduces water loss due to evaporation. Mulch will provide cover for soil insects and often dramatically increases the earthworm population. However, mulches can also introduce weeds to your garden bed. For example, try to use straw instead of hay because fewer weeds are found in straw. Leaves, especially from deciduous species such as Maple, add valuable nutrients to the soil but should not be layered too thickly. Thick layers of leaves can form 'mats', which restrict water penetration and harbor insects. You can intersperse layers of straw with leaves to prevent matting.

When planting seedlings, pull the mulch back and dig into the surface just enough to set the plant. The depth of mulch should be only a few inches when seedlings are first planted, then added in layers as the plant grows.

If tilling is required, avoid being overzealous and if possible avoid inverting the soil. Soil structure is most harmed when the soil is either too wet or too dry; a simple method to determine the right moisture content is to form the soil into a ball in your hand, if it falls apart when prodded with a finger it is at the right moisture content. Typical garden tools for gently tilling are hand tools, spades, forks or rakes.

The most common materials used for mulching are:

Grass clippings:	Cut grass before it goes to seed.
Newspaper:	Avoid using paper with colored inks; can blow away in the wind.
Yard waste:	Cut up any branches or woody material.
Compost:	Needs to be finished so as not to attract pests.
Hay:	Good mulching material but be aware that seeds may be introduced.
Straw:	Good source of carbon; excellent mulching material.
Fine bark:	Can be acidic, may need to add lime at the same time.
Wood shavings:	Avoid shavings from chain saws or tools that leave oil residue.
Leaves:	Valuable source of carbon; intersperse with other materials to prevent matting. Shredding the leaves keeps them from blowing away.

Planting

Seeds

The most cost effective way to establish a garden is through seeding. Seeding does, however, require maintenance over a 2–3 year period before a functioning garden is established. Much of the information below is from www.prairienursery.com. Prairie Nursery out of Westfield, Wisconsin sells seed mixes for all native garden types.

Site preparation

Proper soil preparation is the single most important factor in the success of your prairie planting. The planting area must be completely free of weeds. Existing weeds will compete with the prairie seedlings for nutrients, water and sunlight. If not controlled, they can delay or prevent the growth and maturation of your prairie. Whether you are planting seeds or transplanting plants, adhere to the following guidelines to ensure good results.

The first step in soil preparation is to eliminate the existing vegetation. All weeds and grasses on the site must be killed, using smothering, herbiciding or combination of these techniques. On small areas of a few thousand square feet or less, smothering weeds on the area is simple, effective, and requires no chemicals or special equipment. Smothering involves covering the soil surface with black plastic, old rugs, pieces of old plywood, or a thick layer of newspapers covered with leaves or grass clippings. This should be left in place for a full growing season in order to kill the plants underneath. An exception to this rule is lawns, which can usually be killed in two months using smothering. However, if perennial weeds are present in the lawn, a full year of smothering may be required to kill them.

If using herbicides, we recommend using a broad spectrum, non-persistent herbicide such as glyphosate (ie. Roundup, Ranger or Kleenup). If pernicious perennial weeds such as Canada Thistle, Canada Goldenrod, Horsenettle, or woody shrubs and vines are present, it may be necessary to add a broadleaf herbicide and a surfactant to the Roundup mixture to kill these tough weeds. When using herbicides, **ALWAYS READ THE LABEL**, and follow the manufacturer's instructions.

Do not till your planting area. Tilling surfaces weed seeds that will compete with your natives.

Seeding

Once the area to be planted has been properly prepared, seeding can commence. On small areas of less than an acre or two, seed can be planted by hand broadcasting. Broadcast seeding a prairie is very similar to planting a lawn. Instead of using a seeder, the prairie seed should be mixed in a larger volume of a lightweight, inert material such as sawdust, peat moss, vermiculite, or sand. This inert matter should be slightly damp, so that the seed will stick to it. For a 1000 square foot planting, two bushel baskets of inert material are plenty. For a tenth acre planting (4400 square feet), eight bushel baskets are sufficient. A pickup truck full of sawdust from a sawmill will cover one acre.

Mix the seed evenly into the inert material. Take one-half of the total mix and spread it across the area. In the event that you run out before covering the entire area, you still have the other half. Once you have covered the area with the first half of the seed mix, spread the second half evenly across the same area, walking perpendicular to your first pass. Rake or drag the seed into the soil so that it is lightly covered, 1/4 to 1/2 inch deep. Roll the site with a roller, or drive across it with truck or tractor tires to firm the seed into the soil. Do not roll the site if the soil is wet. Wait until the soil is dry to avoid soil compaction.

Plan to seed the area in the autumn. The seed will work its way down into the soil as the soil freezes and thaws throughout the winter. Most native wildflower seed germinates better after exposure to a period of cold temperature, called stratification. This is a natural protective mechanism that prevents the seed from germinating at the wrong time of year.

Watering

Spring rains should adequately water your native garden; however, in dryer weather, water every other day for 15 minutes to half an hour, just enough to keep the soil moist. Overwatering can drown seedlings, especially on heavy clay soils.

Plugs

A plug plant is a general term for seedlings or rooted cuttings that have been started in trays of individual cells. Many plug plants are propagated from cuttings. Plugs are more expensive than direct seeding, but gardens will mature faster with less initial maintenance than sowing.



Plugs have an approximate 2 1/4" top diameter and measure approximately 4 1/2" deep. Grooves running lengthwise channel the roots to the open bottom of the pot where they are air pruned. This avoids root circling and stimulates lateral branching of the root system. Even tap rooted species develop more root tips, resulting in faster establishment when planted out in the landscape.

Planting

Some plugs are delivered in a dormant state (with no foliage); this is a safer state for the plant to be transported. Follow the steps below or the recommendations from your plant supplier to establish plugs:

1. Immediately remove your potted plants from the box and packing materials.
2. Place the plants in a cool and shaded area that does not receive direct sunlight.
3. Thoroughly water your plants. Give them enough water so that the entire soil mass is wet and water is draining out the pot bottom.
4. Let your plants re-hydrate in the shade for 24 hours.
5. Plants dry out very quickly when exposed to heat and wind. If you are unable to transplant within the next few days, place them in a protected area out of direct sunlight and wind. Check them once to twice a day for watering needs.
6. Dig a hole that is about the same depth as the soil of the potted plant. Remove the plant and soil from the pot and position in the hole so that the soil level of the potted plant is slightly below the surrounding soil surface. Fill soil in around the plant completely, firming the soil as you go. Covering the potted soil mix with just a little garden soil helps reduce wicking of moisture out of the potted soil mix.

7. Mulch fall transplants with 3-4 inches of weed-free straw or leaves after they go dormant in late fall. This will help protect them over winter. Remove most of the mulch in early spring so they can emerge from the soil easily.
8. Use the enclosed pot tags to mark your plants, so you can find them later. This is especially important with fall transplants (*Source: Prairie Nursery*).

Watering

It is integral that plugs receive proper watering during the first growing season. Water just enough to keep the soil moist. There is no need to add fertilizer to your native gardens, in fact, according to one local nursery, natives do better without fertilizers.

Plants

You can also purchase fully grown native plants at local nurseries. While these are more costly, the gardener is rewarded with instant mature, flowering plants for their native garden. If the palate of plants offered by a nursery is limited, combine plants with plugs to create an instant, colorful garden that functions to improve water quality.

Purchasing seeds, plugs, and plants

Appendix A is a directory of plant species for each garden type described above. Appendix B lists suppliers for seeds, plugs, and mature plants. While this manual is meant to be a guide for plant selection and installation, distributors are a good source of information on how to grow and maintain a healthy garden.



Blue Vervain

<i>Verbena Hastata</i>	Blue Vervain
<i>Verbena Stricta</i>	Hoary Vervain
<i>Vernonia Fasciculata</i>	Ironweed
<i>See Appendix A For Full List</i>	

Maintenance

Gardens planted with plugs and plants will require weeding and watering just as you would for any ornamental garden. Gardens planted from seed will require additional maintenance during the first two growing seasons. The instructions below are recommendations of Prairie Nursery.

