# Native Plants and Pollinator Conservation in North Carolina

**Gabriela Garrison**

**Eastern Piedmont Habitat Conservation Coordinator**

**NC Wildlife Resources Commission**

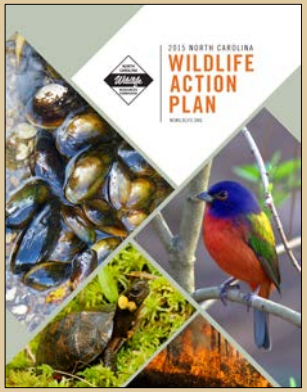
# Pollinator Diversity in North Carolina

- 500 species of native bees
- 2200 species of moths
- 175 species of butterflies
- 1 species of bird
- **Unknown** number of other insect pollinators



# North Carolina State Wildlife Action Plan

- A comprehensive planning tool developed to conserve and enhance wildlife species and habitat in North Carolina.
  - Developed in cooperation with numerous partners: www.ncwildlife.org/plan.
  - Identifies Species of Greatest Conservation Need (SGCN), imperiled habitats, threats and conservation actions.




- Insect SGCNs: 7 species of bumble bees and 18 species of butterflies, in addition to other insects.

# North Carolina State Wildlife Action Plan

- Bumble Bees in decline.
  - Rusty-patched bumble bee (federally endangered)
  - Yellow-banded bumble bee (proposed for listing)
- Butterfly species imperiled due to loss of plant host.
  - Frosted elfin (proposed for listing) – habitat management issues? Rattlesnake master borer moth? Need more information.
  - Monarch butterfly (proposed for listing)
- Primary threats are habitat loss and fragmentation.

# Importance of Pollinators


# Importance of Pollinators


# List of Removed Products

- Apples
- Onions
- Avocados
- Carrots
- Mangos
- Lemons
- Limes
- Honeydew
- Cantaloupe
- Zucchini
- Summer Squash
- Eggplant
- Cucumbers
- Celery
- Green Onions
- Cauliflower
- Bok choy
- Leeks
- Kale
- Broccoli
- Broccoli rabe
- Mustard greens

# Native Plants for Wildlife

- Provide habitat – bunch grasses, host plants.
  - Unmowed and unmanicured is preferable and also allows for lower maintenance costs.
  - Maintenance through prescribed burning.

- Provide travel corridors – aids in movement across larger landscape.
  - May provide connectivity – increased access to other forage areas, aids in reproduction and increases genetic diversity.

- Provide forage – some nectar/fruits/seeds from non-native, invasive plants are non-edible or poisonous.

# Doug Tallamy

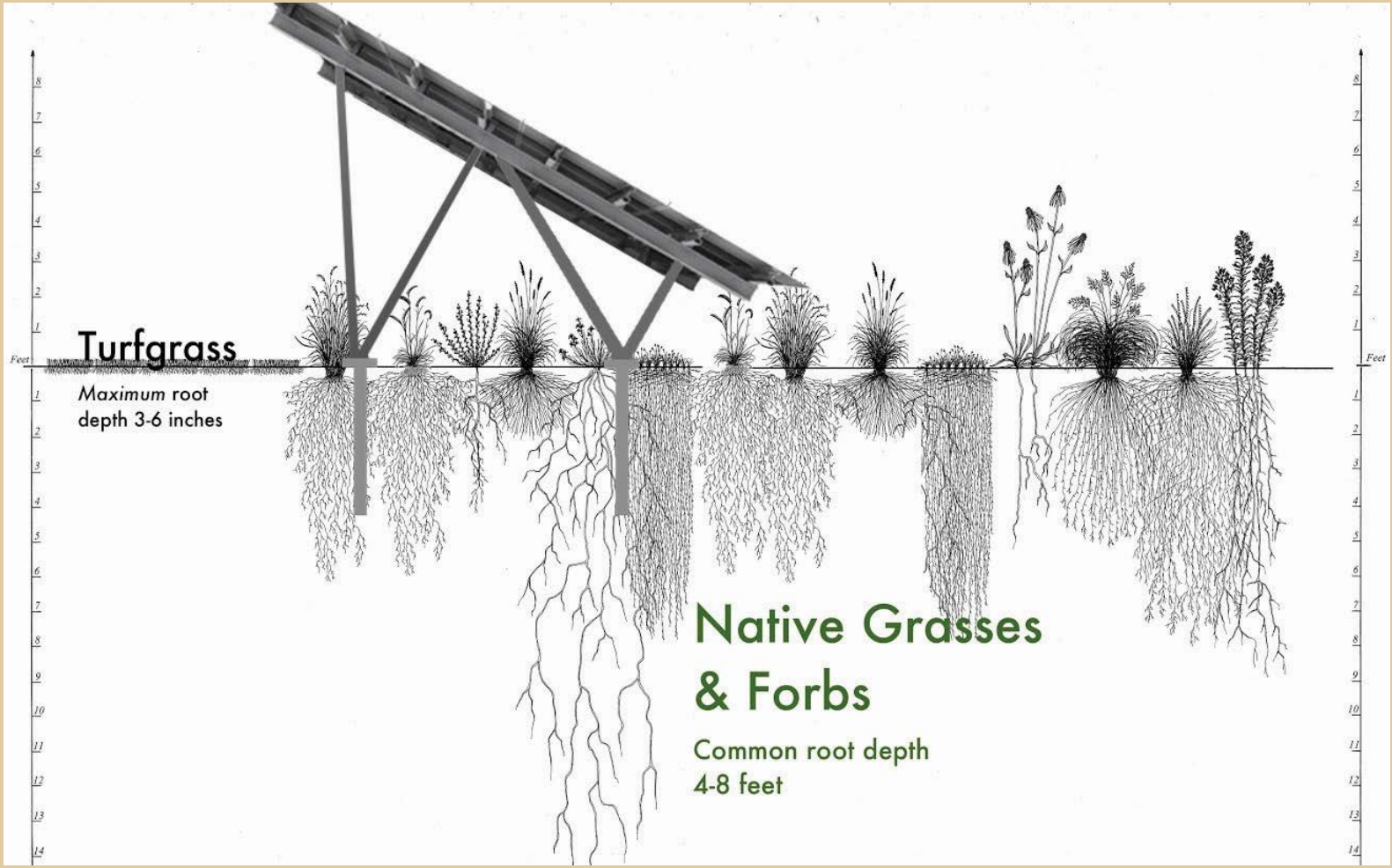
- Entomologist emphasizing the importance of native plants and biodiversity.
- Observational study: chickadee pair with 2 young.
  - On average, nestlings eat 1 caterpillar every 3 minutes.
  - Over 18 days, 6,000-9,000 caterpillars.

