Forest Edges to Meadows

Supporting Pollinators Across Your Land

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Protect their lives. Preserve ours.

Lacey Smith, Northeast Regional Partner Biologist

- Pollinator Partnership's mission is to promote the health of pollinators, which are critical to food and ecosystems, through conservation, education, and research.

- Visit **Pollinator.org** to learn more about pollinator conservation resources and available programs!
  - Bee Friendly Gardening (BFG)
  - Bee Friendly Farming (BFF)
  - Pollinator Stewardship Certification (PSC)

Pollinator Partnership and NRCS

- Joined Pollinator Partnership in April 2023 as the Northeast Regional Partner Biologist.

- As a Partner Biologist, I work with the USDA Natural Resources Conservation Service (NRCS) to support NRCS staff, partners, producers, and landowners with pollinator related conservation activities.

- I am based here in Central New York and provide support to the Northeast.

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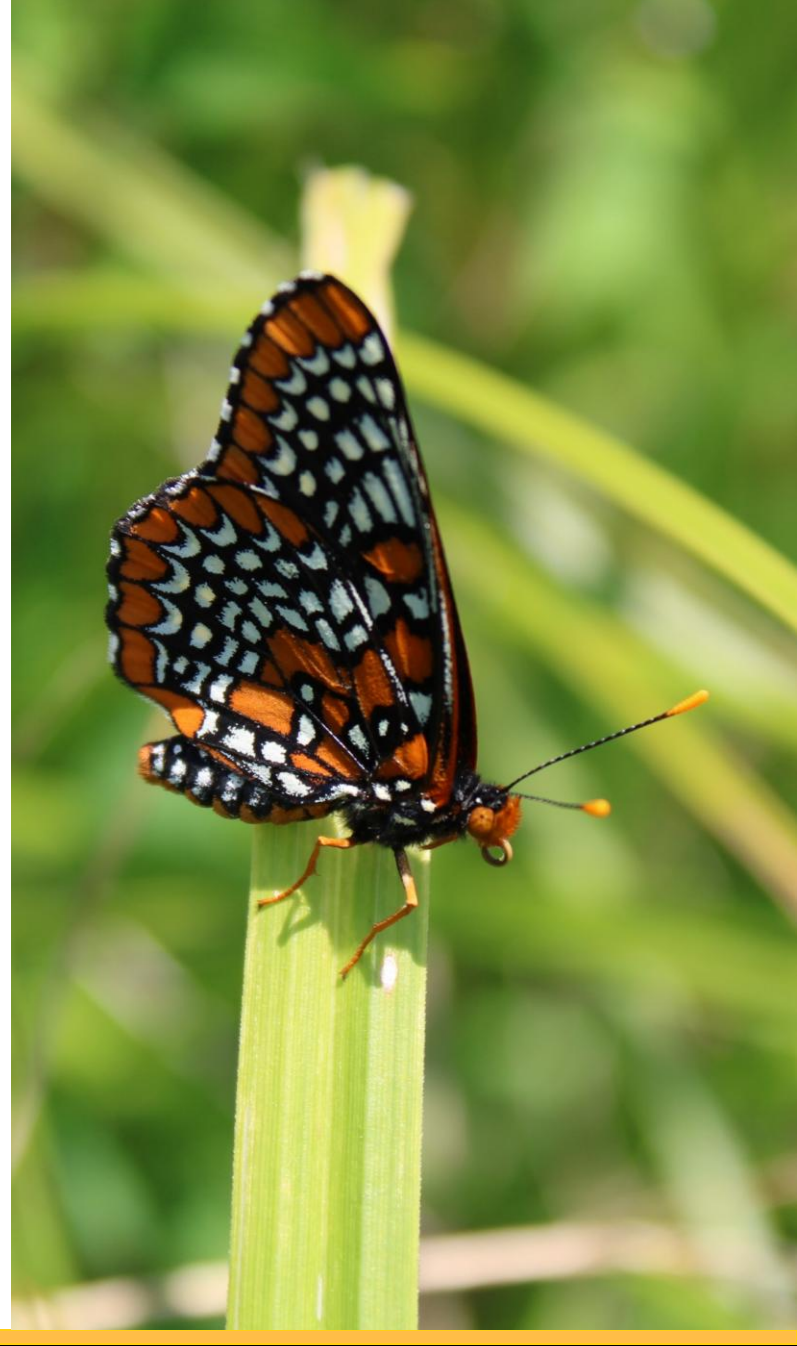
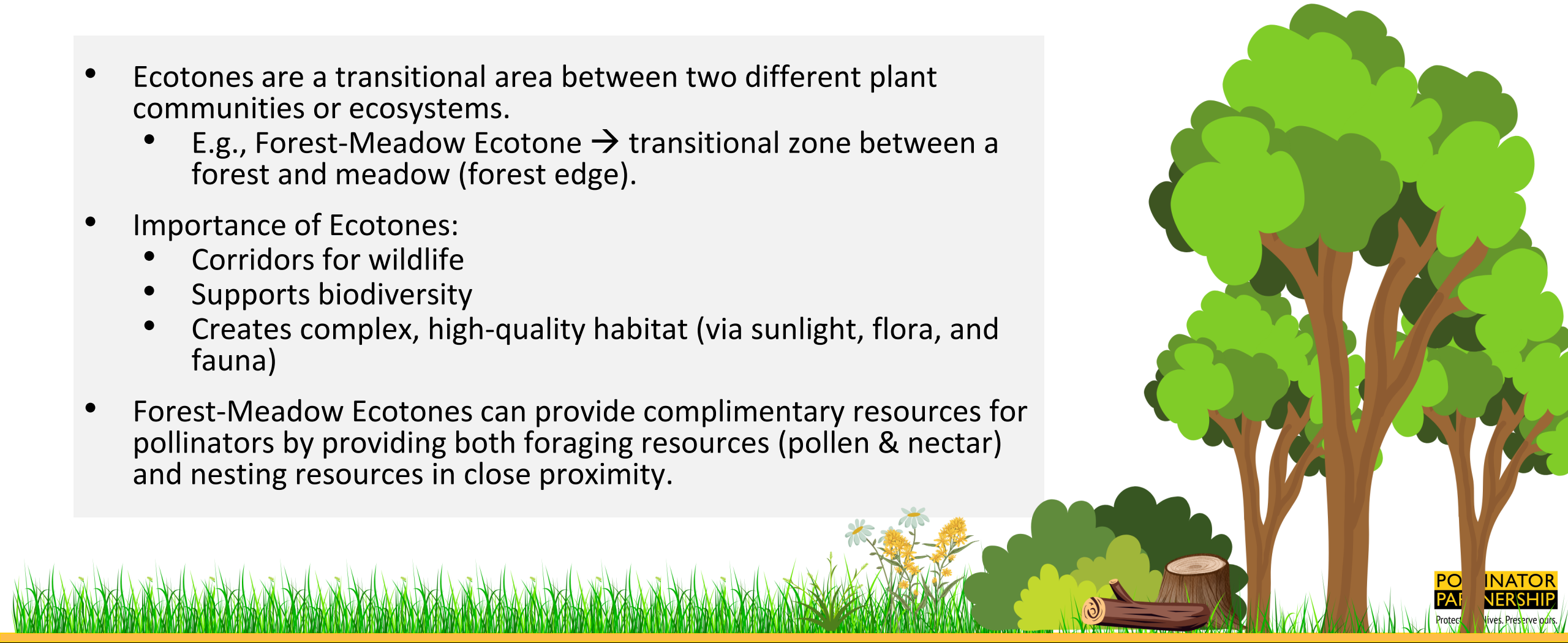
Agenda