Seed Plantings

Year One

Weed control during the first growing season is essential. The perennial prairie seedlings grow slowly, and are easily out-competed by the faster-growing weeds that will inevitably germinate. Seeded areas should be mowed to a height of 6 inches approximately three times during the first growing season. When weeds reach a height of 12-16 inches, the entire planting should be mowed back to 6 inches. Anything that grows taller than 8 inches in the first year is probably a weed. Mowing at 6 inches will cut back taller weeds, while leaving the shorter prairie seedlings unharmed. Use a string trimmer or weed eater on small areas. On larger areas, a flail mower is the best choice. Flail mowers chop up the weeds as they are cut, instead of laying the cut weeds on top of the prairie seedlings. If a flail mower is not available, a rotary mower or sickle bar mower may be used. Be sure to mow before any weeds set seed, to prevent future weed infestation. Do not pull weeds in the first year, as this will disturb or destroy the developing prairie seedlings. At the end of the fall of the first growing season, leave the dead vegetation and stubble standing, to help insulate the seedlings and reduce winter frost heaving.

Year Two

During the spring of the second year, mow the standing residual vegetation to the ground in early spring, and rake off the cuttings. If biennial weeds such as Sweet Clover, Burdock, Wild Parsnip, etc. are a problem, mow again at approximately 12 inches when the majority of biennial weeds are in full flower. Make sure to mow them before they make seed! Expect this second mowing for controlling biennial weeds to occur around mid-June.

Plants, Plugs and Seeds

Year Three and Beyond

Beginning in the spring of the third year, your prairie can be burned for the first time to maintain its diversity and vigor. Burning in mid-spring helps set back non-native cool season weeds and grasses such as quackgrass, bluegrass, bromegrass, etc. Burning also encourages earlier soil warming in spring, which favors growth of the heat-loving warm season prairie plants. If burning is not possible, your prairie can be mowed as closely to the ground as possible, and then the mowed material raked off to expose the soil and encourage warming.

Timing is very important when burning or mowing your prairie. The goal is to allow undesirable cool season plants to begin active growth prior to burning or mowing, so that they will be harmed in the process. The optimal date for burning or mowing can vary by as much as a month in any given year, due to differences in weather. However, we can use plants as our calendar to ensure optimal timing. The best time to burn or mow most prairies is when the buds of the Sugar Maple tree (*Acer saccharum*) begin to break open in spring. This usually will occur sometime between April 1 and May 15, depending upon our location and the weather in any given year.

It is recommended that you divide your prairie into two “Management Units.” Burn or mow one half every other year, alternating from year to year so that each half is burned once every two years. This helps prevent invasion by woody plants, as well as cool season weeds. Burning or mowing less frequently than every other year can result in trees and shrubs gaining a foothold in your prairie. Leaving one half unburned or un-mowed also leaves butterfly and moth pupae and eggs intact, so that they can re-populate the ecosystem that year. Burning every year is generally not recommended, as it tends to increase the dominance of the warm season prairie grasses and certain prairie flowers. Burning or mowing every other year helps create varying conditions from year to year, maintaining maximum plant and animal diversity.

What To Expect During The First Three Years

Prairie seeds will often germinate over a period of two to three years. Some will appear the first year, while others will come up in the second and even third year after the initial planting. Most perennial prairie flowers and grasses will not begin to flower until their third or fourth full growing season. Patience is a virtue when establishing a prairie! Please follow these directions carefully, and give your prairie time to develop. Although your seeding may appear to be a bit of a weed patch in the first year or two, by the third year numerous flowers and grasses should begin blooming.

Perennial prairie plants devote most of their efforts in the first few years to developing their famous root systems. They will not be readily apparent in the first year, with little visible above-ground growth. However, they are steadily building their “root bank accounts” to sustain them in future years. The deep roots of the prairie flowers and grasses give them long-term staying power that allows them to squeeze out annual and biennial weeds, and to return year after year for decades.

When you plant a Prairie, you’re planting more than just pretty flowers...*You’re creating a Plant Community! Put away the lawnmower, sit back, and enjoy your prairie!*



Rain Gardens

Rain Gardens are both functional and aesthetically attractive. A rain garden is a shallow depression in your yard that is planted with native wetland or wet prairie wildflowers and grasses. The rain garden not only looks nice, but soaks up rain water and melted snow from your roof gutters, driveway or lawn. Holding back this runoff helps prevent pollutants such as fertilizers from washing off your yard into storm sewers and eventually into nearby streams. The water that is soaked up by your rain garden also reduces the chances of local flooding. Rain gardens are inexpensive to construct and can be creatively landscaped into almost any site.

Location

Your home rain garden can be either near the house to catch only roof runoff, or farther from the house to catch both roof runoff and lawn runoff. To help you decide, consider the following:

1. Locate the garden at least 10 feet from the house to be sure any infiltrating water does not seep into the foundation.
2. Do not place the garden directly over a septic system.
3. Keep rain gardens away from steep slopes.
4. Do not build your rain garden under a large tree. The excavation process could harm the tree.
5. It is better to build the garden in full or partial sun, not in complete shade.
6. Keep in mind that you will be excavating soil for the garden, so the flatter the slope is, the easier it will be to build.



This rain garden is strategically placed to capture runoff from the lawn and street.

Rain Garden Depth and Slope

The ideal depth of a rain garden is between four and eight inches deep. A rain garden that is less than 4 inches will need to be larger in size to store rainwater from heavy storms. However, a garden that is over eight inches deep might hold water for too long. Use the table below to determine appropriate rain garden depth.

Slope of land before excavation	Depth
≤4%	3 – 5 inches
5% - 7%	6 – 7 inches
8% - 12%	8 inches maximum

Sizing the Rain Garden

A typical home rain garden ranges from 100 to 300 square feet in size. The general rule is to make your rain garden 1/3 the size of the area draining into it. To estimate your roof drainage area, divide the total area by the number of downspouts. Then multiply this result by the number of downspouts directed to your garden. You should also consider the soil type when sizing your rain garden. The table below summarized recommended size ratios for various soil types. Multiply the corresponding percentage by your estimated roof drainage area to calculate the size of your rain garden. To determine your soil type, rub moist soil between your finger tips. Sand soil feels gritty, silty soil feels smooth, and clayey soil feels sticky.

Size of rain garden relative to roof area for different soil types and rain garden depths			
	3 – 5 in.	5 – 7 in.	8 in.
Sandy soil	20%	15%	8%
Silty soil	35%	25%	6%
Clayey soil	45%	30%	20%

If you are placing your garden more than 30 feet from a downspout, then the size of your garden can be 3 – 10% of the drainage area.

If your garden is more than 300 square feet, it is recommended you divide your garden into a greater number of smaller gardens.

Directing Water to Your Rain Garden

To direct roof water to your rain garden, disconnect a downspout near the ground and reroute it to your garden. This can be accomplished by creating a grassy swale, a rock-lined channel, or by extending the downspout across your lawn. Another option is to run a PVC pipe underground from your downspout to the rain garden. To slow velocity of the routed rain water and prevent erosion, you may need to install landscape fabric, rocks or bricks at the outlet of the pipe.

<i>Helianthus Mollis</i>	Downy Sunflower
<i>Helianthus Laetiflorus</i>	Showy Sunflower Seed
<i>Heliopsis Helianthoides</i>	The Oxeye Sunflower
See Appendix A For Full List	



Downy Sunflower

Shaping the Garden

Rain gardens can be any shape. Choose one that fits your landscape. Ovals or unusual shapes add more appeal to the landscape. The longer side of the garden should run perpendicular to the flow of water to maximize the amount of water your garden will intercept. Generally, the garden should be twice as long as wide. You can use a rope to lay out possible shapes and designs to see which one you like best.