| | | |
|---|---|---|
| White oak: | 233 caterpillars | 15 species |
| Black cherry: | 53 caterpillars | 10 species |
| Ornamental pear: | 1 caterpillar | 1 species |

# Native Plants for Ecosystem Services

- Soil Stabilization –deep-rooted native vegetation maintains soil and ground structure.
  - Caution on using erosion control blankets for establishment – recommend biodegradable with loose-weave netting to avoid trapping wildlife.

- Storm Water Filtration – plant communities slow water movement, as well as reduce the amount entering streams; minimizes turbidity.
  - Rain gardens can be a good alternative in urban areas.



Turfgrass
Maximum root depth 3-6 inches
Native Grasses & Forbs
Common root depth 4-8 feet
Feet
Feet

# Native Plants for Ecosystem Services

- Pollinator Services for Agriculture – native bees are specialized (=more efficient pollination) and provide free pollination services. Greater than 70% of crops require insect pollination.
  - In the US, pollination of crops is valued at 10 billion dollars, at least!

- Decreased Herbicide/Pesticide Use – native plants are adapted to the local climate and often need minimal (if any) pesticides/fertilizers.
  - native habitat attracts beneficial insects that can be predators of crop pests.

- Carbon Sequestration – native habitat acts as 'carbon sinks', with most of carbon absorption happening below ground in deep root systems.

# Invasive Species

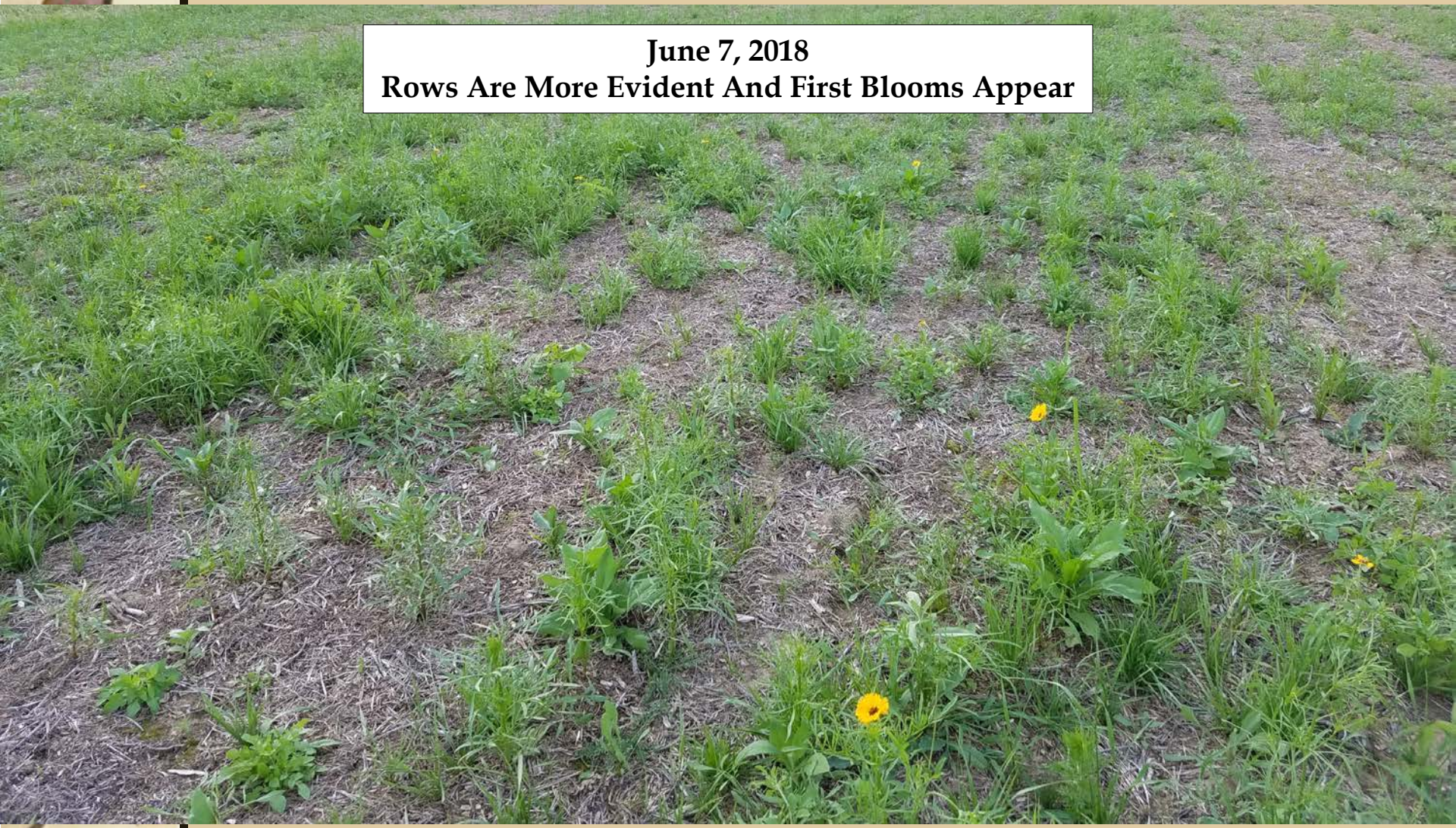
- Invasive species are a major contributor to species depletion, second only to habitat loss.
  - Approximately $130 billion/year to control.
- There may be short term benefits for soil stabilization, but invasive plants often prevent (re)establishment of many native species.
  - Invasives can spread to nearby natural communities and displace native species.