1. Ecotones
2. Edge Feathering
3. Pollinator Habitat Planting
4. Working with NRCS
5. Q/A Session



What are Ecotones?

- Ecotones are a transitional area between two different plant communities or ecosystems.
  - E.g., Forest-Meadow Ecotone → transitional zone between a forest and meadow (forest edge).
- Importance of Ecotones:
  - Corridors for wildlife
  - Supports biodiversity
  - Creates complex, high-quality habitat (via sunlight, flora, and fauna)
- Forest-Meadow Ecotones can provide complimentary resources for pollinators by providing both foraging resources (pollen & nectar) and nesting resources in close proximity.

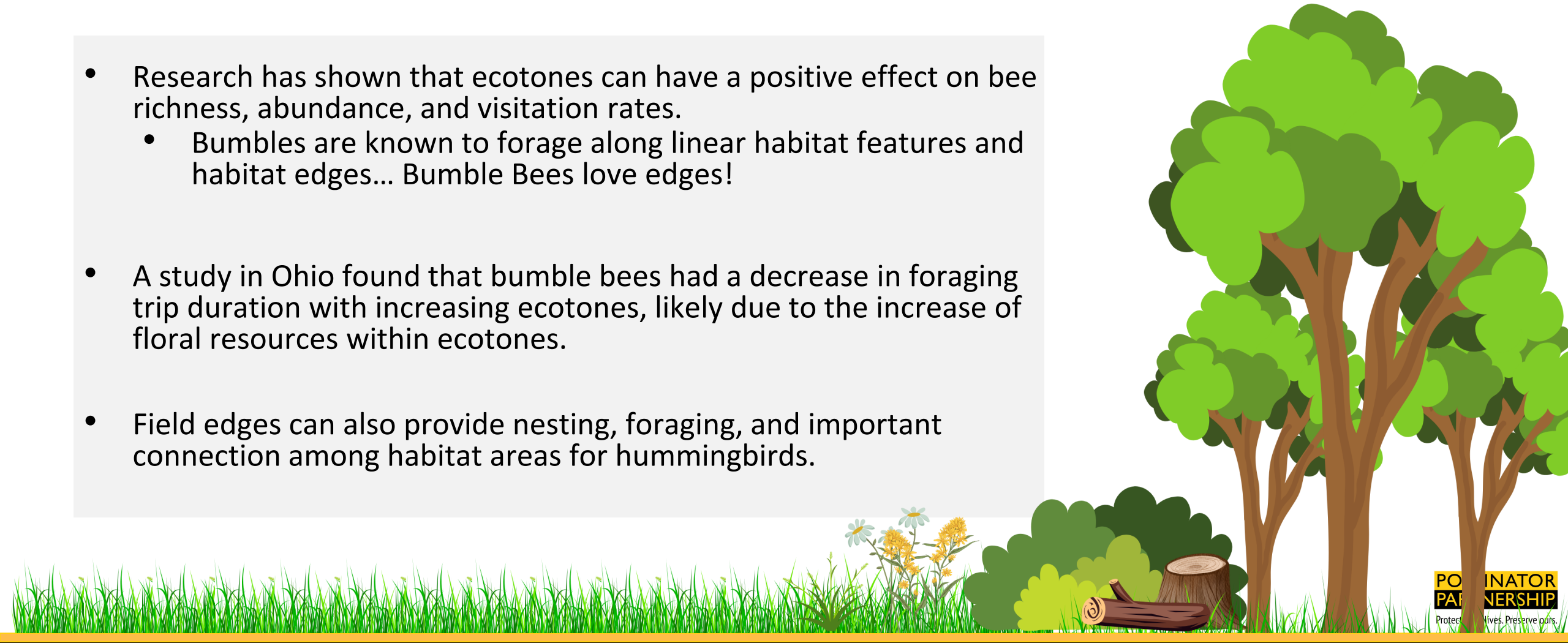


Pollinators and Ecotones

- Research has shown that ecotones can have a positive effect on bee richness, abundance, and visitation rates.
  - Bumbles are known to forage along linear habitat features and habitat edges… Bumble Bees love edges!