Digging the Garden

Remember - before digging the rain garden, call **JULIE at 1-800-892-0123** to be sure there are no underground utilities. If you are replacing turf grass, you can reduce digging time by killing the grass with smothering or by herbicide application.

Remove the sod from the whole area including the berm. Be sure that your rain garden has a flat, level bottom. This will require more digging at the higher end in sloped locations. While digging, place the excavated soil at the downhill edge to construct a berm.

The berm is a low earthen mound that helps hold water in the garden during a storm. The berm should be highest at the downhill edge and gradually taper off around the sides. Roughen the existing soil surface to strengthen the contact between soil layers when building the berm. The berm should be one foot wide and six inches high with very gentle side slopes. Plant the berm with grass or native dry-tolerant plants. Use straw or erosion control matting to prevent erosion until vegetation is established.



Native landscaping adds color, structure, and diversity to the landscape and provides habitat for butterflies.

Choosing Plants

In order to choose the plants you want for your garden, you must know:

1. What kind of soil do I have (sand, loam, or clay)?
2. Will the garden be in full sun or partial sun?

Once you have this information, you can choose plants that are adapted to your soil and site conditions. Take into consideration the mature height of the plants, the bloom time and color, and the shape and texture of the plant. Mix heights, shapes, color and bloom time so that the garden is interesting throughout the year. It is also a good idea to "group" plants, with 5-7 plants of the same species planted close together. Do this in a random pattern, repeated throughout the garden.

Plugs or fully grown plants are best for rain gardens because they are easier to establish and maintain and will bloom the first year of planting. You should plant in late spring/early summer for the best results. It is a good idea to place plant labels next to each individual grouping. This will help identify the young native plants from weeds as you maintain the garden. Mowed grass borders are recommended around the garden. Appendix A lists plant types appropriate for rain gardens.

You can also cast seeds as described in the Chapter 2 of this manual. Please see Appendix A for a complete list of rain garden plants.

Maintenance

Once your garden is built and planted, maintenance will be minimal. Mulch and water every other day for the first two weeks or so until your plants get established. Weed as necessary. Leave the vegetation over the winter - it will provide cover and food for the birds and wildlife. In the spring, cut off the dead vegetation. Additional weeding may be required in the first two years. In later years, as the plants mature, some thinning may be needed.

One rain garden concern is that the standing water will become a breeding ground for mosquitoes. While rain gardens do pool water for a short period of time, the garden is dry between rainfall events. Mosquitoes need 7 - 12 days to lay and hatch eggs, and the standing water will last only for a few hours after most storms. Also, rain gardens attract dragonflies, which eat mosquitoes.



Downspout Runoff

Stormwater runoff quickly flows from impervious surfaces like roads and rooftops and into streams and rivers causing flash flooding and pollutants. Redirecting downspouts to permeable surfaces, such as rain gardens, rain barrels, vegetated swales, pop-up drain emitters, drywells, or turf grass can significantly slow this flow.

If your downspouts are connected to an underground drain, disconnect them and direct the stormwater away from your house and onto a pervious surface. Even without a rain garden or other technologies, a downspout released over turf grass is better than a direct connection to a storm sewer system.

Rain Barrels

Why Bother?

Rain barrels are a great way to capture runoff from your roof. Water captured in barrels is a free source of water for your gardens and lawns and for washing your car, with the added advantage of helping the environment. Because rainwater is softer than tap, it can actually be better for your plants.

Over summer, it is estimated that about 40% of household water is used for lawn and garden maintenance. Rain barrels collect and store water during these dry summer months, just when it is most needed. An estimated 1300 gallons of water can be gathered in rain barrels over this period.

Water collected in a rain barrel would normally flow through your downspout, across paved surfaces and then go into a storm drain. Rain barrels help reduce water pollution by reducing stormwater runoff that picks up pollutants like oil, grease, nutrients, pesticides and bacteria on its way to local streams. Storing rainwater also helps recharge groundwater by saving it for use when the ground is no longer saturated.

How to Construct a Rain Barrel

Home-made rain barrels are relatively easy to construct from 55-gallon drums and a few other basic components that can be bought for as little as \$20. There are many different ways to construct rain barrels, but they all serve the same basic purpose. The following is a simple plan for constructing your own rain barrel:

Did you know that during an average rainstorm (1 inch in 24-hours) more than 700 gallons of water run off the roof of a typical home? That's enough water to take 17 baths or 58 showers!



Supplies	Tools
1- 55-gallon plastic barrel	7/8" spade drill bit
2- 3/4" plastic faucets	Electric jigsaw
3/4" female coupling	Electric drill
Skimmer basket like those found in pools	Utility knife
Roll of Teflon tape	Marker
All-purpose caulk or plumbing sealant	
Several feet of garden hose	
4- hose couplers	
12" x 12" piece of fiberglass window screen	

The Top Hole

1. Use the basket to trace a template on the barrel.
2. Pre-drill a small hole using the 1" spade bit.
3. Make sure to drill inside the line.
4. Use a jigsaw to cut out the hole using the line as a guide.



The Basket

1. Cut fiberglass window screen to fit the basket.
2. Affix the screen to the lip of the basket using caulk/plumbing sealant.
3. Allow several hours to dry, then place in top hole.



The Lower Drain

1. Mark hole at least two inches from the bottom of the barrel.
2. Use a 1" drill bit to drill hole.
3. Screw plastic faucet into hole.
4. Use utility knife, as needed to increase hole size.
5. Remove faucet, wrap threads in tape, caulk threads, replace faucet.
6. Caulk area where faucet and barrel meet to prevent leakage.



The Upper Drain (overflow)

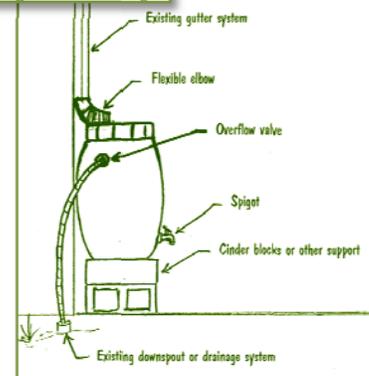
1. Mark hole at least two inches from the top of the barrel.
2. Use a 1" drill bit to drill hole.
3. Screw plastic faucet into hole.
4. Use utility knife as needed to alter hole.
5. Wrap 3/4" coupling threads in Teflon tape and caulk and screw onto faucet inside the barrel.

The Hoses

1. Cut 2 lengths of hose.
2. One section should be long enough to have easy access to water flowing from the bottom faucet, the other should be long enough to direct water from the overflow drain away from the foundation.
3. Push each end of the hose into a hose coupler and tighten screws.
4. Attach your overflow and watering hoses.
5. You could attach multiple barrels through your overflow system for more water storage.



The Key Aspects of a Rain Barrel



Final Steps and Tips

- Build a base out of concrete blocks to elevate the rain barrel—this will increase water pressure and make access to the bottom faucet easier.
- Adjust the downspout to flow into the barrel once it is on the base.
- Always keep the top overflow valve open.
- Covering the top basket with a screen keeps debris and insects from entering the barrel.
- Disconnect the barrel from the downspout during winter to avoid the formation of damaging ice.
- Use food grade barrels with no harmful chemicals and make sure they are clean prior to use.
- Paint or decorate your rain barrel to make it a distinct part of your yard.
- Once you are ready, you can “chain” other barrels to this one to collect and store additional water.