**Stanly County**
**March 29, 2018**
**Cover Crop Terminated With 1 Quart Glyphosate And 4-5 Ounces Imazapic Per Acre**

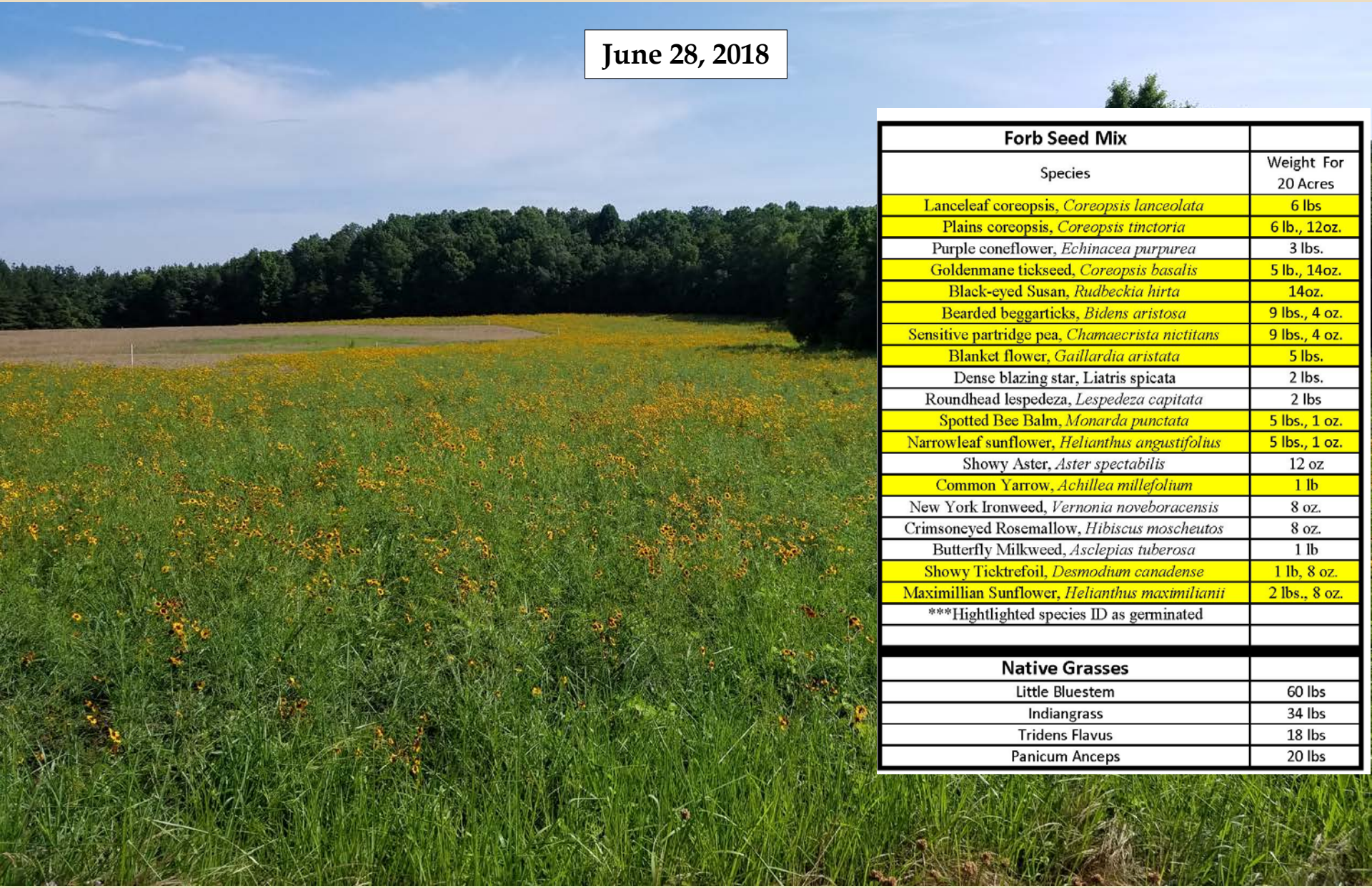

| Forb Seed Mix | |
|---|---|
| Species | Weight For 20 Acres |
| Lanceleaf coreopsis, *Coreopsis lanceolata* | 6 lbs |
| Plains coreopsis, *Coreopsis tinctoria* | 6 lb., 12oz. |
| Purple coneflower, *Echinacea purpurea* | 3 lbs. |
| Goldenmane tickseed, *Coreopsis basalis* | 5 lb., 14oz. |
| Black-eyed Susan, *Rudbeckia hirta* | 14oz. |
| Bearded beggarticks, *Bidens aristosa* | 9 lbs., 4 oz. |
| Sensitive partridge pea, *Chamaecrista nictitans* | 9 lbs., 4 oz. |
| Blanket flower, *Gaillardia aristata* | 5 lbs. |
| Dense blazing star, Liatris spicata | 2 lbs. |
| Roundhead lespedeza, *Lespedeza capitata* | 2 lbs |
| Spotted Bee Balm, *Monarda punctata* | 5 lbs., 1 oz. |
| Narrowleaf sunflower, *Helianthus angustifolius* | 5 lbs., 1 oz. |
| Showy Aster, *Aster spectabilis* | 12 oz |
| Common Yarrow, *Achillea millefolium* | 1 lb |
| New York Ironweed, *Vernonia noveboracensis* | 8 oz. |
| Crimsoneyed Rosemallow, *Hibiscus moscheutos* | 8 oz. |
| Butterfly Milkweed, *Asclepias tuberosa* | 1 lb |
| Showy Ticktrefoil, *Desmodium canadense* | 1 lb, 8 oz. |
| Maximillian Sunflower, *Helianthus maximilianii* | 2 lbs., 8 oz. |
| | |

| Native Grasses | |
|---|---|
| Little Bluestem | 60 lbs |
| Indiangrass | 34 lbs |
| Tridens Flavus | 18 lbs |
| Panicum Anceps | 20 lbs |