- A study in Ohio found that bumble bees had a decrease in foraging trip duration with increasing ecotones, likely due to the increase of floral resources within ecotones.

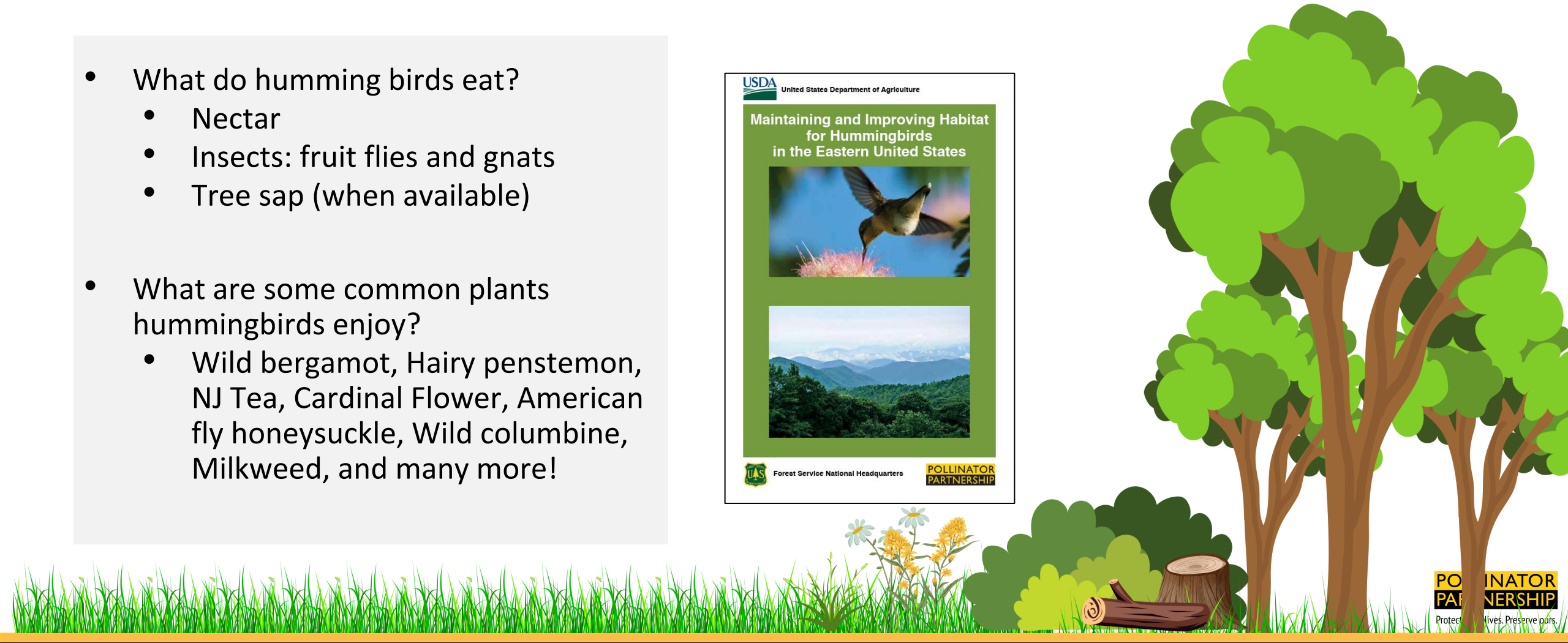
- Field edges can also provide nesting, foraging, and important connection among habitat areas for hummingbirds.



Hummingbirds

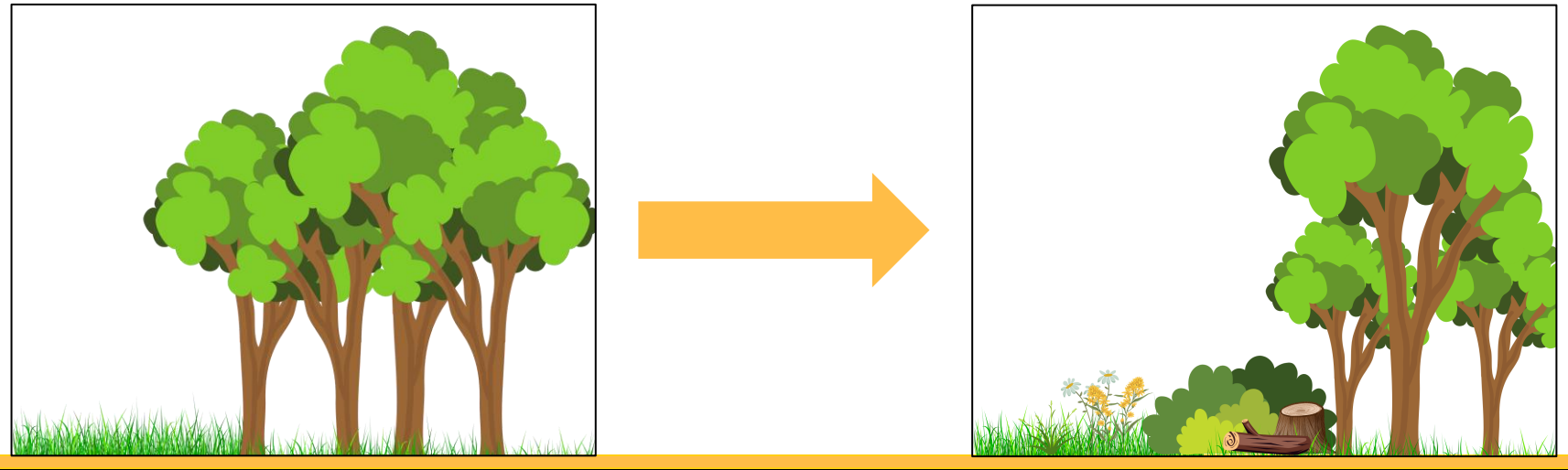
- What do humming birds eat?
  - Nectar
  - Insects: fruit flies and gnats
  - Tree sap (when available)

- What are some common plants hummingbirds enjoy?
  - Wild bergamot, Hairy penstemon, NJ Tea, Cardinal Flower, American fly honeysuckle, Wild columbine, Milkweed, and many more!



