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Intro to Pollinator Gardens

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INTRO TO POLLINATOR GARDENS



tdunn.org

Thomas Dunn Learning Center

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My gardening background

- 23 years personal gardening experience and observation
- Lots of reading
- Master Gardener training and certificate
- 9 years as a Master Gardener
- 7 years gardening business blogging for a hardware store
- Part time work at a landscaping company for about a year and a half



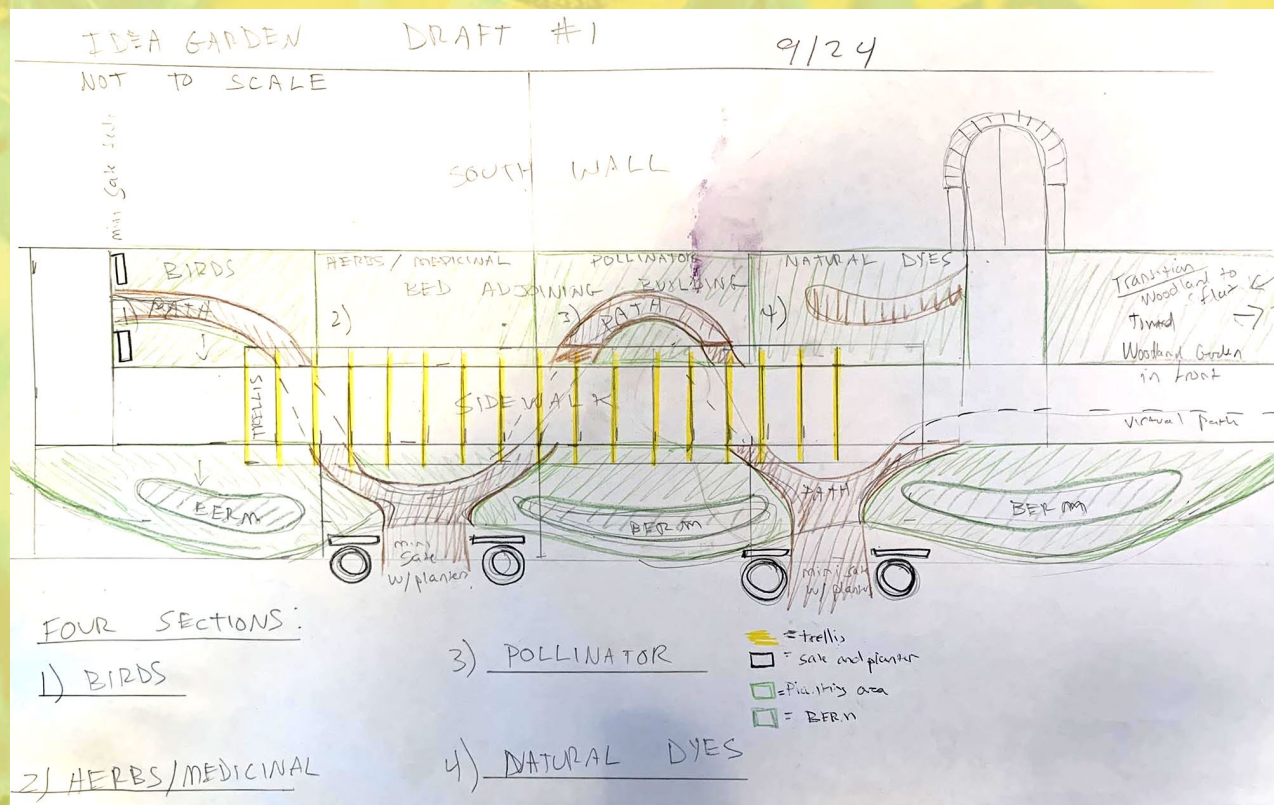


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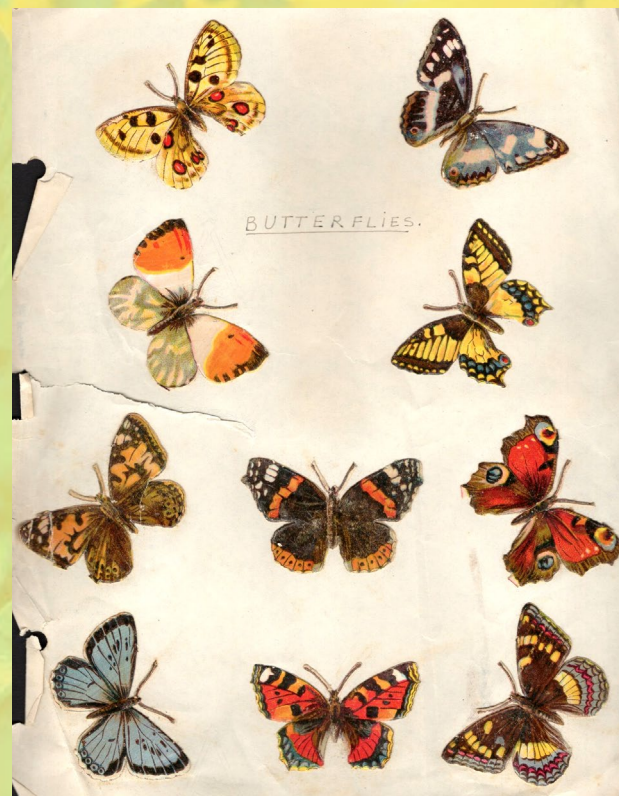
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What is a pollinator?

In this context, an animal that inadvertently transfers pollen from one plant to another while going about it's usual business.





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Examples of pollinators:

Bees

Butterflies

Moths



Birds

Flies

Beetles



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Why do we want them?

- Plants and animals need habitat to survive
- Pollinate our plants
- Beauty and interest
- Human health rewards of gardening for pollinators
 - Provide us with food
 - Nature exposure and fascination are good for mental health
 - Gardening is good exercise





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Food for other animals

- Birds
- Frogs
- Toads
- Fish
- Invertebrates
- Lizards
- Turtles
- Mammals





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When might we not want more of certain pollinators in the garden?

- If they scare people out of using the garden
- If they are a hazard to people or pets
- If our garden is a hazard to them
 - Window strikes
 - Pesticides
 - Predators
