

# Planting for Pollinators

Principles and Design for  
Residential Pollinator Habitat

**YOUR YARD CAN  
BEE THE  
CHANGE!**

Monarch  
butterfly



Checkerspot  
butterfly



Carpenter  
bee



Rusty patched  
bumblebee



Small Mining  
bee



Bi-colored  
Sweat bee



# Planting for Pollinators

## Principles and Design for Residential Pollinator Habitat

This resource was developed to accompany the state of Minnesota's Lawns to Legumes Program but can be used for anyone interested in creating and managing pollinator habitat.



## Introduction:



### The Lawns to Legumes program

A new state funding and technical assistance program designed to help establish residential pollinator habitat in support the Rusty Patched Bumble Bee and other pollinators.

#### Goals:

1. Create critical pollinator habitat in residential yards.
2. Build public support for high-quality residential pollinator habitat.

The good news is our mandate to provide critical habitat for the Rusty-Patched Bumblebee will also support Minnesota's other pollinators and wildlife, and improve air, soil and water quality.

Creating and maintaining enough high quality plantings to support declining pollinator populations is an enormous effort. We need to change public perception of residential landscapes. We want Minnesotans to embrace pollinator habitat in our yards!

#### Before you begin a pollinator planting project...



You may have heard that native plantings are a lot of work to create and establish. This can be true, but this work is also enormously rewarding. Consider the following:

- This type of project involves a time commitment. Creating and especially MAINTAINING your project will take time, especially in the beginning while your plants are becoming established.
- Your commitment to maintain your planting promotes this effort in your community. You are demonstrating residential pollinator habitat to your neighborhood.
- Your efforts add up! As a part of this statewide campaign to help protect Minnesota's pollinators, more people who build habitat connection in their neighborhoods means pollinators don't have to travel as far to find resources that they need to survive.

#### Some messiness is OK...when its well-planned and intentional.

It is important to know your aesthetic goals before you begin a planting. Projects should be planned to fit into the context of their surroundings. When planting for pollinators, however, keep in mind that what we might think is messy is important for their survival. This includes diverse wildflowers, as well as a variety of nesting habitat (dead stems, brush, wood, rocks or rock piles, and areas with bare ground).

- Are you ready to accept a slightly less groomed yard if it has clear environmental benefits?
- What type of habitat will you provide?
- How large will your project be?





### The Xerces Society On the risk of stings:

Most bees are not aggressive and will not sting unless their nests are disturbed. Bees are very docile when visiting flowers.

...wild native bees are far less aggressive than European honey bees or social wasps.



## What about stings? Is pollinator habitat dangerous?

- Wild native bees are unlikely to sting unless threatened.
- Wear your shoes...the most threatening thing you can do is STEP on a bee.

It's easy to confuse bees -mostly very docile, with social wasps -often aggressive if they have a nest nearby. **Your planting is most likely to attract bees, butterflies, and moths.**

\* Wasps are less likely to visit, but if you do see them that's not a bad thing!  
Many wasps are important predators of garden pests.

## What if I am not a homeowner?

You don't have to be a homeowner to participate in this program! The funding was allocated to residential properties (unfortunately this doesn't include businesses, schools or churches). But there are ways to participate even if you don't own your land.

If you rent your home:

- Ask your landlord for permission to create a Pocket Planting. You will need to assure them that you will be responsible for the maintenance of the planting. The benefits to your landlord are reduced lawn maintenance and beautification of their property.
- Use a Community Garden plot: Planting flowering habitat in your plot not only helps pollinators but is beneficial for vegetable plots as well, since flowering habitat can help increase vegetable pollination rates. You will need to check if the garden is zoned for residential use.
- Help a neighbor. Maybe there is someone in your neighborhood who you could partner with to create pollinator habitat in their yard?
- Plant in pots! You can create a garden on a balcony or outside an apartment with large pots. There are flowering perennial plants that will overwinter in pots with some protection, as well as annuals that are good foraging for pollinators. Be sure to protect your potted garden from wind so that pollinators can access it!

## We need YOU!

**Create pollinator plantings and contribute to the health and survival of our pollinators!**







## Why plant for Pollinators?

Pollinators play an essential role in food production as well as maintaining healthy ecosystems. There are more than 450 native bee species in Minnesota, along with hundreds of species of flower-visiting butterflies, moths, beetles and native flies.

The decline of pollinators and other beneficial insect populations worldwide and in here in Minnesota has led to significant concern by conservation professionals, legislators and the public.

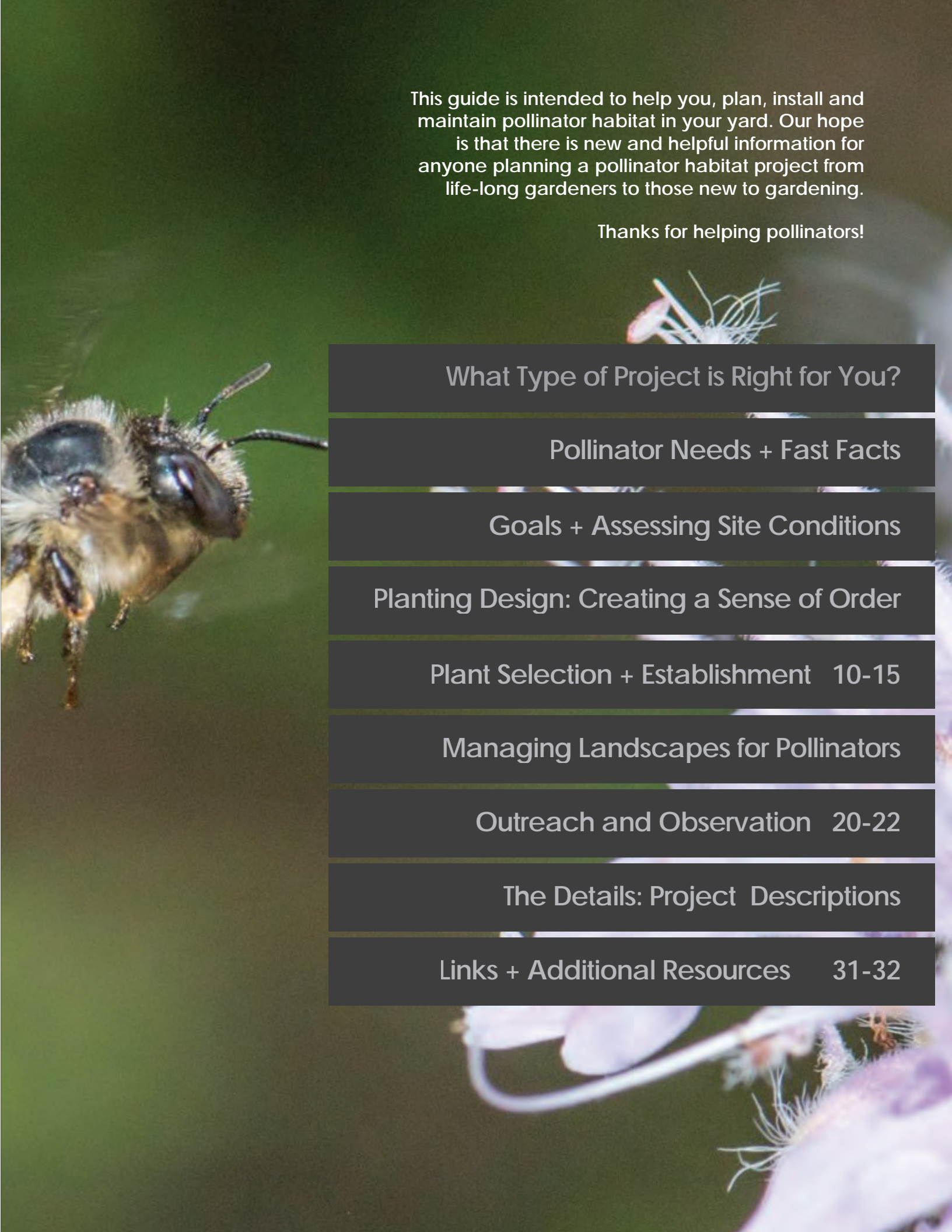
Contributors to pollinator decline include:

- Habitat Loss
- Pesticides: including Insecticides, Fungicides, and Herbicides
- Parasites and Pathogens
- Climate Change

Planting habitat for pollinators and protecting it from pesticides is one of the easiest ways for you to help pollinators! Additional benefits include: habitat for other species, stormwater infiltration, soil microbial health, and carbon sequestration. And there are benefits for human communities, too, as we increase our opportunities to enjoy, examine, and engage with the natural world around us.







This guide is intended to help you, plan, install and maintain pollinator habitat in your yard. Our hope is that there is new and helpful information for anyone planning a pollinator habitat project from life-long gardeners to those new to gardening.

Thanks for helping pollinators!

What Type of Project is Right for You?

Pollinator Needs + Fast Facts

Goals + Assessing Site Conditions

Planting Design: Creating a Sense of Order

Plant Selection + Establishment 10-15

Managing Landscapes for Pollinators

Outreach and Observation 20-22

The Details: Project Descriptions

Links + Additional Resources 31-32

# What type of Project is Right for You ?

The most important pollinator habitat you can create is one that fits your lifestyle so you can maintain long-term. Providing native perennial habitat and nesting resources will best support Minnesota pollinator populations.

Planning how you can best maintain your project will help ensure success. See the chart below to decide what type of project works best for you and your neighborhood.



Plants, shrubs and trees can all provide pollinator habitat.

