

CREATING RESILIENT LANDSCAPES

Blue
Thumb



PLANTING FOR CLEAN WATER®



Presented by

Metro Blooms

CONTENTS

Creating Resilient Landscapes	2
Site Assessment	3
Drawing Plans for a Site	4
Improving Resilience	5
Downspout Redirection	6
Stormwater Runoff Diversion	7
Permeable Pavement	8
Nurture Healthy Soils	9-14
The Value of Trees in the Landscape	15-17
Turf Alternatives	18
Pollinator Lawns	19
Boulevard Gardens.....	20
Raingardens	21
Raingarden Planning	22
Raingarden Design	23-24
Raingarden Installation	25-26
Designing with Native Plants for Pollinators	27-28
Native Plantings for Resilient Yards	29-32
Garden Maintenance	33-34
Lawns to Legumes	35-40
Metro Blooms Programs	41
Help With Your Project	42



Metro Blooms

A non-profit 501(c)(3) organization that partners with communities to create resilient landscapes and foster clean watersheds, embracing the values of equity and inclusion to solve environmental challenges. Metro Blooms coordinates the Blue Thumb program.



Blue Thumb - Planting for Clean Water

A public/private partnership helping property owners reduce runoff and improve water quality. Blue Thumb partners include cities, watershed districts, landscape designers, contractors and native plant nurseries.

CREATING RESILIENT LANDSCAPES

Resilience generally refers to the ability to bounce back or recover easily from a setback. But what does it mean when we talk about a Resilient Yard? Pavement and Kentucky bluegrass are fine things when and where necessary—but they offer no forage to struggling pollinators and send large amounts of runoff to polluted . In doing so, they make our landscape and ecosystem increasingly brittle at the same time that weather patterns in Minnesota are changing. We are seeing more erratic, powerful precipitation throughout the year, resulting in frequent flooding.

With such environmental stresses, we should expect each aspect of our landscape to serve multiple functions. Boulevards can absorb water and provide forage for pollinators; patios can be gathering spaces and also infiltrate water; and turf and traditional gardens can incorporate plant species selected for their resistance to drought, or ability to provide shade and habitat.

This booklet explores a variety of plantings and projects that can help your yard, and your community, flourish. Although they may seem small in comparison to global issues, interventions at the residential scale make a difference. Any runoff you retain on your property reduces the volume that flows to our over-stressed and aging storm sewer infrastructure. Our urban gardens can start to rebuild the critical habitat corridors displaced by land use changes and shifting habitat zones. Your actions are an educational tool for friends and family. Improving the ecological resilience in your yard ensures that the small piece of land you (and so many others) call home flourishes in the face of change. This resilience translates to your community, region and global environment.



SITE ASSESSMENT

Function

- If you are not actively using your lawn, consider replacing it with more ecologically functional plants such as native perennials, shrubs and trees.
- If there is an opportunity to capture stormwater runoff that is currently getting away, consider installing a raingarden. Raingardens can be incorporated into larger planting beds.
- Think about the paths of travel throughout the yard. Consider the seating, play and pet areas, as well as your existing landscape beds and trees. Would reorganizing any of these functional areas create any new opportunities for stormwater capture or native plantings?
- Call 811 to have underground utilities located, and be aware of private utilities connecting to garages.

Hydrology

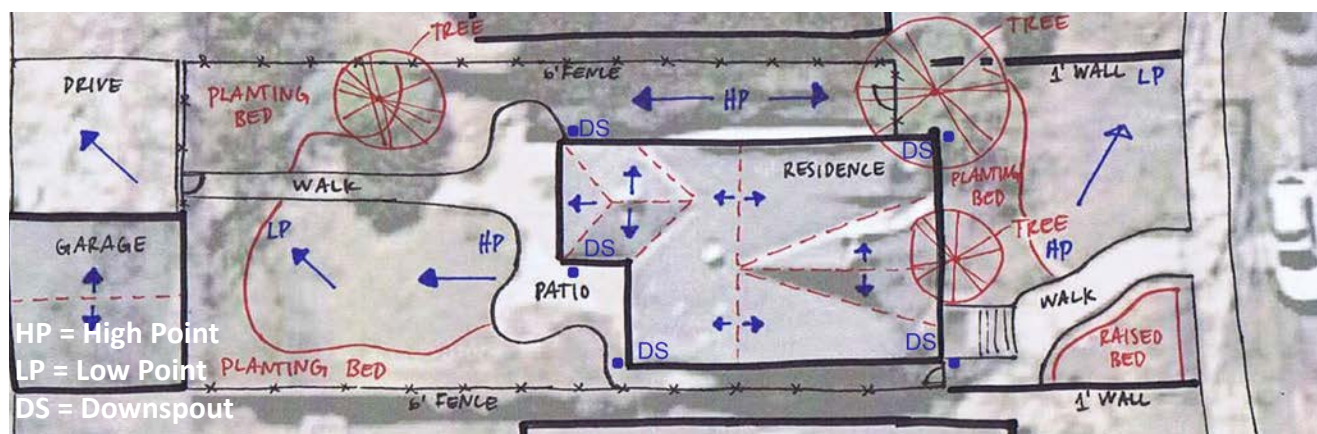
- Draw arrows showing how rain flows off pervious and impervious surfaces in the yard. Look for where water is getting away and flowing to the storm drain in your street or down your alley.
- What are the high and low points in the yard? Is there pooling/flooding in your yard?
- Map the downspouts of the gutters on your roof and estimate the roof areas that are draining to each downspout (see picture on p. 21).
- Are there areas of erosion near a downspout?

Sun/Shade

- Consider the trajectory of the sun in relation to your yard. Is your house facing east or west, so the front and back yards receive equal amounts of sun throughout the day? Or does it face north or south and receive drastically different amounts of sunlight?
- How do the trees and buildings on your property shade the yard? There are plenty of plant options for sun or shade, but you will need to choose accordingly.

Site design tip:

A nuisance, damaged, or misplaced tree can be a design opportunity. A new raingarden placement could be an impetus for the removal of an unwanted tree or large shrub.

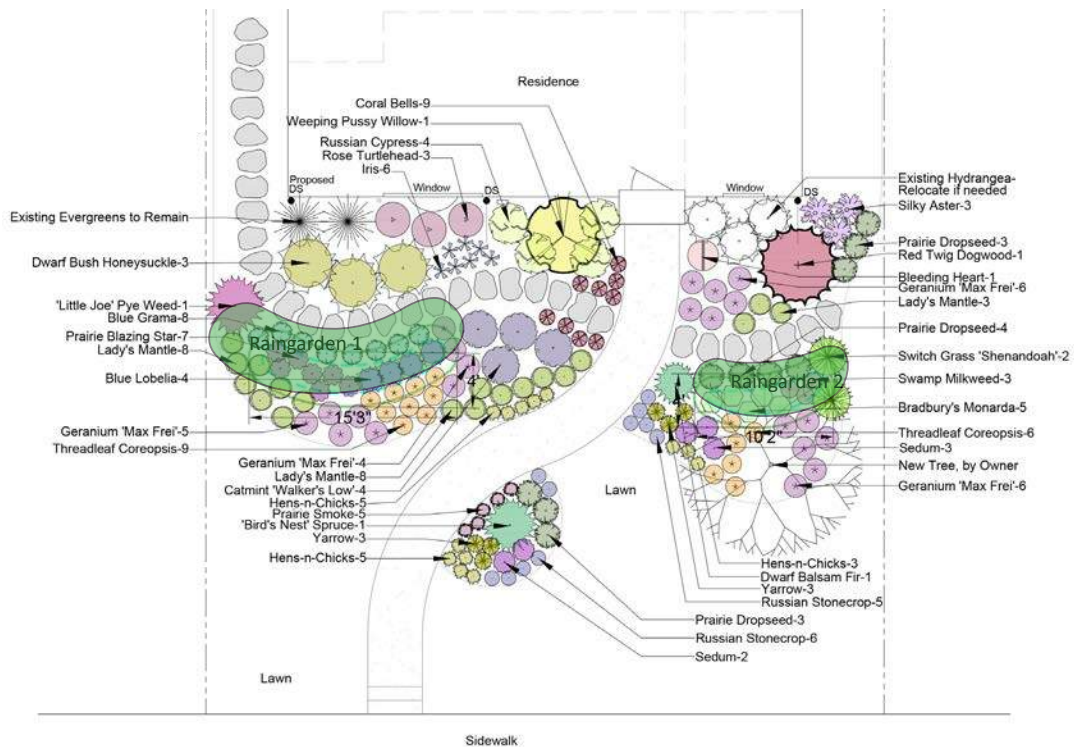
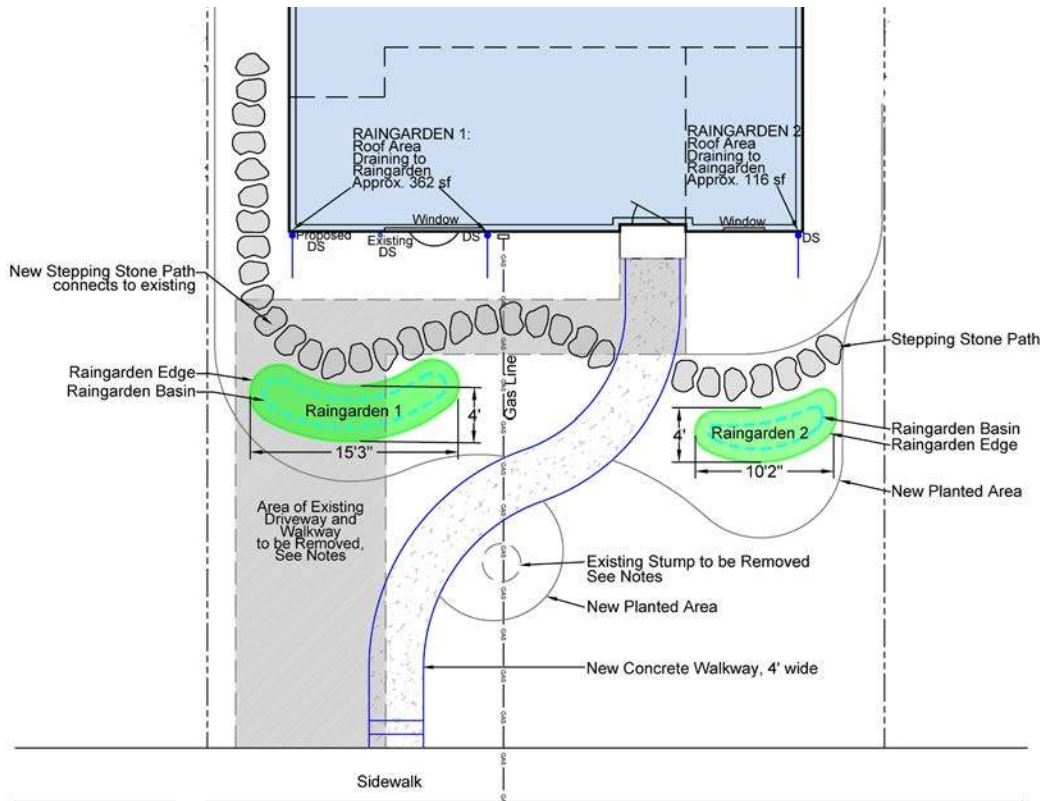


Site assessment drawn on an aerial image

DRAWING PLANS FOR A SITE

Concept Plan

After assessing your yard, you might end up with a plan that looks like this. For example, it might show areas of pavement to be removed, areas for native plantings, as well as raingardens placed to infiltrate runoff from downspouts.