 - Diseases
 - Risk of persecution by humans



Identification very important

- There are good reasons to be very cautious around things that look like stinging insects
 - Venom allergies and multiple stings can be genuinely dangerous
- There is mimicry and bluffing behavior in many species
 - Knowing the species is necessary for assessing actual danger
 - If you don't know it's best to be cautious
- There are different lifestyles and behavior
 - Some are aggressive by nature
 - Most only defensive if attacked
 - Level of tolerance of humans varies a lot



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Bluffing and mimicry



Eastern
Carpenter Bee

Xylocopa virginica



Black Soldier Fly

Hermetia illucens



Yellow Jacket Hoverfly

Milesia virginiensis



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Behavior examples - anecdotes



Yellow Jacket

Vespa spp.



Bumble Bee

Bombus spp.



Mud Dauber Wasp

Three genera: *Sceliphron*, *Trypoxylon*,
and *Chalybion*



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Mud Dauber Wasp

- Campground bathroom in Oklahoma
- I was the only one in the whole campground
- Took a shower with dozens of wasps, almost every surface had nests
- Was careful not to touch them and all was well – we both passed the test!



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Is control necessary?

- A healthy garden will be full of insects and invertebrates
- We might have to develop more tolerance as a culture to make more progress
- If control is needed, consider non-lethal means if possible
- Sometimes specialists who are conservation-minded can be consulted
 - For example, a honeybee swarm can be collected by a beekeeper who is looking for one
 - Have a plan in place before there is a problem so that you don't have to make hasty decisions