**May 26, 2018**
**Grasses And Forbs Germinating; Faint Rows Of Seedlings Are Visible**


June 7, 2018
Rows Are More Evident And First Blooms Appear


June 22, 2018

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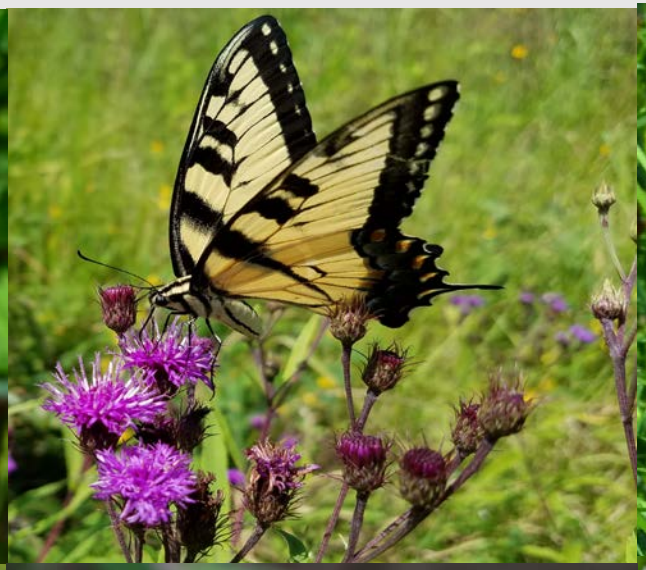




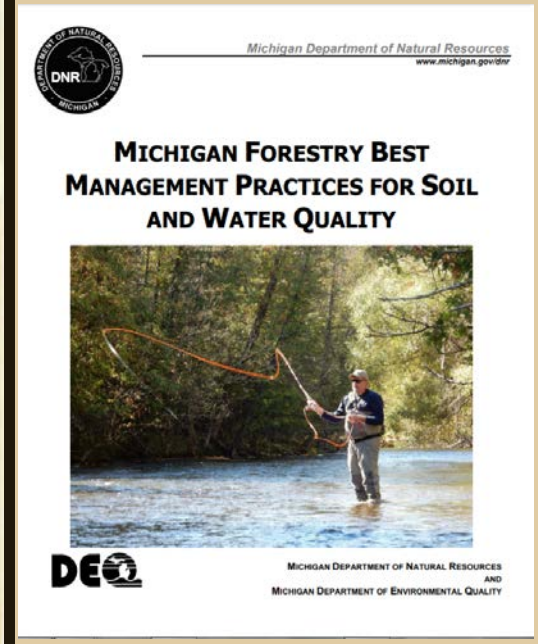
# Case Study: Virginia

- Criteria to use native species:
  - Slopes < 15% slope gradient.
  - Soils with K factors < 0.36 (soils are not highly erodible).
  - For use on storm water conveyance channels and streambanks, species must have proven effectiveness at the expected maximum storm water flow volume and velocity.

# Case Study: Virginia

| *Invasive Non-Native Species* | *Alternative Virginia Native* | |
|---|---|---|
| *Common Name* | *Common Name* | *Scientific Name* |
| **Common Reed** | Great bulrush | *Schoenoplectus tabernaemontani* |
| | Common Cattail | *Typha latifolia* |
| **Chinese Lespedeza**<br>**Birdsfoot Trefoil**<br>**Orchard Grass**<br>**Redtop**<br>**Weeping Lovegrass** | Roundheaded bushclover | *Lespedeza capitata* |
| | Patridge pea | *Chamaecrista fasciculata* |
| | Butterflyweed | *Asclepias tuberosa* |
| | Joe-pye weed | *Eutrochium dubium* |
| | Black-eyed Susan | *Rudbeckia fulgida* |
| | Big blue stem | *Andropogon gerardii* |
| | Indian grass | *Sorghastrum nutans* |
| | Side oats grama | *Bouteloua curtipendula* |
| **Crownvetch** | Roundheaded bushclover | *Lespedeza capitata* |
| | Patridge pea | *Chamaecrista fasciculata* |
| | Big blue stem | *Andropogon gerardii* |
| | Little blue stem | *Schizachyrium scoparium* |
| | Indian grass | *Sorghastrum nutans* |
| | Switchgrass | *Panicum virgatum* |
| **Tall Fescue** | Big blue stem | *Andropogon gerardii* |
| | Little blue stem | *Schizachyrium scoparium* |
| | Indian grass | *Sorghastrum nutans* |
| | Switchgrass | *Panicum virgatum* |
| | Broomsedge | *Andropogon virginicus* |
| | Deertongue | *Dichanthelium clandestinum* |
| | Side oats grama | *Bouteloua curtipendula* |
| | Canadian wildrye | *Elymus canadensis* |
| | Bottlebrush grass | *Elymus hystrix* |
| | Virginia wildrye | *Elymus virginicus* |

# Case Study: Michigan




- Published by Michigan DEQ.
- "To meet legal requirements and prevent soil from eroding in a water body, certain introduced species may be used, especially if quick establishment is needed. However, this document only recommends those non-native species that are not considered to be invasive, which are most likely to promote the natural succession of the site to native ground cover or are not likely to interfere with the native seed applied at a later date."

