5 Steps for a
Pollinator Garden

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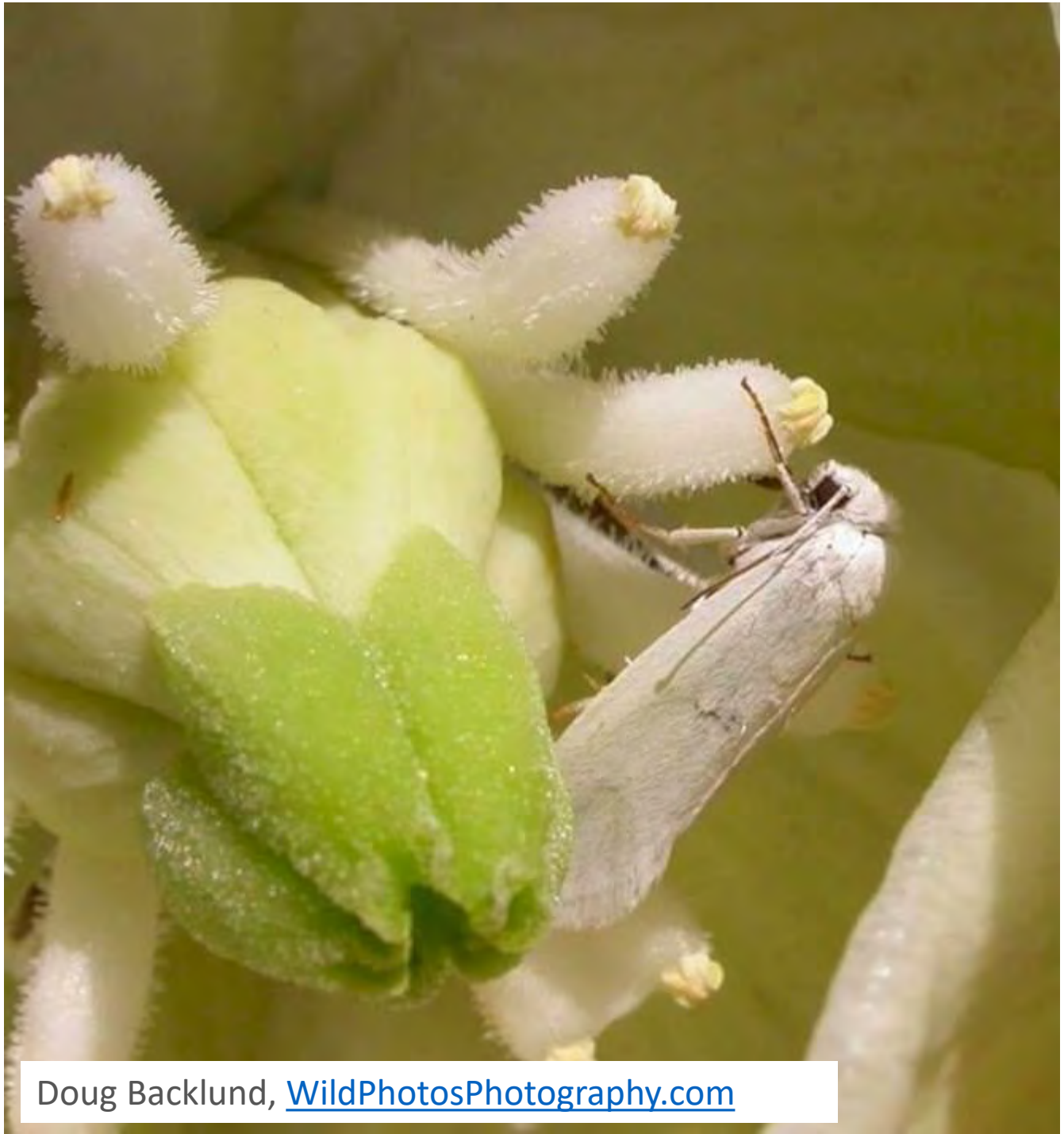
https://abundantnature.com/2011/05/what-is-jack-up-to/

https://abundantnature.com/2011/05/what-is-jack-up-to/

https://www.nwf.org/Educational-Resources/Wildlife-Guide/Invertebrates/Common-Eastern-Bumblebee