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Roll out the welcome mat

Garden
Design

Garden
Maintenance

Plant
Selection



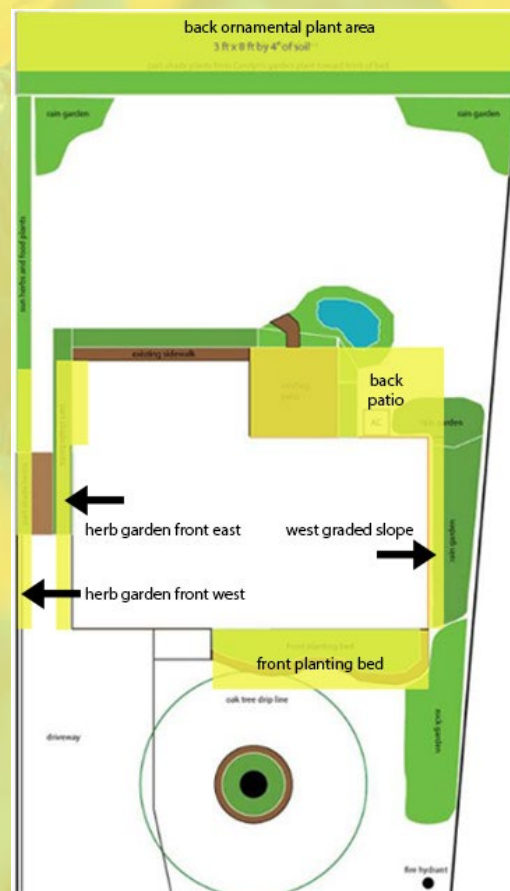
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Helpful garden design features 1

- Continuous corridors
- Variety
 - Plant heights
 - Plant species
 - Blooming times of plants
 - Sheltering and open areas
- Mini habitat sections
 - Foraging
 - Drinking
 - Bathing
 - Resting
 - Hibernation
 - Nesting
 - Sunning
 - Hiding





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Helpful garden design features 2

- Wind breaks
- Large flower clusters
 - Big groups of one plant more enticing than scattered individual plants
- Mix annuals and perennials
 - Annuals usually bloom all season and perennials for a limited time
- Space for bee nesting
 - Brush pile
 - Bee or pollinator house
 - Undisturbed areas of dirt or clay



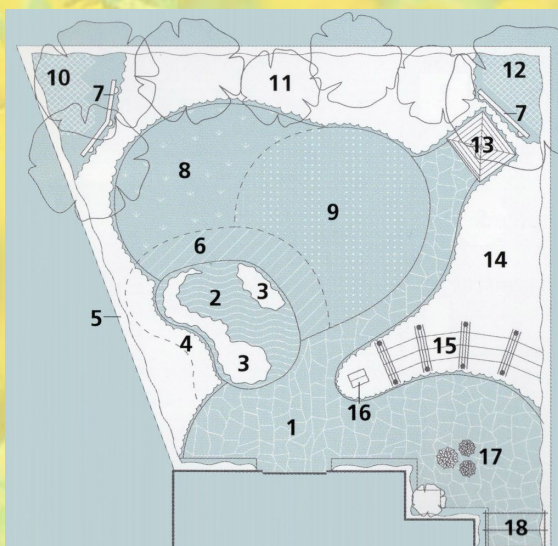


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Professional Sample Design



Garden elements key

- | | |
|-------------------------------|----------------------------------|
| 1 Patio | 11 Woodland |
| 2 Pond | 12 Small mammal hibernation zone |
| 3 Marginals in pond | 13 Rustic arbor |
| 4 Bog garden | 14 Planting |
| 5 Fence | 15 Arches |
| 6 Damp 'meadow' | 16 Bird feeding station |
| 7 Log screen | 17 Annuals in containers |
| 8 "Meadow" | 18 Pergola |
| 9 Lawn | |
| 10 Amphibian hibernation zone | |





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Garden maintenance tips

- Avoid garden cleanup until spring
 - Food for wildlife – Goldfinches were eating last year's seeds off my Bee Balm in late April
 - Allows time for hibernating insects to emerge from dried up plant parts
- Leave the leaf litter in planting beds if possible
- Provide undisturbed garden sections in out of the way areas if you must make some compromises for aesthetics
- Pile yard waste on-site discreetly if possible
- Avoid pesticides



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Rewards for waiting to clean up



Goldfinch pair

Spinus tristis



Polyphemus Moth

Antheraea polyphemus



Plant selection - natives

- **Most important** – plant native plants
- Remove invasives
- Natives much more likely to be used as host plants and therefore support many more invertebrates than imports
- Entomologist Dr. Doug Tallamy recommends at least 70% native plants to avoid further reduction in bird populations
- Bird populations could be thought of as indicative of the overall health of the food web
- Many life forms including humans are dependent on invertebrates as part of the food web as well as for pollinating