## Guide to Project Types:

	pockets of habitat: <sup>*</sup> p23	flowering trees and shrubs: p25	pollinator lawn: <sup>*</sup> p27	pollinator meadow: p29
type	native plants potted	shrubs and trees potted	pollinator lawn from seed	native plants seeds or potted
difficulty	• • •	•	• • • • • • *	• • • • • • •
cost	• • •	• • • • • • • •	• •	• • • • •
installation	<ul style="list-style-type: none"> <li>• sod removal or</li> <li>• sheet mulching</li> </ul>	<ul style="list-style-type: none"> <li>• dig holes</li> <li>• plant trees/shrubs</li> </ul>	<ul style="list-style-type: none"> <li>• over-seed or</li> <li>• remove lawn and re-seed</li> </ul>	<ul style="list-style-type: none"> <li>• solarization or</li> <li>• sheet mulching or</li> <li>• remove lawn &amp; re-seed</li> </ul>
maintenance	<ul style="list-style-type: none"> <li>• hand weed, especially in first few years</li> <li>• divide plants as they outgrow their space</li> </ul>	<ul style="list-style-type: none"> <li>• some may need winter protection from rabbits</li> <li>• prune annually</li> </ul>	<ul style="list-style-type: none"> <li>• hand weed, especially in first few years</li> <li>• over-seed to promote more flowers</li> <li>• raise mower height</li> </ul>	<ul style="list-style-type: none"> <li>• hand weed aggressive perennial weeds, especially in first few years</li> <li>• mow twice yearly to control annual weeds.</li> </ul>
notes	<ul style="list-style-type: none"> <li>• easier to maintain</li> <li>• best habitat value for the least amount of effort</li> <li>• a great way to start gardening!</li> <li>• recommended for beginners!</li> </ul>	<ul style="list-style-type: none"> <li>• easiest to maintain</li> <li>• adds habitat value + neat appearance</li> <li>• best for smaller lots + preference for a managed look</li> </ul>	<ul style="list-style-type: none"> <li>• can be difficult to successfully establish in a dense turf lawn</li> <li>• less habitat value than a native planting</li> <li>• less mowing than a traditional lawn</li> </ul>	<ul style="list-style-type: none"> <li>• most work to maintain</li> <li>• best habitat value</li> <li>• best for larger lots</li> </ul>



## Think like a Pollinator: What's Missing?

Typical turf lawns and foundation plantings don't support pollinator needs.



Rusty Patched  
bumblebee  
*bombus affinis*

- **Native Plants:** Wild bees, butterflies, and other native pollinators prefer native plants. Studies have found that native plants in residential gardens help enhance wild bee populations and diversity. ([Pardee. 2014](#))
- **Blooms Through the Season:** there are few or no blooming plants in many yards, and many that only provide a brief time period of bloom like the ones in this yard. ([see below](#)) Since residential landscaping often focuses on non-native plants (like hostas and daylilies), most yards do little to support butterfly caterpillars or specialist bees.  
[see appendix Plant Lists](#)
- **Nesting:** Many nesting needs are overlooked or eliminated due to the way we manage our yards. Ground nesting and cavity nesting bees need specific conditions to survive and reproduce (e.g., access to soil, dead wood, and dead stems). [see Xerces Society Nesting fact sheet](#)
- **Protection from Insecticides and Fungicides:** Most of us wouldn't intentionally spray bumble bees or butterflies with insecticides, but may use chemicals harmful to pollinators without making a connection to the harm



Lack of pollen  
and nectar  
bearing  
native plants

Lack of  
flowers  
blooming  
throughout  
the season

Turf grass  
doesn't  
provide any  
food for  
pollinators

Few nesting  
opportunities

No  
Protection  
from  
insecticides



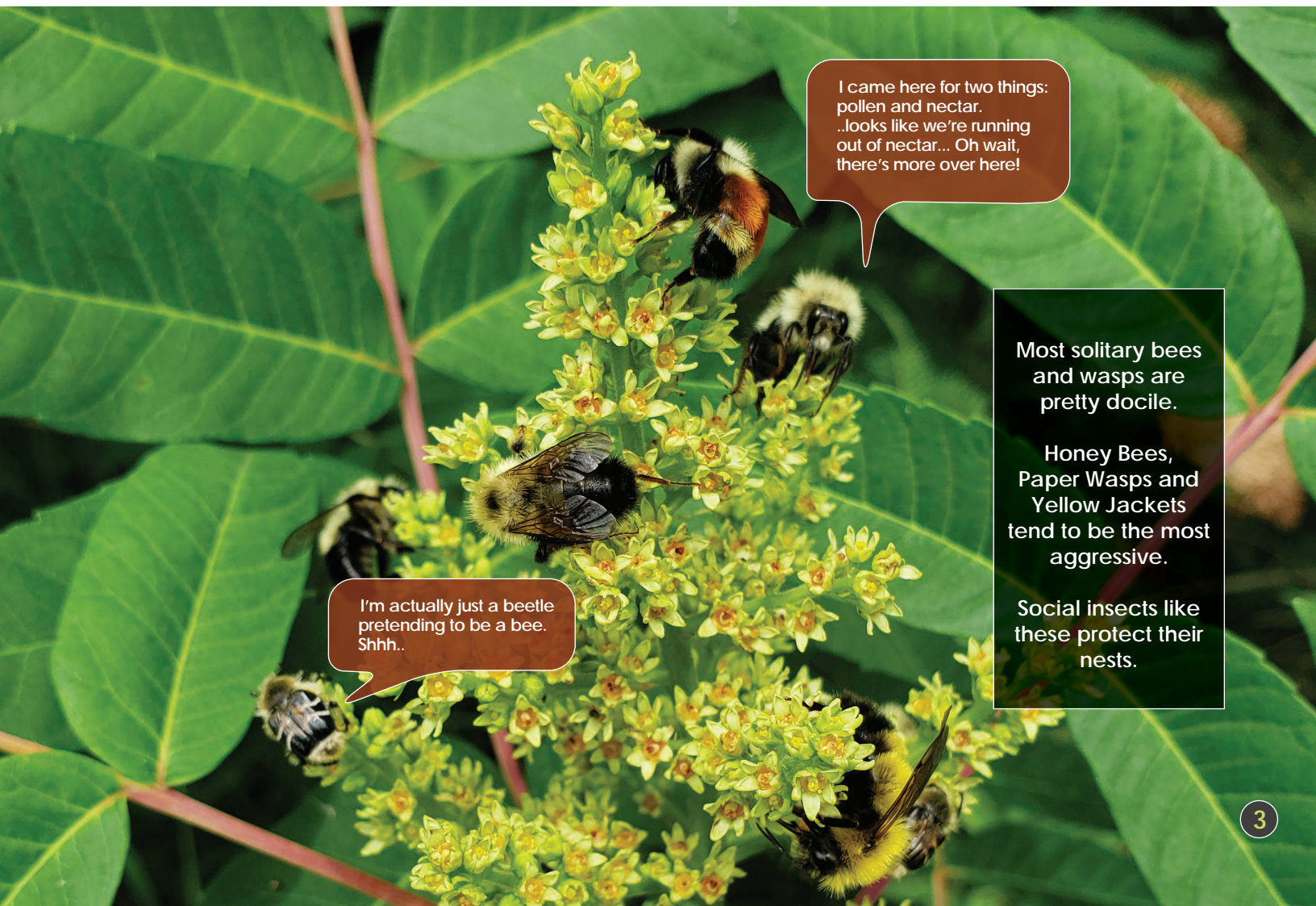
These tips will help keep you and your pollinators happy and safe in your yard:

## Bees in the Yard: Safety



A raised leg is the first line of defense for bumble bees.

- **Be Calm:** Remember, bees don't want to sting you! They only sting if they feel threatened, particularly when their nests are in danger. Don't swat at them, just remain calm and slowly move away.
- **Wear your shoes!** Especially if you have a bee lawn you may have pollinators underfoot. Avoid walking barefoot through this part of your yard.
- **Plant away from doors:** There is less chance of a negative encounter if your pollinator habitat is not in a highly trafficked area.
- **Avoid strong scents and bright colored clothes** You are more likely to be visited by bees or wasps if you look and smell like a flower while you are in your garden.
- **Observe:** Now that you are more comfortable around them, notice that they are not very interested in you, just your flowers.



I came here for two things:  
pollen and nectar.  
..looks like we're running  
out of nectar... Oh wait,  
there's more over here!

I'm actually just a beetle  
pretending to be a bee.  
Shhh..

Most solitary bees  
and wasps are  
pretty docile.

Honey Bees,  
Paper Wasps and  
Yellow Jackets  
tend to be the most  
aggressive.

Social insects like  
these protect their  
nests.

Foraging ranges differ for pollinators as do preferred food sources. Providing plentiful and varied blooming plants can help support pollinator diversity in an urban setting.

## Pollinator Needs: Food

### Minnesota's State Bee



**Rusty-Patched  
Bumble Bee**  
*Bombus affinis*

Most of its native prairie habit is now farmed or developed, contributing to its current endangered species status.

Urban habitat has become increasingly important for the Rusty-Patched Bumblebee.

- Pollinators are active early in the spring and into the autumn. They need continuous blooms from April to October.
- The proximity of high quality pollen and nectar sources to bumble bee nests are critical to the number of queens the hive produces. Pollinator populations grow or shrink based on available food resources.
- Recommended native plant species:  
*see Plant Lists in appendix*
- Foraging pollinators are at risk from human activities:
  - » limit or avoid insecticide and fungicide use and plants treated with pesticides
  - » provide native plants, the best food sources  
Avoid low value non-native ornamental plants -these include double flowered cultivars and plants bred for decorative foliage and not allowed to flower, like hostas.

The diversity of native plants in this garden supports a wide range of pollinators with food...

...and shelter opportunities with stems and bunch grasses for nesting.



## Pollinator Needs: Nesting

Human expectations of an attractive yard can conflict with the nesting and overwintering needs of pollinators. Try to create some specific habitat for pollinators to nest and overwinter in.

In a Best-Case scenario, pollinators have enough food resources within their typical foraging range.

They can use that energy to reproduce instead of looking for food.



Monarch butterfly



Checkerspot butterfly



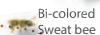
Rusty patched bumblebee



Mining bee



Small Mining bee

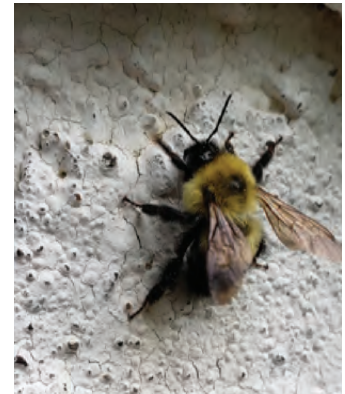


Bi-colored Sweat bee

Pollinator foraging ranges vary by size and species, typically larger species have increased ranges. Planting a diverse range of flowers supports small specialist species

Pollinators need ample habitat for shelter, nesting and overwintering. This includes dead stems of flowering plants, branches of flowering shrubs and trees, bare ground, leaf litter, dead wood and unmown grassy areas (that ideally include native bunch grasses).

Ground nesting bees need bare or sparsely vegetated soil that is loose and well drained and in a sunny location.



5

last year's stem stubble supports cavity nesting bees

crevices + bare earth: support ground nesting needs

Factors such as square footage, function, existing plant communities, soil moisture levels, weed pressure, hardiness zone, and local ordinances should be considered when designing habitat plantings.