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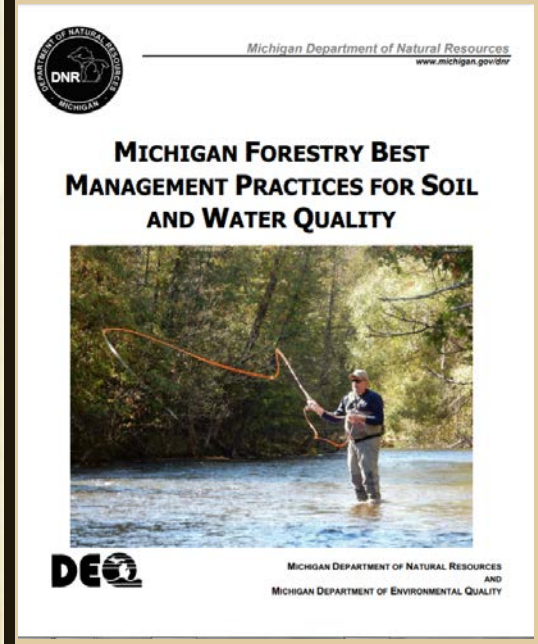


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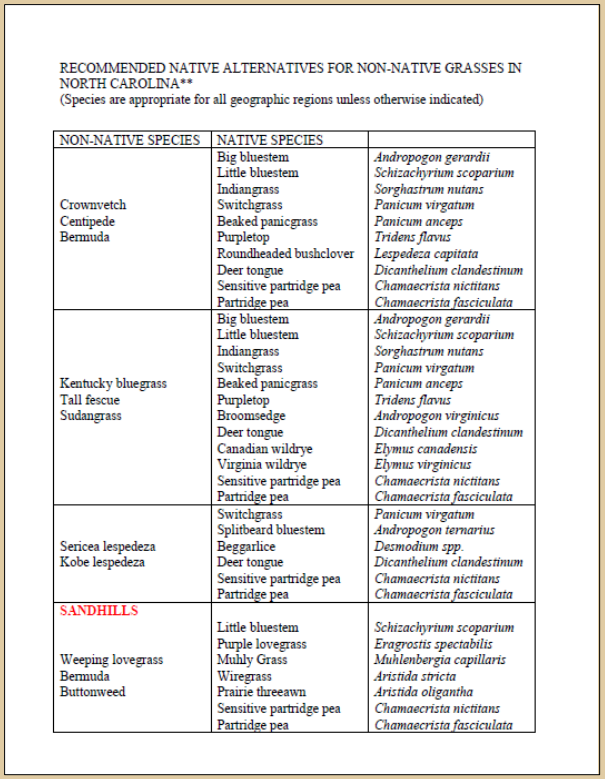
# Case Study: Michigan

| Common (*Latin*) | SOIL | MOISTURE | LIGHT | REGION | Comments |
|---|---|---|---|---|---|
| Big bluestem (*Andropogan gerardii*) | S-L-C | D-M-W | S | SW | Native perennial, warm season grass* |
| Creeping red fescue (*Festuca rubra*) | S-L-C | D-M-W | S , P | SW | Non-native perennial |
| Indian grass (*Sorghastrum nutans*) | S-L-C | D-M-W | S-P | NLP, SLP | Native perennial, warm season grass* |
| June grass (*Koelaria micrantha*) | S-L-C | D-M | S, P | SW | Native perennial, cool season grass** |
| Little bluestem (*Schizachyrium scoparius*) | S-L | D-M | S, P | SW | Native perennial, warm season grass*, dune stabilization |
| Oats (*Avena sativa*) | S-L-C | D-M | S, P | SW | Non-native annual, temporary cover |
| Redtop (*Agrostis gigantea*) | L, C, M | M-W | S | SW | Non-native perennial, cool season grass** |
| Switchgrass (*Panicum virgatum*) | S-L-C | D-W | S | SW | Native perennial, warm season grass* |
| Wild-rye, Canada (*Elymus canadensis*) | S-L | D-M-W | S, P, Sh | SW | Native perennial, cool season grass** |
| Wild-rye, Virginia (*Elymus virginicus*) | L-C | M-W | S, P, Sh | SW | Native perennial, cool season grass** |
| | | | | | |
| **Forbs (Wildflowers)** | | | | | |
| **Legumes:** | | | | | |
| Alsike Clover (*Trifolium hybridum*) | L-M | D-M-W | S, P | SW | Non-native, perennial, good for forest roads in northern hardwoods |
| Lupine (*Lupinus perennis*) | S-L | D-M | S - P | SLP + Newaygo Co. | Native perennial, butterfly host, nectar source |
| Medium Red Clover (*Trifolium pratense*) | S-L-C | D-M-W | S, P | SW | Non-native, perennial legume, good for forest roads in northern hardwoods |
| Round-headed bush clover (*Lespedeza capitata*) | S-L | D-M | S | SLP + Newaygo Co. | Native perennial legume, wildlife food |
| White Dutch Clover (*Trifolium repens*) | L-C-M | D-M-W | S, P | SW | Non-native, perennial legume, good for forest roads in northern hardwoods |