Edge Feathering

- How can we support forest-meadow ecotones? Edge Feathering!
- Edge feathering is a management technique of creating a gradual change or transition from the forest to meadow (or open habitat).
- It is accomplished by cutting select trees (which increases understory light availability) and/or by planting native shrubs, wildflowers, and grasses of various heights that gradually transitions into the open habitat.



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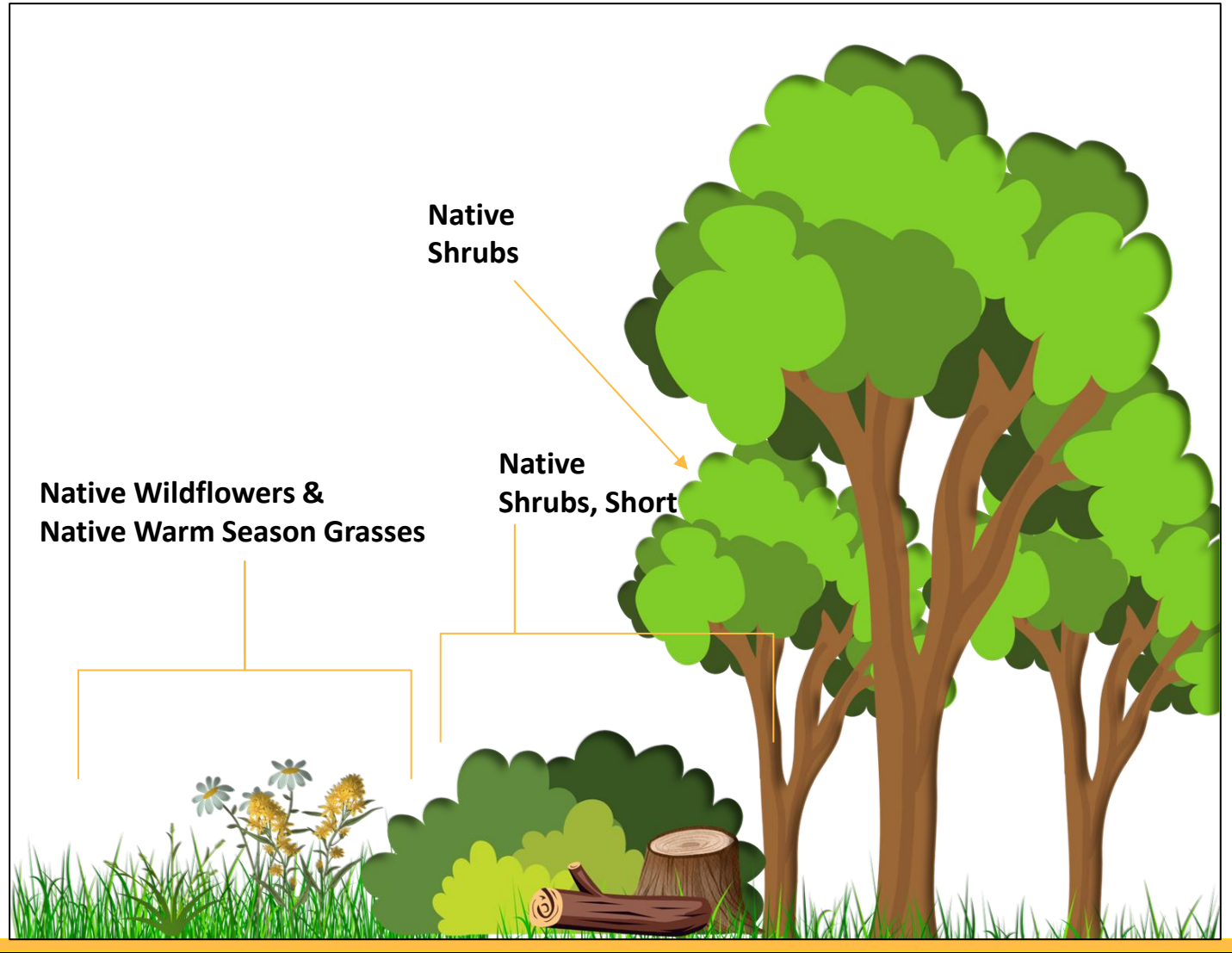
Edge Feathering



Native Wildflowers:
Joe Pye Weed, Goldenrod, Partridge Pea, Foxglove Beardtongue, Blackeyed Susan's, False Sunflower, Bee Balm, Mountain Mint, New England Aster