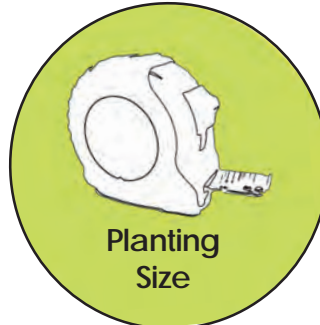
## Design Considerations + Goals

Always protect pollinator habitat from insecticide and fungicide use to prevent harmful exposure.

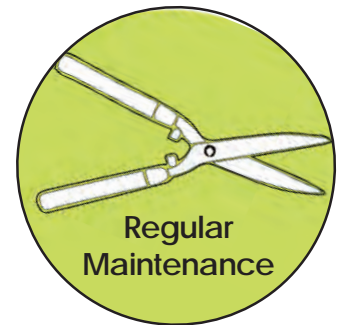
### PRIORITIZE THESE



### MAKE DESIGN DECISIONS



### THINK LONG TERM





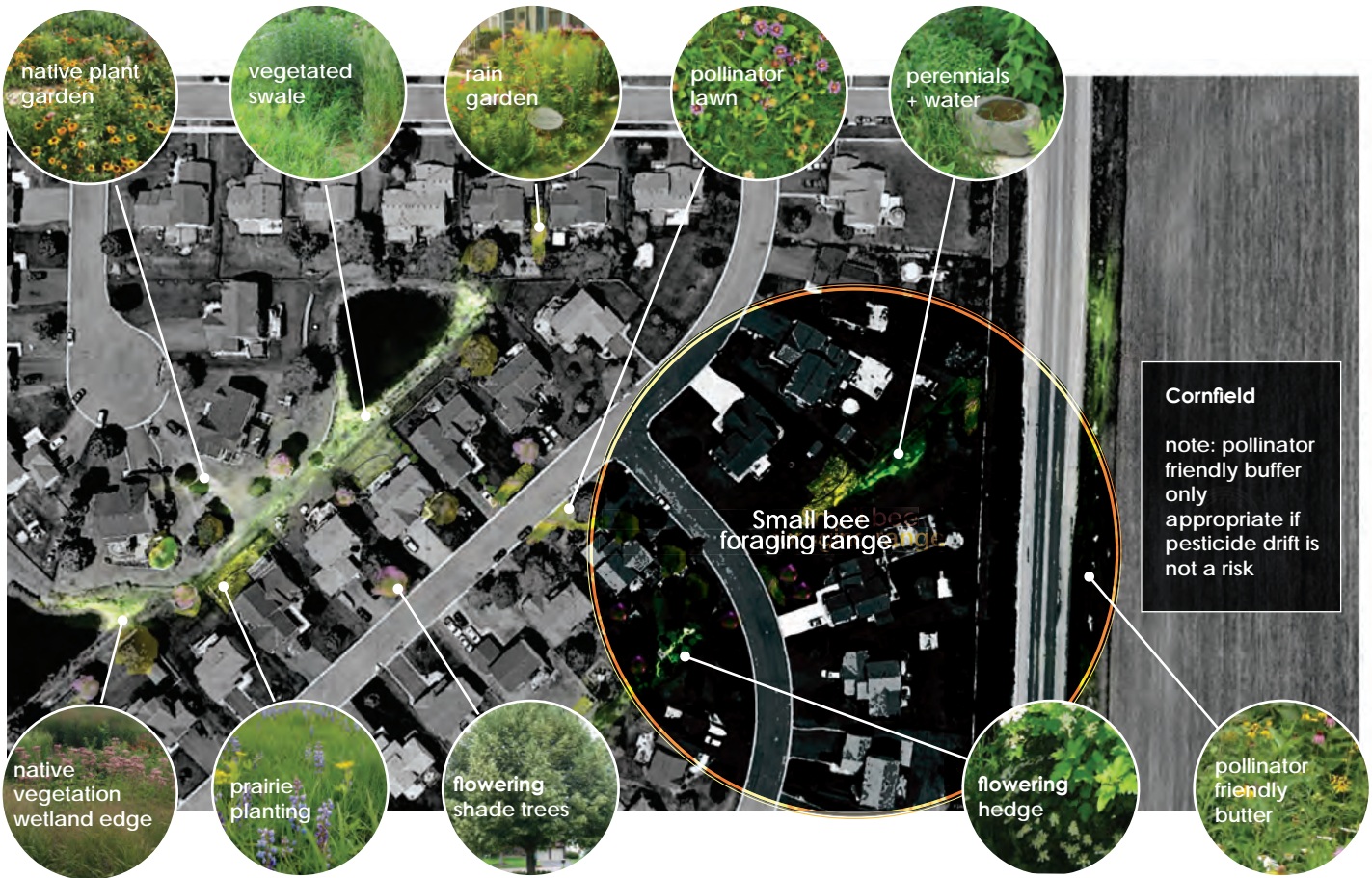
# Pollinator Resources: Residential Habitat

Development, roads and tilled fields have decreased food and nesting sources for many pollinator species. Creating habitat corridors that connect existing natural areas and quality habitat is key to supporting pollinators in Minnesota. Your yard can be an important part of these corridors!

Imagine your neighborhood from a pollinator's perspective:

How far does a pollinator need to fly from its nest to food and water sources?

A wide range of habitat will support small bees that have short flight distances as well as larger pollinators.



## Resource availability throughout the year + How you can help

### winter

overwintering habitat



Leave flower stalks intact over the winter. Prune back in early spring to heights of 8" to 24"

### spring

early pollen and nectar + nesting habitat



provide critical early blooms such as willows, fruit trees, and spring wildflowers

### summer

abundant pollen, nectar and nesting habitat



plant for continuous bloom to create consistent food resources

### fall

abundant pollen and nectar + overwintering habitat



leave plant material, leaves, stems, woody debris in your yard to provide shelter for the winter

### spring-fall

water source

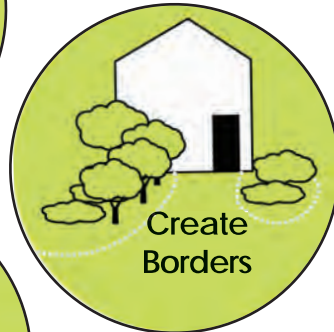


provide clean, shallow, water close to food and nests

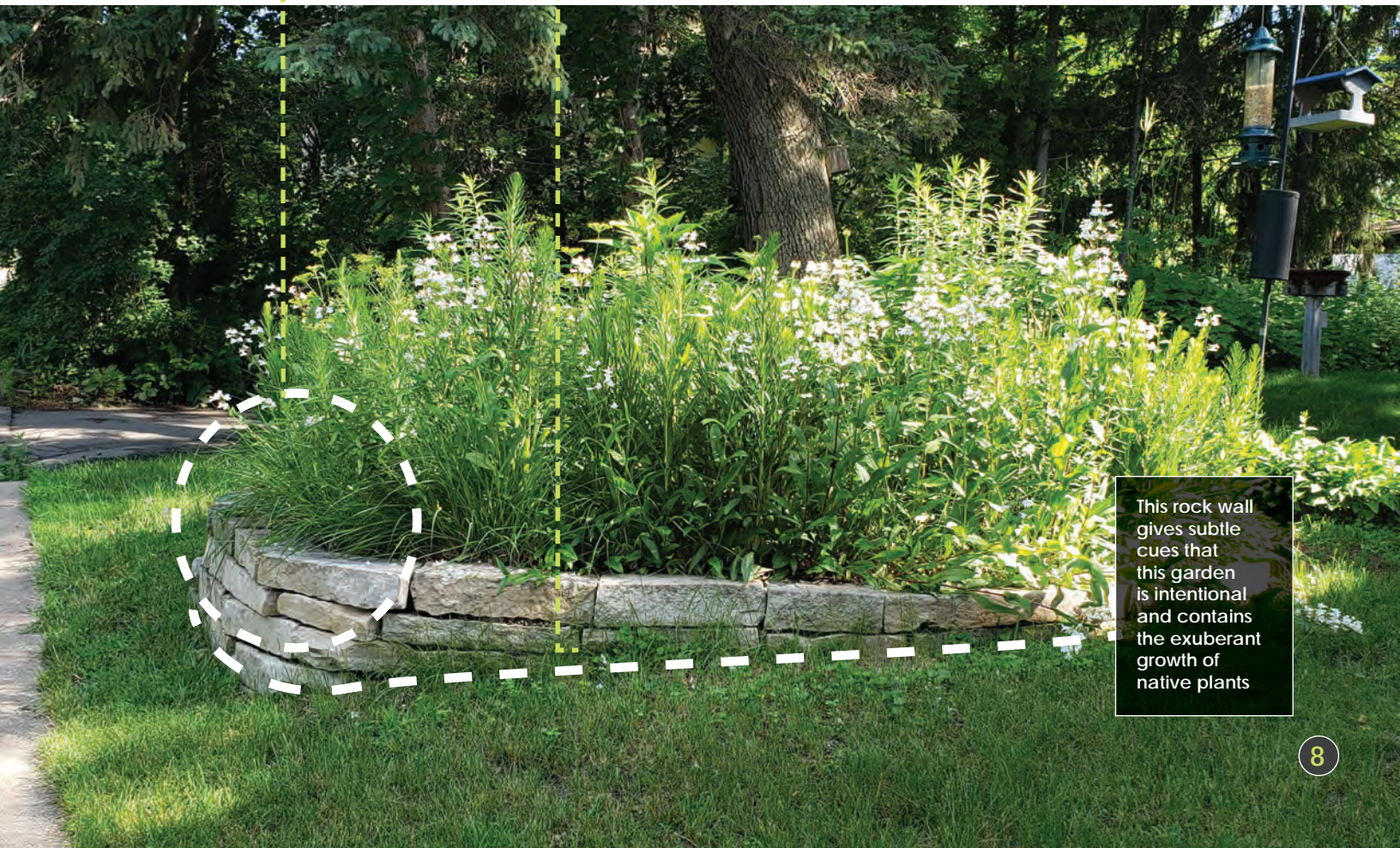
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Cues of Care: Carefully planned additions to the landscape help indicate that a garden is intentional and maintained.