https://thegentlemensbackyard.com/



Doug Backlund, WildPhotosPhotography.com

https://www.flickr.com/photos/lastingimages/10484286795/

5 Steps for a Pollinator Garden

1. Site Selection
2. Site Preparation
3. Plant Selection
4. Site Planting
5. Site Maintenance

Photo by Kathy Fell

Site Selection

Key Considerations for Site Selection

- Size: How big can you manage? Pollinator gardens can range in size from containers on a patio to mutilple acres.
- Location: Pollinators need sunshine and protection from the wind. Pick a location with at least 6 hours of full sun a day and sheltered from the wind. Check upwind to be sure there are no invasive plants or undesirable weeds.
- Soils: What are the native soils like? Are they mostly dry or are they soggy after a rain? Please do not fertilize or mix in compost. This will make the soil too rich for native plants. They will grow too tall and topple over. You will need the soil information for your plant selection.
- Access: How will you get water to the site while plants are getting established? Can you drive a tractor or get a mower to the site for periodic maintenance? Is a gas-powered weed whacker your tool of choice?
- Slope: If the site is sloped, what is your plan to mitigate erosion? If there are drainage or erosion issues, fix them first!

Photo by Kathy Fell

Site Preparation

Site Preparation

- Mow, as close to the ground as you can.
- Fix any humps or bumps that will get in your way for annual maintenance.
- Kill off EVERYTHIING that is there. It is essential to kill off any non-native grasses and weeds, including the seedbank, before planting. There are two techniques:
  1) Chemical herbicides – recommended for larger areas
     - Apply for two consecutive years before planting
     - There is a dye you can add to the spray, so you can see where you have already sprayed
     - Wear protective clothing!
  2) Smothering – This works for smaller sites.
     - Cover the entire area with multiple layers of Cardboard or newspaper
     - Top with 4 inches of mulch
     - Let sit for at least one growing season. A full year is better
     - The worms will come. They will do all the hard work for you. Then the cardboard or newspaper will just “disappear”.

Resources:
https://www.ernstseed.com/resources/planting-guides/southeastern-sites-planting-guide/
https://www.prairiemoon.com/blog/site-prep
https://www.prairienursery.com/media/pdf/five-steps-to-successful-prairie-establishment.pdf

Smothering

Photo by Kathy Fell: Site Prep

1) Mow
2) Lay cardboard or multiple layers of newspaper, overlapping edges.
3) Top with 4 inches of shredded wood mulch
4) Let sit for a full growing season

Photo by Kathy Fell: Break point

My system

- Stack 8 full pages of newspaper
- Lay on the ground, overlapped 50% in all directions
- Weigh down with rocks
- Cover with mulch (removing the rocks)
- Stop for the day with a half page of newspaper exposed.

Photo by Kathy Fell

Plant Selection

Plant Selection

- Select regionally native species of full sun to part sun plants appropriate for your soil condition.
- Focus on species that are host plants for local species of lepidoptera.
- Select a mixture of plants that will provide continuous bloom from early spring to late fall.
- Include trees and shrubs if you have room. Trees are the first to bloom in the spring, well before the forbs, and pollinators need an early source of nectar. Trees and shrubs can also provide berries for birds over winter.
- Bees are attracted to blossoms that are blue, white, yellow and purple.
- Flowers that are white, pink, purple, red, yellow and orange attract the most butterflies.
- For a meadow effect, select plants that are about the same height. Short things will get lost.

Key Resources:

- DCR: https://www.dcr.virginia.gov/natural-heritage/solar-site-native-plants-finder
- NWF: https://www.nwf.org/NativePlantFinder/Plants
- Regionally native: http://vaplantatlas.org/

Photo by Kathy Fell: Cercis canadensis

Acquiring Plants

- Seed vs Plugs or potted plants
  - Potted plants are expensive, but you know what you are getting and they might bloom the first year
  - Plugs are less expensive but will not bloom the first year.
  - Seeds are the least expensive, but you need to figure out how much, which mix, and when to sow. Perennial seeds will not bloom the first year.
  - Adding annuals will provide bloom while perennial plugs or seeds get established.

- Seed mixes
  - Most commercial “wildflower” seed mixes will contain non-regional or non-native plants
  - Some nurseries will provide custom mixes: https://www.prairiemoon.com/custom-seed-mixes https://www.ernstseed.com/

Photo by Kathy Fell: Solidago

Acquiring Plants

- Shop your local Native Plant Sales
  - Know what you are looking for
  - Check if regionally native before you buy

- Avoid “Native Hybrids”, especially those that alter the shape of the blossom. Caterpillars are VERY picky!