IMPROVING RESILIENCE

Behavior changes can be among the easiest changes to start creating a resilient yard.

- Keep grass clippings and leaves out of the street. They can be used as mulch or ingredients for compost.
- Adopt a drain—keep your local stormsewer drain clear of debris. For more information, check out adopt-a-drain.org.
- Clean up pet waste. It can cause algal blooms and disease when washed into lakes.
- Reconsider the use of fertilizer, pesticides and herbicides. Plants that aren't adapted to our climate need more "babying" from you, at the same time that they provide much less benefit to our native pollinators and other wildlife.
- Raise mower blade to at least 3". Turf grass generally grows roots as deep as it grows high. Taller leaves and deeper roots make it healthier, and help to infiltrate more runoff.
- Water with intention – Don't set it and forget it. It's best to water before 10am.
- Avoid salt usage when possible. 1 teaspoon of salt permanently pollutes 5 gallons of fresh water. Instead, shovel walks & drives promptly and use grit if needed for traction.
- Compost your organic waste.
- Make a plan for a resilient yard!



Water early in morning, before evaporation can occur.



Dig up weeds before they get too big!

DOWNSPOUT REDIRECTION

Roof surfaces contribute large volumes of stormwater runoff, and typically this water is collected and conveyed using gutters and downspouts. Redirecting the flow of water from downspouts is one of the simplest and easiest ways to capture stormwater in raingardens or other practices. Here are just a few creative ways that water can be used as an interesting and dynamic feature in your landscape.



Rain Barrel



Catch Basin



Atrium grate



Drain tile

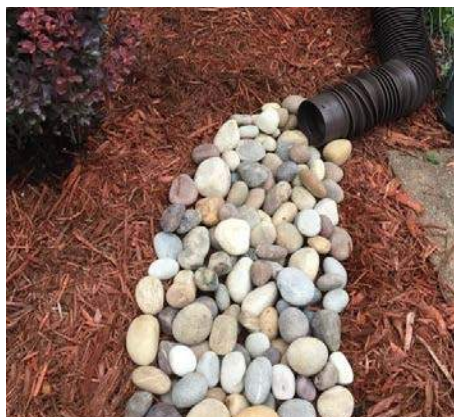


Photo: Devin Olson

Overhead conveyance to rain chain



Downspout and sump pump to dry creek bed



Splash rock for slowing water



Planted swale

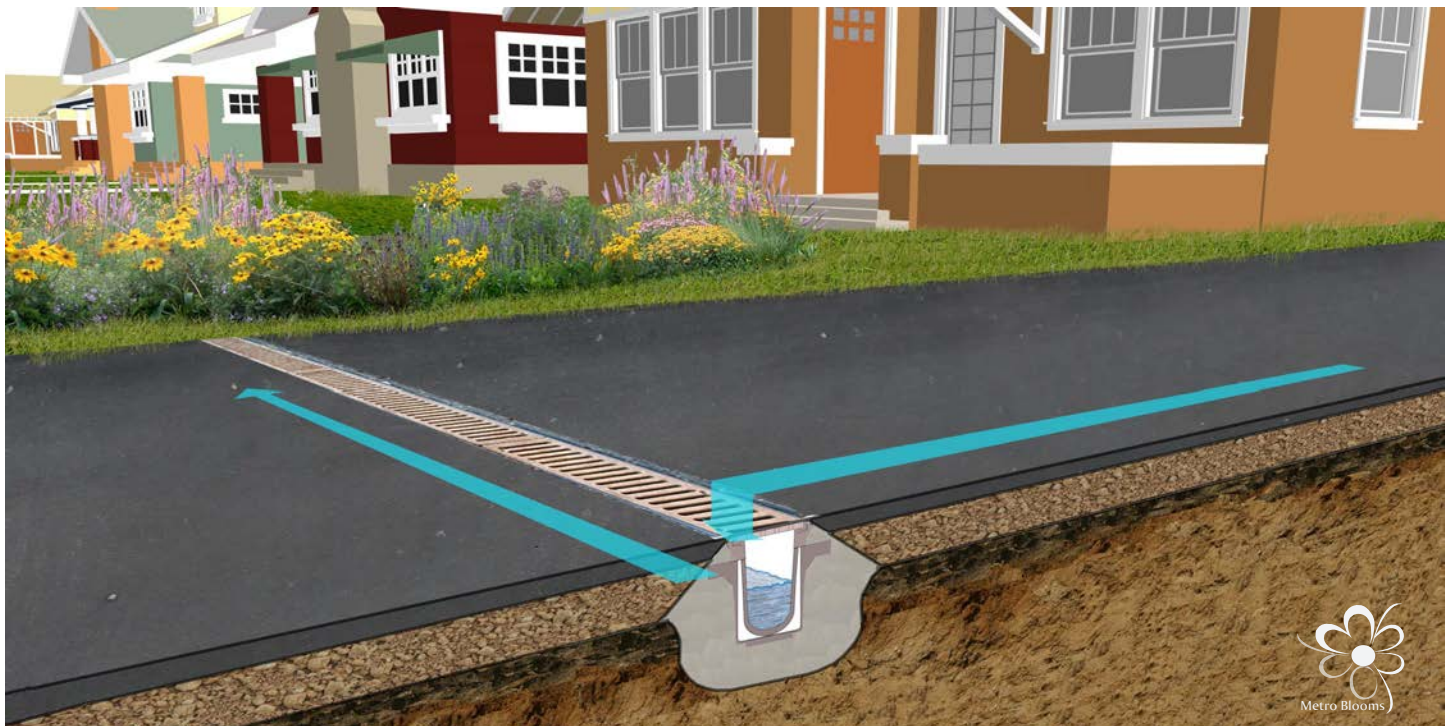
Dry creek beds and planted swales are examples of great design solutions to convey runoff to your raingarden!

STORMWATER RUNOFF DIVERSION

On a typical urban property, the driveway is often the greatest contributor of runoff and pollutants to the local lake or river. This stormwater has little or no chance of infiltrating before flowing to the storm sewer system. Luckily, it is possible to divert runoff from your driveway or walking path into a raingarden via a channel drain. This is most affordable when you are replacing an old (or installing a new) driveway.



Channel drain



Driveway channel drain directing runoff to a raingarden



Gutter redirection



Gutter and sump pump redirection

A channel drain

can help you divert water to a raingarden and decrease stormwater runoff from your property. Other diversion opportunities include gutter redirection and sump pump and downspout extensions.

PERMEABLE PAVEMENT

Conventional paving such as concrete, asphalt, and even compacted gravel is impervious to water, contributing large amounts of stormwater runoff to our lakes and rivers every time it rains. If you are planning any paving in your future landscaping projects, consider using permeable pavement for your driveway, patio, parking area, or sidewalks. Understanding the capacity of your soil to infiltrate water is important. These systems work best in well drained soils. Talk to a designer if considering permeable pavement around foundations and basements.



Permeable pavement infiltrates water into rock storage chambers and soils below



Permeable pavers



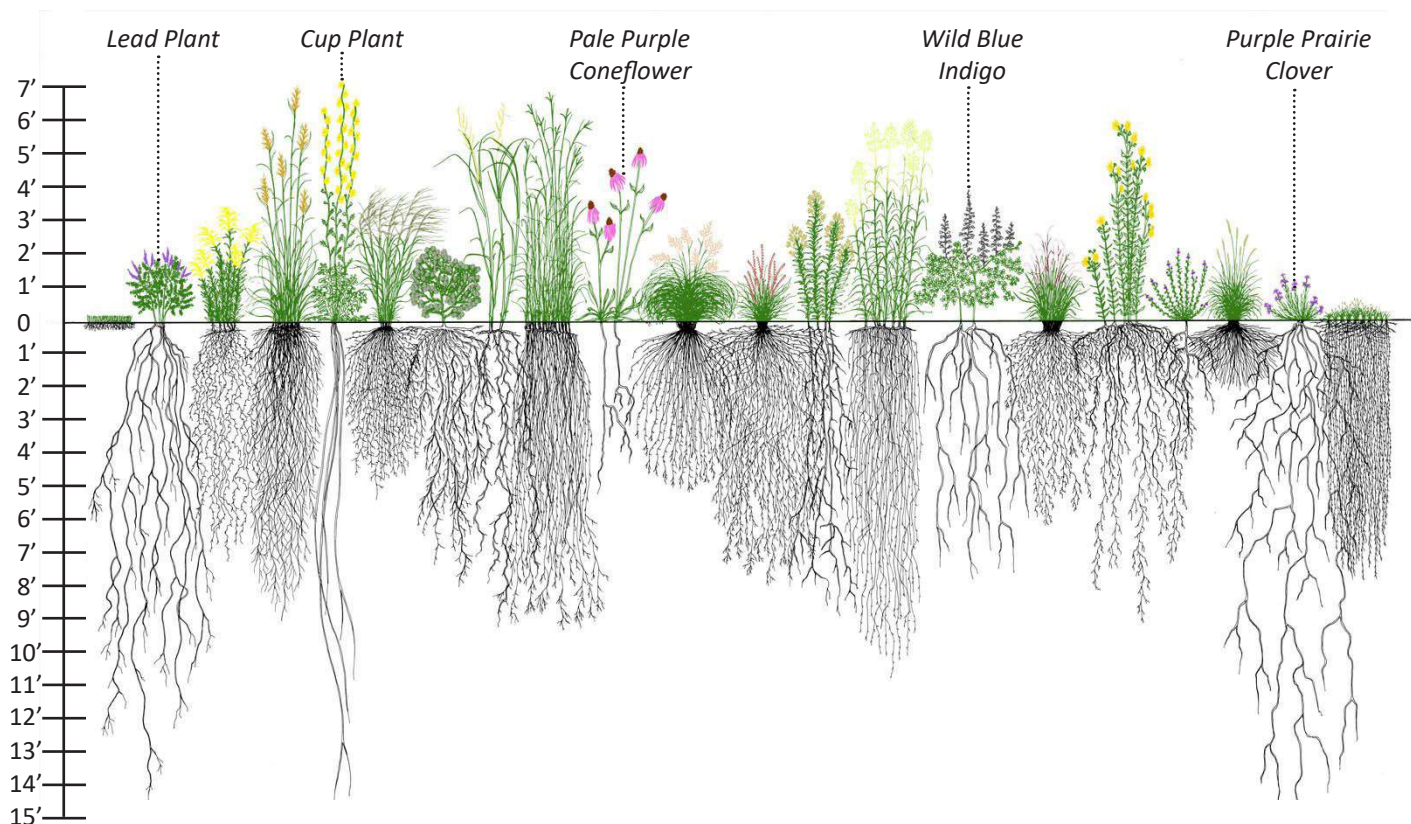
Permeable pavers with bedding course

Permeable paver surfaces look very similar to conventional paver surfaces, but construction of the sub-base is much deeper and built to collect and temporarily store stormwater.

NURTURING HEALTHY SOILS

Healthy soil plays a very important role in creating a resilient yard and ecosystem. Soil is the foundation upon which plants grow. Healthy soil anchors mature trees, seedlings, and everything in between. **Healthy soil is alive!** It has pores and channels throughout the soil structure, and is held together by the action of billions of thriving microbes. Healthy soils capture water more effectively during heavy rains, are more resilient during drought, recharge groundwater and support healthy plants. It is time to consider what is below the surface of the soil when creating resilient landscapes above it. This section describes some of the challenges to healthy soil and suggestions for improving soil health in your yard.