- **Create Borders** by mowing edges or creating pathways with mulch or ground cover in the areas immediately adjacent to sidewalks, driveways, and property lines.
- **An Orderly Framework** prevent plants from obstructing traffic and falling into the neighbors' properties or onto the sidewalk. This framework also shows tidiness and human intention.
- **Add Architectural Features** and human elements such as fences, lawn ornaments, wildlife houses and feeders, and keep features well maintained.
- **Include Signs** to communicate with your neighbors about your project and promote pollinator and natural habitats. *see sign option featured in the appendix*



This rock wall gives subtle cues that this garden is intentional and contains the exuberant growth of native plants




## Choosing Plants

Where you buy your plants is very important. Some nurseries treat their plants with insecticides and fungicides that can be harmful to pollinators in your garden.



Avoid plants treated with Neonic insecticides and other harmful pesticides

- **Ask about pesticide use** and see the MN DNR's list of native plant retailers. [see Wild Ones and DNR resources lists in appendix](#)
- **Select plants based on site conditions** such as soil type, sun exposure, and moisture levels. A good retailer can help you choose your plants if you know your garden's conditions. [see planting templates in appendix](#)
- **Choose high-quality native plants** that will supply pollinators with abundant nectar and pollen. [see plant lists in appendix](#)
- **Support entire lifecycles** by including food plants for caterpillars (such as milkweed) and nesting plants for bees (such as native plants with pithy stems).
- **Buy Locally Produced Native Plants:** this helps protect nearby native plant communities and provides plant species that are sure to be compatible with local insect populations. [see plant lists and Wild Ones resources list in appendix](#)

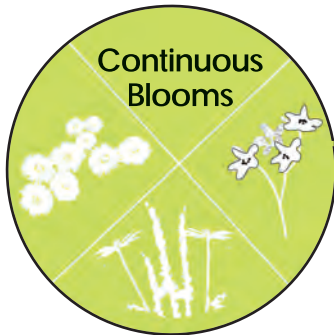


Mock Orange shrubs and Coral Bell cultivars are examples of non-native plants that have value to pollinators.



Most pollinators have adapted with native plant communities. Native plantings provide the best support for native pollinator species. Choose a range of native plants based on the following considerations:

## Planting Design



flowering trees and shrubs are an excellent way to provide continuous blooms when there are limited early season options for pollinators

- **Plan for continuous bloom** throughout the growing season this helps ensure pollinators have food when they need it, and allows them to conserve energy by not having to travel long distances when blooms are scarce. Include an assortment of flower colors, sizes, shapes and scents to attract a variety of pollinators [see planting templates in appendix](#)
- **Group plants** together to help pollinators find and access resources more easily. It also creates a sense of order in your planting.
- **Best Selections:** A number of sources provide information on specific plant species that provide excellent pollen and nectar resources for native bees, monarchs, and other pollinators. [see plant lists in appendix](#)



### Top Ten MN Plants for Native Bumblebees:

Virginia Bluebells *Mertensia virginica*  
 Red Columbine *Aquilegia canadensis*  
 Wild White Indigo *Baptisia alba*  
 Beardtongues *Penstemon* species  
 Milkweeds *Asclepias* species  
 Blue Giant Hyssop *Agastache foeniculum*  
 Bee Balms *Monarda* species  
 Blazingstars *Liatris* species  
 Asters *Symphyotrichum* species  
 Goldenrods *Solidago* species



## Installation and Maintenance: Lawn and Garden Professionals

There are many options for residents who want to convert lawns to pollinator habitat but don't have time or expertise with yardwork. You may be able to hire a professional to help install and /or maintain your project.



- **Sustainable Lawn Care:** Look for companies that specialize in sustainable practices and have an understanding of good pollinator habitat. • [see Wild Ones resources list](#)
- **Weeding Assistance:** If you choose to plant a pollinator garden, plan for weekly weeding, especially in the first year. For a small garden this is typically 1/2 hour of weeding each week.
  - » You can hire gardeners to weed your planting, typically on a bimonthly or monthly schedule.
  - » Some gardeners offer ala carte weeding or installation as needed.
- **Design Assistance:** landscape architects and garden designers can create plans for pollinator plantings and plant lists for your specific site and needs. • [see Wild Ones resources list](#)
  - » Some landscape design businesses also offer maintenance services.
- **Avoid maintenance contracts that include insecticide or fungicide use.**

Maintenance is critical to the success of your planting over time.

Hiring a professional might be a way to learn about your plants and enjoy your garden more.





For any type of project, you will need a strategy to remove the current vegetation. There are many ways to accomplish this task, some might work better for your project than others:

## Site Preparation: Plants, Shrubs and Trees



Herbicide Application followed by tilling can be used for preparing a garden bed, but several rounds of herbicide and tilling may be needed for sufficient control. This is not beneficial to soil health. There are other methods to prepare your planting:

**Alternatives to Herbicides:** The Xerces Society has developed a guide to organic site preparation methods such as the use of clear plastic to control weeds solarization shown below for instructions: see appendix.

- **Sod Removal:** it is a good idea to cut away the sod prior to planting to effectively remove weed roots and seeds. This can be accomplished with sod cutters, sod kickers or shovels for smaller areas.  
sod kicker shown below
- **Sheet Mulching:** Layering cardboard and mulch to suppress existing vegetation is a way to make pollinator bed prep easier.  
Renaissance Soils sheet mulching instructions: see appendix





## Site Preparation : Plants, Shrubs and Trees



### Save your soil!

Preventing erosion and preserving soil moisture are important to the health of your new planting. Assemble all the materials you will need ahead of time, and have a plan for where you will install each plant.

- **Prevent soil erosion and loss of soil moisture.** Don't remove existing vegetation until you are ready to plant. This shouldn't be more than a few days, and ideally is the same day.
- **Erosion control may be needed for areas with steep slopes.** Containerized plants can be installed directly into erosion fabric by cutting holes for planting. Avoid synthetic fibers.
- **Weed Suppression Mat (below)** Paper or natural fiber fabric can be helpful for weed control, but make sure to provide nearby areas of open soil for nesting habitat.
- **Mulch:** If you choose not to use a weed suppression fabric, plan to mulch your plants immediately after planting. This prevents new weed seeds from sprouting and conserves soil moisture for your plants.
- **Opt for un-dyed mulch** as it is less likely to contain chemicals which might harm pollinators.



Cut small holes and plant directly into weed suppression fabric.

Be sure to anchor it with large staples, bricks, or rocks so it doesn't blow away



Use non-synthetic weed suppression fabric ie: paper or wood based.

Other wildlife can get caught in synthetic fibers.



Preparing an area for sowing seed requires more weed control than site prep for containerized plants. Small seedlings can't compete with weeds the way larger plants do. Careful preparation can create the best conditions for your newly seeded garden.

## Site Preparation: Seeds



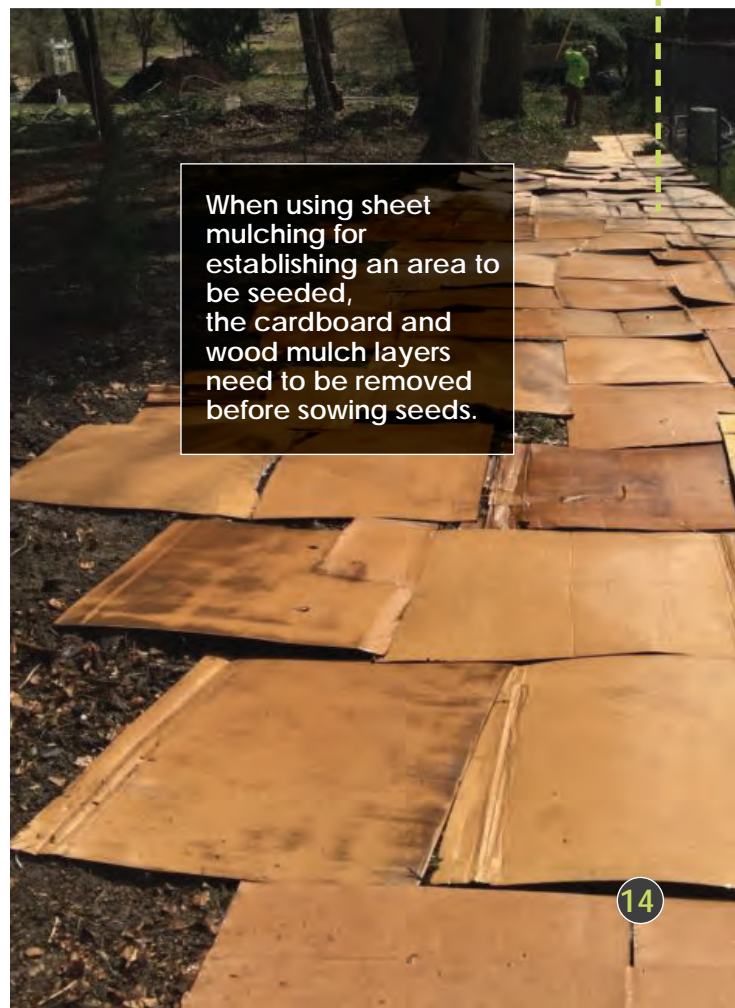
Herbicide application followed by tilling can be used for preparing a garden bed, but several rounds of herbicide and tilling may be needed for sufficient control. If you want to avoid herbicides see the following options:

### Alternatives to Herbicides:

- **Solarization:** The Xerces Society has developed a guide to organic site preparation methods such as the use of clear plastic to control weeds solarization shown below [instructions: see appendix.](#)
- **Sheet Mulching:** Layering cardboard and mulch to suppress existing vegetation is a way to make pollinator bed prep easier. Unlike the method for containerized plants, the cardboard and mulch will need to be removed before seeding.  
[Renaissance Soils sheet mulching instructions: see appendix](#)
- If you till your soil, **Cover crops** are a good option prior to planting, and can be grown over the spring, summer, and early fall to prepare the soil for seeding in the late fall (an excellent time to seed wildflower plantings)



Solarization requires full sun and careful preparation.

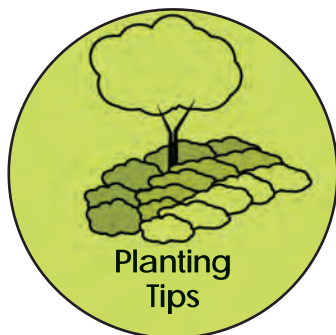


When using sheet mulching for establishing an area to be seeded, the cardboard and wood mulch layers need to be removed before sowing seeds.