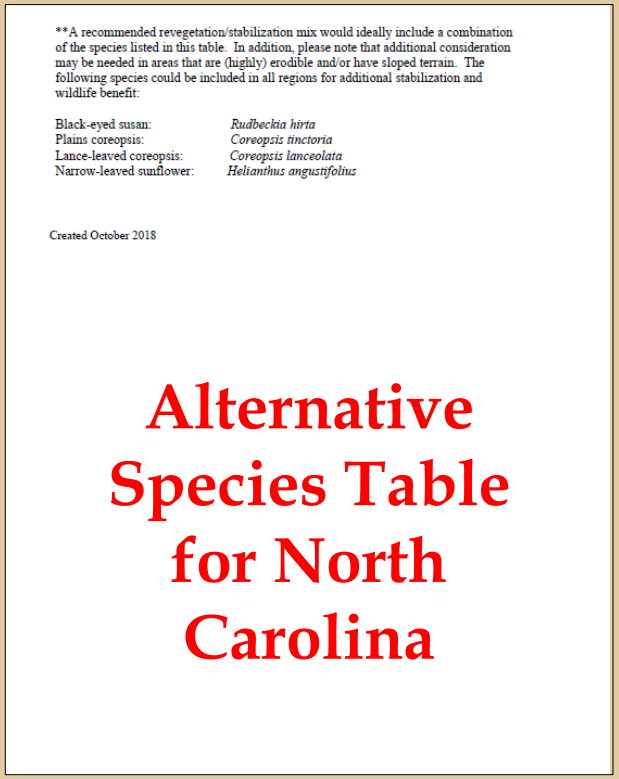
# Resources for North Carolina

1.



RECOMMENDED NATIVE ALTERNATIVES FOR NON-NATIVE GRASSES IN NORTH CAROLINA**
(Species are appropriate for all geographic regions unless otherwise indicated)

| NON-NATIVE SPECIES | NATIVE SPECIES | |
|---|---|---|
| Crownvetch<br>Centipede<br>Bermuda | Big bluestem<br>Little bluestem<br>Indiangrass<br>Switchgrass<br>Beaked panicgrass<br>Purpletop<br>Roundheaded bushclover<br>Deer tongue<br>Sensitive partridge pea<br>Partridge pea | *Andropogon gerardii*<br>*Schizachyrium scoparium*<br>*Sorghastrum nutans*<br>*Panicum virgatum*<br>*Panicum anceps*<br>*Tridens flavus*<br>*Lespedeza capitata*<br>*Dicanthelium clandestinum*<br>*Chamaecrista nictitans*<br>*Chamaecrista fasciculata* |
| Kentucky bluegrass<br>Tall fescue<br>Sudangrass | Big bluestem<br>Little bluestem<br>Indiangrass<br>Switchgrass<br>Beaked panicgrass<br>Purpletop<br>Broomsedge<br>Deer tongue<br>Canadian wildrye<br>Virginia wildrye<br>Sensitive partridge pea<br>Partridge pea | *Andropogon gerardii*<br>*Schizachyrium scoparium*<br>*Sorghastrum nutans*<br>*Panicum virgatum*<br>*Panicum anceps*<br>*Tridens flavus*<br>*Andropogon virginicus*<br>*Dicanthelium clandestinum*<br>*Elymus canadensis*<br>*Elymus virginicus*<br>*Chamaecrista nictitans*<br>*Chamaecrista fasciculata* |
| Sericea lespedeza<br>Kobe lespedeza | Switchgrass<br>Splitbeard bluestem<br>Beggarlice<br>Deer tongue<br>Sensitive partridge pea<br>Partridge pea | *Panicum virgatum*<br>*Andropogon ternarius*<br>*Desmodium spp.*<br>*Dicanthelium clandestinum*<br>*Chamaecrista nictitans*<br>*Chamaecrista fasciculata* |
| SANDHILLS<br><br>Weeping lovegrass<br>Bermuda<br>Buttonweed | Little bluestem<br>Purple lovegrass<br>Muhly Grass<br>Wiregrass<br>Prairie threeawn<br>Sensitive partridge pea<br>Partridge pea | *Schizachyrium scoparium*<br>*Eragrostis spectabilis*<br>*Muhlenbergia capillaris*<br>*Aristida stricta*<br>*Aristida oligantha*<br>*Chamaecrista nictitans*<br>*Chamaecrista fasciculata* |



**A recommended revegetation/stabilization mix would ideally include a combination of the species listed in this table. In addition, please note that additional consideration may be needed in areas that are (highly) erodible and/or have sloped terrain. The following species could be included in all regions for additional stabilization and wildlife benefit:

| | |
|---|---|
| Black-eyed susan: | *Rudbeckia hirta* |
| Plains coreopsis: | *Coreopsis tinctoria* |
| Lance-leaved coreopsis: | *Coreopsis lanceolata* |
| Narrow-leaved sunflower: | *Helianthus angustifolius* |

Created October 2018

**Alternative Species Table for North Carolina**

2. **https://projects.ncsu.edu/goingnative/howto/mapping/invexse/**

# "Prohibited Species" List

- Create a list of plants that should not be used in any case.
- Plants on the list are the most invasive and detrimental to native plants and habitats or could inhibit establishment of native species.
  - Example species: Sericea Lespedeza, Sudangrass, Korean Lespedeza, Kobe Lespedeza, Bermuda Grass.
- Annual Rye vs. Perennial Rye – Perennial Rye species can be allelopathic to some native species.
  - Tall Fescue, Sudangrass and Kentucky Bluegrass are also considered allelopathic to many native plant species.

# North Carolina Pollinator Conservation Alliance

- Partnership of more than 25 agencies and organizations with interests in pollinator conservation.

- Within this partnership, there are six committees, including Plant Resources, Outreach, Habitat Assessment, Research, Energy and Pesticide Stewardship.
  - Plant Resources: create plant lists for various audiences.
  - Habitat Assessment: create site prep and planting guidance.
  - Energy: created technical guidance document for installing native habitat on solar farms.