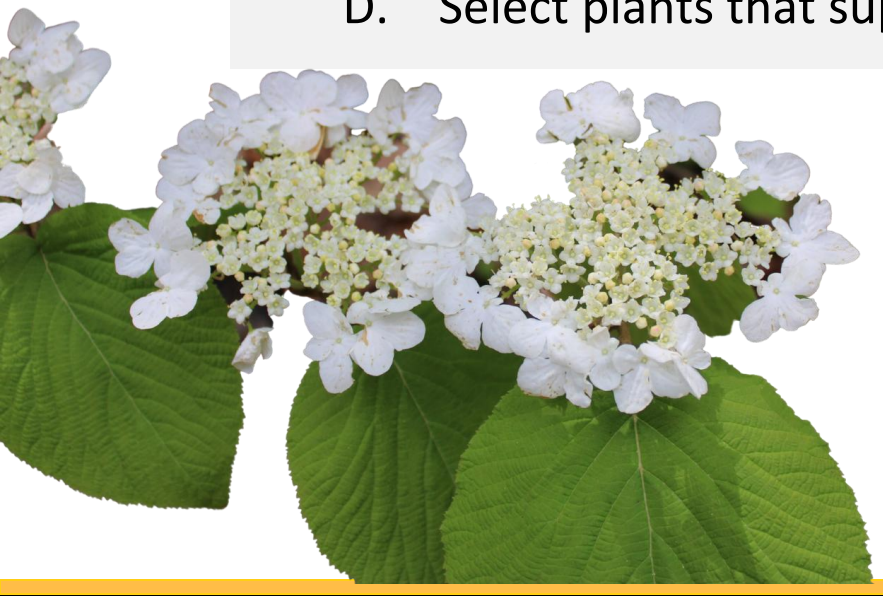
Native Grasses:
Little bluestem, Indiangrass, switchgrass

Native Shrubs, Short:
Wild plum, arrowwood, serviceberry, hazelnut, elderberry

Native Shrubs:
- Dogwood, crabapple, hawthorn, black choke cherry

Plants for Edge Feathering

- Only select plants that will thrive in the planting area → sunlight, soil moisture, soil pH, etc.
- To support pollinators:
  A. Select pollen and nectar producing plants
  B. Select plants that support pollen specialists
  C. Select plants with hollow or pithy stems
  D. Select plants that support a high number of native caterpillars



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A. Flowering Trees and Shrubs

Common Name	Scientific Name	Shade Tolerance	Soil Moisture	Soil pH	Bloom Time
American plum	*Prunus americana*	Intermediate	Moist	5.0-7.0	April-May
Basswood	*Tilia americana*	Tolerant	Moist-Dry	4.5-7.5	July-August
Black cherry	*Prunus serotina*	Intolerant	Moist-Dry	4.0-7.5	May-June
Flowering dogwood	*Cornus florida*	Intermediate	Dry-Moist	4.8-7.7	March-May
Red maple	*Acer rubrum*	Tolerant	Moist	4.7-7.3	March-April
Sassafras	*Sassafras albidum*	Intolerant	Moist	4.5-7.3	April-May
Tulip poplar	*Liriodendron tulipifera*	Intolerant	Moist	4.5-6.5	May-June
Spice Bush	*Lindera benzoin*	Tolerant	Moist-Wet	4.5-6.0	May-June

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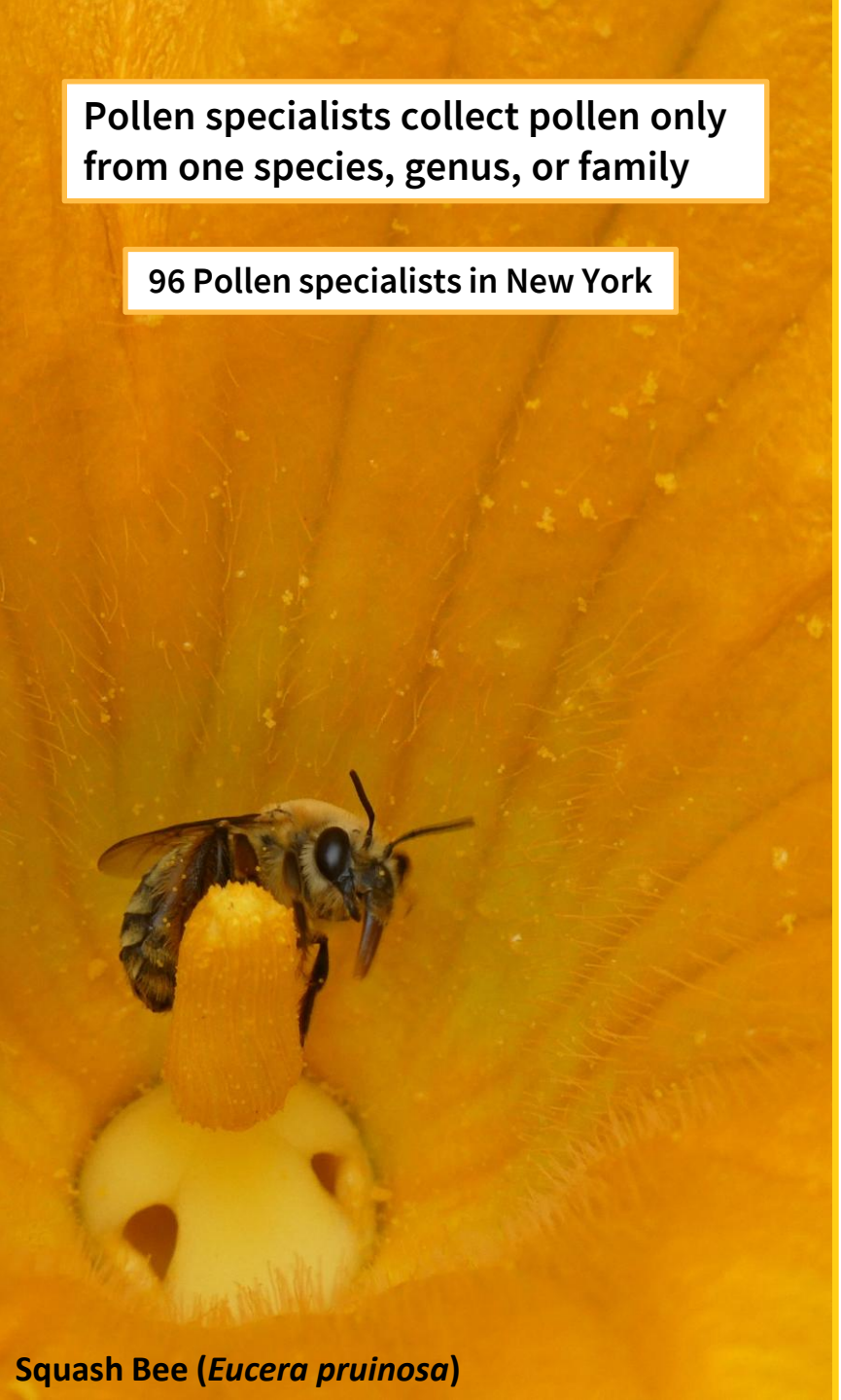
Pollen specialists collect pollen only from one species, genus, or family

