# Planning For Success CPS 420 & CPS 647



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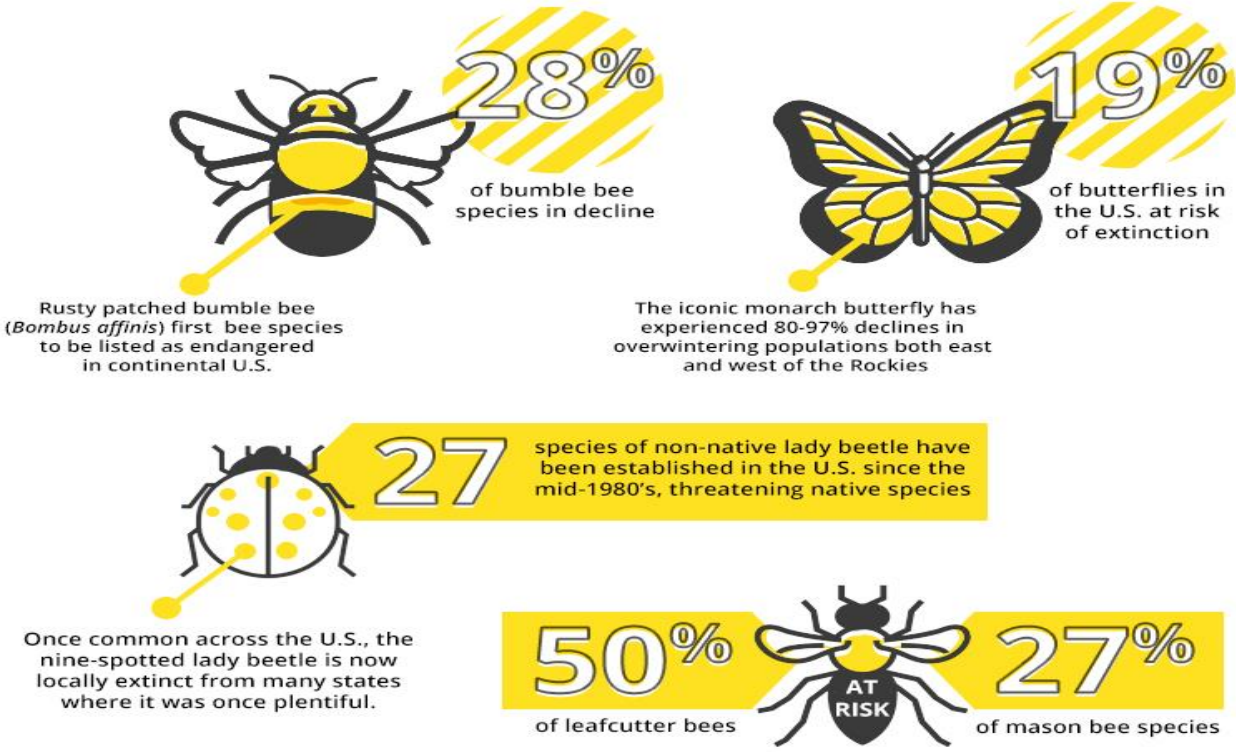
# Why 420 is SO IMPORTANT

- 28% bumblebees in decline
- 19% of U.S. butterflies at risk of extinction
- 50 % of leafcutter bees species are at risk
- 27% of mason bee species are at risk
- 27 species of non-native lady beetles threaten our native beetles



# Why 420 & 647 is SO IMPORTANT

- **Forest birds** have experienced consistent declines, with big losses among beloved species such as Wood Thrush and Baltimore Oriole. Altogether, forest bird populations have lost 1.2 billion birds since 1970. The Baltimore Oriole has declined by 44% since 1970; it is designated as a species of greatest conservation need in 7 states.
- **Shorebirds** include many migratory species such as Ruddy Turnstone and Semipalmated Sandpiper that are declining fast, with critically low populations that may soon trigger Endangered Species Act listings. Ruddy Turnstone numbers have fallen by 80% since 1974; it is designated as a species of greatest conservation need in 17 states.
- **Grassland birds** have suffered the steepest losses, with a population decline of 700 million birds. The biggest declines are among birds beloved by birdwatchers and hunters alike, such as Northern Bobwhite. Bobwhite populations have declined by 78% since 1970, and the species is designated as a species of greatest conservation need in 26 states.

# Why Plan Both 420 & 647?

- **Increases success rate of <u>quality</u> habitat**
  - Better educates Land Managers on necessary actions to create quality habitat
  - Increases NRCS follow up during critical establishment period
  - Provides more cost assistance for Land Managers to complete necessary management
- **Provides Critically Needed Early Successional Habitat**
  - Requires contract holders to conduct management over a longer timeframe
  - Reduces woody encroachment and invasive species succession, which contribute to less pollinator habitat.

# What do pollinators need?

- Diverse Native plants
- Non-native, non-invasive can be good too
- Continuous bloom
- Flowers rich in protein and nectar
- Host plants
- Mix: woody, herbaceous, grasses
- Habitat Connectivity
- Pesticide Free Areas
- Nesting areas

POLLINATOR PARTNERSHIP

# Pollinator communities vary with vegetation structure and time since management within regenerating timber harvests of the Central Appalachian Mountains

Codey L. Mathis a,* , Darin J. McNeil Jr. b , Monica R. Lee a , Christina M. Grozinger b , David I. King c , Clint R.V. Otto d , Jeffery L. Larkin

## Summary


- Bee and butterfly abundance were positively associated with season-wide floral abundance and negatively associated with dense vegetation that inhibits the growth of understory floral resources.
- Particularly in late summer, few pollinators were observed in stands >6 years post-harvest, with models predicting five times more bees in 1-year-old harvests than in 9-year-old harvests. Pollinator species diversity was positively associated with floral diversity and percent forb cover, and negatively associated with percent tall (>1 m) sapling cover.
- These results suggest that regenerating timber harvests promote abundant and diverse pollinator com- munities in the Appalachian Mountains, though pollinator abundance declined quickly as woody stems regenerated.
- Ultimately, our findings contribute to a growing body of literature suggesting that dynamic forest management producing a mix of age classes would benefit forest pollinator populations in the Central Appalachian Mountains.