Soil compaction is a major challenge to healthy soil, especially in an urban and suburban environment. Soils get compacted from many common human activities. Heavy trucks used to build a house, tilling, even fertilizers and pesticides can destroy healthy soil. Healthy soil has air pockets that allow oxygen to reach microorganisms in the soil. When soil has been compacted or crushed by heavy machinery, those air pockets go away and so do the microorganisms that rely on them. Tilling does the same thing by pulverizing the structure of the soil. Chemicals such as synthetic fertilizers and pesticides have much the same effect by harming the microorganisms in the soil that help create its structure and overall health.



What can you do?

Keep the soil covered! Bare soil will get compacted and lose its structure when rain beats down upon it. To restore soil health, start by keeping shredded hardwood mulch, dried leaves, grass clippings or groundcovers on the soil. Using mulch has additional benefits like reducing weeds, holding moisture in the soil and adding organic matter to the soil as the mulch breaks down. If you need to turn your soil, use a shovel instead of a tiller. And avoid spraying herbicides or pesticides on your soil.

Increase Plant Diversity! Plants have incredibly diverse root systems, and having a diversity of plants in your yard will mean that there is a diversity of root structures below ground. We're talking about trees, shrubs and perennials. Some native prairie plants have fibrous root systems that extend 15 feet into the ground! When 30% of their roots die back every winter, they add organic matter and leave channels for water to percolate through the soil. Talk about a great way to re-engineer your soil, while supporting pollinators at the same time!



Prairie roots

Deep-rooted prairie natives



White Wild Indigo



Butterfly Milkweed



Pale Purple Coneflower



Greenheaded Coneflower



Joe Pye Weed



Prairie Blazingstar



Little Bluestem



Showy Goldenrod

NURTURING HEALTHY SOILS

Living Soils

Did you know that there are billions of living organisms in healthy soil? Soil is not just made up of minerals and organic matter, it is the living organisms in soil that are essential to plant growth and healthy soil ecosystems. **One teaspoon of healthy soil contains 100 million to 1 billion individual microorganisms.** By minimizing tilling and chemicals, and keeping your soil covered you are providing a healthy environment for the microorganisms in your soil.

Living in the soil are plant roots, bacteria, fungi, protozoa, algae, mites, nematodes, worms, ants, maggots, insects and grubs, and larger animals. The millions of species and billions of organisms in soil represent the greatest concentration of biomass anywhere on the planet. These organisms create the soil food web.



Soil microorganisms

There are many ways that the soil food web is an integral part of landscape processes:

- Soil organisms decompose organic matter such as manure, decaying plants, and pesticides, preventing them from entering water and becoming pollutants.
- They sequester nitrogen and other nutrients that might otherwise enter groundwater, and they fix nitrogen from the atmosphere, making it available to plants.
- Soil organisms help plants get nutrients from the soil and help defend against pests.
- Mycorrhizal fungi serve as root extensions that take minerals from soil and trade them with plants for sugars.
- Many soil organisms enhance soil aggregation and porosity, thereby increasing infiltration of runoff.



Soil macroorganisms

Mycorrhizae

Soil mycorrhizae are fungal communities that are especially important for healthy plants and soil. They are the underground parent organisms that produce mushrooms, and form a network of filaments that are associated with plant roots. These networks transfer water and nutrients to the roots that the plant roots would not otherwise be able to access. In turn, the plant roots provide sugars to the mycorrhizal network. Soil mycorrhizae clump particles of soil together, helping soil to resist erosion, retain moisture and reduce compaction.

Research has shown that plants inoculated with mycorrhizae grow faster and larger than those without inoculation, but their effectiveness is often unproven in the landscape. It is recommended to incorporate wood-based mulch as a natural inoculant and a microbial food source instead.

The Rusty Patched Bumblebee

also calls the soil “home.” In the spring, the queen bee builds a nest in the ground, either by excavating its own in loose (i.e. non-compacted) soil, or often by claiming an abandoned rodent’s burrow for its own. Throughout the spring and early summer she’ll raise a group of worker bees who then help raise a new batch of queens and drones. In the fall, the new queens and drones leave the nest to mate, and the queens bury themselves under a few inches of undisturbed soil to overwinter and start their own colonies next spring.



Examples of soil mycorrhizae

NURTURING HEALTHY SOILS

Organic matter and soil amendments

Organic matter is an essential component of healthy soil. By building soil organic matter and allowing for the creation of soil aggregates and good soil structure, you can create a healthy soil.

Benefits of Soil Organic Matter:

- Provides food and energy for soil and animals
- Increases water infiltration and retention
- Holds nutrients which are then available for plants
- Helps sand, silt and clay form aggregates
- Improves soil structure, which increases pore space and decreases compaction

Organic matter derived from plants or animals, such as manure, leaf or yard waste, compost or compost tea, are great options as they break down easily into the nutrients that are readily available to plants and soil organisms. When using these materials you are not supporting the production of synthetic chemical fertilizers, which can often leave residues of salts in the soil, can more easily leach excess nutrients causing water pollution, and can kill beneficial microorganisms.

High quality natural soil amendments can vary greatly but here's what to look for to provide the most benefit to urban soils, while minimizing nutrient leaching:

- Organic matter should be at least 25% of the compost by weight.
- Manure, yard waste and composted food waste (in that order) have been found to be beneficial.
- A lower Carbon-to-Nitrogen ratio (C:N) is helpful for plant establishment and a C:N ratio of 10:1 or 20:1 is ideal for larger, established plants.

Good compost should smell earthy. Bagged compost can go bad due to a lack of oxygen. Try to smell it before buying; an offensive odor means it has spoiled.



Mulching leaves back into a lawn



Compost is broken down organic material



Spraying compost tea on a lawn



Double-shredded hardwood mulch



Spread shredded leaves on perennial beds



Wild geranium and dead nettle ground cover

Mulch

As we mentioned earlier, keeping the soil covered is a first step to improving soil health, especially in an urban environment. Let's take a closer look at how you can do this!

Double-shredded Wood Mulch

- Available at garden centers, in bulk and in bags.
- Binds together and is great for weed suppression and holding moisture in the soil.
- Apply it 2-3" deep under existing trees, shrubs, perennials and in any landscaped areas.
- Breaks down over time (adding organic matter to soil), may need to be replenished every few years.
- Use wood mulch until your plants get bigger and fill in, then you may only need to replenish it in small areas between the plants to cover the soil.

Leaves and grass clippings

- Leaves and grass clippings provide great, free mulch.
- In the fall, use a bagging mower to chop up leaves that fall just on your lawn, then add them to your landscaped areas.
- It is important to not chop up ALL your leaves. Many native insects, including fireflies and some butterflies, spend their winters rolled up in leaves.
- In the summer, apply your lawn clippings to your perennials beds for added nitrogen and cover.

Living Mulch & Groundcovers

- These are low-growing plants that cover the soil below larger perennials, shrubs and trees. Examples include: Dutch white clover, wild ginger, penn sedge, wild strawberry, violets, creeping phlox, and wild geranium.

Not recommended for ground cover:

Dyed mulch, shredded tire & rubber mulch, plastic landscape fabric, and rock.

THE VALUE OF TREES IN THE LANDSCAPE

Trees and shrubs play a very important role in the landscape

- Many trees and shrubs flower early (often in March-May) providing critical early season food for pollinators.
- Trees absorb huge amounts of stormwater runoff.
- Shade from trees combat the urban heat island, cooling the ground by up to 40°F.
- Planting a diversity of trees and shrubs creates a resilient landscape.
- Root systems host billions of microbes that break down pollutants and supply nutrients to plants.
- Documented benefits of trees in the landscape include improving public health, sequestration of carbon dioxide from the atmosphere, and increased property values.



American basswood planted as a street tree

When selecting a tree for your yard, consider a few factors to make sure you choose the right tree. Things to consider:

- How much space is there for the tree to grow to maturity? If there are overhead power lines or lots of existing trees, consider an understory tree.
- Don't plant the tree too close to your house. Think about your roof overhang. **A Metro Bloom's rule of thumb: 10 feet from any structure, or the height that the structure/basement goes into the ground.**
- If you have space for a large, overstory tree, go for it! Planting on the west side of your house can provide late day shade, but allow for sunlight from the south in winter.
- **Locate underground utilities: call Gopher One at 811**



Red Buckeye



Serviceberry



Winterberry

Online Tree Resources

- I-tree
- James Urban Tree Resources
- Scenario Journal: Building the Urban Forest
- Minnesota Tree Care Advocate
- UMN Extension's Trees and Shrubs
- Arbor Day Foundation

TREES (large to small)

Common Name	Latin Name	Height	Width	Soil	Light
Bur Oak	<i>Quercus macrocarpa</i>	70-80'	70-80'	Dry/Medium	Sun
American Basswood/Linden	<i>Tilia americana</i>	50'-80'	30'-50'	Medium	Sun
River Birch	<i>Betula nigra</i>	50-75'	35-50'	Medium/Wet	Sun/Part
Kentucky Coffee Tree	<i>Gymnocladus dioica</i>	50-70'	30-50'	Medium	Sun
Swamp White Oak	<i>Quercus bicolor</i>	50-60'	50-60'	Medium/Wet	Sun
Red Maple	<i>Acer rubrum</i>	40-70'	30-50'	Medium/Wet	Sun/Part
Freeman Maple	<i>Acer x freemanii</i>	40'-50'	25'-40'	Medium	Sun
Ironwood/Hop Hornbeam	<i>Ostrya virginiana</i>	20-40'	15-30'	Medium	Part/Shade
Blue Beech/Hornbeam	<i>Carpinus caroliniana</i>	20-35'	20-35'	Medium	Part/Shade
Eastern Redbud	<i>Cercis canadensis</i>	20-30'	25-30'	Medium	Sun/Part
Pagoda Dogwood	<i>Cornus alternifolia</i>	15-25'	20'-25'	Medium	Part/Shade
American Plum	<i>Prunus americana</i>	15'-25'	15'-25'	Dry/Medium	Sun/Part
Eastern White Cedar/Arborvitae	<i>Thuja occidentalis</i>	10'-40'	10'-20'	Medium	Sun
Eastern Red Cedar	<i>Juniperus virginiana</i>	10'-30'	6'-15'	Dry/Medium	Sun/Part
Serviceberry	<i>Amalenchier arborea</i>	15'-25'	15'-25'	Medium/Wet	Sun/Part

SHRUBS (large to small)