- Other options
  - Share/swap with a friend
  - See what nature provides
  - Toss in seed heads
  - Move things around on your own property

Resources:
https://www.ernstseed.com/
https://growingsmallfarms.ces.ncsu.edu/wp-content/uploads/2020/04/2020-Top-25-Pollinator-Plants.pdf?fwd=no

Photo by Kathy Fell: Packera anonyma

Photo by Kathy Fell

Site Planting

Site Planting

- Trees first, plant in spring or fall.
  - Start small and protect from deer. Mail order bare root has worked for me. Best location is on the north side of the site. Be aware of the mature size!
  - Water and mulch root zone, NO VOLCANOS!

- Shrubs next, plant in spring or fall
  - Protect from deer, water and mulch root zone
  - Be aware of the mature size!

- Perennials (and annuals) last, plant in spring or fall
  - Do not plant unless you are SURE you killed all the turf and weeds!
  - Plant in “waves” by planting large groups of the same species together. This makes it easier for pollinators to find the plants. You can do this by hand spreading seeds for single species in separate areas of your garden

Photo by Kathy Fell

Photo by Kathy Fell

Site Maintenance

1st Year Maintenance

- Do not use pesticides or fertilizers
- Keep an eye on the moisture
  - Young plants will need watering during dry spells the first year, until their roots get established. Spot watering once a week should be enough, if there is no rain. Do not make mud.

- Keep an eye out for undesirables, remove them carefully before they get established. Pulling weeds is not recommended in seeded beds.

- For seeded sites, when weeds get to 12”, mow to a height of 4-6 inches to keep them from going to seed. This is high enough to not kill the perennials.

- Leave the leaves in fall! Most species of lepidoptera lay eggs on tree leaves in the fall. The eggs overwinter in the leaf mulch and hatch in the spring.

Photo by Kathy Fell: Tiger Swallowtail on Viburnum

Later Year Maintenance

- Leave grasses and seed heads in provide to shelter over winter.
- Mow to 4 to 6 inches in spring, after things start to germinate. Leave time for eggs to hatch!
- Spot check for invasive weeds. Many of the invasive species will emerge before natives. Small gardens can be hand-weeded. For larger gardens, consider using a weed-whacker or mow before the natives get too tall.
- An annual prescribed burn may be needed on larger gardens if the invasive species get out of control. This requires a certification from DoF.

Resources:
Prescribed Burns: http://www.dof.virginia.gov/fire/prescribed/index.htm

Photo by Kathy Fell: Zebra Swallowtail on Butterflyweed

Photo by Kathy Fell

Other Considerations

Other Considerations

- Water
  - Bees and Butterflies need water. They will revisit the same water source once they find it.
  - Pollinators need a safe place to stand when collecting water. A shallow bowl filled with rocks or marbles makes a nice watering spot.
  - Biologists believe bees find water by smell, so they tend to go for stagnant or slimy water
  - Bees are attracted to sugary or salty water. A little sugar or some oyster shells will help them find a new water source
- Salt
  - Bees and Butterflies need salts. You can make a damp salt lick by creating a wet spot and adding sea salt, table salt, or wood ashes into the mud. Sea salt provides more micronutrients than table salt
- Fruit
  - Butterflies need more than nectar. Try providing slices of overripe bananas, oranges and other fruits and see who comes to investigate.

Photo by Joe May

Photo by Kathy Fell : Cercis canadensis

Trees for Pollinators

Latin Name	Common Name	Bloom Time
Acer negundo	Eastern Boxelder	Mar – May
Acer Rubrum	Red Maple	Jan - May
Amelanchier arborea	Downy Serviceberry	Mar - May
Cercis canadensis	Eastern Redbud	Mar - May
Cornus florida	Flowering Dogwood	Mar - May
Diospryros virginiana	Persimmon	May - Jun
Ilex opaca	American Holly	Apr – Jun
Lirodendron tulipifera	Tulip Poplar	Apr – Jun
Nyssa sylvatica	Black Gum	Apr – Jun
Oxydendron arboretum	Sourwood	Jun – Jul
Prunus angustifolia	Chickasaw Plum	Mar – Apr
Prunus serotina	Wild Black Cherry	Apr – May
Salix Nigra	Black Willow	Mar – Apr
Tilia americana	American Basswood	Jun - Jul