For a slightly more involved project that can produce sturdier barrels, visit www.home.comcast.net/~leavesdance/rainbarrels/construction.html

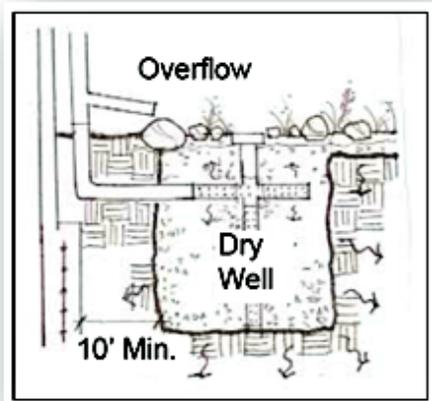
Popup Drain Emitters



Popup drain emitters allow water to be piped from the downspout to an area on your landscape away from foundations or erosion prone areas. The structure sits flush with the ground for easy mowing and “pops up” under the pressure of water. Popup emitters are available at local hardware stores.

Dry Wells

Dry Wells are infiltration pits that can be used to collect rooftop runoff. When appropriately sited, they reduce the amount of runoff that reaches storm sewers. Dry wells are most commonly used for small sources of runoff such as roof drains, small parking lots, and tennis courts. They require permeable, well-drained soils in order to be effective. They are not, however, recommended for use on a slope greater than 15% and should be set back from edges of ravines. They should be located at least 10 feet from building foundations to avoid seepage into basements.



Simple dry wells consist of a pit filled with gravel, riprap, rubble, or other debris. Such pits resist collapse, but do not have much storage capacity because their interior volume is mostly filled by stone. A more advanced dry well defines a large interior storage volume by a reinforced concrete cylinder with perforated sides and bottom. These dry wells are usually buried completely, so that they do not take up any land area.



Other Technologies

Pervious Pavement

Pervious pavement is designed to allow infiltration of stormwater through the surface into the soil below where the water is naturally filtered and pollutants are removed. In contrast normal pavement is an impervious surface that sheds rainfall and associated surface pollutants forcing the water to run off paved surfaces directly into nearby storm drains and then into streams and lakes.

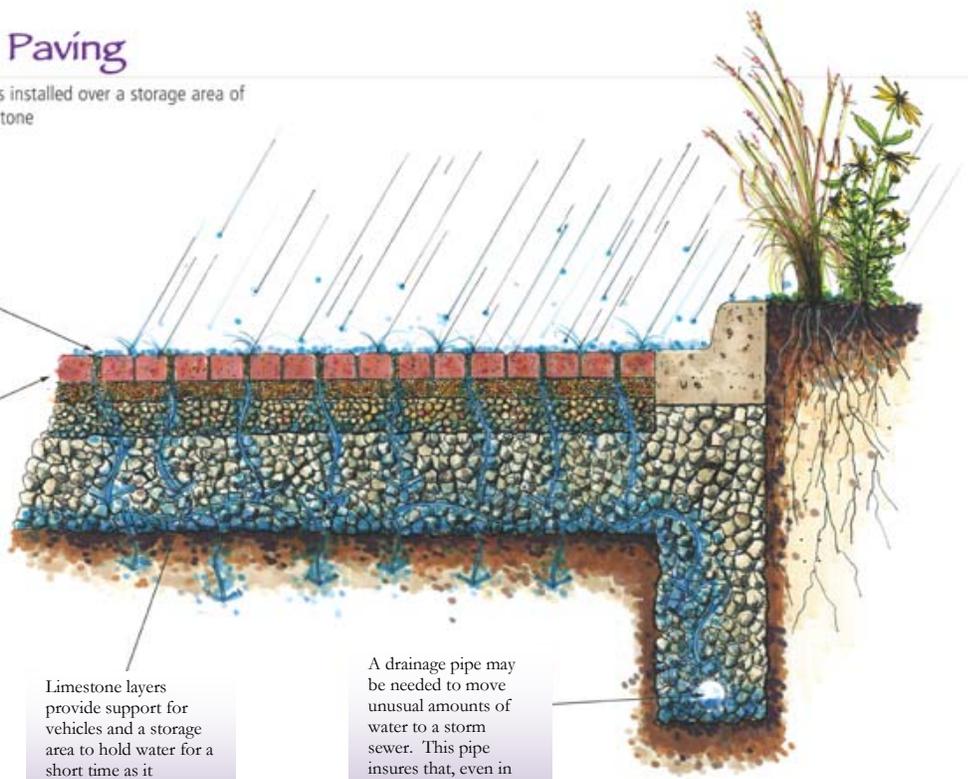
Pervious Paving

Modular paver blocks installed over a storage area of uniformly-sized limestone

This system prevents car related pollutants on parking areas from reaching our rivers and streams.



Spaces between modular pavers funnel storm water into an 18-inch layer of limestone below. Here water is temporarily stored as it infiltrates into soil and groundwater below.



Limestone layers provide support for vehicles and a storage area to hold water for a short time as it infiltrates into the soil and groundwater below.

A drainage pipe may be needed to move unusual amounts of water to a storm sewer. This pipe insures that, even in extreme weather, all water leaves the parking surface.

Block and concrete modular pavers are designed to funnel water between blocks into a basement layer of washed sand and gravel where water slowly drains away through the soil. The open areas in the paving system provide 20-50% more opportunity for the drainage of water than in the normal paved system.



Concrete grid pavers are similar in composition to concrete block pavers, but the structure and pattern is different. The construction of the permeable base is the same.



Plastic grid pavers are made mainly out of recycled plastic materials that provide a high porous surface using grass or gravel to make the area more attractive. These pavers are also flexible, allowing them to be used on uneven sites. This system is environmentally friendly; it uses recycled plastic, reduces the imperviousness of the area, and therefore the volume of stormwater runoff.



Pervious asphalt is fundamentally the same as regular asphalt, but it does not contain the fine particles that asphalt does. This creates porosity in the matrix, which allows water to flow through and infiltrate into the ground.



Infiltration Trenches

Infiltration trenches are constructed to help eliminate standing water following a rain event. While the first recommendation is to place native vegetation in such sites, infiltration trenches are an option for landowners that do not wish to maintain a garden or areas of high traffic where gardens are not feasible. Infiltration trenches are defined as excavated trenches filled with coarse granular material, j-drains, or perforated pipes; they collect stormwater runoff for temporary storage and infiltration. Typically, infiltration trenches can capture only a small amount of runoff and therefore may be designed to capture the first flush of a runoff event rather than the full volume of water. For this reason, they frequently are combined with another best management practice (BMP) such as a detention basin, rain garden, or vegetated swale to control peak hydraulic flows.

Perforated Pipe and Gravel Trench

A gravel perforated systems will improve drainage in low spots in the yard that tend to hold water. The gravel allows water to leach into a perforated the pipe (a pipe with holes) from surrounding areas. The more pipe and gravel installed the more water that will percolate into the system. Because water is collected and flowing through a pipe, the pipe must daylight at a distinct location such as a rain garden or turf area.

1. Call **JULIE at 1-800-892-0123** before you dig to locate underground utilities
2. Decide where to re-route excess water

Probably the most important part of this project is deciding where the water should be re-routed. Ideally this will be an area where the water will not have a negative impact on your own, or anyone else's land or property. Locate the most suitable route for your drain. Do not place infiltration trenches near building foundations or steep slopes. Steeper gradients will facilitate faster drainage, but less overall infiltration.

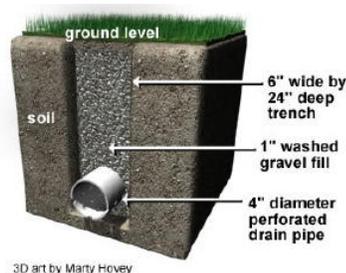
If large areas require infiltration trenches, consider hiring a professional.

3. Digging the trench

Digging the trench is the most labor intensive part of the project. Your trench should be 5" - 6" wide, in extreme cases (where a large amount of water has to be re-routed) a larger trench of 12" - 18" may be required.

4. Line with gravel

On completion of the trench, line with 2"-3" of coarse gravel.



5. Lining the trench

Next, line the trench with landscape fabric (reinforced membrane) leaving some excess on either side, you will later fold these inward to create an enclosed drain pipe and gravel structure, this will help prevent dirt from clogging up the gravel.