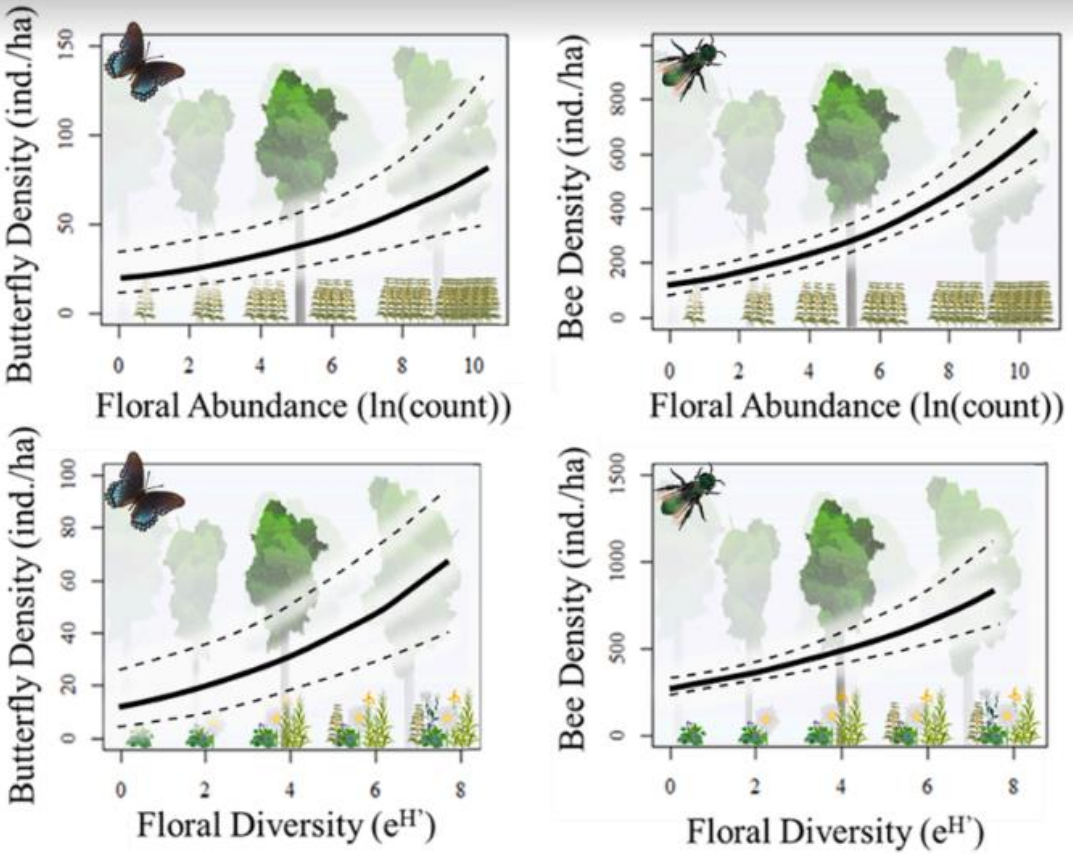




**Fig. 3.** Estimated pollinator densities (individuals per hectare; butterflies on the left, bees on the right) by the average floral abundance on a site (log-transformed; above) or average floral diversity (effective species: $e^{H'}$). Data are derived from observations of bees (Anthophila), butterflies (Papilionoidea), and flowers in regenerating timber harvests across Pennsylvania. Floral variables are from the total floral resource variable set. Models were created through hierarchical distance models in the package '*unmarked*' in program R. The solid line shows model predictions, and the dashed lines depict 95% confidence intervals. The models are fit to data from the fifth round of sampling in 2018 (Aug 2–22, 2018). Illustrations created by C. Mathis and D. J. McNeil.

# CPS 420 Planning – Inventory & Evaluation

- Where / what are the opportunities for pollinator habitat?

# Current & Future Site Conditions

- Soil Type – Slope, sunlight -erosion potential
- Drainage
- Land use
- Cropping system immediately prior to 420 seeding – herbicide carry over, residue
- Weed pressure
- Use of or need for cover crops
- Adjacent site conditions