96 Pollen specialists in New York



Squash Bee (*Eucera pruinosa*)

B. Pollen Specialist Bees

~25% of Native Bees in the Eastern U.S. are a Pollen Specialist!

New Jersey Tea	Waterleaf	Cranberry
Flowering dogwood	Wild bergamot	Cutleaf toothwort
Trout lily	Beebalm	Azure bluet
Asters	Beardtongue	Squash
Springbeauty	Coneflower	Silky willow
Blueberry	Blackeyed susan	Gray dogwood
Huckleberry	Pussy willow	Violets
Rosemallow	Showy goldenrod	**And Many More!!**

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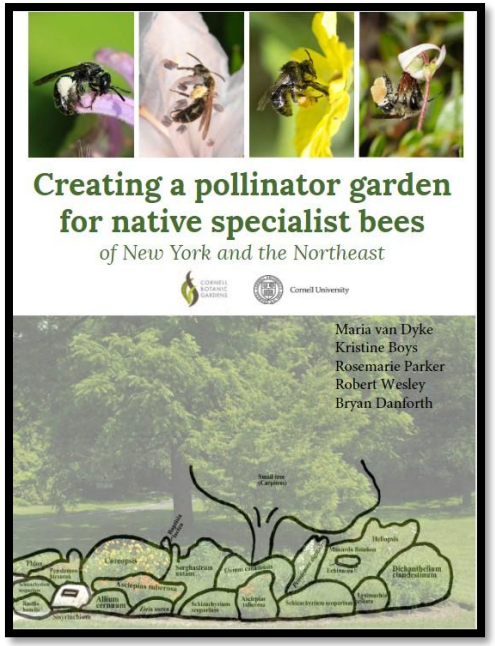
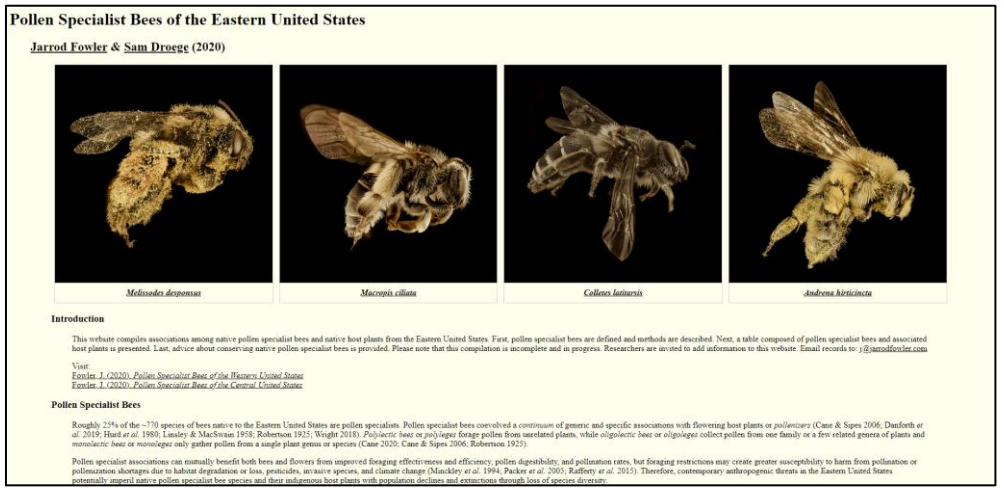
B. Trees and Shrubs for Pollen Specialists

- Willow/*Salix* (14 species)
- Blueberry/*Vaccinium* (10 species)
- Dogwood/*Cornus* (5 species)
- Holly/*Ilex* (4 species)
- Staggerbush/*Lyonia* (4 species)
- Mt. Laurel/*Kalmia* (3 species)
- New Jersey Tea/*Ceanothus* (2 species)
- Redbud/*Cercis* (1 species)



Great resource for pollen specialists!



https://jarrodfowler.com/specialist_bees.html

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C: Woody Plants with Hollow or Pithy Stems

~30% of bees are stem and cavity nesting!

- Common Blackberry
- Black Raspberry
- Purple Flowering Raspberry
- Common Elderberry
- Red Elderberry
- Pasture Rose
- Swamp Rose

D. Native Trees and Shrubs for Caterpillars

- Researchers have found that woody plants support more species of moths and butterflies (Lepidoptera) than herbaceous plants.
- AND that native plants support more moths and butterflies than introduced woody ornamentals.
- This list ranks vascular plants in the mid-Atlantic region by their ability to support Lepidoptera species as host plants.