6. Lay the drainage pipe

Lay the drain pipe on top of the lining and fill the trench with coarse gravel. Leave 4"-5" at the top of the trench. If you are using perforated pipe, ensure the holes are facing downwards.

7. Enclose the gravel and pipe

Fold the excess liner over the top of the gravel.

8. Fill and Finish!

Fill the rest of the trench by shoveling on some coarse sand, add a few inches of topsoil, seed or turf and the job is done!



Turtlehead

<i>Chelone Spp.</i>	Turtlehead
<i>Veronicastrum Virginicum</i>	Culver's Root
<i>Desmodium Canadense</i>	Canada Tick Trefoil
See Appendix A For Full List	

Building a Simple Gravel Trench

A simpler version can be built, without a liner or pipe. After following steps 1-3 listed above, fill 1/4 of the trench with small stones, 2/4 with coarse gravel and finish as in step 8.



Strip Drain

There are ways to install infiltration trenches without interrupting the available space on your property. One type of technology on the market is the J-Drain® MVP-6. This strip drain is used in athletic fields and was installed at the North Minster Presbyterian Church in Peoria, IL to drain water ponding on the playground.

The J-Drain MVP-6 is a strip drain that consist of a high-flow dimpled drainage core banded to a layer of filter fabric. Water is absorbed into the strip and allowed to percolate into the soil. The instructions for installing the J-Drain SWD are located in Appendix B. Follow manufacturer's instructions for other strip drain technologies.





Turf Management

Mowing

Typically, lawns are maintained very short. Unfortunately, shorter turf results in a shallower root system. By simply letting turf grow from 1.5” or 2” - 4” high, root masses will enlarge and allow more rain to be absorbed. Even turf maintained at 3” or 4” high however, will not typically infiltrate enough rainwater to prevent runoff. Establishing simple border plantings of deep and fibrous rooted plants at the edges of residential properties could significantly help absorb rainwater. Where the backyard is adjacent to a natural setting, a majority of a yard can be converted to prairie.⁶

Yard Waste

DO NOT DUMP YARD WASTE INTO RAVINES!! This prohibits the growth of native vegetation in the forests and contributes to erosion of the slopes. By dumping yard waste, it appears that you are filling in the ravine and reducing erosion when in fact; soil often erodes under the pile out of site. Alternatives for dumping yard waste are listed below:

- Mulch your grass clippings where they lie instead of bagging.
- Mulch leaves where they lie instead of bagging. If you have a large amount of leaves, this will require multiple mowings. Do not wait until the leaves are two-feet deep.
- Mulch leaves and place in gardens.
- Compost yard waste
- Bag leaves for the yard waste pick up program
- **Do a combination of the above to eliminate the need for dumping in the ravines.**

Litter Removal

Litter enters surface waters via wind and runoff events. Litter and yard wastes can clog stormwater control and conveyance structures making the devices ineffective in stormwater pollutant control. Contaminants such as plastics and Styrofoam degrade slowly, while presenting environmental risks to fish and wildlife. Promote litter removal programs in your community.

⁶ Mossville Bluffs Watershed Plan



Additional Resources

Backyard Habitat Programs

The Illinois Rain Garden Initiative is an environmental initiative of the Office of Lt. Governor Pat Quinn, and offers grants to help schools and community organizations to create rain gardens. The goal is to empower citizens, institutions and communities to confront local flooding concerns, restore native Illinois prairie habitats, and learn about “green solutions” to storm water management. For more information, visit the website at www.raingarden.il.gov or contact the Lt. Governor’s Office at 312/814-6671.

The National Wildlife Federation (NWF) sponsors a certification program designed to help individuals plan and apply a wildlife habitat plan for a home site or small acreage. On request, NWF will send you an application package and instructions for its Backyard Wildlife Habitat Program. If your application and plan meet the criteria, you will receive a certificate and, if you wish, a sign to show your commitment to wildlife conservation.

Backyard Wildlife Habitat Program
National Wildlife Federation
8925 Leesburg Pike
Vienna, VA 22184-0001

<http://www.nwf.org/backyardwildlifehabitat/>

The U.S. Fish and Wildlife Service's Office of Migratory Bird Management works with groups and individuals to conserve and manage migratory birds. This agency offers information about backyard habitats for birds and wildlife. For more information contact:

U.S. Fish and Wildlife Service
Office of Public Affairs
Washington, DC 20240

Other References

This document is considered progressive, and may be amended and updated to provide the homeowner with additional practices and resources. To check for updates, please visit our web site at:

<http://www.tricountyrpc.org/goto/mossvillebluffs>

or contact us at:

411 Hamilton Blvd., Suite 2001, Peoria, IL 61602
Phone: 309.673.9330
Fax: 309.673.9802

RAIN GARDENS

-
- Wisconsin Department of Natural Resources. *Rain garden how-to manual for homeowners, home & garden clean water practices, rain gardens on a small scale, design & installation, getting kids involved*
www.dnr.state.wi.us/runoff/rg/
- Rain Gardens of West Michigan. *Rain garden video, downloadable manuals, sample design layouts,*
www.raingardens.org
2006. Geauga Soil and Water Conservation District. pdf. **Rain Garden Manual For Homeowners: Protecting Our Water, One Yard At A Time.** *What is a rain garden & why do we need them, locating, sizing, & installing.*
http://www.geaugaswcd.com/pdfs/2007_rain_garden_manual.pdf

NATIVE PLANTS

-
- Illinois Natural History Survey. **Gallery of Illinois Plants.** *List of families, species, common names, plants not found wild in Illinois* http://www.inhs.uiuc.edu/cwe/illinois_plants/
- Wild Ones. *Native plants, native landscaping, preservation & restoration of native communities, promoting environmental education* www.for-wild.org/
- PlantNative. *Directories, native plants, how to tutorial, community service organizations.* www.plantnative.org

OTHER BMPS

-
1991. Goo, Robert. EPA Journal. Html. **Do's And Don'ts Around The Home.** *Household chemicals, landscaping & gardening, septic systems, water conservation,*
www.epa.gov/owow/nps/dosdont.html
2003. United States Environmental Protection Agency. Pdf. **Make Your Home The Solution To Stormwater Pollution: A Homeowner's Guide To Healthy Habits For Clean Water** *Healthy habitats for clean water..* www.epa.gov/npdes/pubs/solution_to_pollution.pdf
2008. Illinois Environmental Protection Agency. Html. **What You Can Do To Prevent NPS Pollution.** *Urban stormwater runoff, NPS categories, mining, forestry, & agriculture*
www.epa.gov/owow/nps/whatudo.html

WATERSHED PLANS

-
2002. Conservation Design Forum and STS Consultants. **Mossville Bluffs Watershed Restoration Master Plan.** Tri-County Regional Planning Commission.
www.tricountyrpc.org/goto/watershed
2003. The Natural Resources and Your Development Task Force. **Oakbrook Ravine Restoration Concept Plan.** Tri-County Regional Planning Commission.
www.tricountyrpc.org/goto/watershed

2008. The Natural Resources and Your Development Task Force and Tri-County Regional Planning Commission. **Watershed Management Practices: A plan for Mossville Bluffs Watershed 1 -6.** Tri-County Regional Planning Commission.

Landscapers/Nurseries

Absolutely Wild

25310 S. Stoney Island Ave., Crete, IL 60417 Tel: 708/672-5908 Fax: 708/672-5911

Web: www.absolutelywild.com

More than 200 varieties of perennials and grasses.