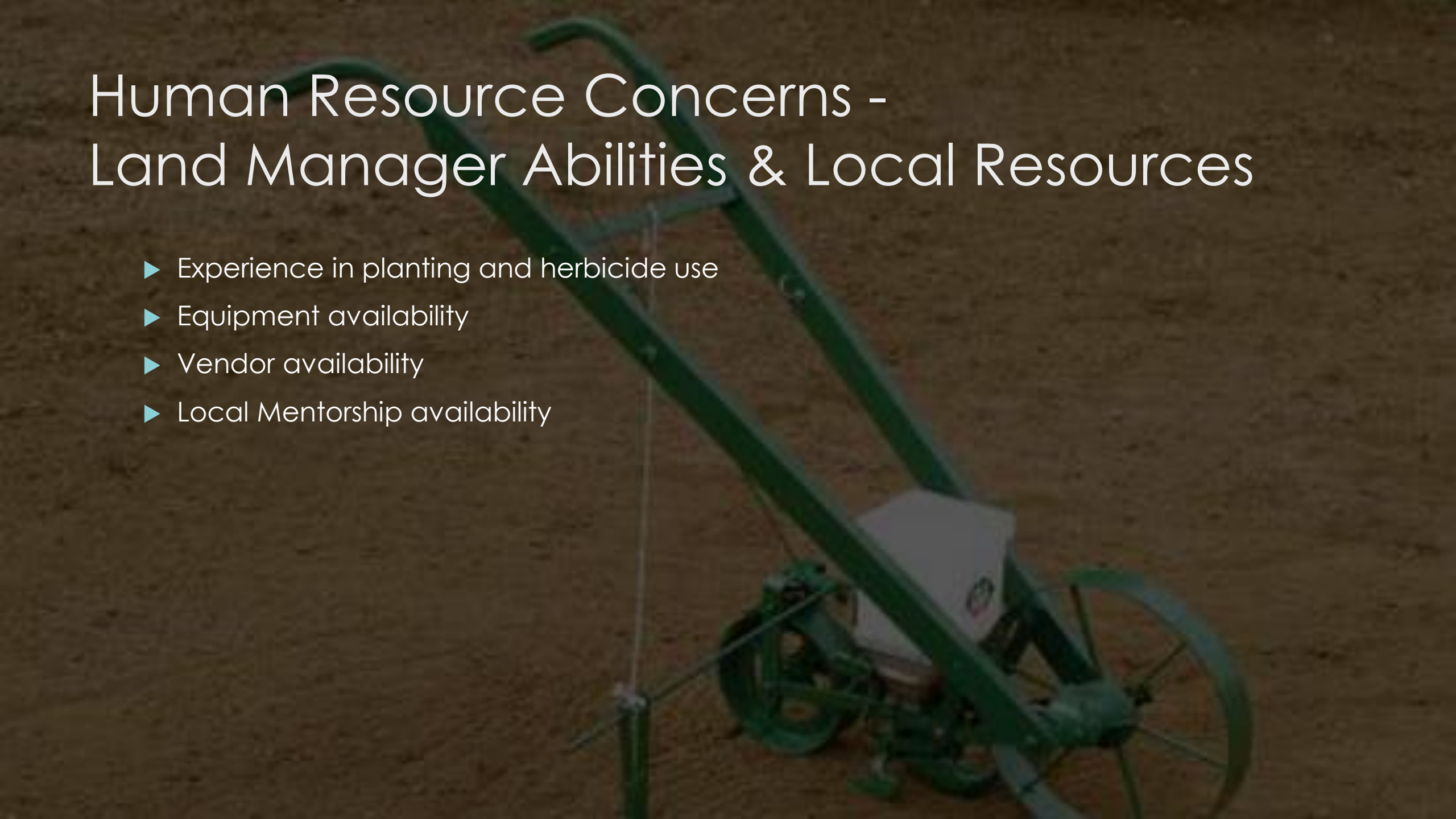
# Key Site Characteristics

Site selection for pollinator habitat should take the following into consideration:

- **Pesticide Drift:** Habitat must be protected from pesticides (especially insecticides and bee-toxic fungicides and herbicides). Only sites with no to very low risk for pesticide drift should be established as new habitat. This includes some pesticides approved for use on organic farms.
- **Accessibility:** New habitat should be accessible to equipment for planting and maintenance operations.
- **Sunlight:** Most wildflowers and native shrubs grow best in full sunlight.
- **Slope:** Steep or highly erodible sites should not be disturbed. For re-vegetating such sites, consider Critical Area Planting (342) or other suitable Practice Standards.
- **Weed Pressure:** Areas with high weed pressure will take more time and effort to prepare for planting. It is also important to note the primary weed composition. Knowing the most abundant weed species on site, their reproductive methods, and whether they are grass or broadleaf, perennial or annual, and woody or herbaceous, will help significantly in planning for site preparation and follow-up weed management during establishment.
- **Site History:** Factors such as past plant cover (e.g., weeds, crops, grass sod, and/ or native plants), use of pre-emergent herbicides or other chemicals, and soil compaction can affect plant establishment. It is also important to know if sites may have poor drainage or may flood, as such conditions make habitat establishment more difficult and require a plant mix adapted for the site.
- **Soils and Habitat:** Most plants listed in the Appendix of this guide are tolerant of many soil conditions and types, however all plants establish better when matched with appropriate conditions.
- **Irrigation:** Establishing plants from plugs, pots, or bare root will require irrigation. Irrigation is generally not needed for plantings established from seed.
- **Other Functions:** The site may offer opportunities to serve other functions, such as run-off prevention, stream bank stabilization, wildlife habitat, or windbreaks. Those factors can influence plant choice and/ or design.