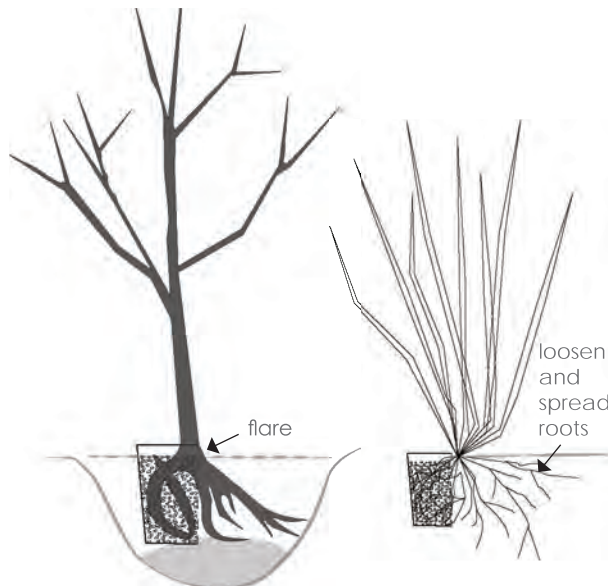


## Planting: Plants

Containerized plants, not seeds, are the best choice for new gardeners and smaller gardens. They allow more control over layout and design of your garden, mature and bloom faster and have a higher survival rate. Here are some important planting tips:



Containerized plants, trees and shrubs are planted in similar ways. The most important elements of planting are digging a large enough hole for your plants, and planting at the right depth.



- Dig a hole as deep and 2-3 sizes wider than the pot.
- Remove the pot.
- Loosen roots and remove any roots that have grown in a circle around the base of the plant.
- The soil level should be just below the flare of the tree or shrub and the base of your plant.
- Mulch around the plant, but don't place mulch against the stem or trunk
- Water immediately after planting, then once a week for the first summer.

On planting day, it's a good idea to place your containerized plants in the layout you have planned.

This lets you visualize your design and make changes as needed.



It can take much longer to establish native plants from seeds, and it can be difficult for new gardeners to distinguish weedy plants from desired species. Plants in containers tend to be the best choice for smaller plantings. However, seed mixes can be a cost efficient way to introduce diversity in larger pollinator plantings.

## Planting: Seeds



Planning to seed a large pollinator meadow? Include some of these annual species attractive to pollinators:

alyssum, basil, borage, calendula, coleus, crocus, cosmos, dill, pansy, hyacinth, lavender, melon, nasturtium, nicotiana, partridge pea, snapdragon, sunflowers, verbena, zinnia

- **Buy Locally Produced Native Seeds** This helps protect nearby native plant communities and provides plant species that are sure to be compatible with local insect populations.  
*see Wild Ones resources list in appendix*
- **Sow in Late Fall, Spring, or Early Summer** Many native seeds need exposure to winter conditions to help break their dormancy.
- **Ensure Good Seed to Soil Contact** Spread seeds on top of the soil surface and lightly rake them into the soil to achieve good soil contact. Be careful to plant the tiny flower seeds near or on top of the soil surface. A common mistake is to plant native seed too deep.
- **After Sowing** Lightly pack the soil surface. You do not need to provide native plant seedlings with supplemental watering as long as they receive about one inch of rainfall a week.
- **Do Not Fertilize** Native plants are well-adapted to poor soils. if necessary, amend with 1/2 " of compost annually.



This planting is a good example of a large pollinator meadow.

Seeds can be a good way to establish large plantings, but offer less control of plant placement.



# Managing Gardens for Pollinators

Management can be one of the most important factors in a planting's long-term success.



- **Allow Bare Soil** Keep an area in a well-drained, ideally south-facing planting bed bare and mulch free to support ground nesting pollinators—they make up 80% of native bees.
- **Mulch Sparingly** If it is needed for weed suppression and erosion control, only apply mulch the first few years until plants fill in and are established. One exception to this rule: you can mulch thickly around the border of your planting to define the edge. [see page 8, Planting Design: Creating a Sense of Order](#)
- **Create Overwintering Areas** Leave some woody debris near your planting and leave plant material standing through the winter.
- **Leave Standing Stems over the Winter** When cutting back wildflower stems in the fall. Leave standing stubble 12"-18" tall to provide nesting sites for stem-nesting bees to lay their eggs in. This stubble will break down naturally with time.
- **Incorporate clean water** in your yard by adding bird baths, saucers, water features, or rocks with shallow indentations, and change the water frequently to prevent mosquito larvae from hatching.



## Nesting/ Overwintering Needs:

1. Woody debris
2. Standing stems 8" or taller
3. Exposed, loose soil

If you chose to use a 'Bee Hotel' or a nesting box, it is important to clean it out each year to prevent the spread of disease!

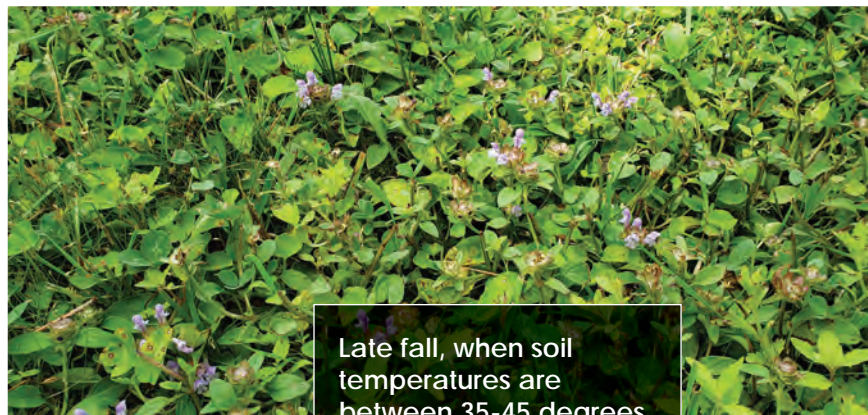
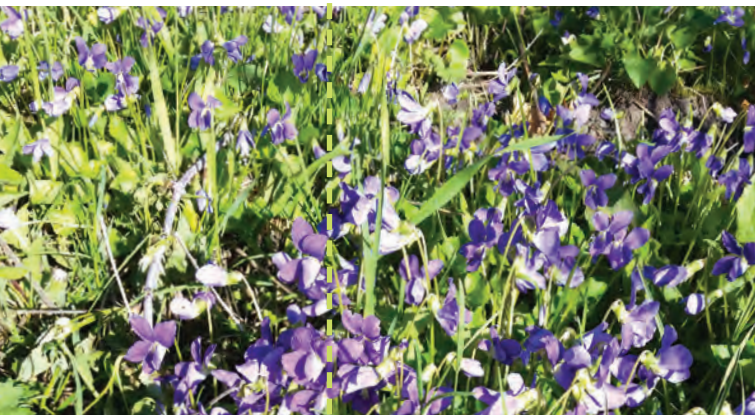


Bee Lawns and mow-able pollinator friendly plant species need specific management techniques.

## Managing Bee-Lawns for Pollinators



- **Adjust Mowing Frequency and Timing** Wait to mow until lawns are 4 1/2" high and raise the mowing height to 3" or higher. Allow dandelions and clover to flower in turf areas.
  - » This is especially important early in the season when pollinator food sources are limited.
- **Overseeding:** Scalp your lawn: cut grass to 1" height or less and broadcast a specific bee lawn mixture of flowers such as White Dutch clover, Creeping Thyme, Self heal and Ground Plum and Violets.
  - » Alternately, many of these flowering species can be added as containerized plants.
- **Aeration or Compost Addition** can aid seed-to-soil contact and germination rates. Broadcast 1/2" of compost across the whole yard and seed into that layer. Use approximately 6 yards of compost for a standard sized yard (>4,000 ft<sup>2</sup>).
- **Limit Herbicide Use** Plan to spot weed manually if needed, herbicides will negatively affect your flowering lawn species.
- **Skip the Fertilizer** Bee lawns with clover shouldn't need additional fertilizer as clover fixes nitrogen in soils.



Late fall, when soil temperatures are between 35-45 degrees Fahrenheit is the best time to overseed your bee-lawn.



Raise the blade height on your mower to 3" or higher.



# Managing Insect Pests

**Integrated Pest Management (IPM)** can help prevent and reduce pesticide applications by correctly identifying pests and determining acceptable thresholds for economic and aesthetic loss.



- **Don't Spray!** These are plantings for insects. Think of the larger ecosystem benefits that your planting offers: besides supporting pollinators, you are providing food for birds, other beneficial animals like amphibians and bats, and supporting cleaner air and water.
- **Choose Disease and Pest Resistant Plants** Native plants and proven cultivars tend to have less disease issues than non-native hybrids, leading to fewer long-term maintenance issues.
- **Avoid Pesticides** Opt for plants that have not been treated with systemic insecticides and other pesticides. Ask your nursery if any insecticides have been used.
- **Use a Tiered Approach** If management is needed, use non-chemical methods first, such as mechanical, cultural, and biological controls.
- **Choose Least Toxic Options + Timing** If these methods are unsuccessful and pesticide use is warranted, select the least toxic option, follow pesticide labels exactly, and avoid applications when pollinators are active.

*Integrated Pest Management: see appendix*





One of the most rewarding parts of a pollinator plantings is observing the different types of insects that benefit from a project.

## Monitoring Your Project



- **Record Keeping:** consider documenting the seed mixes and plants that were used for a project. Record the timing of planting and management and observations about insects that used the plantings.
- **Phenology:** note seasonal variations in plant emergence, first pollinator sightings and climatic changes.
- **Spur Community Action:** Your project can be a catalyst for engaging the public in the larger pollinator conversation. This can promote community support for your efforts as well as inspire others to take action on this issue.
- **Tell Your Story-**There are many programs to track your habitat efforts:
  - » Bumble Bee Watch
  - » Monarch Larva Monitoring Project
  - » Monarch Watch
  - » Journey North
  - » Minnesota Bee Atlas





## Neighborhood Outreach

Talk to your neighbors about your project, increase awareness of declining pollinator populations and the important role of urban habitat creation and connections.



- **Neighborhood Conversations:** Research has shown that changes in landscapes are more likely to be accepted if **neighbors** are demonstrating the new practices.
- **Signs:** pollinator gardens and plantings are likely to attract attention from neighbors and passersby. This can be an opportunity to educate and inform your community of the purpose of the pollinator habitat, and possibly spark interest in others to create their own.
- **Social Media:** provides instant exposure that promotes your project and promotes the larger conversation of critical pollinator habitat.
- **Host a Native Plant Garden Tour** and share what you have learned!
- **Start a Native Plant Swap** in your community, via social media or create an in-person event.