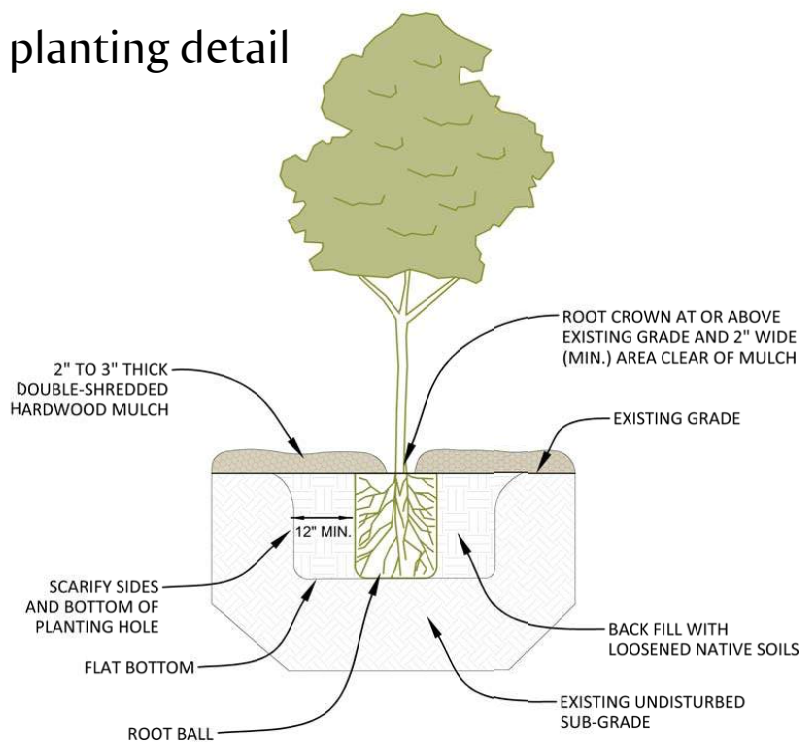
Common Name	Latin Name	Height	Width	Soil	Light
Red Buckeye	<i>Aesculus pavia</i>	12-15'	12-15'	Medium	Sun/Part
Eastern Wahoo	<i>Euonymus atropurpureus</i>	12-20'	15-25'	Medium/Wet	Sun/Part
Witch Hazel	<i>Hamamelis virginiana</i>	10-20'	10-20'	Medium	Sun/Part
Pussy Willow	<i>Salix discolor</i>	6'-15'	4'-12'	Medium/Wet	Sun/Part
Winterberry	<i>Ilex verticillata</i>	5'-12'	5'-12'	Medium/Wet	Sun/Part
Elderberry	<i>Sambucus canadensis</i>	5-12'	5-10'	Medium/Wet	Sun/Part
Buttonbush	<i>Cephalanthus occidentalis</i>	4'-12'	4'-8'	Medium/Wet	Sun/Part
Red-osier Dogwood	<i>Cornus sericea</i>	6-9'	7-10'	Medium/Wet	Sun/Part
Ninebark	<i>Physocarpus opulifolius</i>	5-8'	4-6'	Dry/Medium	Sun/Part
Black Chokeberry	<i>Aronia melanocarpa</i>	3-8'	2-6'	Medium	Part/Shade
Raspberry	<i>Rubus ssp.</i>	3-7'	4+'	Medium	Sun/Part
Dwarf Bush Honeysuckle	<i>Diervilla lonicera</i>	2-3'	2-4'	Medium	Sun/Shade
New Jersey Tea	<i>Ceanothus americanus</i>	1'-3'	2'	Dry	Sun/Part

Rusty Patched Bumblebee Preferred Plant

How to plant a tree or a shrub

- Dig a wide, shallow hole the same depth as the container or root ball of the tree or shrub you plan to plant, and 2-3 times as wide as the container. The hole should be as wide at the bottom as it is at the top. Roughen sides of the hole.
- If you are planning to add compost, add it to the hole and mix it in thoroughly to existing soil.
- Fill the hole with water and allow it to soak into the ground prior to planting.
- Remove the tree or shrub from the container. If the roots are circling the root ball, use a hand saw to cut off the circling roots. This will not hurt the tree! It is much better to cut the circling roots than to leave them where they will eventually strangle and kill the tree.
- Plant the tree or shrub so that the root flare, the spot where the trunk flares out to the roots, is 1" above the soil surface. Ensure the tree is straight.
- Backfill the soil into the hole a little at a time, gently packing the soil around the base of the root ball to stabilize it as you go.
- Mulch around the base of the tree with 2"-3" of double-shredded hardwood mulch. Do not place mulch up to the trunk. Place a ring of mulch around the tree at least 2" from the trunk. Do not grow lawn up to the base of the tree as mowing and weed-trimming can damage the trunk.
- Water thoroughly after planting. Water slowly and for longer rather than all at once.

Tree planting detail



Make sure that

mulch is not piled up against the tree. The root crown should be just above the surrounding grade, and mulch should not be touching its bark. Trees with root crowns planted below ground or with mulch piled up against them can suffer from root girdling or rot.

TURF ALTERNATIVES

Expand the positive ecological impact of your property by considering low-input alternatives to turf grass. Traditional lawns require frequent watering and regular fertilizer application and mowing to maintain a healthy appearance. By switching to a low-input alternative, you can cut down on each of these practices. A successful turf alternative needs to match how you use your yard. By studying the function, traffic flow, and sun/shade patterns of your yard, you can determine an appropriate alternative. Below are three types of turf alternatives. The next page goes into more detail about Bee Lawns. See the plant list at the bottom of this page for more information about the plants that can be part of your new “lawn”.

Low-Maintenance Turf

Similar to typical lawn but made up of species needing less inputs

- Can be used in frequently used areas
- Species for the northern climate include **fine and tall fescues**



Bee and Pollinator-Friendly Lawn

Introduce low-growing plants to provide food for pollinators.

- Not a traditional, “picture-perfect” lawn
- Can be used in high-intensity or frequently used areas
- Suitable for sun or shade
- **Fine fescue, clovers, self heal, creeping thyme**



Perennial Ground Cover

Remove turf & replace with a matrix of tightly knit grasses & forbs.

- Best for low traffic, minimal use areas
- Requires hands-on maintenance for 2-3 growing seasons
- Suitable for sun or shade



Common Name	Latin Name	Dimensions	Soil Type	Sun/Shade	Bloom Period			
					Early	Spr	Sum	Fall
Fine Fescue	<i>Festuca spp.</i>	1-8"	dry to mesic	Sun/full shade	N/A			
Dutch White Clover	<i>Trifolium repens</i>	2-8"	dry to mesic	Sun/partial shade		X	X	X
Self-heal	<i>Prunella vulgaris</i>	2-8"	dry to mesic	Sun/partial shade		X	X	
Creeping Thyme	<i>Thymus serpyllum</i>	2-6"	dry	Sun			X	X
Prairie Smoke	<i>Geum triflorum</i>	8-12"	dry	Sun	X	X		
Butterfly Milkweed	<i>Asclepias tuberosa</i>	18"	dry to mesic	Sun		X	X	
Purple Prairie Clover	<i>Dalea purpurea</i>	2'	dry to mesic	Sun			X	X
Pussytoes	<i>Antennaria neglecta</i>	6-12"	dry to mesic	Sun/partial shade	X	X		
Path Rush	<i>Juncus tenuis</i>	2-24"	dry to mesic	Sun/partial shade		X	X	
Blue Grama	<i>Bouteloua gracilis</i>	12-24"	dry to mesic	Sun/partial shade			X	X
Whorled Milkweed	<i>Asclepias verticillata</i>	2'	dry to mesic	Sun/partial shade		X	X	X
Woodland Strawberry	<i>Fragaria vesca</i>	6-12"	dry to mesic	partial/full shade	X	X		
Common Violet	<i>Viola sororia</i>	3-8"	dry to mesic	partial/full shade	X	X		
Canada Anemone	<i>Anemone canadensis</i>	1-2'	mesic to wet	partial/full shade		X	X	
Virginia Waterleaf	<i>Hydrophyllum virginianum</i>	1-2'	mesic to wet	partial/full shade		X		

Rusty Patched Bumblebee Preferred Plant

POLLINATOR LAWNS

Pollinator friendly lawns contain a mixture of turfgrass and low-growing flowers. These plantings are designed to maintain the recreation and aesthetics traditionally associated with a lawn, while providing high quality forage for pollinators. Pollinator lawns can be installed via overseeding, where flower seed is spread evenly across an already established lawn, or as a lawn renovation, where pre-existing turf is removed and new grass and flower seed are spread at the same time across the soil.



Common name	Latin name	Seeding rate
Fine fescue*	<i>Festuca spp.</i>	4 lbs/1000 sq ft
Dutch white clover	<i>Trifolium repens</i>	3.2 oz/1000sq ft
Creeping thyme	<i>Thymus serpyllum</i>	1.0 oz/1000sq ft
Self-heal	<i>Prunella vulgaris</i>	3.6 oz/1000 sq ft

Seeding rates for bee lawn species

Pollinator lawn fun fact:
Over 60 species of bees have been observed on pollinator lawns in Minneapolis alone!

Bee Lawn Establishment	
Overseeding	Lawn Renovation
<ol style="list-style-type: none"> MOW your lawn as short as possible. A low mow will improve seed to soil contact upon seeding. RAKE away lawn clippings to expose the soil. SPREAD the pollinator lawn seed mix evenly throughout the lawn area. WATER the lawn 2-3x per week for the first month after planting. Rain and irrigation combined. <p>*NOTE* ONLY overseed into lawns containing either Kentucky bluegrass (KYBG) or fine fescue (FF).</p>	<ol style="list-style-type: none"> REMOVE your existing turfgrass. Use a sodcutter for a small area, or contact a local landscape professional for a larger area. SPREAD the pollinator lawn seed mix evenly throughout the lawn area. WATER the lawn 2-3x per week until grass germinates <p>*NOTE* Lawn renovation should be considered if lawn is overrun by weeds, or if turf present is not KYBG or FF.</p>



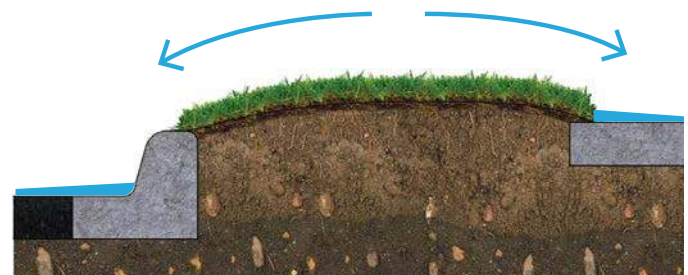
BOULEVARD GARDENS

Urban boulevards tend to rise over time as a result of bio-accumulation and soil erosion from neighboring properties. This tends to block water from flowing into the boulevard and results in thirsty grass and trees. This can also cause dangerous ice problems in the winter. Boulevard gardens can alleviate these common problems, provide pollinator habitat and serve to beautify your neighborhood.

The key is to lower the soil below the level of the sidewalk to encourage water to flow into the boulevard and infiltrate into the ground. This new condition allows plants in the boulevard to utilize more rainwater, and will keep walkways dry.

If you decide to plant your boulevard with flowering plants, make sure that the level of mulch is below the level of the sidewalk. This ensures that the mulch will be held in place and not end up all over the sidewalk or even worse, in the storm drain!

Many cities have height restrictions for boulevard plantings. Most require that they are under 36", and under 24" if you are on a corner. Check local ordinances so that you can choose plants that will be in compliance.