# Human Resource Concerns - Land Manager Abilities & Local Resources

- Experience in planting and herbicide use
- Equipment availability
- Vendor availability
- Local Mentorship availability



# 420 Do's and Don'ts - Seeding

## Do

- Get 1 full year of weed control if possible – start in September for weed control for following August by planning CPS 315. More may be needed in grassy areas, less in crop fields with good weed control.
- Try to plan forbs for Dormant seeding, Early spring is good if using a NT drill
- Dormant is good for broadcast seeding, especially small scale, needs cultipacker / roller
- Use right mix for soil type / drainage/ species of concern
- Plant into soybean stubble if marestail is controlled. Be aware of chemical residuals!
- Consider a cover crop CPS 340 to assist in weed control prior to seeding, allowing for weed control / thatch control prior to seeding. ensure it is mowed to prevent thick thatch layer in spring.
- Consider nurse crop on erosive soils for fall seedings

## Don't

- Use the same generic mix for everything
- Assume the contract holder knows how to prepare the site
- Neglect adjacent land use impacts – weed encroachment, spray drift etc. Consider buffer/management area
- Hesitate to include supplemental resource material in contract documents. (establishment guides/vendor lists / invasive species ID guides / OSU fact sheets on herbicide use

# 420 Do's and Don'ts – Establishment Years

## Do

- Complete 420 IR with details on weed control. MOW MOW MOW IN YEAR ONE no closer than 6-8" And in YEAR 2 (May and June) no closer than 8-10"
- Check the Scenarios to determine if you can include CPS 647 or CPS 315 to assist in mowing during establishment year 1 or 2
- Follow up with contract holder on specific recommendations after site visit for payment inspections, or a subsequent drive by.

## Don't

- Plant it and forget it – you or the land manager!
- Expect a beautiful meadow the first year or two, or maybe 3.... Prepare the participant with reasonable expectations.
- Let a good contract review go to waste – ask the participant how the seeding is progressing.

# CPS 647 it is more than Mowing and Edge Feathering!

## Where to Plan

- Forest land that is getting Edge Feathering or Forest Openings after CPS 314 if applicable.
- Pollinator or WSG plantings or existing stands for management
- Unmanaged areas with increasing tree canopy coverage needing mechanical treatment after CPS 314 / 315 if applicable
- Unmanaged areas with monocultures - golden rod, reed canary grass or other dominate vegetation, after CPS 315, or 314 if applicable

## Benefits of 647

- Increase diversity of vegetation and wildlife species – insects, birds, mammals.
- Reduction and management of future invasive species
- Increases pollinator habitat
- Provides the habitat most lacking for Ohio wildlife!

# Other Practices for Pollinators

- Conservation Cover (CRP)
- Hedgerow Planting / Windbreaks
- Tree/Shrub Establishment **(Shrubs included in 420 in FY2023)**
- Field Borders
- Riparian Cover – 390, 391, 580
- Cover Crop
- Forest stand improvement
- Prescribed burning
- Prescribed grazing
- Associated practices for success – 315, 314

# RESOUCES FOR PLANNERS

**PLANNERS**

**Visual Habitat Guides:**

- Monarch Wings Across Ohio Farm Habitat Guide - https://www.pollinator.org/pollinator.org/assets/generalFiles/MonarchWingsOhio_Farms.LO-RES_FINAL-for-webv2.pdf
- Conservation and Management of Monarch Butterflies: A Land Manager's Restoration Guide for the Eastern U.S. https://www.pollinator.org/pollinator.org/assets/generalFiles/Monarch-Restoration-Guide.pdf

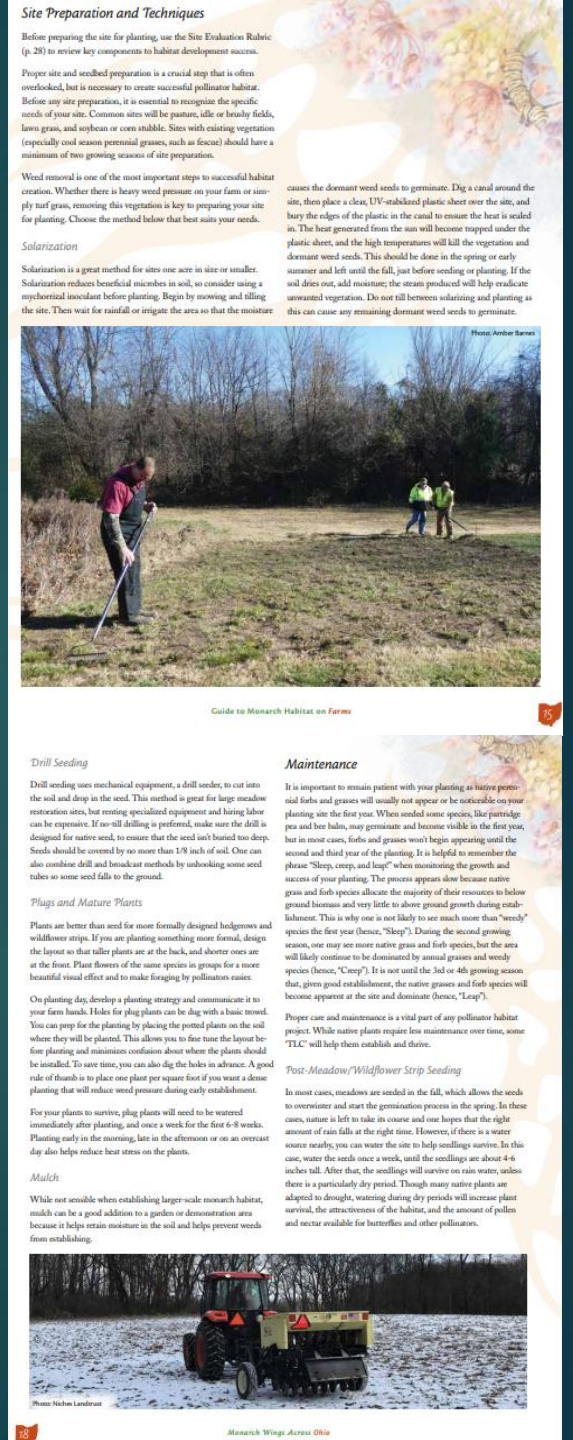
**IR Sheets:**

- OPHI JOBSHEETS
- PA Pollinator IR sheet 420_PA_IR_Pennsylvania_Wildlife_Habitat_Planting_2015_pollinator (usda.gov) EFTOG