Community involvement can encourage neighborhood investment in the success of your project.





Local politicians, land managers, community planners, educators, landscape business and parks staff might not realize how important pollinator habitat is. Your efforts can make a difference in local ordinances and regulations.

## Greater Community Outreach



- **Pollinator Initiatives:** Many community groups, conservation organizations, state and local agencies, and universities have extensive information about pollinator efforts and other forms of outreach.
- **Encourage your city or organization to sign a resolution** supporting pollinators, some examples are the Xerces Society's Bee City, USA and Bee Campus, USA programs.
- **Social Media** can be a platform for showing support for greater community efforts in support of pollinator habitat. Promote your project to community leaders and ask them to support similar efforts.
- **A Press Release** can provide exposure of your project to the public who might not be reached by social media, agencies, and companies near and far. For home gardens, local newsletters or newspapers can inform your neighbors of your project.
- **Public Events,** workshops and summits can be great places to talk about ways to increase the impact of creating pollinator habitat and share information and best practices.





## Pocket Planting: Native Plants



A boulevard or alley can be a good way to begin creating pollinator habitat on a residential lot. Start small and expand the areas over time. Ask for help: sustainable landscape experts, master gardeners, water stewards or neighborhood gardeners might have suggestions for their favorite native plants.

- **Start Small** and add to your garden over time. It's important to plan a garden that you will have enough time to maintain. Plan for a half an hour of maintenance a week for the first growing season.
- **Create Borders** to help prevent the landscape from looking untidy. Mulch, edging, stones or low ground covers work well to create a border.
- **Be Patient.** It often takes a while for native plants to look their best, but when they do, it's worth it!
- **Choose Plants and Layout Carefully.** Keep taller plants to the back of plantings. Smaller cultivars of native plants may be appropriate. As with all pollinator plantings, try to provide blooms throughout the season. [see Planting design templates in appendix](#)
- **Check with Your City** to ensure that your plan meets vegetation ordinances.



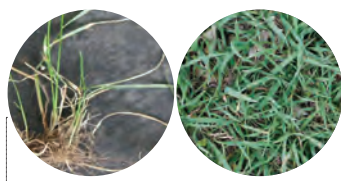
Joe Pye Weed  
Ironweed  
Rattlesnake Master  
Bee Balm  
Little Bluestem  
Blazingstar  
Coneflowers  
Black-Eyed Susan



The best ways to start a small pollinator bed are either removing sod or existing vegetation by hand or sheet mulching. See tips and timelines below to choose the method best for you.

## Pocket Planting

• **Sheet Mulching** is a good option for converting turf or existing plants that don't have deep roots. Most weeds and seeds can be suppressed with sheet mulch, but avoid this option for areas with tree seedlings, or plants like quack-grass, lily of the valley, snow on the mountain or creeping bellflowers.



quack grass: roots and plant



creeping bellflower: plant + rhizomes



lily of the valley

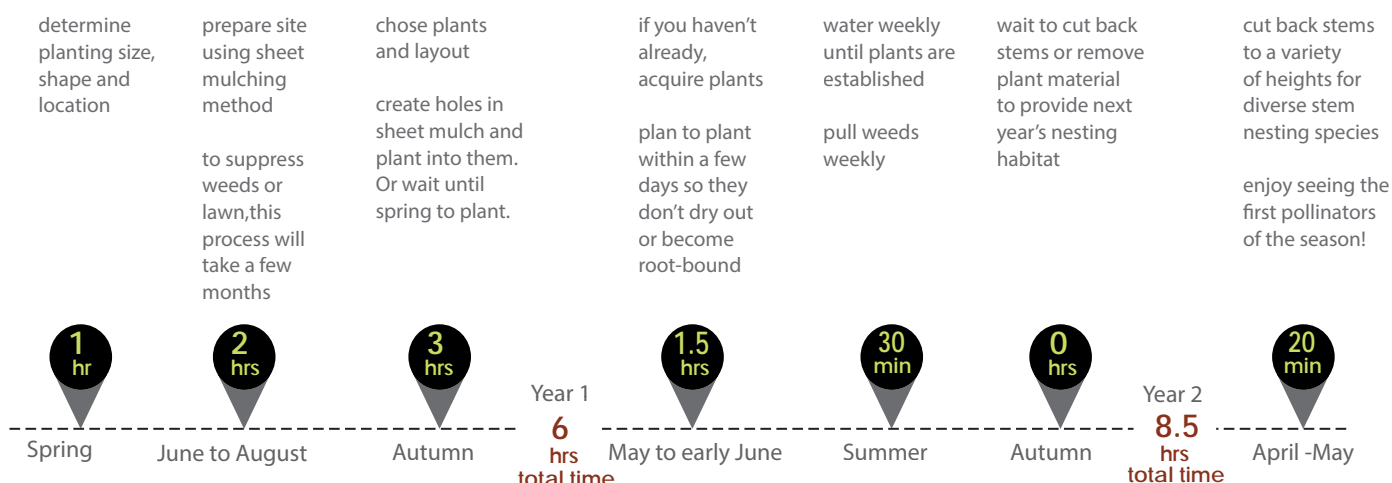


snow on the mountain



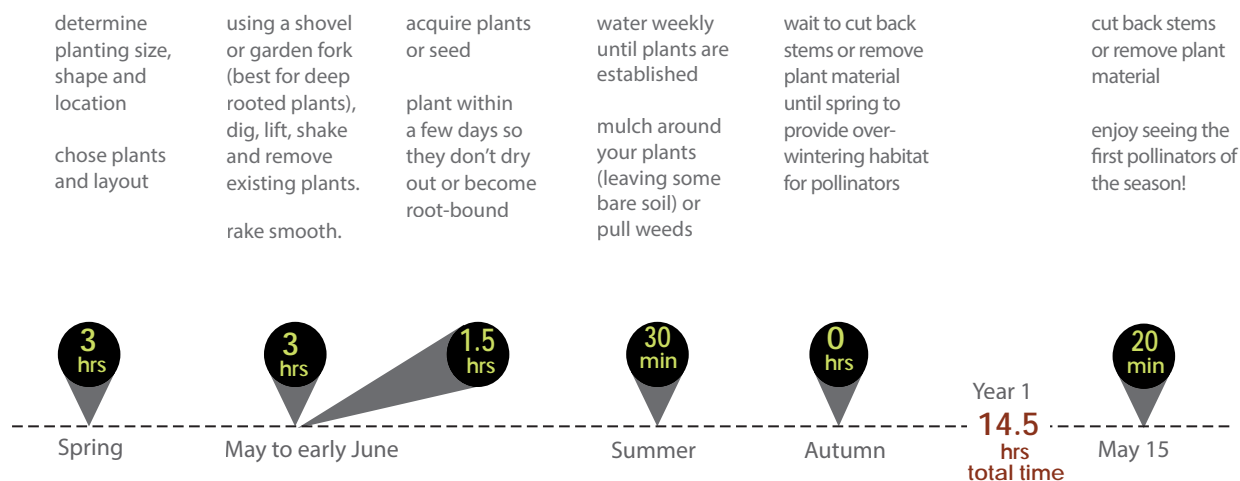
tree seedlings

### SHEET MULCHING TIMELINE:



• **Hand Digging** will be most successful for areas with existing deep rooted plants (see above). It is the fastest timeline for installing a pollinator bed, but the most physical labor. Be sure to remove all the root material if you have the plants pictured above. They will resprout from any root fragment.

### HAND DIGGING TIMELINE:



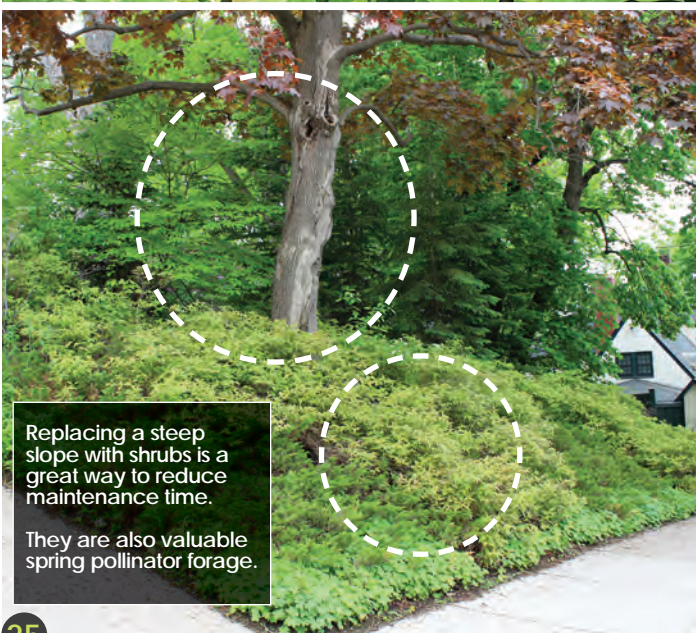
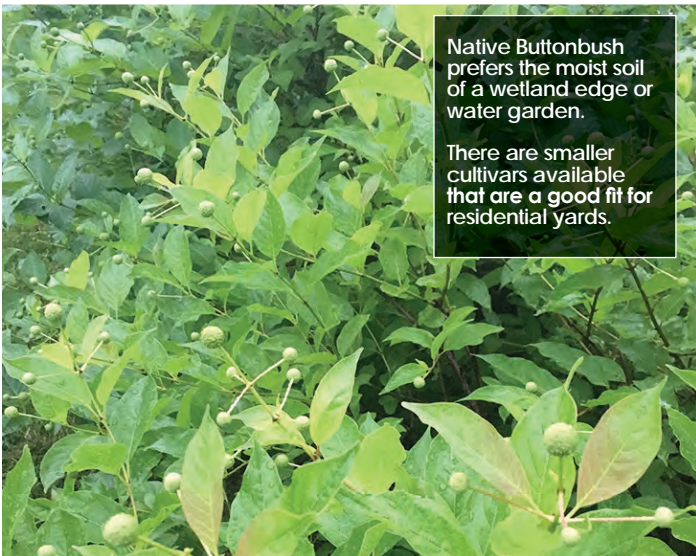


# Add Flowering Trees and Shrubs

**Native flowering trees and shrubs can offer a lot of benefits to pollinators, both as food sources and habitat.**



- **The early spring blooms** of flowering shrubs and trees are a great way to provide food for pollinators when resources are limited.
- **Choose native shrubs and trees** when possible.
- **Wait to prune shrubs until after blooming.** Prune for nesting, leave some woody debris and allow some old canes of currants and raspberries to remain.
- **Pruning is a once a year task** that keeps shrubs and small trees looking their best. Not sure how to prune your trees and shrubs? Hire a professional or consult UMN Extension for tips.