Aquatic Nursery

38 W. 135 McDonald Rd., Elgin, IL 60123 Tel: 847/741-7678

Art & Linda's Wildflowers

E-mail Us at: art@artandlindaswildflowers.com

Fax: 708-863-6534

Cell Phone: 708-785-2943

Mailing Address: 3730 S. 59th Ave.,

Cicero, IL 60804

Blazing Star Associates

2107 Edgewood Drive, Woodstock, IL 60098 Tel: 815/338-4716

E-mail: tallgrass@blazing-star.com

Web: www.blazing-star.com

Bluestem Prairie Nursery

13197 E. 13th Rd., Hillsboro, IL 62049 Tel: 217/532-6344

E-mail: bluestemnursery@yahoo.com

Earthskin Nursery

9331 NCR 3800E, Mason City, IL 62664 Tel: 217/482-3524 Fax: 217/482-3524

E-mail: lrnelms@springnet1.com Web: www.earthskinnursery.com

Enders Greenhouse

104 Enders Dr., Cherry Valley, IL 61016 Tel: 815/332-5255 Fax: 815/332-5255

E-mail: info@endersgreenhouse.com Web: www.endersgreenhouse.com

Genesis Nursery, Inc.

23200 Hurd Rd., Tampico, IL 61283 Tel: 815/438-2220 Fax: 815/438-2222

Gerard & Greene

26225 S. Woodlawn Ave., Crete, IL 60417 Tel: 708/672-1201

E-mail: info@gerardandgreene.com Web: www.gerardandgreene.com

Greenview

2700 W. Cedar Hills Drive, Dunlap, IL 61525, Tel: 309/ 243-7761 Fax: 309/ 243-9353

Web: www.greenview.com

H. E. Nursery

1200 Old Rt. 66, North Litchfield, IL 61056 Tel: 217/324-6191 Fax: 217/324-5756

ION Exchange

1878 Old Mission Drive, Harpers Ferry, IA 52146-7533 Tel: 800/291-2141 Fax

563/535-7362 Web: www.ionexchsngce.com

Kelly Seed and Hardware Co.

202 Hamilton Blvd., Peoria, IL 61602 Tel: 309/674-0368

Lee's Gardens

Janis Lee, P.O. Box 5, Tremont, IL 61568 Tel: 309/925-5262 Fax: 309/925-5010

E-mail: jiboshi@aol.com Web: www.LeesGardens.com

Mason State Nursery IL Dept. of Natural Resources, Forest Resources

17855 N. Country Road, 2400 E. Topeka, IL 61567 Tel: 309/535-2195

Fax: 309/535-3286

E-mail: dhorvath@dnrmail.state.il.us

The Natural Garden, Inc.

38 W 443 Hwy. 64, St. Charles, IL 60175

Tel: 630/584-0150 Fax: 630/584-0185

Web: www.thenaturalgardeninc.com

Possibility Place Nursery

7548 W. Monee-Manhattan Road, Monee, IL 60449

Tel: 708/534-3988 Fax: 708/534-6272

E-mail: info@possibilityplace.com Web: www.possibilityplace.com

Prairie Earth Nursery

Jim Alwill, Rural Route 1 Box 151, Bradford, IL 61421 Tel: 309/897-9911

E-mail: Jim_alwill@yahoo.com

Prairie Patch

10932 Park Rd., Niantic, IL 62551 Tel: 217/668-2409

Prairie Woods Farm

29092 Queenswood Road, Morton, IL 61550 Tel: 309/370-1581 or 309/370-6689

E-Mail: cjg@mtco.com

Union State Tree Nursery

IL Dept. of Conservation Forest Resources, 3240 State Forest Rd., Jonesboro, IL

62952 Tel: 618/833-6125 Fax: 618/833-8123

E-mail: dhouseman@dnrmail.state.il.us

Wilson Seed Farms

Chris Wilson, 10872 1400 E. Street, Tiskilwa, IL 61368 Tel: 815/878-8572 Fax:

815/366-9050

E-mail: cwilson5@hotmail.com Web: www.wilsonseed.com

Country Road Greenhouses, Inc.

19561 E. Twombly Rd., Rochelle, IL 61068 Tel: 815/384-3311 Fax: 815/384-5015

E-mail: crinc@prarieplugs.com Web: www.prairieplugs.com

Elmer Bailey Nursery

2617 Tonti Road, Salem, IL 62881 Tel: 618-548-1603

Illinois Forest Products

8699 Arenzville Rd., Beardstown, IL 62618

*Wholesale
Only*

Tel: 217/323-4540, 800/304-TREE Fax: 217/323-9468

E-mail: ifp@casscomm.com Web: www.illinoisforestproducts.com

King Nursery

6849 Rt.34, Oswego, IL 60543 Tel: 630/554-1171 Fax: 630/554-1348

Lafayette Home Nursery

1 Nursery Lane, Lafayette, IL 61449 Tel: 309/995-3311 Fax: 309/995-3909

Landscape Architects

Designer Concepts

Landscape Architecture, Inc.

1214 E. Richwoods Ste. B

Peoria, IL 61603

309/303-0919

Pizzo and Associates, Ltd.

10729 Pine Road

Leland, IL 60531

815/495-2300

Organizations

Below are a brief list of additional information and assistance on native landscaping.

Lt. Governor Pat Quinn Standing Up for Illinois. Find resources on rain garden initiatives, how to create rain gardens, native plant, and projects www.raingarden.il.gov

Chicago Wilderness a Regional Nature Reserve. Find information on landscaping with native species, and protecting and landscaping for wildlife www.chicagowilderness.org

University of Illinois Extension. Find information and resources on horticulture, garden design, bed assessment, preparation, and maintenance, lawn care, and composting <http://web.extension.uiuc.edu/state/>

The Illinois Environmental Protection Agency. Find information and resources on landscaping with native plants, applications of natural landscaping, and to demonstrate installation and management techniques, case studies and benefits <http://www.epa.gov/greenacres/>

Appendix A

Native Plant List

Following is a variety of native plants and shrubs suitable for almost any backyard. Not only will you discover what types of native plants you can add to your yard, you'll also learn what conditions are most suitable for each plant and whether your yard can provide for such conditions. Each plant draws in a number of wildlife, from butterflies and songbirds, to chipmunks, deer and beneficial insects.

Plants for Full Sun ☀

Grasses & Flowers

<i>Scientific Name</i>	Common Name
<i>Arnoglossum Atriplicifolium</i>	Pale Indian-Plantain.
<i>Aster Pilosus</i>	Frost Aster
<i>Asclepias Tuberosa</i>	Butterflyweed
<i>Agastache Foeniculum</i>	Lavender Hyssop
<i>Allium Cernuum</i>	Nodding Pink Onion Seed
<i>Amorpha Canescens</i>	Leadplant
<i>Andropogon Gerardi</i>	Big Bluestem
<i>Andropogon Scoparius</i>	Little Bluestem
<i>Arnoglossum Plantagineum</i>	Pale Indian Plantain
<i>Asclepias Incarnata</i>	Marsh Milkweed
<i>Asclepias Tuberosa</i>	Butterflyweed
<i>Asclepias Tuberosa</i>	Butterfly Milkweed
<i>Aster Ericoides</i>	White Aster
<i>Aster Laevis</i>	Smooth Blue Aster
<i>Aster Novae-Angliae</i>	New England Aster
<i>Aster Oolentangiensis</i>	Sky Blue Aster
<i>Astragalus Canadensis</i>	Canada Milk-Vetch
<i>Baptisia Australis</i>	Blue False Indigo
<i>Baptisia Lactea</i>	White False Indigo
<i>Baptisia Leucantha</i>	White Wild Indigo
<i>Baptisia Leucophaea</i>	Cream Wild Indigo
<i>Bouteloua Curtipendula</i>	Side-Oats Grama
<i>Brickellia Eupatorioides</i>	False Boneset
<i>Ceanothus Americanus</i>	New Jersey Tea