**Webinars:**

- Habitat webinars series for Ohio land managers found at https://www.pollinator.org/mwaebf/webinars
- Pollinator Habitat Restoration: Planning and Contracting — The Webinar Portal (conservationwebinars.net)

| Field Number | Planned Activity | Date Activity Will Take Place | Extent of Activity | Specifications |
|---|---|---|---|---|
| | Herbicide | October - November 2018 | | Herbicide application of broadleaf herbicide at labeled rates for thistle to control annual weeds and prepare site for planting. (streamline) |
| | Herbicide | October - November 2019 | | Herbicide tank mix application of Glyphosate and broadleaf herbicide at labeled rates for thistle to control annual weeds and prepare site for planting. |
| | Herbicide | May 2020 | | Herbicide application of Glyphosate at labeled rates for thistle to control annual weeds and prepare site for planting. |
| | Seeding | May 2020 | | Seeding of planned species according to recommended guidelines and listed on provided job sheet. Please be advised to follow seeding dates and site prep methods stated in job sheets. |
| | Mowing | June - July 2020 | | Mow at heights of 10"-12" to control noxious weeds and aid in the establishment of the planted species. |
| | Mowing | July - August 2020 | | Mow at heights of 10"-12" to control noxious weeds and aid in the establishment of the planted species. |
| | Herbicide | October - November 2020 | | Post emergent herbicide application of Imanzapic at labeled rates by species planted to control noxious weeds and aid in the establishment of planted species. |
| | Seeding | December 2020 - March 2021 | | Seeding of planned species according to recommended guidelines and listed on provided job sheet. Please be advised to follow seeding dates and site prep methods stated in job sheets. |
| | Mowing | June - July 2021 | | Mow at heights of 10"-12" to control noxious weeds and aid in the establishment of the planted species. |



*Site Preparation and Techniques*

Before preparing the site for planting, use the Site Evaluation Rubric (p. 28) to review key components to habitat development success.

Proper site and seedbed preparation is a crucial step that is often overlooked, but is necessary to create successful pollinator habitat. Before any site preparation, it is essential to recognize the specific needs of your site. Common sites will be pasture, idle or brushy fields, lawn grass, and soybean or corn stubble. Sites with existing vegetation (especially cool season perennial grasses, such as fescue) should have a minimum of two growing seasons of site preparation.

Weed removal is one of the most important steps to successful habitat creation. Whether there is heavy weed pressure on your farm or simply turf grass, removing this vegetation is key to preparing your site for planting. Choose the method below that best suits your needs.

*Solarization*

Solarization is a great method for sites one acre in size or smaller. Solarization reduces beneficial microbes in soil, so consider using a mychorrizal inoculant before planting. Begin by mowing and tilling the site. Then wait for rainfall or irrigate the area so that the moisture causes the dormant weed seeds to germinate. Dig a canal around the site, then place a clear, UV-stabilized plastic sheet over the site, and bury the edges of the plastic in the canal to ensure the heat is sealed in. The heat generated from the sun will become trapped under the plastic sheet, and the high temperatures will kill the vegetation and dormant weed seeds. This should be done in the spring or early summer and left until the fall, just before seeding or planting. If the soil dries out, add moisture; the steam produced will help eradicate unwanted vegetation. Do not till between solarizing and planting as this can cause any remaining dormant weed seeds to germinate.

Photo: Amber Barnes

Guide to Monarch Habitat on *Farms* 15

*Drill Seeding*

Drill seeding uses mechanical equipment, a drill seeder, to cut into the soil and drop in the seed. This method is great for large meadow restoration sites, but renting specialized equipment and hiring labor can be expensive. If no-till drilling is preferred, make sure the drill is designed for native seed, to ensure that the seed isn't buried too deep. Seeds should be covered by no more than 1/8 inch of soil. One can also combine drill and broadcast methods by unhooking some seed tubes so some seed falls to the ground.

*Plugs and Mature Plants*

Plants are better than seed for more formally designed hedgerows and wildflower strips. If you are planting something more formal, design the layout so that taller plants are at the back, and shorter ones are at the front. Plant flowers of the same species in groups for a more beautiful visual effect and to make foraging by pollinators easier.

On planting day, develop a planting strategy and communicate it to your farm hands. Holes for plug plants can be dug with a basic trowel. You can prep for the planting by placing the potted plants on the soil where they will be planted. This allows you to fine tune the layout before planting and minimizes confusion about where the plants should be installed. To save time, you can also dig the holes in advance. A good rule of thumb is to place one plant per square foot if you want a dense planting that will reduce weed pressure during early establishment.

For your plants to survive, plug plants will need to be watered immediately after planting, and once a week for the first 6-8 weeks. Planting early in the morning, late in the afternoon or on an overcast day also helps reduce heat stress on the plants.

*Mulch*

While not sensible when establishing larger-scale monarch habitat, mulch can be a good addition to a garden or demonstration area because it helps retain moisture in the soil and helps prevent weeds from establishing.