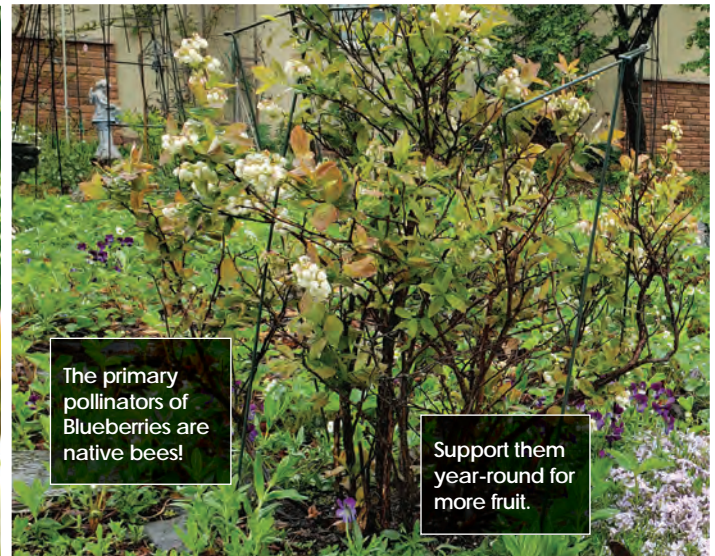
## Top Ten Shrubs/ Trees for Native Bumblebees:

Wild Currant *Ribes* spp  
 Serviceberry *Amelanchier* spp  
 Buttonbush *Cephalanthus occidentalis*  
 Native Bush Honeysuckle *Dervilla*  
 spp.  
 Plums and cherries *Prunus* species  
 Willows *Salix* spp.  
 Spirea *Spiraea* spp.  
 American basswood *Tilia americana*  
 Lead Plant *Amorpha canescens*  
 Cranberry *Vaccinium macrocarpon*

plant lists: see appendix

## Flowering Trees and Shrubs

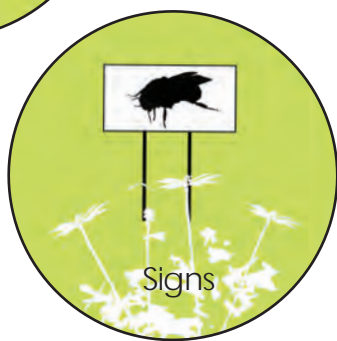
### ADD FLOWERING TREES AND SHRUBS TIMELINE:





## Pollinator Lawn

This project type varies in time and investment. A pollinator lawn could be as simple as allowing existing clovers and violets to flower, but it is most beneficial to seed a specific pollinator lawn mixture.



- **Choose Carefully:** would your neighbors prefer a more managed look? Maybe a pocket planting would be a better option.
- **Seed into an Existing Lawn** this is more challenging but can be done. Follow the steps in these partner groups' guidance. [see Appendix: Pollinator Lawn fact sheets](#)
- **Pick the right Flowers** you may need a seed mixture that is right for the conditions of your yard. Some plants do better in shade, others full sun. Your soil conditions can also determine what will grow successfully in your yard.
- **Maintenance Determines Success** Bee lawns require specific management to benefit pollinators. (See timelines on next page.)

A sign can be a good way of letting your neighbors know what you are doing, it may help them to be more accepting of change AND show that you value pollinators.

Fine Fescues are lawn grasses with smaller leaves that allow flowering plants more space to grow.

Self Heal and White Dutch Clover share this flowering swath

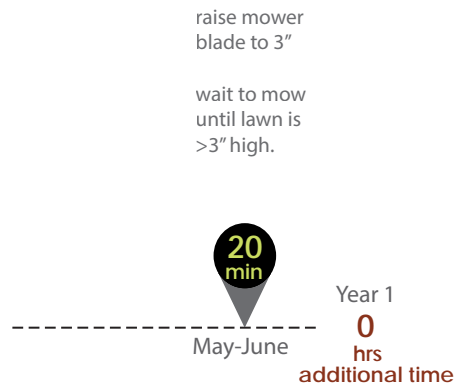
Pollinators benefit more from specific pollinator-mix plants than they do from simply allowing plants like dandelions and plantain to bloom.



Guidance for creating a Pollinator lawn from Metro Blooms and the Pollinator Friendly Alliance can help you install your own project. Alternatively, some garden design and lawn care companies can help you establish your flowering lawn. [see Appendix Bee Lawn fact sheets](#)

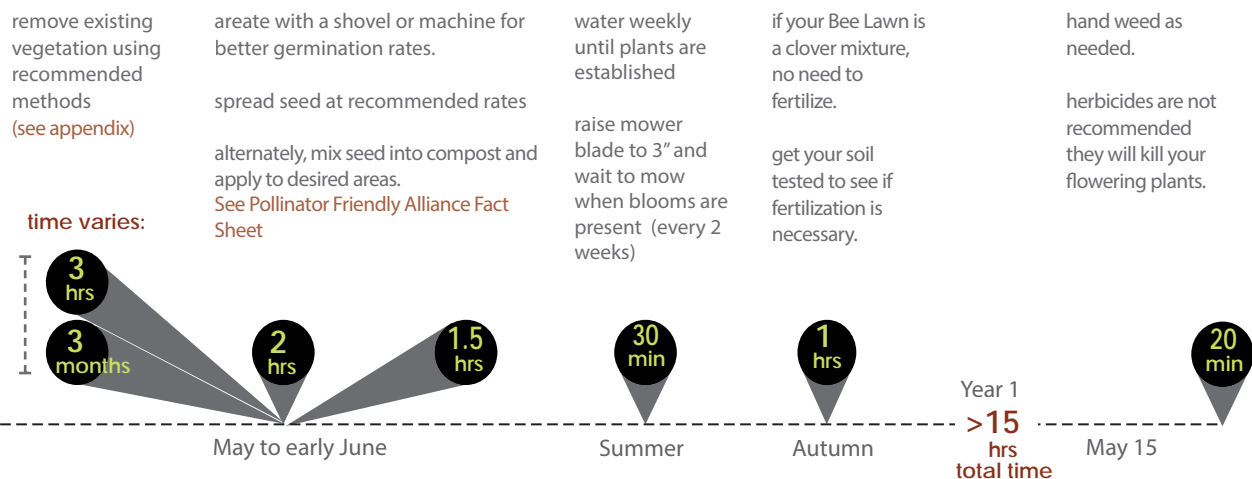
## Pollinator Lawn

### ALLOW LAWN TO FLOWER TIMELINE:



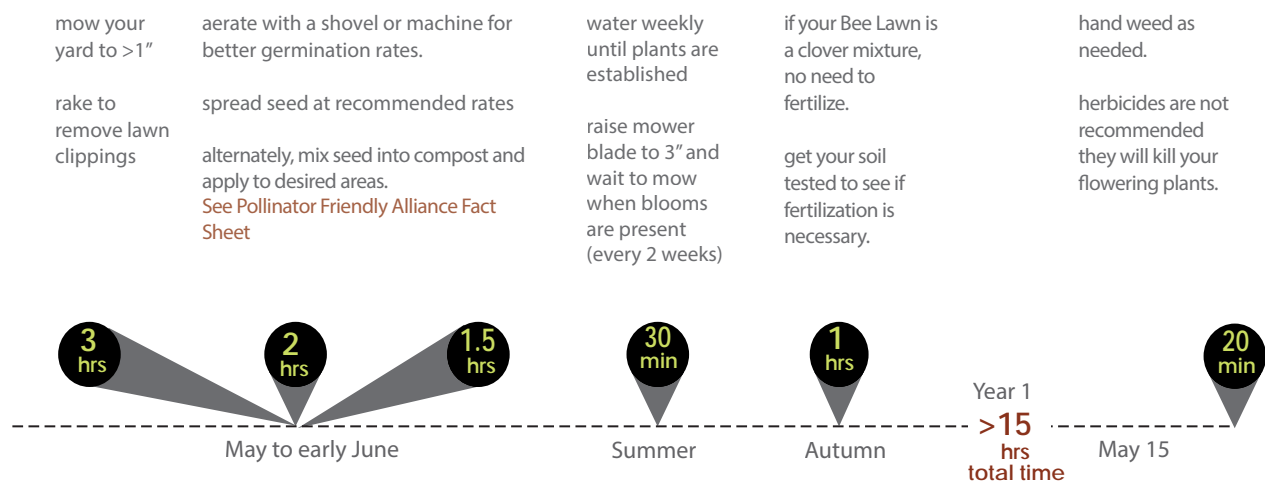
- **Install a Pollinator Lawn** -Starting from no lawn or completely replacing your lawn  
[see Appendix: Pollinator Lawn fact sheets](#)

### INSTALL A POLLINATOR LAWN TIMELINE:



- **Overseeding Existing Lawn** allows flexibility but may be more difficult to establish.

### OVERSEEDING TIMELINE:





## Pollinator Meadow From Seed

One of the most beneficial project types for multiple reasons, large native plantings requires space, time to establish and regular maintenance to succeed.



- **Consider Your Site:** Most native wildflowers need full sun conditions, but there are woodland species with pollinator benefits too. Assess your soil type and moisture level.
- **Site Preparation is Key:** It is important to provide the best possible site preparation to prevent failure due to weed pressure, low seed germination and preventable maintenance issues.
- **Pick the Right Seeds** “Local eco-type” seeds are the best possible choice for your seeding project. It is also important to plan the species make-up and amount of seed for each species.
- **Maintenance Determines Success** Native plantings require specific management to become established enough to suppress weed species and to regenerate year after year (See timelines on next page.)