Nodding Pink Onion Seed



Butterflyweed



Pale Purple Coneflower



Lupine

<i>Chamaechrista Fasciculata</i>	Partridge Pea
<i>Coreopsis Lanceolata</i>	Lanceleaf Coreopsis
<i>Coreopsis Palmata</i>	Prairie Coreopsis
<i>Dalea Candida</i>	White Prairie Clover
<i>Desmodium Canadense</i>	Canada Tick Trefoil
<i>Echinacea Pallida</i>	Pale Purple Coneflower
<i>Echinacea Purpurea</i>	Purple Coneflower
<i>Elymus Canadensis</i>	Canada Wild Rye
<i>Eragrostis Spectabilis</i>	Purple Lovegrass
<i>Eryngium Yuccifolium</i>	Rattlesnake Master
<i>Geum Triflorum</i>	Prairie Smoke
<i>Helianthus Mollis</i>	Downy Sunflower
<i>Helianthus Laetiflorus</i>	Showy Sunflower Seed
<i>Heliopsis Helianthoides</i>	The Oxeye Sunflower
<i>Juncus Tenuis</i>	Path Rush
<i>Koeleria Macrantha</i>	(Prairie Junegrass)
<i>Lespedeza Capitata</i>	Round-Headed Bushclover
<i>Liatris Aspera</i>	Rough Blazingstar
<i>Liatris Pycnostachya</i>	Prairie Blazing Star
<i>Lupinus Perennis</i>	Lupine
<i>Monarda Fistulosa</i>	Bergamot
<i>Monarda Fistulosa</i>	Wild Bergamot
<i>Monarda Lambada</i>	Bee Balm - Dotted Mint
<i>Oligoneuron Rigidum</i>	Stiff Goldenrod
<i>Panicum Virgatum</i>	Switch Grass
<i>Parthenium Integrifolium</i>	Wild Quinine
<i>Penstemon Canascens</i>	Beardtongue
<i>Penstemon Digitalis:</i>	Smooth Penstemon,
<i>Petalostemum Dalea</i>	Purple Prairie Clover
<i>Phlox Pilosa</i>	Prairie Phlox
<i>Physostegia Virginiana</i>	False Dragonhead/Obedient Plant
<i>Polygonatum Canaliculatum</i>	Great Solomon's Seal Seed
<i>Ratibida Pinnata</i>	Yellow (Gray-Headed) Coneflower
<i>Rudbeckia Hirta</i>	Blackeyed Susan
<i>Rudbeckia Subtomentosa</i>	Sweet Black-Eyed Susan
<i>Rudbeckia Triloba</i>	Brown-Eyed Susan
<i>Ruellia Humilis</i>	Wild Petunia
<i>Senna Hebecarpa</i>	Wild Senna
<i>Silphium Integrifolium</i>	Rosinweed



Showy Goldenrod

<i>Silphium Laciniatum</i>	Compass Plant
<i>Silphium Perfoliatum</i>	Cup Plant
<i>Silphium Terebinthinaceum</i>	Prairie Dock
<i>Solidago Speciosa</i>	Showy Goldenrod
<i>Sorghastrum Nutans</i>	Indiangrass
<i>Sporobolus Heterolepis</i>	Prairie Dropseed
<i>Tradescantia Ohiensis</i>	Ohio Spiderwort
<i>Tradescantia Ohiensis</i>	Spiderwort
<i>Verbena Hastata</i>	Blue Vervain
<i>Verbena Stricta</i>	Hoary Vervain
<i>Vernonia Fasciculata</i>	Ironweed
<i>Veronicastrum Virginicum</i>	Culver's Root

Shrubs

<i>Scientific Name</i>	Common Name
<i>Corylus Americana</i>	American Filbert
<i>Prunus Americana</i>	American Plum
<i>Viburnum Prunifolium</i>	Blackhaw Viburnum
<i>Rosa Blanda</i>	Early Wild Rose
<i>Spirea Tomentosa</i>	Hardhack
<i>Salix Humilus</i>	Prairie Willow
<i>Potentilla fruticosa</i>	Shrubby Cinquefoil

Wetland/Rain Garden Plants

Grasses & Flowers

Scientific	Common
<i>Allium Cernuum</i>	Nodding Pink Onion
<i>Andropogon Gerardii</i>	Big Bluestem
<i>Arisaema Triphyllum</i>	Jack-In-The-Pulpit
<i>Arnoglossum Atriplicifolium</i>	Pale Indian Plantain
<i>Asclepias Incarnata</i>	Swamp Milkweed
<i>Athyrium Spp.</i>	Lady Ferns
<i>Blue Vervain</i>	<i>Verbena Hastata</i>
<i>Caltha Palustris</i>	Marsh Marigold

<i>Carex Bebbii</i>	Bebb's Sedge
<i>Carex Comosa</i>	Bottlebrush Sedge
<i>Carex Hystericina</i>	Porcupine Sedge
<i>Carex Stipata</i>	Awl Fruited Sedge
<i>Carex Vulpinoidea</i>	Fox Sedge
<i>Chelone Spp.</i>	Turtlehead
<i>Desmodium Canadense</i>	Canada Tick Trefoil
<i>Dietes Grandiflora</i>	Wild Iris
<i>Dropteris Spp.</i>	Shield Ferns
<i>Drosera Spp.</i>	Sundews
<i>Elymus Canadensis</i>	Canada Wild Rye
<i>Elymus Virginicus</i>	Virginia Wild Rye
<i>Eupatorium Maculatum</i>	Joe-Pye Weed
<i>Eupatorium Perfoliatum</i>	Boneset
<i>Helenium Autumnale</i>	Dogtooth Daisy
<i>Heliopsis Helianthoides</i>	Ox Eye Sunflower
<i>Hoary Vervain</i>	Verbena Stricta
<i>Ilex Verticillata</i>	Winterberry
<i>Iris Versicolor</i>	Blue Flag Iris
<i>Liatris Pycnostachya</i>	Prairie Blazingstar
<i>Liatris Spicata</i>	Dense Blazingstar
<i>Lobelia Cardinalis</i>	Cardinal Flower
<i>Lobelia Siphilitica</i>	Great Blue Lobelia
<i>Lolium Multiflorum</i>	Annual Rye
<i>Monarda Didyma</i>	Bee Balm
<i>Monarda Fistulosa</i>	Bergamot
<i>Oligoneuron Rigidum</i>	Stiff Goldenrod
<i>Osmunda Cinnamonmea</i>	Cinnamon Fern
<i>Osmunda Regalis</i>	Royal Fern
<i>Panicum Virgatum</i>	Switchgrass
<i>Pinguicula Spp.</i>	Butterworts
<i>Ratibiba Pinnata</i>	Yellow Coneflower
<i>Rudbeckia Hirta</i>	Black Eyed Susan
<i>Rudbeckia Submentosa</i>	Sweet Black Eyed Susan
<i>Rudbeckia Triloba</i>	Brown Eyed Susan
<i>Sagittaris Latifolia</i>	Arrowhead
<i>Sarracenia Spp</i>	Pitcher Plants
<i>Scripus Atrovirens</i>	Dark Green Bulrush
<i>Senna Hebecarpa</i>	Wild Senna



Cardinal Flower



Cinnamon Fern

<i>Silphium Terebinthinaceum</i>	Prairie Dock
<i>Silphium Integrifolium</i>	Rosinweed
<i>Silphium Perfoliatum</i>	Cupplant
<i>Solidago Spp.</i>	Goldenrods
<i>Sorghastrum Nutans</i>	Indiangrass
<i>Spartina Pectinata</i>	Prairie Cordgrass
<i>Symphotrichum Novae-Angliae</i>	New England Aster
<i>Symplocarpus Foetidus</i>	Skunk Cabbage
<i>Tradescantia Ohiensis</i>	Spiderwort
<i>Typhus Spp.</i>	Cattails
<i>Veratrum Viride</i>	False Hellebore
<i>Veronicastrum Virginicum</i>	Culver's Root
<i>Verbena Hastata</i>	Blue Vervain
<i>Vernonia Fasciculata</i>	Iron Weed
<i>Veronicastrum Virginicum</i>	Culver's Root
<i>Woodwardia Areolata</i>	Netted Chain Fern
<i>Zizia Aurea</i>	Golden Alexanders