Typical Urban Boulevard

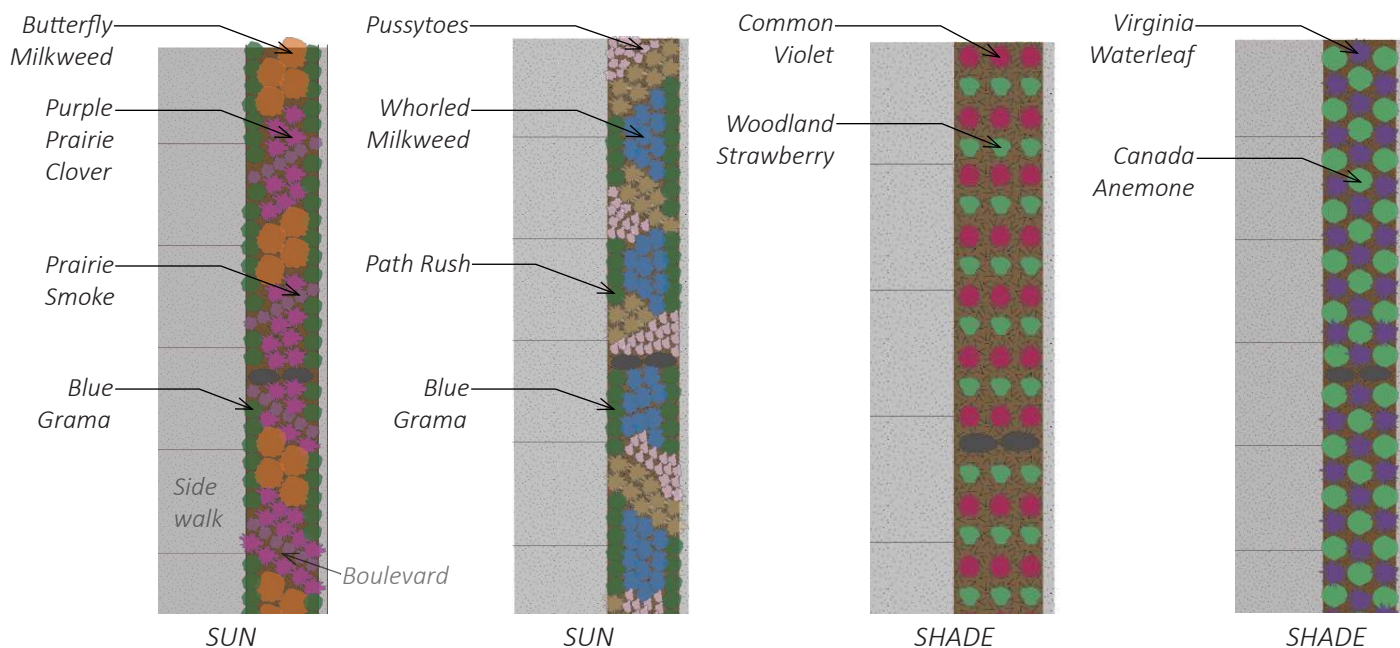


Lowered Turf Boulevard



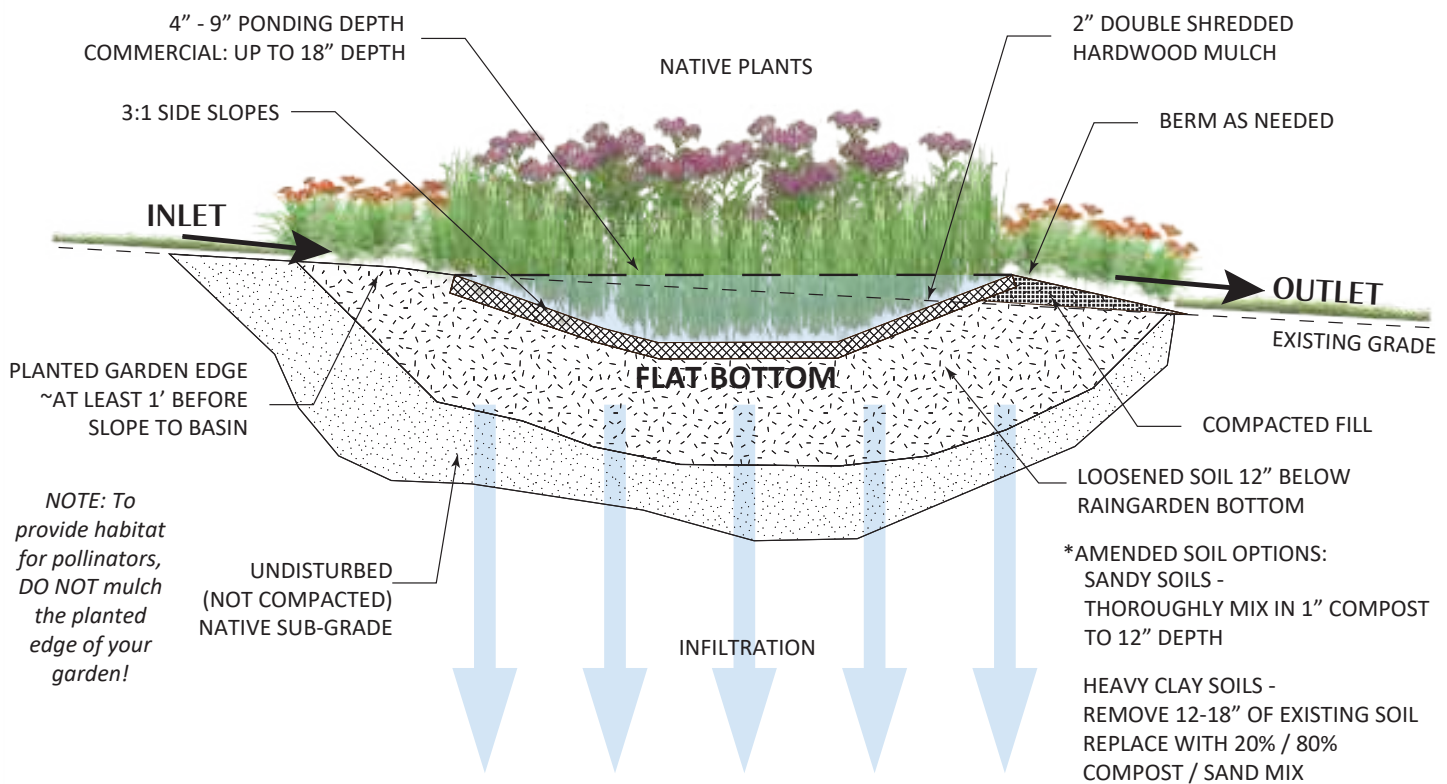
Boulevard bioswale

Boulevard Plant Palettes



RAINGARDENS

A **raingarden** is a bowl-shaped garden with a flat bottom that is designed to collect and infiltrate stormwater runoff from impervious surfaces such as roads, driveways, roofs, and sidewalks. Minnesota's lakes and rivers are increasingly polluted, and the greatest source of water pollution in urban and suburban areas is from stormwater runoff.



Stormwater runoff affects wildlife and our drinking water supply. The water that flows over the urban landscape picks up road salt, sediment, oils, heavy metals, animal waste, fertilizers and organic wastes. Raingardens capture runoff before it flows into the storm sewer system and help to clean water the way nature originally intended.

Raingardens are typically 6 - 9" in depth and drain completely within a 24 - 48 hour period. Most raingardens are designed with plants that are well-adapted to the unique conditions of our region.

For more information:

- *The Blue Thumb Guide to Raingardens*
By Rusty Schmidt, Dan Shaw, and David Dods
- *Plants for Stormwater Design, Vol. I, II*
By Rusty Schmidt, Dan Shaw



Ripley Gardens, Minneapolis 2019

RAINGARDEN PLANNING

Infiltration Test

How much water can your soils infiltrate?

- Dig a coffee can-sized hole in your chosen location.
- Fill your hole with water and let all of that water soak into the ground.
- Fill the hole with water again; mark the full water level with a stick or pencil (as shown in the photo) to keep track of how long it takes all of the water to infiltrate.
- Measure the distance from the stick to the top of the water after one hour. Use the equation below to calculate the depth of your raingarden.
- Even though your soils may have the capacity to infiltrate more than 12" of stormwater, residential raingardens are typically 4 - 9" deep.



Filling test hole with water

1 hour measurement (inches) x 24 hours = Amount of water your soil can infiltrate
For example: 1/4" per hour x 24 hours = 6" deep raingarden

THIS INFORMS HOW DEEP YOUR RAINGARDEN CAN BE

Siting Your Raingarden

Where can your raingarden be built?

- Look for a spot that is a minimum of 10' from any basement foundation.
- Avoid trees. Stay out of the dripline—roots generally extend at least as far as the leaves above them.
- Avoid utility lines and septic tanks.
- Direct downspouts, sump pump outlets, and/or driveway water runoff into raingarden.



Raingarden basin sited the proper distance from a house

RAINGARDEN DESIGN

Sizing Your Raingarden

- **A = Area of your property draining to the raingarden, measured in square feet...**
(length x width)
- **D = Depth of raingarden in inches (from your percolation test)**

Area of roof draining to raingarden

Downspout extension

Raingarden



Raingarden capturing specific part of roof

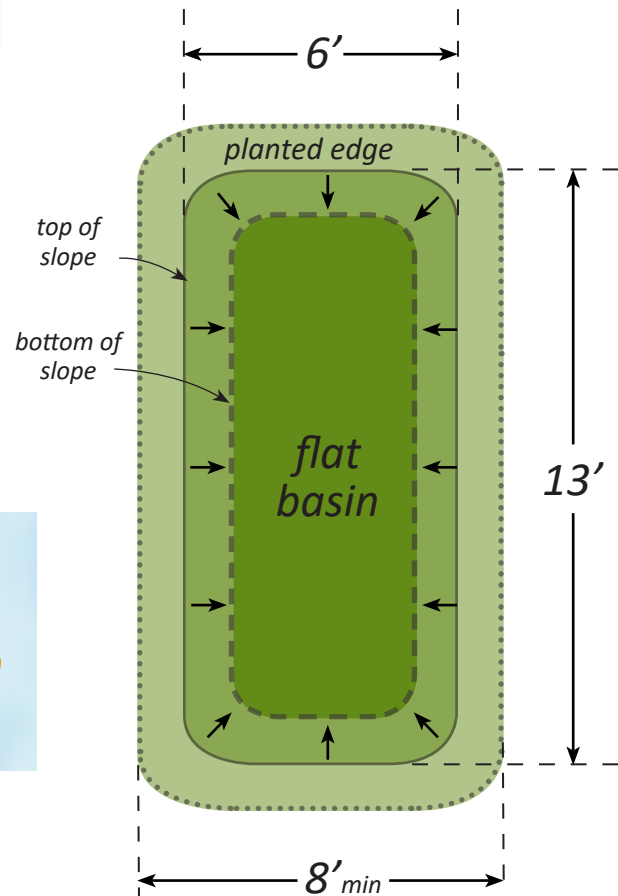
$$A / D = \text{Garden Size}$$

(This equation is for a 1-inch / 24-hr rain event)

Here is an example:

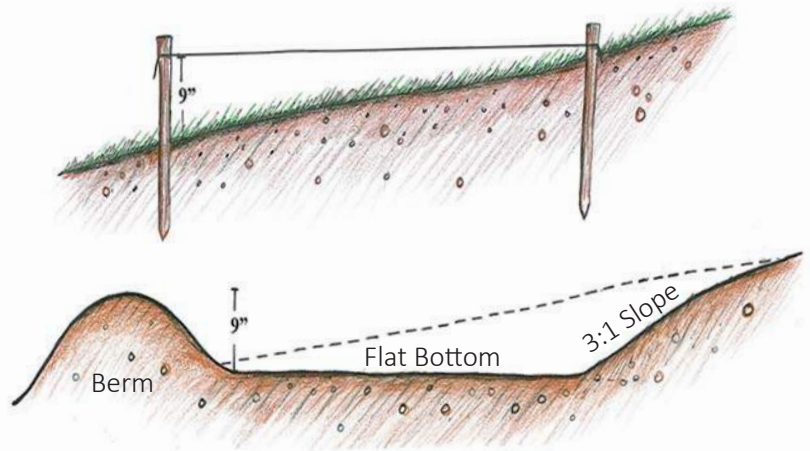
- Michelle's Driveway = **450 square feet**
- Michelle's infiltration test indicated that she could get 6" of water to soak into the ground within 24 hours:

450 sq ft of driveway / 6" depth =
75 square feet of raingarden



Raingardens on a Slope

- If your yard is sloped, a small berm or retaining wall may be needed on the downhill side in order to hold water in the garden.
- Use stakes and a string to level the top of the garden and help you decide how high to make the berm or wall.
- Practice cut and fill; use soil dug from the basin to build the berm.