*Maintenance*

It is important to remain patient with your planting as native perennial forbs and grasses will usually not appear or be noticeable on your planting site the first year. When seeded some species, like partridge pea and bee balm, may germinate and become visible in the first year, but in most cases, forbs and grasses won't begin appearing until the second and third year of the planting. It is helpful to remember the phrase "Sleep, creep, and leap" when monitoring the growth and success of your planting. The process appears slow because native grass and forb species allocate the majority of their resources to below ground biomass and very little to above ground growth during establishment. This is why one is not likely to see much more than "weedy" species the first year (hence, "Sleep"). During the second growing season, one may see more native grass and forb species, but the area will likely continue to be dominated by annual grasses and weedy species (hence, "Creep"). It is not until the 3rd or 4th growing season that, given good establishment, the native grasses and forb species will become apparent at the site and dominate (hence, "Leap").

Proper care and maintenance is a vital part of any pollinator habitat project. While native plants require less maintenance over time, some 'TLC' will help them establish and thrive.

*Post-Meadow/Wildflower Strip Seeding*

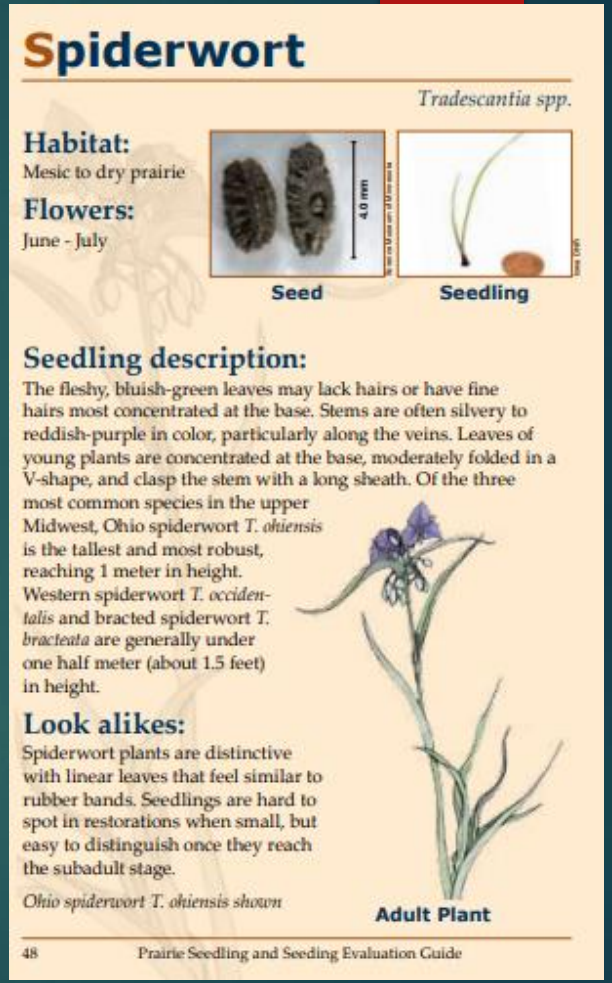
In most cases, meadows are seeded in the fall, which allows the seeds to overwinter and start the germination process in the spring. In these cases, nature is left to take its course and one hopes that the right amount of rain falls at the right time. However, if there is a water source nearby, you can water the site to help seedlings survive. In this case, water the seeds once a week, until the seedlings are about 4-6 inches tall. After that, the seedlings will survive on rain water, unless there is a particularly dry period. Though many native plants are adapted to drought, watering during dry periods will increase plant survival, the attractiveness of the habitat, and the amount of pollen and nectar available for butterflies and other pollinators.

Photo: Niches Landtrust

Monarch Wings Across Ohio 16

# RESOUCES FOR PLANNERS

- **Plant Guides:**
- Plant guides: PWEC_Wingspan_Plant Profile-Zizia aurea (pollinator.org)
- Iowa Prairie Seedling and Seedling Evaluation Guide PrairieSeedlingGuide.pdf (iowadot.gov)
- Plants Database: USDA Plants Database
- Apps: plantnet, seek

# RESOUCES FOR PLANNERS

- **Insect Resources:**
- NRCS eDirectives - Biology - 12 - BUTTERFLIES (ORDER: LEPIDOPTERA) (usda.gov)
- How to Identify and Enhance Ohio's Wild Bees in Your Landscape | Ohioline (osu.edu)
- Rusty patched bumble bee fact sheet (fws.gov)

How to Identify and Enhance Ohio's Wild Bees in Your Landscape

**Shiny green bees** (*Augochlora pura, Augochlorella aurata, Augochloropsis* spp., and *Agapostemon* spp.)

**Size and Color:** Distinctive in their bright green coloration, often called racecar green (Image 7). Range in size, but the largest *(Agapostemon)* are smaller than honey bees (5-11 mm).

**Key Character(s):** Bright metallic green coloration.

**Occurrence:** Common throughout the spring, summer, and fall. Easily found throughout Ohio.

**Nesting:** Bees in the genus *Augochlora* nest in soft wood, and prefer to live in rotten wood that is nearly soil-like in consistency. Other genera of bright green bees are thought to nest mainly in the ground within soft, nutrient rich soils.

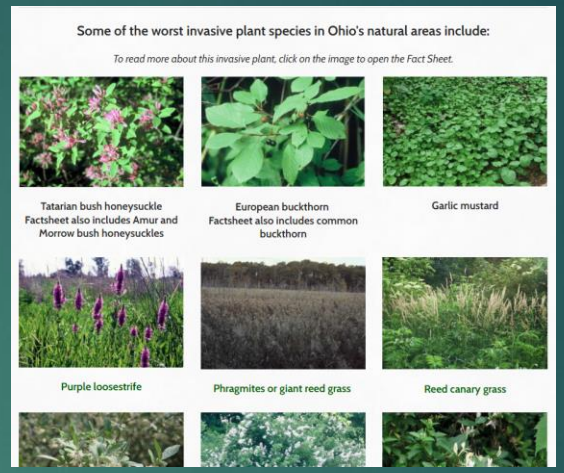
**Management:** If your property includes wooded areas, leave downed wood. Logs can also be added to a wooded habitat to provide a nesting resource.