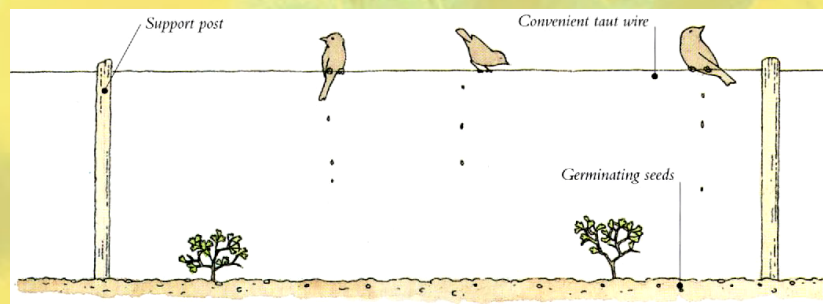
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How invasive plants spread

One way is by bird droppings.





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Plant selection – pesticide free

- Systemic pesticides can contaminate soil and water
 - Destructive to soil-dwelling native bees
 - Kills water invertebrates which affects all animals that need them for food, such as fish
- Pesticides applied directly to plants can kill pollinators on contact
- Try to get your plants from a source that is pesticide free
 - Plant sales by ecology minded organizations
 - Trading with ecology minded friends
 - Purchasing from organic growers



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Plant selection – open pollinated

- Open pollinated plants don't need human intervention to reproduce
- Open pollinated plants offer the most genetic diversity
 - Healthier plants
 - More resilient plants
- Where to get open pollinated plants and seeds
 - Trading
 - Plant sales, where people sell off their extra seedlings rather than buy them from a supplier
 - Ecology related festivals
 - Ecology centered organizations or growers



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Plant selection – “weedy” or “wild”

- My definition of weed is “a plant where you don’t want it”
- Many plants that are great for pollinators have “weed” somewhere in the name, like Milkweed.
- The closer to the wild species that the plant is, the better it is for pollinators
- Plants selectively bred to please humans often focus on looks only and have less pollen and nectar to feed pollinators



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Plant selection – early blooming perennials

- Some pollinators, like certain butterflies, emerge early before there are a lot of plants in bloom
- There are imports as well as native plants that bloom early, for example wild violets, dandelions, henbit, spring beauty to name a few





Plant selection – aromatic

The mint family is full of plants that pollinators adore. There are natives and imports in this group.

- Peppermint
- Spearmint
- Slender Mountain Mint
- Lemon Balm
- Horehound
- Giant Anise Hyssop
- Calamint

Other culinary herbs

- Dill
- Fennel
- Oregano
- Marjoram
- Basil
- Cilantro
- Thyme
- Rosemary
- Sage
- Many more!



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One of my favorites – Rue

Used to be popular in medicine and food but not as much today

Some people are sensitive to it and could get a rash

Extremely popular plant with Swallowtail butterflies even though it isn't a native

Could move caterpillars from a food plant you want to this to help with pest control





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Plant selection – aquatic

Water features are already great for pollinators because they need a place to drink. If you're trying to increase your percentage of native plants, try some native aquatics in your water features.

- American Water Willow (pictured)
- Water Canna
- Aquatic Milkweed
- Pickerel Plant
- Broadleaved Arrowhead
- And many more!