Drawing of raingarden basin on a slope



Raingarden at Ralph Rapson Hall - University of MN Twin Cities Campus



Raingarden capturing driveway runoff



Raingarden capturing roof runoff

RAINGARDEN INSTALLATION



1. Materials

Double-shredded hardwood mulch, organic compost, rock (for conveyance), plants



2. Lay out the Garden

Using spray paint or a garden hose.



3. Remove Sod

Sod can be rolled up and reused, composted, or given away.



4. Dig the Basin

Start by excavating the basin area to desired depth, then simply turn over the side slope area.



5. Amend with Compost

If your rain garden is sandy, spread a layer 1" thick. A little bit goes a long way with natives! Mix thoroughly to 12".



6. Grade Slopes and Flatten Bottom

Check that the overflow/outlet is lower than the top of the inlet; be careful not to step in your garden.



7. Check Your Level

Use a 4' level to make sure that the basin is flat.



8. Mulch First

Applying mulch first is much easier, and it reduces soil compaction during planting!



9. Then Plant

Break apart root ball and make sure to plant roots into soil rather than just the mulch.



10. Water

Plantings should receive at least 1" per week for the first year following installation.

Raingarden Installation Tip: Reuse the soil excavated from the basin for a berm on the downhill side of the garden or in a different place in the yard. Flip over sod rolls to serve as the base of a larger berm. Soil and sod may also be given away to neighbors or friends.

DESIGNING WITH NATIVE PLANTS FOR POLLINATORS

Full Sun to Part Shade

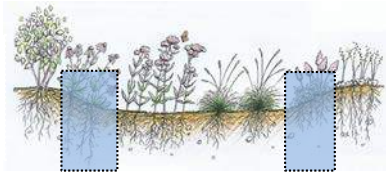


Dry Soil
(Dry, Dry Mesic)



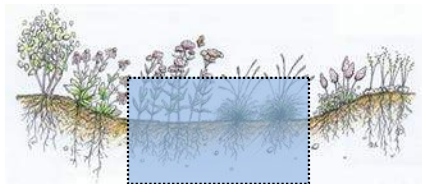
Spring	Late Spring to Summer			Summer to Fall	
<i>Prairie Smoke</i>	<i>Lance-Leaf Coreopsis</i>	<i>Butterfly Weed</i>	<i>Meadow Blazing Star</i>	<i>Prairie Dropseed</i>	<i>Aromatic Aster</i>

Average Soil
(Mesic)



Spring	Late Spring to Summer			Summer to Fall	
<i>White Wild Indigo</i>	<i>Ohio Spiderwort</i>	<i>Wild Strawberry</i>	<i>Blue False Indigo</i>	<i>Common Wood Sedge</i>	<i>Black-eyed Susan</i>

Moist Soil
(Wet Mesic)



Spring	Late Spring to Summer			Summer to Fall	
<i>Blue Flag Iris</i>	<i>Purple Coneflower</i>	<i>Bee Balm</i>	<i>Swamp Milkweed</i>	<i>Pink Turtlehead</i>	

Soil Moisture Tolerance

Moisture tolerance refers to the level of pooled water that specific species of plant will be able to tolerate within a raingarden. This is one of the more important plant characteristics required for your planting design because not all native plants can thrive in the basin of a raingarden where water will collect.

You can use the charts on pages 29-31 to help you make decisions about plants, and even incorporate shrubs from page 16 if your garden is large enough.

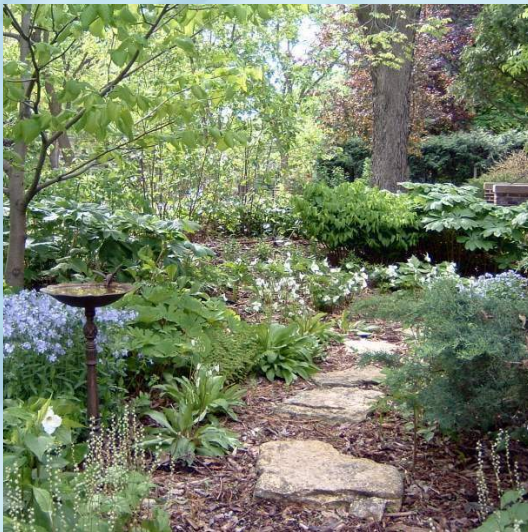
The important thing to remember is that plants chosen for your raingarden basin are not wetland plants. Wetland plants need constantly wet conditions, similar to a wetland or the edge of a lakeshore. Raingarden basin plants are prairie plants that can tolerate temporary inundation, but not constant wetness. Plants that are good choices for raingarden basins are plants with a wet to medium soil moisture tolerance.



Plantings in the basin must be able to withstand periods of inundation

Natives for Shade

There are many wonderful native plant species that will work for raingardens in shaded areas. Typically, natives for shady areas are plants that would be found in woodland areas throughout our region. Shade tolerance can be a rather complex set of characteristics unique to each species, but in general shade conditions receive less than 3 hours of sunlight. Also, the quality of the available sunlight will be defined by the time of day the area will receive direct light. A shade- to part-shade garden will be more appropriate where there is some filtered light in the morning or late afternoon.



Shady landscape planting created by EnergyScapes

Plant Selection Tip

Full sun > 6 hours
 Part sun/shade 3 - 6 hours
 Shade < 3 hours

For more information on native plants, visit the Blue Thumb native plant finder: bluethumb.org/plants/

Part Shade to Shade



Dry Soil
(Dry, Dry Mesic)



Spring

Late Spring to Summer

Summer to Fall

Wild Geranium

Lady's
Mantle

Columbine

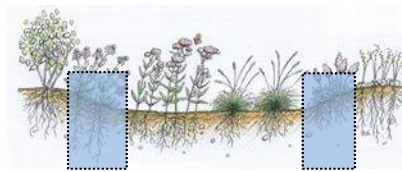
Wild
Garlic

Nodding
Onion

Big-leaved
Aster



Average Soil
(Mesic)



Spring

Late Spring to Summer

Summer to Fall

Jacob's Ladder

Bradbury's
Monarda

Penn Sedge

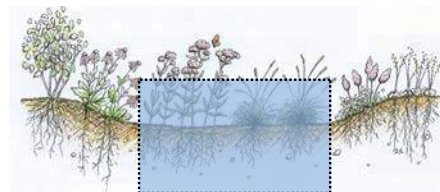
Tall
Thimbleweed

Heart-leaved
Aster

Mistflower



Moist Soil
(Wet Mesic)



Spring

Late Spring to Summer

Summer to Fall

Wild Ginger

Celandine Poppy

Lady Fern

Canada Anemone

Black Cohosh

Great Blue
Lobelia



NATIVE PLANTS FOR RESILIENT YARDS

Native trees, shrubs and perennials help improve water quality by mitigating stormwater runoff and reducing the load of pollutants that reach our waterways. These plants have deep roots that can break up compacted urban soils and allow water to infiltrate into the earth on your property. Root systems also host billions of microbes that break down pollutants and supply nutrients. Additional benefits include lowering energy consumption, improvement of public health, sequestration of carbon dioxide from the atmosphere, providing food and habitat for pollinators, and the creation of aesthetically pleasing spaces for your neighborhood.



Monarch on Rattlesnake master plant

Sun/Part-sun perennials

Common Name	Latin Name	Soil			Dimensions		Bloom Period				
		Wet	Med	Dry	Height	Width	EARLY	SPRING	SUMMER	FALL	LATE
Soft Rush	<i>Juncus effusus</i>	x	x		1-2'	1-2'		x	x	x	
Blue Lobelia	<i>Lobelia siphilitica</i>	x	x		1-3'	2'			x	x	x
Tussock Sedge	<i>Carex stricta</i>	x	x		1-3'	1-2'		x			
Wild Garlic	<i>Allium canadense</i>	x	x	x	2'	6"		x	x		
Mountain Mint	<i>Pycnanthemum virginianum</i>	x	x		3'	1'		x	x	x	
Swamp Milkweed	<i>Asclepias incarnata</i>	x	x		3'	1'		x	x		
Stiff Goldenrod	<i>Solidago rigida</i>	x	x	x	4'	1'				x	x
White Wild Indigo	<i>Baptisia alba</i>	x	x	x	4'	3'		x	x		
Wild Bergamot (bee balm)	<i>Monarda fistulosa</i>	x	x	x	4'	2'			x	x	
Blue False Indigo	<i>Baptisia australis</i>	x	x		4'	2'		x	x		
Little Joe-Pye Weed	<i>Eutrochium dubium</i> 'Little Joe'	x	x		4'	2'			x	x	
Prairie Blazing Star	<i>Liatris pycnostachya</i>	x	x		4'	1'			x	x	
Purple Coneflower	<i>Echinacea purpurea</i>	x	x		4'	1-2'			x	x	x
Boneset	<i>Eupatorium perfoliatum</i>	x			4'	1'			x	x	
Sneezeweed	<i>Helenium autumnale</i>	x			4'	2'				x	x
Indian Grass	<i>Sorghastrum nutans</i>	x	x	x	4-7'	1-2'				x	x
Blue Vervain	<i>Verbena hastata</i>	x	x		5'	1'			x	x	
Tall Bellflower	<i>Campanula americana</i>	x	x		5'	1-2'			x	x	x
Big Bluestem	<i>Andropogon gerardii</i>	x	x	x	5-9'	2-3'			x		
Wild Golden Glow	<i>Rudbeckia laciniata</i>	x	x		7'	3'			x	x	x
Amethyst Shooting Star	<i>Dodecatheon amethystinum</i>		x		1'	1'	x	x			
Midland Shooting Star	<i>Dodecatheon meadia</i>		x		1'	6"	x	x			
White Prairie Clover	<i>Dalea candida</i>		x		1-3'	1'		x	x		
Blue Eyed Grass	<i>Sisyrinchium montanum</i>		x		2'	1'		x			