Blue Vervain

Shrubs

Scientific	Common
<i>Amorpha Fruticosa</i>	Indigo Bush
<i>Cornus sericea</i>	Red osier dogwood
<i>Ilex verticillata</i>	Winterberry
<i>Potentilla fruticosa</i>	Shrubby cinquefoil
<i>Prunus Virginiana</i>	Chokeberry
<i>Sambucus Canadensis</i>	Elderberry
<i>Spirea Tomentosa</i>	Hardhack



Winterberry

Plants for Partial Shade ○

Grasses & Flowers

Scientific	Common
<i>Agastache Foeniculum</i>	Lavender Hyssop
<i>Allium Cernuum</i>	Nodding Wild Onion
<i>Aquilegia Canadensis</i>	Wild Columbine
<i>Arisaema Triphyllum</i>	Jack In The Pulpit
<i>Arnoglossum Atriplicifolium</i>	Pale Indian Plantain
<i>Aster Lateriflorus</i>	Calico Aster



Blue Flag Iris



Black Eyed Susan

<i>Aster Shortii</i>	Short's Aster
<i>Baptisia Alba</i>	White False Indigo
<i>Baptisia Australis</i>	Blue False Indigo
<i>Campanula Americana</i>	Tall Bellflower
<i>Carex Gracillima</i>	Purple-Sheathed Graceful Sedge
<i>Dodecatheon Meadia</i>	Shooting Star
<i>Echinacea Purpurea</i>	Purple Coneflower
<i>Elymus Villosus</i>	Silky Wild Rye
<i>Elymus Virginicus</i>	Virginia Wild Rye
<i>Eupatorium Purpureum</i>	Sweet Joe Pyeweed
<i>Geranium Maculatum</i>	Wild Geranium
<i>Heuchera Richardsonii</i>	Alumroot
<i>Hierochloe Odorata</i>	Sweet Vanilla Grass
<i>Hystrix Patula</i>	Bottlebrush Grass
<i>Iris Shrevei</i>	Blue Flag Iris
<i>Lobelia Cardinalis</i>	Cardinal Flower
<i>Lobelia Siphilitica</i>	Great Blue Lobelia
<i>Malanthemum Racemosum</i>	Solomon's Plume
<i>Monarda Fistulosa</i>	Bergamot
<i>Oak Sedge</i>	Carex Penslvanica
<i>Penstemon Digitalis</i>	Foxglove Beardtongue
<i>Polemonium Reptans</i>	Jacob's Ladder
<i>Polygonatum Biflorum</i>	Great Solomon's Seal
<i>Rudbeckia Hirta</i>	Black Eyed Susan
<i>Rudbeckia Submentosa</i>	Sweet Black Eyed Susan
<i>Rudbeckia Triloba</i>	Brown Eyed Susan
<i>Zizia Aptaera</i>	Heartleaf Golden Alexander
<i>Zizia Aurea</i>	Golden Alexanders

Shrubs

Scientific	Common
<i>Hamamelis Virginiana</i>	Common Witch Hazel
<i>Hypericum Kalmianum</i>	Kalm's St. Johns Wort
<i>Prunus Virginiana</i>	Chokeberry
<i>Sambucus Canadensis</i>	Elderberry
<i>Viburnum Acerifolium</i>	Maple Leaf Viburnum

Plants for Shady Areas

Grasses & Flowers

<i>Scientific</i>	<i>Common</i>
<i>Adiantum Pedatum</i>	Maidenhair Fern
<i>Aquilegia Canadensis</i>	Columbine
<i>Arisaema Triphyllum</i>	Jack-In-The-Pulpit
<i>Aster Azureus</i>	Sky Blue Aster
<i>Aster Divaricatus</i>	White Woodland Aster
<i>Aster Lateriflorus</i>	Calico Aster
<i>Aster Lateriflorus</i>	Side-Flowering Aster
<i>Athyrium Filix-Femina</i>	Lady Fern
<i>Baptisia Alba</i>	White False Indigo
<i>Baptisia Australis</i>	Blue False Indigo
<i>Carex Muskingumensis</i>	Palm Sedge
<i>Chasmanthium Latifolium</i>	Norther Sea Oats
<i>Cimicifuga Racemosa</i>	Black Cohosh
<i>Clematis Virginiana</i>	Virgin's Bower
<i>Dicentra Eximia</i>	Wild Bleeding Heart
<i>Dodecatheon Meadia</i>	Shootingstar
<i>Dryopteris Marginalis</i>	Marginal Shield Fern
<i>Echinacea Purpurea</i>	Purple Coneflower
<i>Eupatorium Purpureum</i>	Sweet Joe-Pye Weed
<i>Geranium Maculatum</i>	Wild Geranium
<i>Heuchera Villosa</i>	Maple Leaved Alum Root
<i>Hydrophyllum Virginica</i>	Virginia Waterleaf
<i>Mertensia Virginica</i>	Virginia Bluebells
<i>Osmunda Cinnamomea</i>	Cinnamon Fern
<i>Phlox Divaricata</i>	Wild Blue Phlox
<i>Podophyllum Peltatum</i>	May Apple
<i>Polemonium Caeruleum</i>	Jacob's Ladder
<i>Polygonatum Biflorum</i>	Solomon's Seal
<i>Rudbeckia Triloba</i>	Brown Eyed Susan
<i>Sanguinaria Canadensis</i>	Blood Root
<i>Sedum Ternatum</i>	Wild Stonecrop
<i>Smilacina Racemosa</i>	False Solomons Seal
<i>Solidago Ulmifolia</i>	Elm-Leaved Goldenrod
<i>Thalictrum Dioicum</i>	Early Meadow Rue
<i>Tiarella Cordifolia</i>	Foamflower



Virgin's Bower



Blood Root

<i>Tradescantia Ohiensis</i>	Ohio Spiderwort
<i>Trillium Grandiflorum</i>	Great White Trillium
<i>Trillium Recuvratum</i>	Prairie Trillium
<i>Veronicastrum Virginicum</i>	Culver's Root

Shrubs

Scientific	Common
<i>Hamamelis Virginiana</i>	Common Witch Hazel
<i>Prunus Virginiana</i>	Chokeberry
<i>Viburnum Acerifolium</i>	Maple Leaf Viburnum



Chokeberry

Appendix B

J-Drain Installation

J-Drain® SWD Landscape Drainage Composites

Installation Instructions:

1 Determine Drainage Layout: Locate area that requires drainage and slope to determine direction of drainage system to daylight.



2 Mark and Excavate Trenches: Locate and mark all utility lines. Using this as consideration, mark field or drainage area with a chalk line at trench locations. Excavate trenches 2" - 3" (33 - 105 mm.) wide and to a depth so that the top of the J-Drain SWD is 6" below the turf surface.



3 Install into Trench: Unroll and place J-Drain SWD vertically into trench. Center with temporary wood stakes.



4 Install Fittings: Install proper fittings and tape fittings in place with duct tape to ensure solid connection to drain.



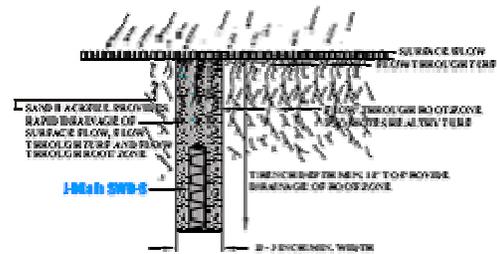
5 Connect to Pipe: Connect J-Drain SWD with Endout fitting to 4" pipe to take water to daylight. Tape.



6 Backfill: Pour select backfill such as washed concrete sand.



7 Top off and replace sod: Remove temporary stakes and flood trench with water to promote proper compaction. Top off trench with sand and replace sod.



Cross Section Diagram

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Project partners include the City of Peoria, the Natural Resources and Your Development Task Force, Heartland Water Resources Council, and Tri-County Regional Planning Commission.



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