Rank	Host Plant (Common Name; Scientific)	# of Native Caterpillars Supported	Approx. # of NY Native Tree/Shrubs
1	Oak; *Quercus*	518	30
2	Willow; *Salix*	440	20
3	Cherry/Plum; *Prunus*	429	9
4	Birch; *Betula*	400	11
5	Poplar; *Populus*	358	8
6	Maple; *Acer*	287	6
7	Blueberry; *Vaccinium*	286	7
8	Crabapple; *Malus*	284	1
9	Alder; *Alnus*	248	3
10	Hickory; *Carya*	233	5

Source: Tallamy and Shropshire (2008). Ranking Lepidopteran Use of Native versus Introduced Plants (https://www.jstor.org/stable/29738829)

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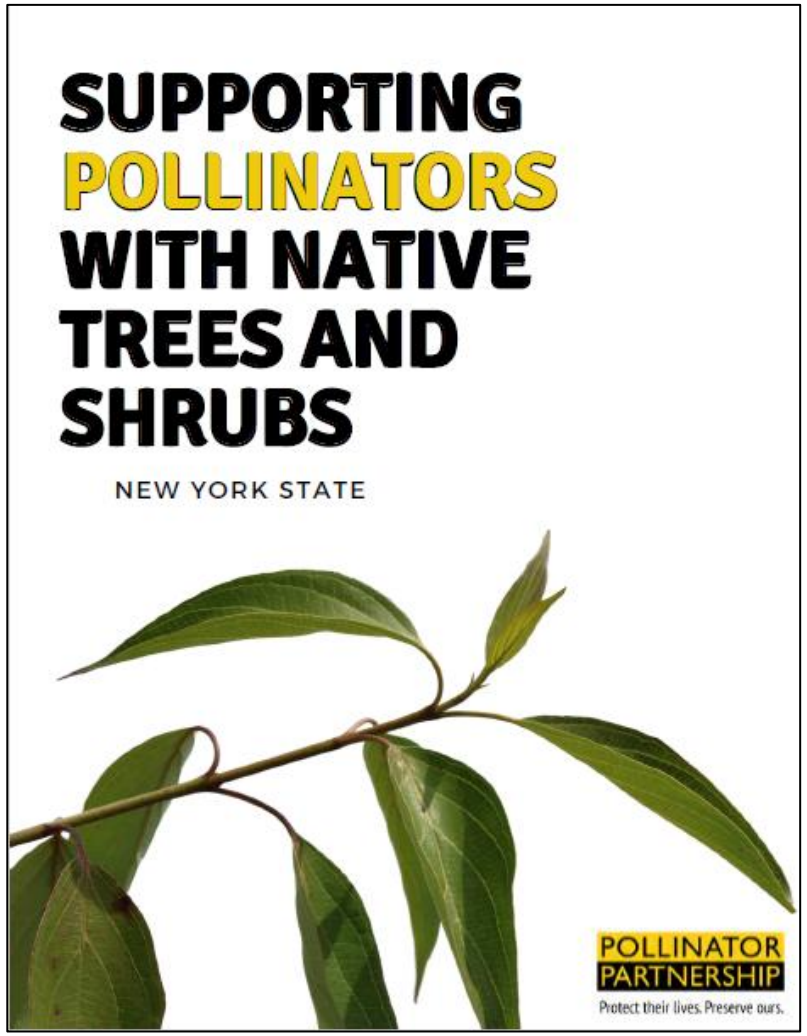

***Quercus* Oak**

	Height at Maturity	Nectar	Shade Tolerance	Soil Moisture	pH
White oak, *Q. alba*	50-80'	No	Intermediate	Dry-Moist	4.5-6.8
Swamp white oak, *Q. bicolor*	50-70'	No	Intermediate	Moist-Wet	4.3-6.5
Scarlet oak, *Q. coccinea*	60-80'	No	Intolerant	Dry-Moist	4.5-6.9
Scrub oak, *Q. ilicifolia*	3-30'	No	Intolerant	Dry	4.0-7.5
Bur oak, *Q. macrocarpa*	70-80'	No	Intermediate	Moist	4.5-7.5
Chinquapin oak, *Q. muehlenbergii*	40-50'	No	Intolerant	Dry-Moist	5.0-8.0
Pin oak, *Q. palustris*	60-70'	No	Intolerant	Moist-Wet	4.5-6.5
Chestnut, oak *Q. montana*	50-70'	No	Intermediate	Dry-Moist	4.5-6.5
Red oak, *Q. rubra*	60-75'	No	Intermediate	Dry-Moist	4.3-7.3
Black oak, *Q. velutina*	60-80'	No	Intermediate	Dry	4.5-6.5

***Salix* Willow**

	Height at Maturity	Nectar	Shade Tolerance	Soil Moisture	pH
Peach-leaved willow, *Salix amygdaloides*	20-40'	Yes	Intolerant	Moist	6.0-8.0
Sage-leaved willow, *S. candida*	3-6'	Yes	Intermediate	Moist-Wet	5.7-7.6
Pussy willow, *S. discolor*	15-30'	Yes	Tolerant	Moist-Wet	4.0-7.0
Heart-leaved willow, *S. eriocephala*	40-50'	Yes	Tolerant	Moist-Wet	4.0-7.0
Shinning willow, *Salix lucida*	3-20'	Yes	Intolerant	Moist-Wet	5.8-7.2
Silky willow, *S. sericea*	10-12'	Yes	Intermediate	Moist-Wet	5.2-7.0
Autumn willow, *S. serissima*	3-15'	Yes	Intermediate	Moist-Wet	5.0-8.0

Prunus* Cherry and Plum

	Height at Maturity	Nectar	Shade Tolerance	Soil Moisture	pH
American plum, *P. americana*	3.3-33'	Yes	Intolerant	Moist	5.0-7.0
Fire cherry, *P. pensylvanica*	15-50'	Yes	Intolerant	Dry-Moist	4.3-7.3
Wild black cherry, *P. serotina*	80-125'	Yes	Intolerant	Dry-Moist	4.0-7.5
Choke cherry, *P. virginiana*	10-25'	Yes	Intolerant	Dry-Moist	5.2-8.4

* Please note that *Prunus* is great for wildlife, but it can be poisonous to livestock. Be sure to avoid near livestock and grazers.