Rusty Patch Bumblebee Preferred Plant

Common Name	Latin Name	Soil			Dimensions		Bloom Period				
		Wet	Med	Dry	Height	Width	EARLY	SPRING	SUMMER	FALL	LATE
Nodding Onion	<i>Allium cernuum</i>		x		2'	6"			x		
Narrowleaf Purple Coneflower	<i>Echinacea angustifolia</i>		x	x	2'	1'		x	x		
Butterfly Milkweed	<i>Asclepias tuberosa</i>		x	x	2'	1-2'		x	x		
Cream Indigo	<i>Baptisia bracteata</i>		x	x	2'	2'		x			
Pale Purple Coneflower	<i>Echinacea pallida</i>		x	x	2'	1'		x	x		
Showy Beardtongue	<i>Penstemon cobaea</i>		x	x	2'	1'	x	x			
Silky Aster	<i>Symphotrichum sericeum</i>		x	x	2'	1'				x	x
Purple Prairie Clover	<i>Dalea purpurea</i>		x	x	2'	1'			x	x	
Bradbury's Monarda	<i>Monarda bradburniana</i>		x		2'	1'		x	x		
Purple Dome Aster	<i>Symphotrichum novae-anglae</i>		x		2'	3'				x	x
Little Bluestem	<i>Schizacarium scoparium</i>		x	x	2-4'	1-2'					
Common Yarrow	<i>Achillea millefolium</i>		x	x	3'	1'		x	x	x	
Large-flowered Beardtongue	<i>Penstemon grandiflorus</i>		x	x	3'	1'		x			
Beardtongue	<i>Penstemon digitalis</i>		x	x	3'	1'		x	x		
Button Blazing Star	<i>Liatrix aspera</i>		x	x	3'	1'			x	x	x
Common Milkweed	<i>Asclepias syriaca</i>		x	x	3'	1'		x	x		
Lead Plant	<i>Amorpha canescens</i>		x	x	3'	2'		x	x		
Anise Hyssop	<i>Agastache foeniculum</i>		x		3'	1'		x	x	x	
Black-eyed Susan	<i>Rudbeckia hirta</i>		x		3'	2'		x	x	x	
Golden Alexanders	<i>Zizia aurea</i>		x		3'	1'	x	x			
Orange Coneflower	<i>Rudbeckia fulgida</i>		x		3'	2'			x	x	
Prairie Coneflower	<i>Ratibida pinnata</i>		x		3'	1-2'			x	x	
Giant Hyssop	<i>Agastache scrophulariaefolia</i>		x		4'	2'			x	x	
Rattlesnake Master	<i>Eryngium yuccifolium</i>		x	x	4'	1-2'			x	x	
Showy Goldenrod	<i>Solidago speciosa</i>		x	x	5'	2'			x	x	
Meadow Blazing Star	<i>Liatrix ligulistylis</i>		x		5'	1'				x	
Poke Milkweed	<i>Asclepias exaltata</i>		x		5'	2'		x	x		
Common Ironweed	<i>Vernonia fasciculata</i>		x		6'	2'			x	x	
Prairie Smoke	<i>Geum triflorum</i>			x	1'	1'	x	x			
Pussy Toes	<i>Antennaria neglecta</i>			x	1'	1'	x	x			
Prairie Dropseed	<i>Sporobolus heterolepis</i>			x	1-2'	2-3'				x	x
Prairie Junegrass	<i>Koeleria macrantha</i>			x	1-2'	1-2'		x	x		
Prairie Onion	<i>Allium stellatum</i>			x	1-2'	1'			x		
Aromatic Aster	<i>Symphotrichum oblongifolium</i>			x	2'	1'			x	x	x
Wild Lupine	<i>Lupinus perennis</i>			x	2'	1'		x	x		
Hoary Vervain	<i>Verbena stricta</i>			x	2'	1'		x	x	x	
Lance-Leaf Coreopsis	<i>Coreopsis lanceolata</i>			x	2'	1'		x	x		
Canada Wild Rye	<i>Elymus canadensis</i>			x	2-5'	2-3'				x	x
Pearly Everlasting	<i>Anaphalis margaritacea</i>			x	3'	1'			x	x	x

Rusty Patched Bumblebee Preferred Plant

NATIVE PLANTS FOR RESILIENT YARDS

Shade/Part-shade perennials

Common Name	Latin Name	Soil			Dimensions		Bloom Period				
		Wet	Med	Dry	Height	Width	Early	Spring	Summer	Fall	Late
Bloodroot	<i>Sanguinaria canadensis</i>	x	x		6"	6"	x				
Wild Ginger	<i>Asarum canadense</i>	x	x		6"	1'	x	x			
Canada Anemone	<i>Anemone canadensis</i>	x	x		1'	1'		x	x		
Jacob's Ladder	<i>Polemonium reptans</i>	x	x		1'	1'	x	x			
Fox Sedge	<i>Carex vulinoidea</i>	x	x		1-2.5'	1-1.5'		x	x		
Virginia Bluebells	<i>Mertensia virginica</i>	x	x		2'	1-2'	x				
Big-leaved Aster	<i>Symphotrichum macrophyllum</i>	x	x	x	2'	2'				x	x
Solomon's Plume	<i>Smilacina racemosa</i>	x	x	x	2'	1-2'	x	x			
Mist Flower	<i>Eupatorium coelestinum</i>	x	x		2'	1'			x	x	x
Ohio Spiderwort	<i>Tradescantia ohioensis</i>	x	x	x	3'	1'		x	x		
Great Blue Lobelia	<i>Lobelia siphilitica</i>	x	x		3'	1'			x	x	x
Rose Turtlehead	<i>Chelone obliqua</i>	x	x		3'	2'			x		
Zig-Zag Goldenrod	<i>Solidago flexicaulis</i>	x	x		3'	1'				x	x
Culvers Root	<i>Veronicastrum vernonia</i>	x	x		5'	2'		x	x		
White Turtlehead	<i>Chelone glabra</i>	x			5'	2'			x	x	
Black Cohosh	<i>Cimicifuga racemosa</i>	x	x		6'	2'		x	x		
Penn Sedge	<i>Carex pennsylvanica</i>		x	x	6"	6"	x	x			
Wood Betony	<i>Pedicularis canadensis</i>		x	x	1'	6"	x				
Wild Geranium	<i>Geranium maculatum</i>		x		1'	1'	x	x	x		
Virginia Waterleaf	<i>Hydrophyllum virginianum</i>		x		1-2'	1'		x	x		
Alumroot	<i>Heuchera richardsonii</i>		x	x	2'	3'		x	x		
Bottle Gentain	<i>Gentiana andrewsii</i>		x	x	2'	1'				x	
Cream Gentian	<i>Gentiana flavida</i>		x		2'	1'				x	x
Columbine	<i>Aquilegia canadensis</i>		x	x	2'	1'	x	x			
Tall Thimbleweed	<i>Anemone virginiana</i>		x		2'	1-2'		x	x		
Heart-Leaved Aster	<i>Symphotrichum cordifolius</i>		x		3'	1'				x	x
Switchgrass	<i>Panicum virgatum</i>		x	x	3-6'	2-3'			x	x	x

Rusty Patched Bumblebee Preferred Plant

For more information on Native Plants,
visit the Blue Thumb native plant selector:
bluethumb.org/plants

Plants for the Rusty Patch Bumblebee

Wild Bergamot



Columbine



New England Aster



Serviceberry



Purple Hyssop



Gooseberry



Buttonbush



Blazingstar



Culver's Root



Andrew's Gentian



Foxglove Beardtongue



Purple Prairie Clover



GARDEN MAINTENANCE

Maintaining your garden is important, especially during its first three years while the plants establish themselves. The more you know about your plants, the better you can provide for their needs and the better they will perform once established.

Spring

- Cut back last year's growth. Leave 18" of stem for pollinators to nest in
- Inspect for erosion
- Pull weeds
- Maintain mulch if desired

Summer

- Inspect for erosion and proper drainage after rainstorms
- Pull weeds
- Water as needed during drought periods
- Take pictures!

Fall

- Clean up excess leaves and trim shrubs
- Deadhead and/or disperse seeds if desired (not necessary for garden health)
- Leave plant duff until spring

Winter

- Try to avoid plowing or shoveling excess snow into your raingarden.
- Keep de-icing salts out of the garden
- Dream up new garden possibilities for next season!

Plant Establishment

Year 1

- Ensure plants get a minimum of 1" of water per week, saturating the soil
- Weed raingarden as needed (see next page)
- Monitor for plant establishment, erosion of inlet or outlet, and ponding water; ensure that water flows into the raingarden freely
- Leave 'duff' (decaying plant material) until spring of the following year and cut back before new growth begins. This will increase insect and bird habitat throughout winter dormancy

Year 2

- Clear basin of any leaves, sediment or trash that may have collected over the winter
- Weed raingarden as needed (see next page)
- Monitor for plant establishment, erosion of inlet or outlet, and ponding water; ensure that water flows into the raingarden freely
- Replace mulch in the basin area if desired; after year three replace as needed
- Replace any plants that did not survive.
- Cut back last year's growth before spring emergence of new growth

Pulling Weeds

Cool-season weeds sprout and spread seed by Memorial Day (on a year with normal spring temperatures). It is imperative that they are pulled prior to spreading seed. The longer they persist, the more established the weed population will become. Avoid using herbicides to remove weeds as this often results in harm to desirable garden plants and is detrimental to beneficial insects and soil health. Weeding becomes less demanding as a garden matures. A newly planted garden will need to be weeded often throughout the season, but once established the plants will naturally suppress weed growth. If unruly weeds continually sprout up in the garden, take time to discover their source.

Pull all warm-season weeds and volunteer trees (ash, elm, hackberry, boxelder, buckthorn) prior to the Fourth of July. Monitor weed emergence throughout the growing season and pull as necessary.



Yellow Nutsedge



Common Ragweed



Lambsquarter



Foxtail

What is a weed?

These plants tend to be aggressive and difficult to remove once established—at the same time, a few still support wildlife or even make a tasty salad or beverage. Some will invariably find their way into your garden; if you choose not to remove them outright, at least keep a wary eye on their behavior.

Cool Season Weeds

- Barnyard Grass
- Common Plantain
- Curly Dock
- Creeping Charlie
- Lambsquarter
- Perennial Rye
- Quackgrass
- Reed Canary Grass

Warm Season Weeds

- Common Burdock
- Common Ragweed
- Common Spurge
- Crabgrass
- Daisy Fleabane
- Foxtail
- Horseweed or Mare's Tail
- Mullein
- Prickly Lettuce
- Sandburs
- Smartweed
- Stinging Nettle
- Thistles
- White Champion
- Yellow Nutsedge

For more information visit the University of Minnesota Extension:
www.extension.umn.edu/garden/yard-garden/weeds

LAWNS TO LEGUMES PROGRAM

The Lawns to Legumes bill

was passed in May of 2019 to promote the conversion of residential turf lawns into pollinator-friendly habitat. This bill places a special emphasis on the conservation of the Rusty Patched Bumblebee, *Bombus affinis*, the first bee species to be listed as an endangered species under the U.S. Endangered Species Act in the continental United States, and the new State Bee of Minnesota.



This program has three components

- Provide grants for demonstration neighborhoods
- Provide grants and coaching for individual residents
- Provide outreach and education for Minnesota



Governor Tim Walz signs the Lawns to Legumes bill into law on May 31, 2019



Funding is provided through the Environment and Natural Resources Trust Fund (ENTRF) and is administered by the Minnesota Board of Water and Soil Resources.



Through BWSR, additional program information, planning guides, templates, plant lists, and more are available online.

<https://bwsr.state.mn.us/l2l>

Minnesota's new state bee and other native pollinators

The Rusty Patched Bumblebee (*Bombus affinis*) was once common throughout the United States, with populations ranging from Minnesota in the Midwest, to Maine in the Northeast, and Georgia in the Southeast. This range of this species has declined in an estimated 87% as compared to its historic range.



What can YOU do to conserve the Rusty Patched Bumblebee?

- **Plant Native Plants:** Wild bees tend to prefer native plants. Studies have shown that installing native plants in residential gardens helps to enhance wild bee diversity and population numbers.
- **Blooms Throughout the Seasons:** The Rusty Patched Bumblebee is active for most of the growing season, from April through September. Make sure you plant flowers with early, mid, and late-season bloom times!
- **Nesting Sites:** The Rusty Patched Bumblebee is a ground nesting bee. Leave some parts of your yard bare and undisturbed to allow the bees to find nesting sites. They often opportunistically claim abandoned rodent burrows.
- **Protection from Insecticides:** Many types of insecticides, especially the neonicotinoid class of insecticides, can be harmful to bees. Make sure to buy plants that are not treated with insecticides, and try to refrain from using chemicals in your yard.



Bee-friendly yard plantings



*Rusty Patched Bumblebee
Photo courtesy of Heather Holm*

Minnesota is home to over 450 species of native bees. Incorporating these techniques into your yard management practices can help to conserve the diverse bee species native to our state.

Who is eligible for this program?