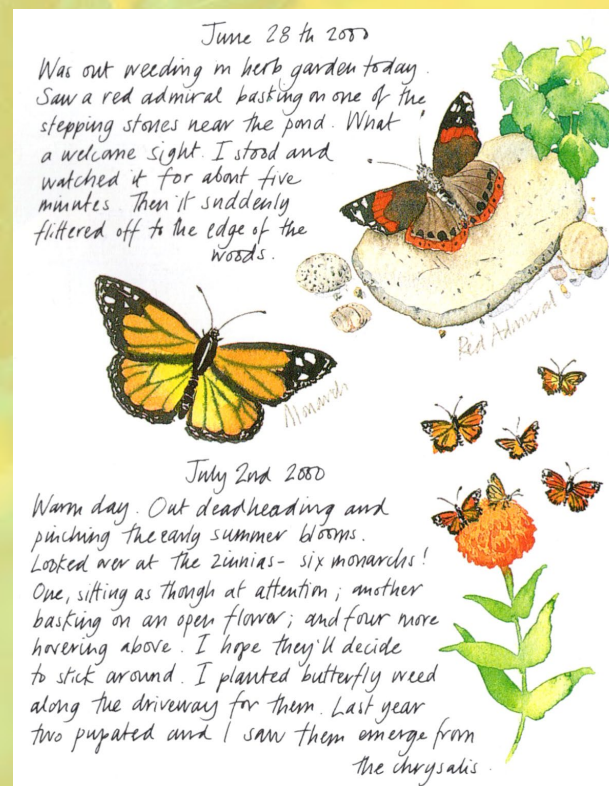
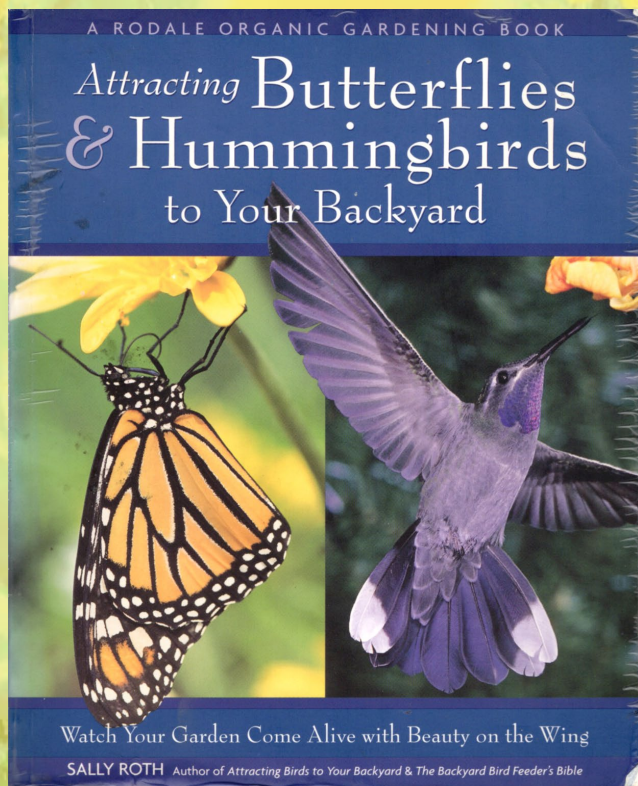
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Matching plants to pollinators

My “Bible”





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Matching plants to pollinators

What do butterflies prefer?

- Favorite color: purple
- Platform-shaped
- Sturdy enough to hold them
- Composite and clustered flowers
- Sturdy spike



Lead
Plant



L-R:
Purple
Coneflower,
Yarrow,
Elder



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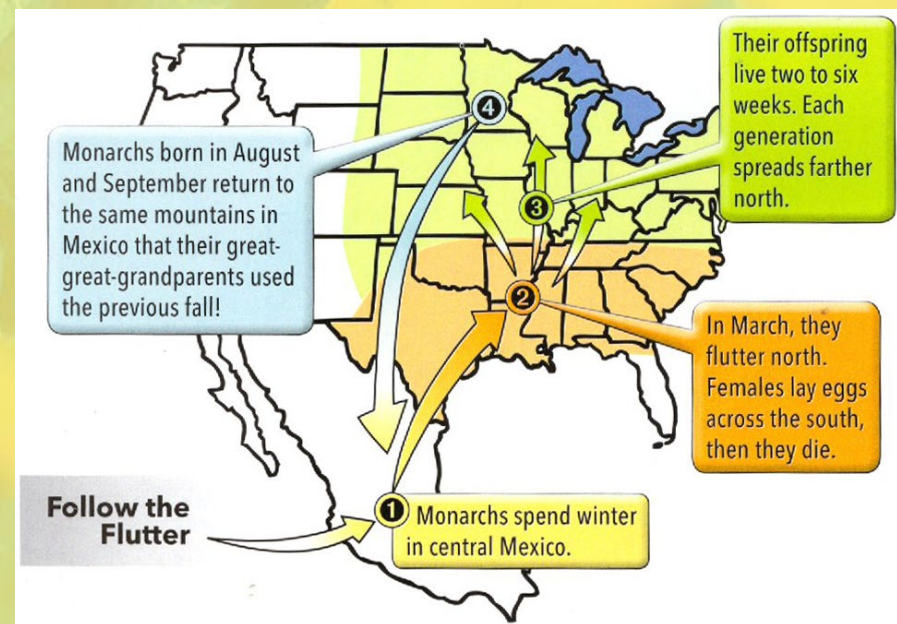