Photo by Kathy Fell: Rubus occidentalis

Shrubs for Pollinators

Latin Name	Common Name	Bloom Time
Ceanothus americanus	New Jersey Tea	May - Jun
Cephalanthus occidentalis	Buttonbush	Jun - Jul
Cornus amomum	Silky Dogwood	May - Jun
Crataegus uniflora	Dwarf Hawthorn	Apr - Sep
Ilex verticillata	Winterberry	Apr - May
Rhus glabra	Smooth Sumac	May - Jul
Rosa carolina	Pasture Rose	May - Jun
Rosa palustris	Swamp Rose	May - Jul
Rubus flagellaris	Common Dewberry	Apr - May
Rubus occidentalis	Black Raspberry	Apr - Jun
Sambucus canadensis	Common Elderberry	Apr - Jul
Vaccinium fuscatum	Hairy Highbush Blueberry	Mar - May
Vaccinium pallidum	Blue Ridge Blueberry	Apr - May
Vaccinium stamineum	Deerberry	Apr - Jun
Viburnum prunifolium	Black-haw Viburnum	Mar - Apr

Rhododendron family is good for bees but produces toxic honey

Photo by Kathy Fell: Coreopsis verticillata

Forbs for Pollinators

Latin Name	Common Name	Bloom Time	Height
Achillea millefolium	Common Yarrow	Apr - Nov	1-2 ft
Ageratina altissima	White Snakeroot	Jul - Oct	1.5-3 ft
Anemone virginiana	Thimbleweed	May - Jul	1-2.5 ft
Angelica venenosa	Hairy Angelica	May - Sep	3-6 ft
Antennaria plantaginifolia	Plaintain-leaf Pussytoes	Mar - May	6-12 in
Apocynum cannabinum	Dogbane	May - Jul	2.5-5 ft
Arnoglossum artiplicifolium	Pale Indian Plantain	Jun - Oct	3-6 ft
Asclepias syriaca	Common Milkweed	Jun - Aug	3-5 ft
Asclepias tuberosa	Butterflyweed	May - Aug	1-2.5 ft
Baptisia tinctoria	Yellow Wild Indigo	Apr - Aug	2-3 ft
Chamaechrista fasciculata	Partridge Pea (Annual)	Jun - Sep	12-18 in
Chrysopsis mariana	Maryland Golden Aster	Jun - Oct	1-2.5 ft
Conoclinium coelestinum	Blue Mistflower	Jul - Oct	1.5-3 ft
Coreopsis auriculata	Lance-leaf Tickseed	Apr - Jun	1-2 ft
Coreopsis verticillata	Thread-leaf Coreopsis	May - July	2-3 ft

These are for full sun to part shade, moist to dry conditions

Photo by Kathy Fell: Eupatorium hyssopifolium

Forbs for Pollinators

Latin Name	Common Name	Bloom Time	Height
Erigeron annuus	Eastern Daisy Fleabane (Annual)	May - Oct	1-3.5 ft
Erigeron pulchellus	Robin's Plantain	Apr - Jun	1.5-2 ft
Eupatorium hyssopifolium	Hyssop-leaf Thoroughwort	Aug - Oct	2-4 ft
Eupatorium perfoliatum	Common Boneset	Aug - Oct	2-4 ft
Euphorbia corollata	Flowering Spurge	Jun - Sep	1-2 ft
Eurybia divaricata	White Wood Aster	Aug - Oct	1-3 ft
Eutrochium fistulosum	Hollow Joe-pye Weed	Jul - Oct	5-7 ft
Fragaria virginiana	Virginia Strawberry	Apr - Jun	3-9 in
Geum canadense	White Avens	May - Jul	4-18 in
Helenium autumnale	Common Sneezeweed	Sep - Oct	3-5 ft
Helianthus atrorubens	Purple-disk Sunflower	Jul - Oct	3-4 ft
Helianthus decapetalus	Ten-petaled Sunflower	Jul - Oct	3-5 ft
Houstonia caerulea	Common Bluets	Apr - May	3-4 in
Hypericum punctatum	Spotted St. John's Wort	Jun - Sep	2 ft
Hypoxis hirsuta	Eastern Yellow Star-grass	Mar - Jun	3-7 in