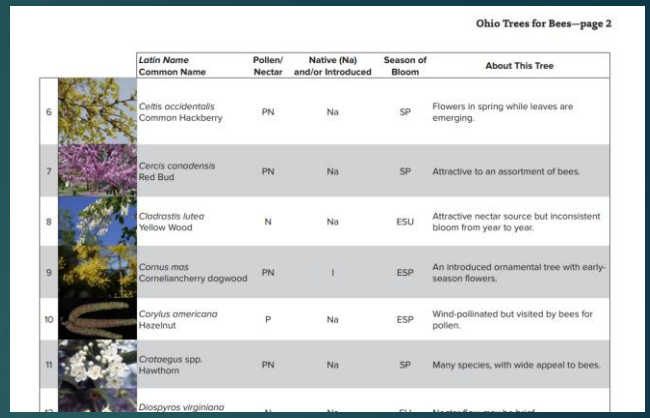
Photo: MaLisa Spring

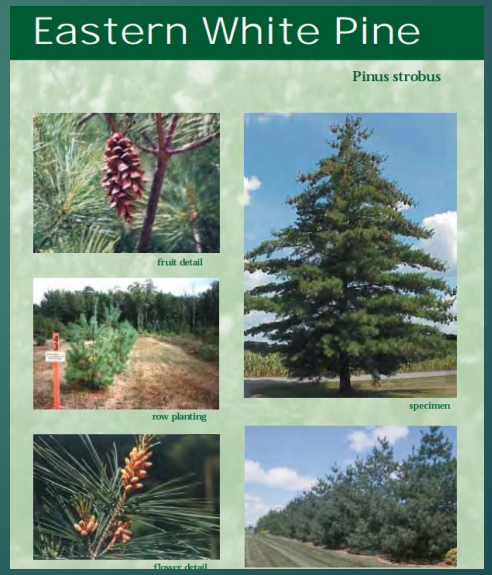
***Image 7:*** *Racecar green bees are eye catching. Their distinct coloration makes identification much easier.*

# RESOUCES FOR LAND MANAGERS

- ODNR Windbreak guide with species photos and wildlife benefits Why Plant A Windbreak (pauldingswcd.org)
- Ohio Trees for Bees | Ohioline (osu.edu)
- Vendor search and habitat guides:
  - Pollinator Conservation Resources: Great Lakes Region | Xerces Society
  - Ohio Native Growers, Ohio's Premier Native Nursery Directory
  - Lady Bird Johnson Wildflower Center : Search by zip code for vendors and seed suppliers
    - Site Preparation and Prairie Seeding Methods (prairienursery.com)
    - BEE AND BUTTERFLY HABITAT FUND - The Bee and Butterfly Habitat Fund (beeandbutterflyfund.org) FREE SEEDS for 2 ac+ plots
    - Ohio CRP Seed Mixes for Sale | Pheasants Forever (pfhabitatstore.com)
    - Ohio Natural Resources Improvement Vendors (osafdirectory.com)
    - Pollinator Favorites Archives - Ernst Seeds
- Milkweeds and Monarchs.pdf (ohiodnr.gov)
- Ohio Invasive species info INVASIVE PLANTS OF OHIO - Ohio Invasive Plants Council (oipc.info)