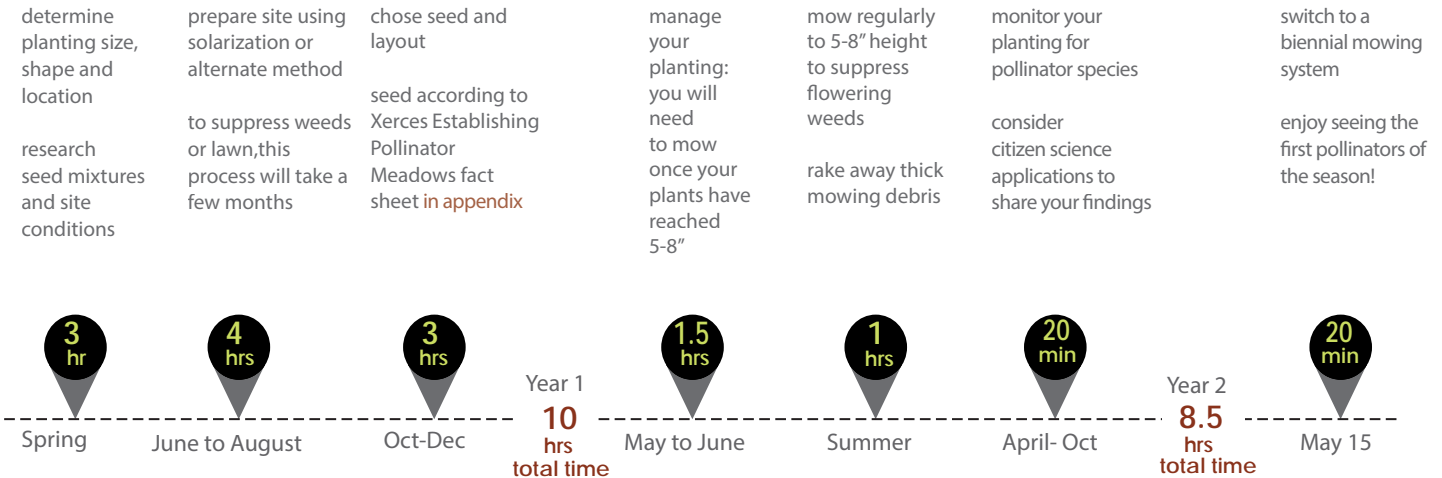


The best ways to start a large pollinator planting are either removing vegetation using solarization, herbicide or manual removal. Tips and timelines below.

## Pollinator Meadow From Seed

- **Solarization** is a good option for converting turf or existing plants without using herbicides. It is important to follow the directions carefully to ensure success. [See Xerces site prep fact sheet-appendix](#)

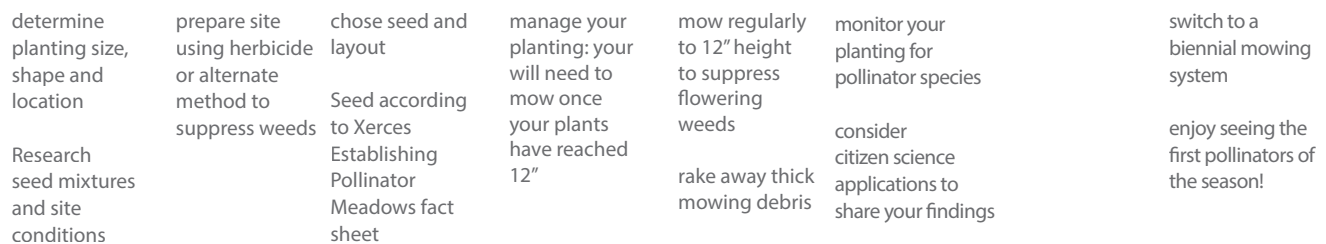
### SOLARIZATION- NATIVE PLANTING TIMELINE:



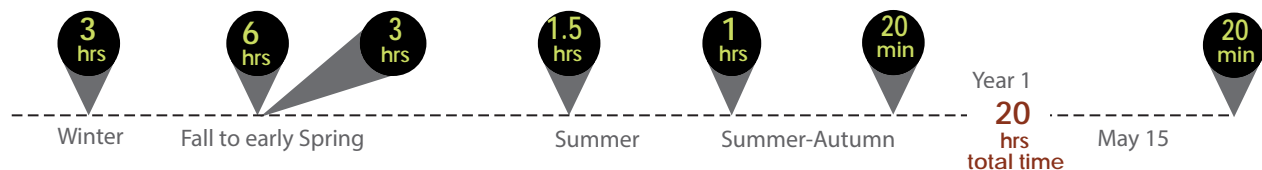
- **Herbicide or Hand Digging** will be most successful for areas with existing deep rooted plants (see below). It is the fastest timeline for installing a pollinator bed, but the most physical labor. Be sure to remove all the root material if you have the **problematic weeds pictured below**. Herbicide might be the most time efficient method.



### HERBICIDE OR HAND DIGGING NATIVE PLANTING TIMELINE:



[See appendix](#)





## Links

### **Pollinator Needs:**

University of Minnesota Bee Lab

<https://www.beelab.umn.edu/>

Minnesota DNR Resources

[https://www.dnr.state.mn.us/pollinator\\_resources/index.html](https://www.dnr.state.mn.us/pollinator_resources/index.html)

### **Assessing Site Conditions:**

Xerces Society Habitat Assessment Guides

<https://xerces.org/pollinator-conservation/habitat-assessment-guides/>

Xerces Society Pollinator-Friendly Parks Guides

<https://xerces.org/publications/guidelines/pollinator-friendly-parks>

### **Planting Design Examples:**

Metro Blooms Garden Awards Archive

[https://metroblooms.org/award\\_year/2015/](https://metroblooms.org/award_year/2015/)

### **Plant Lists:**

Blue Thumb Plant Finder

<http://bluethumb.org/plants/>

BWSR

<https://bwsr.state.mn.us/pollinator-toolbox-selecting-plants-and-seed-mixes>

Xerces Society Pollinator-Friendly Plant Lists

<https://xerces.org/pollinator-conservation/plant-lists/>

### **Plant Suppliers:**

DNR Native Plant Suppliers and Landscapers in MN

<https://www.dnr.state.mn.us/gardens/nativeplants/suppliers.html>

### **Site Preparation:**

Xerces Society Organic Site Preparation

<https://xerces.org/guidelines-organic-site-preparation/>

Lawn to Wildflowers

<https://lawntowildflowers.org/>

### **Managing Landscapes for Pollinators: Bee Lawns**

University of Minnesota Bee Lab

<https://www.beelab.umn.edu/wild-bees/wild-bees-flowers/beelawn>

Blue Thumb Pollinator-Friendly Lawn

<http://www.blue-thumb.org/turfalternatives/pollinator-friendly-bee-lawn/>

### **Managing Landscapes for Pollinators: Integrated Pest Mgmt**

### **Managing Landscapes for Pollinators**

**Community Outreach:** land managers, community planners, educators, landscape





**BWSR**



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### CONTENT

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SPECIAL THANKS TO **HEATHER HOLM** FOR SHARING  
HER POLLINATOR IMAGES USED IN THIS BOOK!

<https://www.pollinatorsnativeplants.com/about-the-author.html>





## Photo Credits

### Page:

Cover collage, **Ali Boese**

Intro Red Admirals at Berger Bank, Beltrami county **BWSR staff**

Why Plant for Pollinators-clockwise from top left-1 & 2 **Rich Harrison**, 3 & 7 **Heather Holm**, 4, 6 & 9 **Ali Boese**, 5 **BWSR staff**, 8 **Candy Sarikoda**

1. Rusty Patched Bumble Bee, **Heather Holm**, Typical Turf Yard, **Ali Boese**
  2. Rusty Patched Bumble Bee, **Heather Holm**, Plants, Trees and Shrubs, **Ali Boese**
  3. Best Pollinator garden, **Metro Blooms**
  4. Rusty Patched Bumble Bee, **Heather Holm** Stem Nesting diagram, **Heather Holm**, Ground Nesting Bee, **Heather Holm**
  5. no photos
  6. Base image, **Google Earth**, Ground Nesting Bee, **Heather Holm**, Goldenrod and Bumble Bee, **Rich Harrison**
  7. no photos
  8. An Orderly Planting, **Ali Boese**
  9. Non-Native pollinator plants, **Ali Boese**
  10. Plants, Trees and Shrubs, **Ali Boese**
  11. Maintenance, **Ali Boese**
  12. Cardboard layer, **BWSR staff**, Sod Kicker **BWSR staff**
  13. Volunteer planting, Pollinator Friendly Alliance, Landscape Fabric, **Dan Schutte**
  14. Solarization, **The Xerces Society**, Cardboard layer, **BWSR staff**
  15. Planting Event, Pollinator Friendly Alliance, Planting Details, **Ali Boese**
  16. An Orderly Planting, **Ali Boese**
  17. Johnson High School, **Rich Harrison**, Ground Nesting Bee, **Heather Holm**
  18. clockwise from top left: Violets, **Lily Shaw**, Pollinator lawn, **Ali Boese**, Pollinator Swath, **BWSR staff**
  19. Best Pollinator garden, **Metro Blooms**
  20. Pocket Planting with Sign, **Ali Boese**
  21. Volunteers, **Metro Blooms**
  22. Pollinator Outreach, 1 & 2 Pollinator Friendly Alliance
  23. Pocket Planing, **Metro Blooms**
  24. Flowering Trees and Shrubs, **Ali Boese**
  25. Flowering Trees and Shrubs, **Ali Boese**
  26. Pollinator Swath, **BWSR staff**
  27. Pollinator Lawn, **Ali Boese**
  28. no photos
  29. Wild Lupine Prairie, **Paul Erdmann**
  30. **BWSR staff**
  31. Monarch Caterpillar, **BWSR staff**
  32. Goldenrod and Bumble Bee, **Rich Harrison**
  33. Swamp Milkweed and Beetle, **Ali Boese**
- Back cover collage, **Ali Boese**



Page:

## Appendix Documents\*

\* Find these downloadable links on MN BWSR's Lawns to Legumes website.

- 35 NATIVE PLANTS FOR POLLINATORS
- 37 SELECTED NON-NATIVE PLANTS FOR POLLINATORS
- 39 XERCES GREAT LAKES POLLINATOR PLANT LIST
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- 57 XERCES SOCIETY-ESTABLISHING POLLINATOR MEADOW FROM SEED-FACT SHEET
- 61 INSECT POLLINATOR BEST MANAGEMENT PRACTICES FOR MN YARDS AND GARDENS  
MN DEPARTMENT OF AGRICULTURE





## YOUR YARD CAN BEE THE CHANGE!

Foraging ranges vary by size and species, plant a diversity of native plants to support small and specialist pollinator populations.

Monarch  
butterfly



Checkerspot  
butterfly



Carpenter  
bee



Rusty patched  
bumblebee



Small Mining  
bee



Bi-colored  
Sweat bee