Matching plants to pollinators

What do Monarch butterflies need?



AS MUCH MILKWEED AS POSSIBLE
AS SOON AS POSSIBLE



Clockwise from top left: Prairie Milkweed, Swamp Milkweed, Mead's Milkweed, Swamp Milkweed.



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Certify your garden



- Explains what you're doing
- Lots of programs to choose from
- Encourages more action, I hope



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Matching plants to pollinators

What do bees and wasps prefer?

Like butterflies, they really like platform flowers and clustered flowers.

One big gulp of nectar or lots of little sips close together means it's worth their while to come.

Tiny native bees and wasps can use the more delicate small plants.



L-R: Feverfew, Cranesbill, Swamp Milkweed.
Bumble bee on the right taking a rain break under the flower cluster.



Matching plants to pollinators

What do moths prefer?

- Night blooming flowers
 - Moonflower
 - Chocolate Flower
 - Evening Primrose
- Some moths feed during the day so add appropriate host plants for the species you most want.
- Hummingbird moths will come to some of the same plants as hummingbirds, possibly because they hover.



I like to grow Yucca Filamentosa because it can only be pollinated by a Yucca Moth and I think that's interesting!



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Matching plants to pollinators

What do flies prefer?

Stinky plants

- Paw Paw
- Carrion Flower

They also like nectar and pollen from the same plants on which other pollinators feed.



Stinky or moist fungi

- Stinkhorn
- Slime mold (not really a fungus, more like an amoeba)





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Matching plants to pollinators

What do hummingbirds prefer?

- Favorite color is red
- Need hovering room around the opening
- Tube-shaped with a lot of nectar in it is best
- Plants that provide nesting material, for example cattails

Stamens that stick out past the flower opening accidentally deposit pollen on their heads.





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Starter Help

STL County Pollinator Pantry Guide

<https://gatewaygardener.com/pollinators/2020-pollinator-planting-guide-expanded-plant-list>

St. Louis Wild Ones <https://stlwildones.org/>

Brightside St. Louis

<https://www.brightsidestl.org/what-we-do/pollinator-conservation/pollinators-in-peril/>

MDC <https://mdc.mo.gov/magazines/xplor/2017-03/how-plant-pollinator-paradise>

Monarch Watch <https://www.monarchwatch.org/>

Journey North <https://journeynorth.org/>



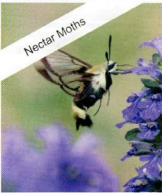
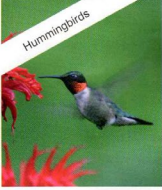
Grow Native! <https://grownative.org/>

Project Pollinator

<https://www.missouribotanicalgarden.org/plan-your-visit/family-of-attractions/butterfly-house/learn-discover-at-the-butterfly-house-/project-pollinator>