- **www.ncpollinatoralliance.org**

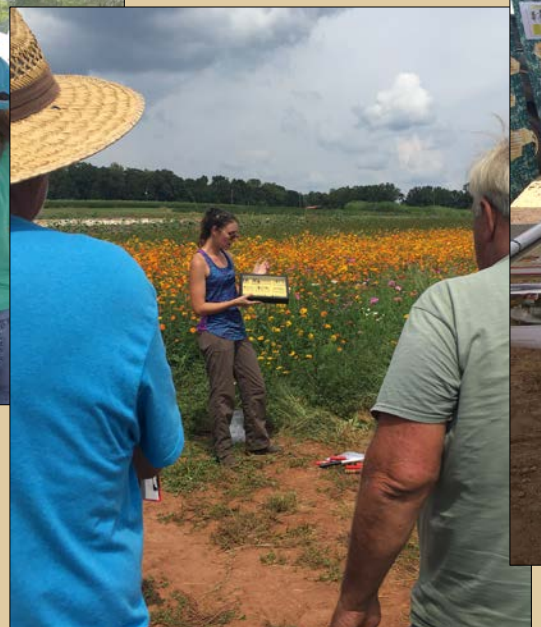
Debbie Roos

# NCPCA Outreach Efforts

- Bugfest 2018 (NC Museum of Natural Sciences)


# NCPCA Outreach Efforts

- 1st Annual Pollinator Field Day (Piedmont Research Station)

# NCPCA Solar Technical Guidance Document

## North Carolina Technical Guidance for Native Plantings on Solar Sites

North Carolina Pollinator Conservation Alliance
October 2018

### Introduction

North Carolina is home to nearly 500 species of native bees and more than 2,200 and 170 species of moths and butterflies, respectively. In the North Carolina Wildlife Resources Commission's 2015 State Wildlife Action Plan (SWAP) (www.ncwildlife.org/plan), there are 28 insect species that have been listed as Species of Greatest Conservation Need (SGCN). This list includes the rusty-patched bumble bee (Bombus affinis), a species that has been recently listed as federally endangered under the Endangered Species Act (ESA). In addition, the yellow-banded bumble bee (Bombus terricola), an SGCN in the SWAP, has been petitioned for listing under the ESA. There are several species of butterfly that are considered threatened or endangered due to loss of host plant habitat, including the frosted elfin (Callophyrs irus) and monarch butterfly (Danaus plexippus), currently under review for listing by the U.S. Fish and Wildlife Service. The primary threat to these imperiled species is habitat loss and fragmentation.

### Threatened and endangered pollinators found in North Carolina


Rusty-patched bumble bee © Susan Day


Yellow-banded bumble bee © Denis Doucet


Frosted Elfin Butterfly © Bill Boulton


Monarch Butterfly © Lindsey Brendel

Historically, a significant portion of North Carolina was considered 'prairie' habitat; less than 1% currently remains. In the early1500's, European settlers detailed the existence of prairie-type openings across the Piedmont region. In 1540, Hernando de Soto wrote of large swaths of un-forested areas that were easily navigated on horseback with abundant amounts of grass. In 1718, a French explorer, Guillaume Delisle, reported the landscape as a sparsely forested, open grassland containing bison and elk, present from the Neuse River to the foot of the mountains.

These early explorers depicted a vastly different landscape than exists in modern-day North Carolina. It is likely these former prairie-type habitats were maintained by centuries of wildfires and Native Americans who managed the open areas for agricultural purposes and game species. After European colonization, Native Americans and large grazers were displaced and prairie areas were converted to pastures, agriculture fields or succeeded to forest. It is difficult to approximate the floral and faunal diversity that has been lost with the disappearance of this expansive habitat. However, the solar industry has an opportunity to create large areas of habitat with similar prairie characteristics that may offset habitat loss and declining pollinator populations (Forup et al. 2008).

# NCPCA Solar Sore Card

## North Carolina Solar Site Pollinator Habitat Planning and Assessment Form

**1. Planned Native Flowering Plant Diversity in Buffer Areas (species with more than 1% cover)**

- ☐ 5-10 flowering species +5 pts
- ☐ 10-15 flowering species +8 pts
- ☐ 16-20 flowering species +10 pts
- ☐ >20 flowering species +15 pts

**2. Planned Native Grass Diversity in Buffer Areas**

- ☐ 2 species +2 pts
- ☐ 3 or more species +5 pts

**3. Planned Native (or Naturalized) Plant Diversity in Rows and Under Solar Array***

- ☐ 1-3 species +5 pts
- ☐ 4-6 species +8 pts
- ☐ More than 7 species +10 pts

**4. Planned Percent of Site Dominated by Native Plant Species****

- ☐ 0-10% + 5 pts
- ☐ 11- 40 % +10 pts
- ☐ 41-70 % +15 pts
- ☐ More than 70% +20 pts

**5. Seasons with at Least Three Blooming Species Present (check all that apply)**

- ☐ Spring (March-May) +10 pts
- ☐ Summer (June-August) +5 pts
- ☐ Fall (September-November) +5 pts

**9. Insecticide Risk**

- ☐ Planned on-site use of insecticide or pre-planting seed/plant treatment (excluding buildings/electrical boxes, etc) -40 pts
- ☐ Communication/registration with local chemical applicators or on www.fieldwatch.com to prevent drift +5 pts

**10. Planned Native Hedgerow/Screening Area (check all that apply)**

- ☐ At least 50% of hedgerow/screen will be planted with flowering plant species +5 pts
- ☐ At least 50% of hedgerow/screen will be planted with native plant species +5 pts
- ☐ Hedgerow/screen will be a minimum of 30 feet wide +10 pts

**11. EXTRA CREDIT (check all that apply)*****

- ☐ Forested stream and wetland buffers of 100 and 50 feet, respectively, are observed +10 pts
- ☐ Install permeable fencing that allows wildlife passage +10 pts
- ☐ Install bird boxes (one box/half acre) +5 pts