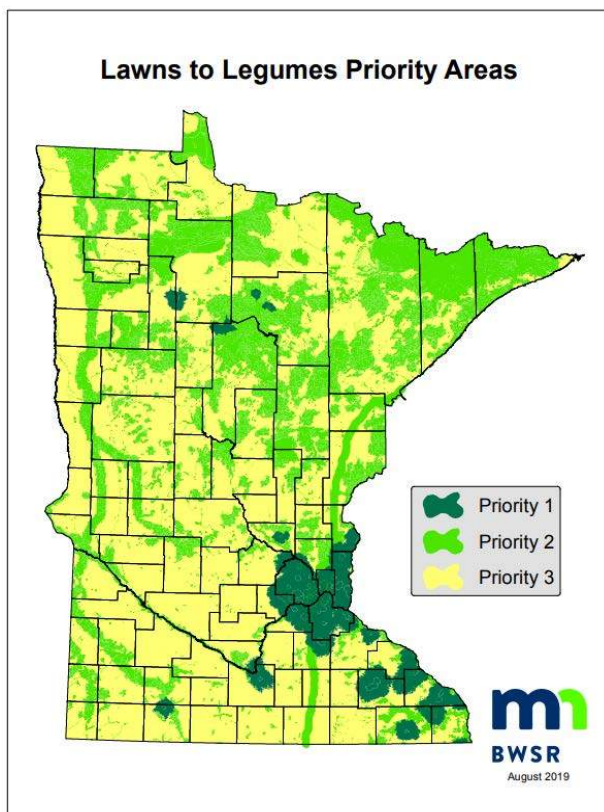
You can get involved in this program by applying for individual support or recording the progress you've made in your yard at bluethumb.org, taking the information here and applying it to your yard, and by using apps or websites like iNaturalist and Bumble Bee Watch to report any Rusty Patched Bumblebees you find.

Demonstration Neighborhoods

Local governments, tribal governments, and nonprofits applied for grants to establish community projects intended to enhance pollinator habitat in key corridors, raise awareness for pollinator conservation, and showcase best management practices.

Individual Support Grants

All Minnesota residents are eligible to apply for individual support grants worth up to \$350. Workshops, coaching, and planting guides and templates are also available through this program. Multiple rounds of funding will take place for individual support grants. Go to bluethumb.org to learn more and apply!



Residents from all parts of Minnesota are eligible to apply for funding in an effort to create a network of pollinator habitat throughout the state of Minnesota. Funding may be targeted in priority areas throughout the State of Minnesota, based on recent sightings of the Rusty Patched Bumblebee.



A neighborhood pollinator garden

Geographic and social equity are important components of the lawns to legumes initiative. This project aims to include residents from diverse backgrounds throughout the state of Minnesota.

Picking the right Lawns to Legumes project for your yard

There are four types of projects that are eligible for funding through the Lawns to Legumes program. Before starting a project, think critically about which project type is best suited for your residence. Consider the following questions when considering :



Flowers, shrubs, and trees can work together to provide food for pollinators

- How much time do you have to dedicate to landcare? Planting types differ in how much maintenance is required to ensure a successful planting.
- How frequently do you use your yard? Do you want to balance recreation and pollinator habitat, or do you want your yard to maximize ecological function?
- Where does the water move throughout your site? Where can you place a planting to capture stormwater runoff?
- How much sunlight does your yard receive? Is this consistent throughout your site? Be sure to pick plants that are suited to the amount of sunlight available.

Guide to Project Types

	Native pocket planting	Flowering trees and shrubs	Pollinator Lawn	Pollinator meadow
difficulty	***	*	****	*****
cost	***	*****	**	*****
install	<ul style="list-style-type: none"> • sod removal • sheet mulching 	<ul style="list-style-type: none"> • dig hole • plant tree/shrub 	<ul style="list-style-type: none"> • overseed • lawn renovation 	<ul style="list-style-type: none"> • solarization • sheet mulching • remove turf & seed
landcare	<ul style="list-style-type: none"> • weed, especially years 1 & 2 • divide plants as they spread 	<ul style="list-style-type: none"> • water, especially years 1 & 2 • prune annually 	<ul style="list-style-type: none"> • weed, especially years 1 & 2 • raise mower height 	<ul style="list-style-type: none"> • weed, especially first few years • mow twice yearly
benefits	<ul style="list-style-type: none"> • easy to maintain • best habitat value for least effort 	<ul style="list-style-type: none"> • easy to maintain • adds habitat value & nest appearance 	<ul style="list-style-type: none"> • pollinator friendly turf alternative • allows for recreation 	<ul style="list-style-type: none"> • high maintenance • greatest habitat & forage value

Native pocket plantings

Small plantings can make a big difference when it comes to pollinator conservation. Native pocket plantings can be as small as 100 square feet, or as large as several hundred square feet. By installing native plants with staggered bloom times, a native pocket planting can help support our native pollinators throughout the growing season. The small size of these plantings make them relatively easy to maintain. Be sure to include species preferred by the endangered Rusty Patched Bumble Bee to help conserve Minnesota’s state bee!



Residential raingardens are pocket plantings

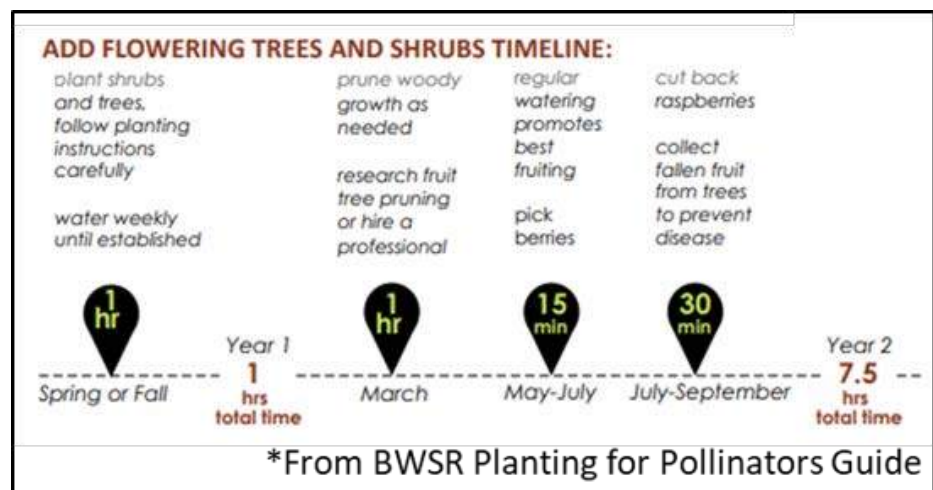
For more information, see pages 27-31 for plant selection, pages 21-26 for rain garden design and installation, and page 20 for working in boulevards.

Pollinator friendly trees and shrubs

Trees and shrubs provide an early season burst of blooms for pollinators. Trees can also serve as nesting habitat for cavity nesting bees, including certain species of bumble bees. Trees and shrubs are a great option for residents who are interested in a low maintenance planting option. They should be planted carefully and watered thoroughly until fully established, after which the only ongoing maintenance required is an annual pruning.



Some tree species, like plum and cherry trees (*Prunus spp.*), provide early season food for bees, and edible products that humans can eat.



See pages 15-17 for more information on trees.

Pollinator Lawns

Pollinator friendly lawns contain a mixture of turfgrass and low-growing flowers. These plantings are designed to maintain the recreation and aesthetics traditionally associated with a lawn, while providing high quality forage for pollinators. Pollinator lawns can be installed via overseeding, where flower seed is spread evenly across an already established lawn, or as a lawn renovation, where pre-existing turf is removed and new grass and flower seed are spread at the same time across the soil

For more information on bee lawns, see page 19.

Pollinator Meadows

Maximize ecological value in your yard area by converting your lawn into a pollinator meadow. A pollinator meadow functions like a native prairie, containing mixtures of native grasses and flowers that were commonplace throughout Minnesota prior to human development. This planting option requires the greatest investment of resources, both in time and money, but the local pollinators will thank you for the high quality forage you are bringing back to your local ecosystem!

Installing a pollinator meadow

- Install your pollinator meadow “bite-by-bite” as a series of native pocket plantings
- Consider organic site preparation methods like solarization or sheet mulching

See pages 27-31 for help with plant selection.



Pollinator lawns look and act much like “regular” lawns, except they support struggling pollinators and increase biodiversity.



Pollinator meadows should contain diverse plants with staggered bloom times to maximize value to pollinators!

For more information on how to sustainably prepare a yard for planting, please refer to the Xerces Society’s Organic Site Preparation guidelines

<https://xerces.org/publications/guidelines/organic-site-preparation-for-wildflower-establishment>

METRO BLOOMS PROGRAMS

Community Installation Projects

We partner with neighborhoods, affordable housing communities, local contractors and governments to install raingardens and native plantings and build awareness about the importance of clean water and urban habitat projects. These programs focus on community participation and leadership to protect water quality, create habitat, enhance green space, and build resilient communities. We focus on equitable engagement to ensure projects benefit those most impacted. Check out the projects page on our website to see where we're working this year.



Volunteers help plant a newly installed rain garden in South Minneapolis

Sustainable Landcare

Maintenance ensures long-term function and beauty of stormwater management practices. Metro Blooms offers affordable landcare and installation services for vegetated stormwater management practices such as raingardens and native plantings at small and large scale sites through our sustainable landcare program.

In addition to field maintenance, we complete inspections and compliance reporting, stormwater credit applications, and offer training for facility staff, residents, outdoor jobs programs, and landscape crews.



Wilderness Inquiry cleaning up after a boulevard installation

Blue Thumb Education

Metro Blooms shares information and resources to build awareness and support for clean water and urban habitat. We host the Blue Thumb – Planting for Clean Water partnership, a public-private partnership of private companies, nonprofits, and local government agencies working towards resilient landscapes and communities. We also work with Blue Thumb partners to host low-cost resilient yard workshops for do-it-yourself home gardeners. Visit our website to see our current workshop selection.



Newly planted boulevards with low-growing native grasses

HELP WITH YOUR PROJECT

Visit metroblooms.org to learn about:

On-Site Consultations

Metro Blooms offers one hour on-site consultations with a Landscape Designer to help you create a resilient landscape. We provide expert design and technical assistance on a variety of topics:

- Stormwater runoff and management practices
- Turf alternatives and bee lawns
- Size, location, and plant selection for gardens and lawns
- Cost share opportunities and stormwater utility fee credit
- Construction oversight and management during installation
- Landcare focused on training in weed identification and management

Landscape Design

Following a site consultation, clients may request a landscape design for their site. This could be for one raingarden or an entire multi-acre property. Our experienced designers can provide concept designs, stormwater management plans, or full-scale construction drawings and planting plans for residential, commercial, or institutional projects. We bring our expertise with native plants and water quality into any landscape project.

Landscape Installation and Care

Our specialty is raingarden installation, but we also install native plantings, stormwater pre-treatment, swales, small patios and retaining walls. Our work is detail-oriented, our pricing is competitive and we always leave a job site cleaner than when we arrived. Following installation, our crew can also help you care for your project long-term.

Led by sustainable landscape experts, our crew work prioritizes ongoing job-training opportunities, enabling us to invest in the green workforce.

Or Check Out a Blue Thumb Partner:

Blue Thumb private partners include plant nurseries, landscape suppliers and landscape design + build companies who are committed to a shared vision of clean water resources supported by beautiful and ecologically functional landscapes that minimize runoff.

Find Blue Thumb partners near you at:

bluethumb.org/partners





PLANTING FOR CLEAN WATER®



metroblooms.org

info@metroblooms.org

(651)-699-2426

[#metroblooms](https://twitter.com/metroblooms)

bluethumb.org

info@bluethumb.org

[#bluethumbmn](https://twitter.com/bluethumbmn)