These are for full sun to part shade, moist to dry conditions

Photo by Kathy Fell: Packera anonyma

Forbs for Pollinators

Latin Name	Common Name	Bloom Time	Height
Lespedeza virginica	Slender Lespedeza	Jul - Sep	3-6 ft
Liatris pilosa	Grass-leaf Blazing Star	Aug - Nov	1-3 ft
Ludwigia alternifolia	Seedbox	May - Oct	2-3 ft
Oenothera biennis	Evening Primrose (Biennial)	May - Oct	2-6 ft
Oenothera fruticosa	Narrow-leaf Sundrops	Apr - Aug	16-18 in
Oxalis stricta	Upright Yellow Wood-sorrel	Mar - Oct	3-8 in
Oxalis violacea	Violet Wood-sorrel	Apr - May	6-9 in
Packera anonyma	Small Ragwort	May - Jun	1-3 ft
Parthenium integrifolium	Wild Quinine	May - Aug	2-4 ft
Penstemon laevigatus	Smooth Beardtongue	May - Jun	2-3 ft
Prunella vulgaris	Common Selfheal	Apr - Dec	6-12 in
Pseudognaphalium obtusifolium	Rabbit Tobacco (Annual)	Aug - Oct	1-3 ft
Pycnanthemum incanum	Hoary Mountain Mint	Jun - Aug	3-6 ft
Pycnanthemum tenuifolium	Narrow-leaf Mountain Mint	Jun – Aug	2-3 ft
Rhexia virginica	Virginia Meadow Beauty	May - Oct	2-3 ft

These are for full sun to part shade, moist to dry conditions

Photo by Kathy Fell: Rudbeckia hirta

Forbs for Pollinators

Latin Name	Common Name	Bloom Time	Height
Rudbeckia hirta	Black Eyed Susan	May - Jul	2-3 ft
Ruellia caroliniensis	Carolina Wild Petunia	May - Sep	1-3 ft
Sabatia angularis	Rose-Pink (Biennial)	Jul - Sep	1-3 ft
Salvia lyrata	Lyre-leaf Sage	Apr - May	1-2 ft
Silphium asteriscus	Starry Rosinweed	Jun - Sep	2-5 ft
Sisyrinchium angustifolium	Narrow-leaf Blue-eyed Grass	Apr- Jun	18-24 in
Solidago altissima	Tall Goldenrod	Aug - Oct	2-4 ft
Solidago bicolor	Silverrod	Aug - Oct	1-3 ft
Solidago caesia	Blue-stemmed Goldenrod	Aug - Oct	1-4 ft
Solidago odora	Sweet Goldenrod	Jul - Oct	2-3 ft
Solidago rugosa	Rough-stemmed Goldenrod	Aug - Oct	2-5 ft
Stylosanthes biflora	Pencilflower	Jun - Aug	6-18 in
Symphyotrichum lateriflorum	Calico Aster	Sep - Nov	1-4 ft
Symphyotrichum patens	Late Purple Aster	Aug - Nov	1-3 ft
Symphyotrichum pilosum	Frost Aster	Sep - Nov	2-4 ft

These are for full sun to part shade, moist to dry conditions

Photo by Kathy Fell: Vernonia novemboracensis

Forbs for Pollinators

Latin Name	Common Name	Bloom Time	Height
Thaspium barbinode	Hairy-joint Meadow Parsnip		2-3 ft
Uvularia sessilifolia	Sessile Bellwort		6-13 in
Verbesina alternifolia	Wingstem		4-8 ft
Vernonia novemboracensis	New York Ironweed		5-8 ft
Viola bicolor	Field Pansy		6 in
Viola pedata	Bird's Foot Violet		4-8 in
Viola primulifolia	Primrose-leaved Violet		2-6 in
Viola sagittata	Arrow-leaved Violet		4-8 in

These are for full sun to part shade, moist to dry conditions

Resources

Digital Atlas (What is native to your county): http://vaplantatlas.org/

Attracting Pollinators:
http://www.fs.fed.us/wildflowers/pollinators/documents/AttractingPollinatorsV5.pdf
https://www.fws.gov/pollinators/pdfs/PollinatorBookletFinalrevPrint.pdf
https://www.fs.fed.us/wildflowers/pollinators/gardening.shtml
http://xerces.org/pollinator-conservation/yards-and-gardens

Butterfly and moth host plants:
https://www.nwf.org/NativePlantFinder/Plants

Native Bees:
https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5306468.pdf
http://www.xerces.org/publications/identification-and-monitoring-guides/bumble-bees-of-eastern-united-states

Pollinator Partnership: https://www.pollinator.org/

Feed-a-Bee (Free seeds): https://www.feedabee.com/

Plant-pollinator information: https://illinoiswildflowers.info/