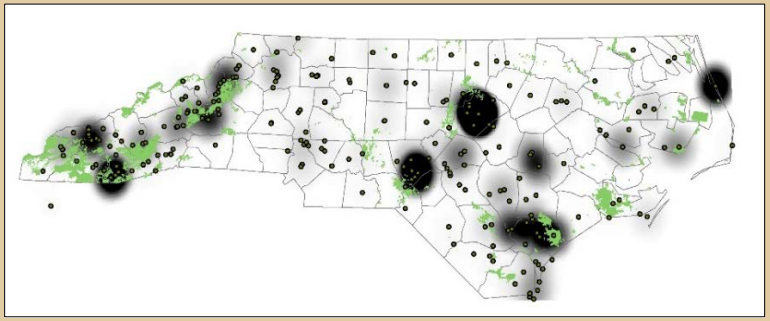
(please see NC Technical Guidance for Native Plantings on Solar Sites)

**TOTAL POINTS:** _____

| | |
|---|---|
| Provides Exceptional Habitat | 85 and higher |

# NCPCA Research Efforts

- Spring/Summer 2019 Native Bee Sampling on 4 Game Lands across the State, based on historic hot spots:



- Three test sites in early successional habitat in each Game Land = 12 test sites total.
- 30 bee bowls will be put out for one day, every two weeks: May-October. Bees will be netted during that day.
- Specimens will be identified by NCSU research associates…habitat management decisions based on results??

# NCPCA Plant List


NCPCA Pollinator 'Best of the Best' Species List

| Species | synonym / previous name | Common Name | Duration | Habit | Nectar or host/habitat | Native to mountai | Native to piedmo | Native to coastal plain | Soil moisture | Light exposure | Flowering season | Max height | Project type (see 'key to project type') | is seed commercially | NC ecotype seed | SC ecotype seed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Actaea racemosa | Cimicifuga | black cohosh | perennial | herb | nectar | x | x | | dry, avg, moist | part shade, shade | summer | 8 | 1,2 | | | |
| Agrostis hyemalis | | small bentgrass | perennial | grass | host/habitat | x | x | x | dry, avg | sun | summer | 3 | 3, 4, 5, 6 | yes | yes - piedmont | |
| Aletris farinosa | | white colicroot | perennial | herb | nectar | x | x | x | dry, avg, moist | sun | summer | 3 | 1, 2, 3, 4, 5, 6, 7 | | | |
| Allium cernuum | | nodding onion | perennial | herb | nectar | x | x | | avg, dry | sun | summer | 1.5 | 1, 2, 3, 4, 5, 6 | yes | | |
| Amelanchier arborea | | common | perennial | shrub, | nectar | x | x | x | moist, avg | sun, part shade | spring | 25 | 1, 2 | | | |
| Ampelaster carolinianus | Aster carolinianus | climbing aster | perennial | vine | nectar | | | x | avg, moist, wet | sun | fall | 6 | 1, 2 | | | |
| Amsonia ciliata | | fringed bluestar | perennial | herb | nectar | | | x | avg | sun, part shade | spring | 2 | 1, 2, 3, 4, 5, 6 | yes | | yes |
| Amsonia | | eastern bluestar | perennial | herb | nectar | x | x | x | avg | sun, part shade | spring | 3 | 1, 2, 3, 4, 5, 6, 8 | | | |
| Andropogon gerardii | | big bluestem | perennial | grass | host/habitat | x | x | x | dry, avg, moist | sun, part shade | summer, fall | 8 | 1, 2, 3, 4, 6, 7 | yes | yes - piedmont | |
| Andropogon ternarius | | split-beard bluestem | perennial | grass | host/habitat | x | x | x | well-drained | sun, part shade | fall | 4 | 1, 2, 3, 4, 6, 7 | yes | | |
| Aquilegia canadensis | | columbine | perennial | herb | nectar | x | x | x | avg, dry | sun, shade | spring | 3 | 1, 2, 3, 4, 6, 7, 8 | yes | | |
| Asclepias incarnata | | swamp milkweed | perennial | herb | nectar, | x | x | x | avg, moist, wet | sun, part shade | summer | 6 | 1, 2, 3, 6, 7, 8 | yes | | |
| Asclepias syriaca | | common milkweed | perennial | herb | nectar, | x | x | | avg, dry | sun | summer | 6 | 2, 3, 6 | yes | | |
| Asclepias tuberosa | | butterfly milkweed | perennial | herb | nectar, | x | x | x | dry, average, well- | sun, part shade | summer | 3 | 1, 2, 3, 4, 5, 6, 7 | yes | | |
| Asclepias variegata | | white milkweed | perennial | herb | nectar, | x | x | x | dry, average | sun, part shade | summer | 3 | 1, 2, 3, 4, 5, 6, 7 | | | |
| Asimina triloba | | paw-paw | perennial | tree | host/habitat | x | x | x | avg, moist, wet | sun, part shade, shade | spring | 30 | 1, 2 | | | |
| Baptisia albescens | | spiked wild indigo | perennial | herb | nectar | | x | x | avg, dry | sun | spring, summer | 4 | 1, 2, 3, 4, 5, 6, 7 | yes | yes | yes |
| Bidens aristosa | | bearded beggarticks | annual / | herb | nectar | x | x | x | avg, moist | sun, part shade | summer, fall | 6 | 3, 4, 6, 8 | yes | yes | |
| Blephilia ciliata | | downy woodmint | perennial | herb | nectar | | x | | dry, avg | sun, part shade | summer | 2.5 | 1, 2, 3, 5 | | | |

NC pollinator species | Species commercially available | key to project type

# NCPCA Projects on the Horizon

- Native Bee ID Classes.
- Pollinator curriculum – Master Pollinator training?
- NCPCA seed packets to distribute at outreach events.
- Additional research and insect sampling on both public and private lands in coming years.
- Develop database of pollinator habitat across the State.
- Work with mosquito sprayers to minimize impact.

# QUESTIONS?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