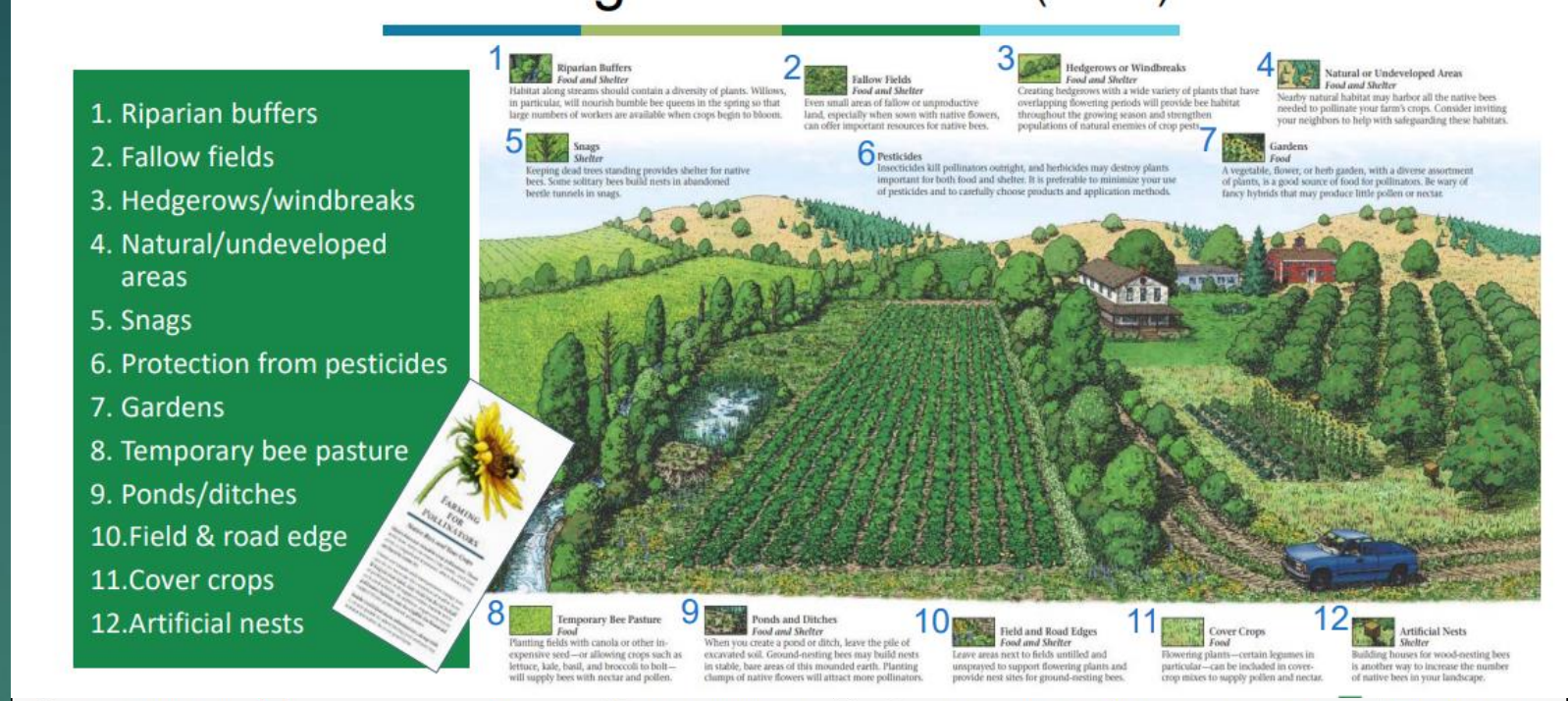


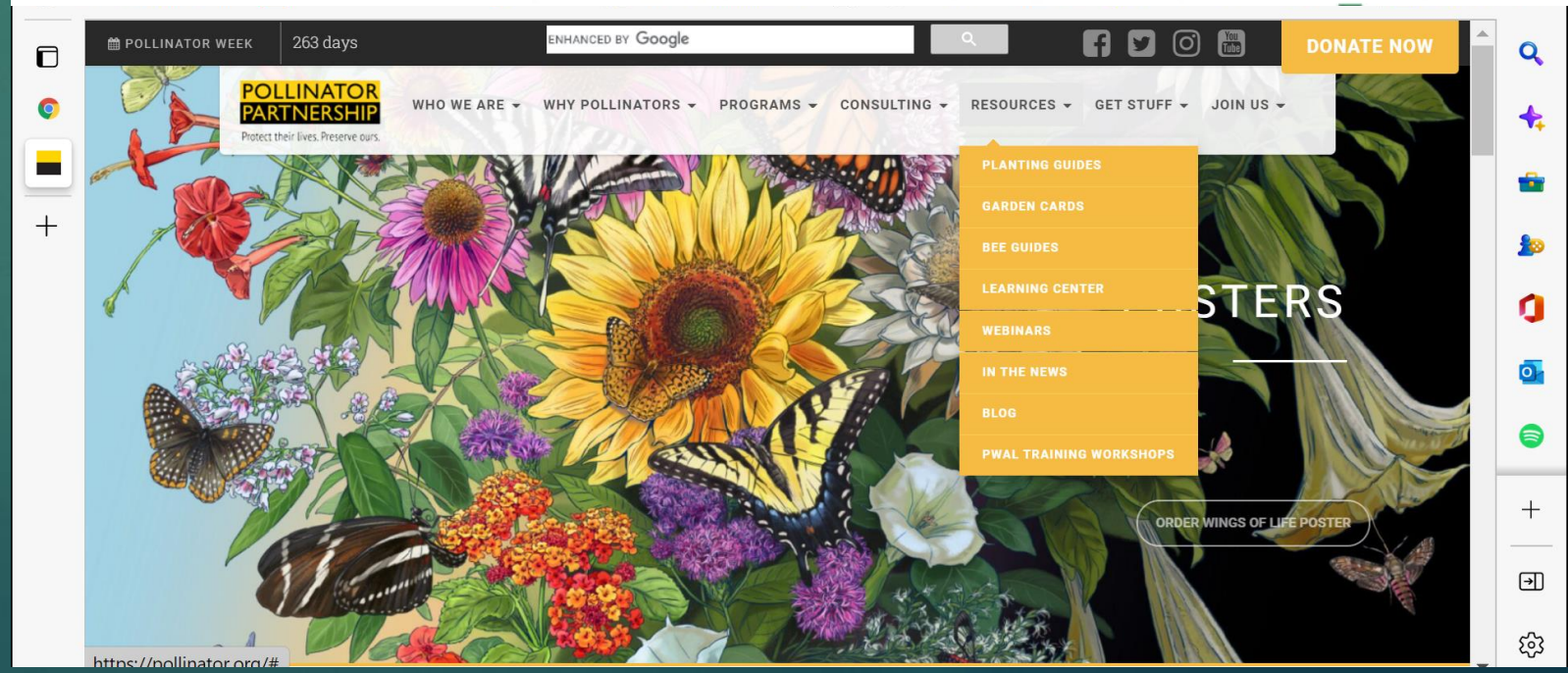




# Additional Resources

- Cover-Cropping-for-Pollinators-and-Beneficial-Insects.pdf (sare.org)
- www.pollinator.org
- Pollinator Toolbox Master Document



# Questions?

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