Missourians for Monarchs

<https://moformonarchs.org/>

 2020 Planting Guide for a Successful 3-Season Pollinator Pantry Garden Meet the Pollinator Ambassadors		
<p>Pollinator insects and hummingbirds play an important role in our gardens and our food chain. There are many different pollinating creatures and all have their own way of carrying and transferring pollen. These primary groups are some of the easiest pollinators to attract, easiest to see, most efficient, most common, least aggressive or just fun to find and watch. Representing each group, we've nominated a Pollinator Ambassador to help introduce you to other lower profile members of its kind. Some pollinators have been studied and some we are still learning about but all are beneficial in many ways and are needed to pollinate plants and help create our food!</p> <p>Below are a few of our pollinator friends and some of the plants they love! For more plant suggestions, see our expanded list at: http://www.gatewaygardener.com/pollinators/2020-pollinator-planting-guide-expanded-plant-list</p>		
Pollinator Ambassadors	3-Season Successional Pollinator Plants	About These Pollinators
	<p>SPRING Old Fashioned Lilac (<i>Syringa vulgaris</i>) Lanceleaf coreopsis (<i>Coreopsis lanceolata</i>) Ninebark (<i>Physocarpus opulifolius</i>)</p> <p>SUMMER Swamp milkweed (<i>Asclepias incarnata</i>) Blazing star (<i>Liatris spicata</i>) Purple coneflower (<i>Echinacea purpurea</i>)</p> <p>FALL Garden phlox (<i>Phlox paniculata</i>) Smooth aster (<i>Symphyotrichum laeve</i>) Upright sedum (<i>Hydronephrum</i> spp.)</p> <p>ANNUALS Blood flower (<i>Asclepias curassavica</i>) Lantana (<i>Lantana camara</i>) Zinnia (<i>Zinnia</i> spp.)</p>	<p>All butterflies and skippers need certain food host plants while in caterpillar stage that is particular to its species. Adult butterflies and skippers have different reach capabilities to drink nectar so different nectar flowers have naturally customized shapes to "fit" different butterflies and skippers.</p> <p>The Ambassador Monarch Butterfly <i>(Danaus plexippus)</i> Caterpillars only eat milkweed (<i>Asclepias</i> spp.). Nectar feeds many adult pollinators.</p>
	<p>SPRING Eastern Bee Balm (<i>Monarda bradburiana</i>) American Linden / Basswood (<i>Tilia americana</i>) Wild petunia (<i>Ruellia humilis</i>)</p> <p>SUMMER Swamp Milkweed (<i>Asclepias incarnata</i>) Blue star (<i>Amorpha</i> spp.) Sweet pepperbush (<i>Clethra alnifolia</i>)</p> <p>FALL Garden phlox (<i>Phlox paniculata</i>) Smooth aster (<i>Symphyotrichum laeve</i>) Joe yee weed (<i>Eutrochium</i> spp.)</p> <p>ANNUALS Garden verbena (<i>Verbena</i> spp.) Zinnia (<i>Zinnia</i> spp.) Lantana (<i>Lantana</i> spp.)</p>	<p>Nectar moths are a group of moths that drink nectar from flowers. Some visit gardens during the day and some are more likely to visit at dawn or dusk or even at night! They are often mistaken for hummingbirds.</p> <p>The Ambassador Hummingbird Clearwing Moth <i>(Hemaris thysbe)</i> Caterpillar is camouflaged by its soft green coloring. When grown it drops to the ground and spins its cocoon, blending in with leaf litter till early spring when it becomes this charming pollinator!</p>
	<p>SPRING Indian pink (<i>Spigelia marilandica</i>) Wild columbine (<i>Aquilegia canadensis</i>) Red buckeye (<i>Aesculus pavia</i>)</p> <p>SUMMER Beardtongue (<i>Pentstemon digitalis</i>) Sweet pepperbush (<i>Clethra alnifolia</i>) Buttonbush (<i>Cephalanthus occidentalis</i>)</p> <p>FALL Joe yee weed (<i>Eutrochium</i> spp.) Blue sage (<i>Salvia azurea</i>) Coral honeysuckle (<i>Lonicera sempervirens</i>)</p> <p>ANNUALS Blood flower (<i>Asclepias curassavica</i>) Hummingbird sage (<i>Salvia coccinea</i>) Bee flower (<i>Cleome serrulata</i>)</p>	<p>Hummingbirds are pollinators. They transport pollen primarily on their face and head feathers and are able to access the nectar of many deep tubular flowers.</p> <p>The Ambassador Ruby-throated Hummingbird <i>(Archilochus colubris)</i> Since the Ruby-throated hummingbird migrates and is the only reliably consistent hummingbird we have in Missouri it is its own ambassador for the Pollinator Pantry program.</p>



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Thank You!





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