***Betula* Birch**

	Height at Maturity	Nectar	Shade Tolerance	Soil Moisture	pH
Yellow birch, *B. alleghaniensis*	60-75'	No	Intermediate	Moist	4.0-8.0
Black birch, *B. lenta*	50-60'	No	Intolerant	Dry-Moist	3.6-6.8
Paper birch, *B. papyrifera*	60-70'	No	Intolerant	Dry-Moist	4.2-7.4
Gray birch, *B. populifolia*	20-30'	No	Intermediate	Dry-Moist	3.5-6.5

***Populus* Poplar**

	Height at Maturity	Nectar	Shade Tolerance	Soil Moisture	pH
Balsam poplar, *P. balsamifera*	30-100'	No	Intolerant	Dry-Moist	4.5-7.0
Eastern cot oniwood, *P. deltoides*	36-190'	No	Intolerant	Dry-Wet	4.6-6.5
Big-toothed aspen, *P. grandidentata*	60-80'	No	Intolerant	Moist	4.8-7.2

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Conservation Assistance

- **The USDA Natural Resources Conservation Service (NRCS) can help you with voluntary conservation practices and programs!**

- Through the Farm Bill, NRCS provides the technical assistance and cost share to private landowners to address natural resource concerns – like pollinator habitat!
  - Edge Feathering, Tree and Shrub Establishment, and Pollinator Habitat Planting

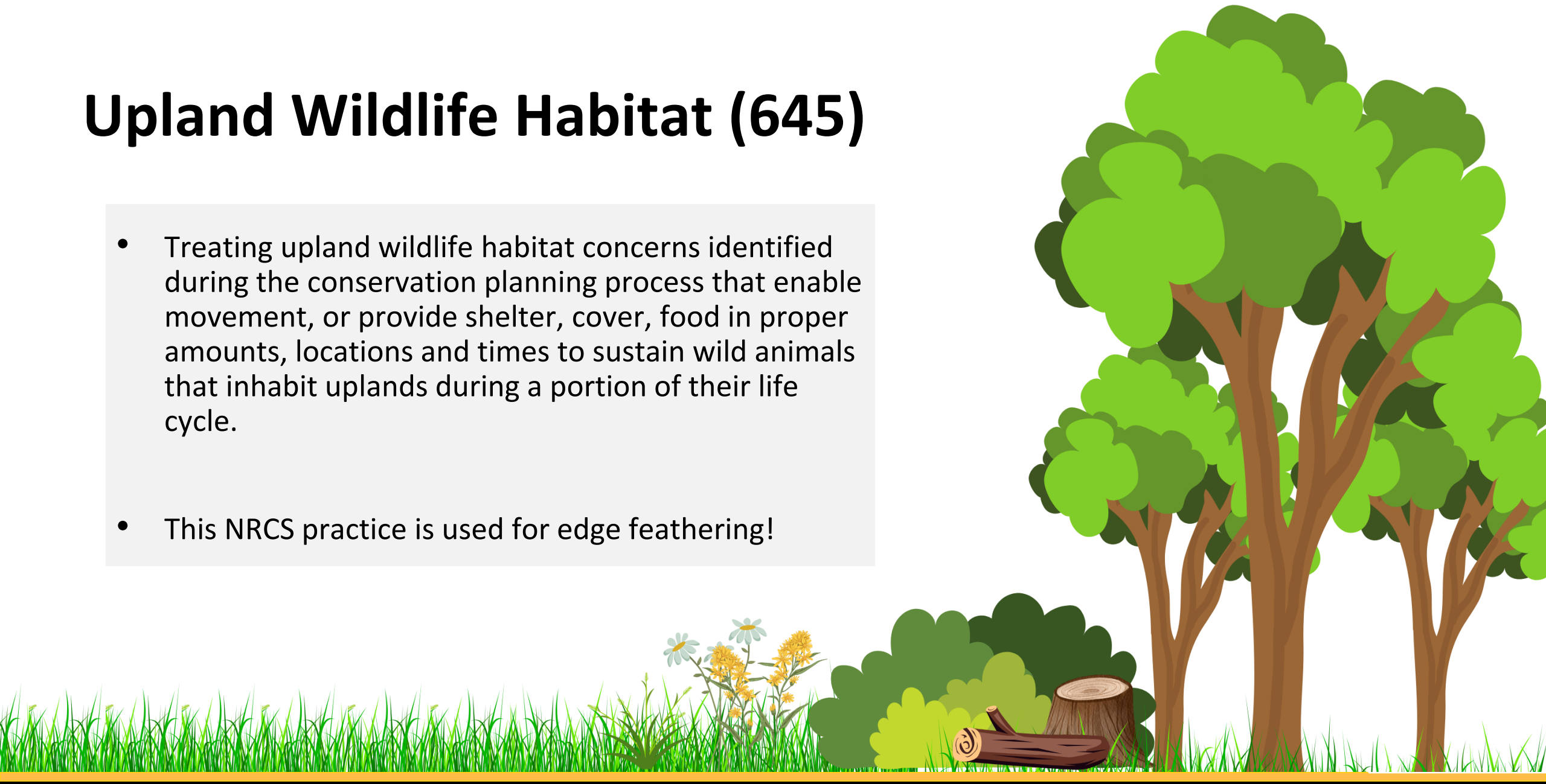
- The Farm Bill is a package of legislation that is passed approximately every 5 years that supports farmers, ranchers, and forest stewards through a variety of safety net, farm loan, conservation, and disaster assistance programs.

**Please note that the conservation programs are competitive as funding is limited. All applications are ranked. The greater the environmental benefit, the higher the ranking score.*

Upland Wildlife Habitat (645)

- Treating upland wildlife habitat concerns identified during the conservation planning process that enable movement, or provide shelter, cover, food in proper amounts, locations and times to sustain wild animals that inhabit uplands during a portion of their life cycle.

- This NRCS practice is used for edge feathering!

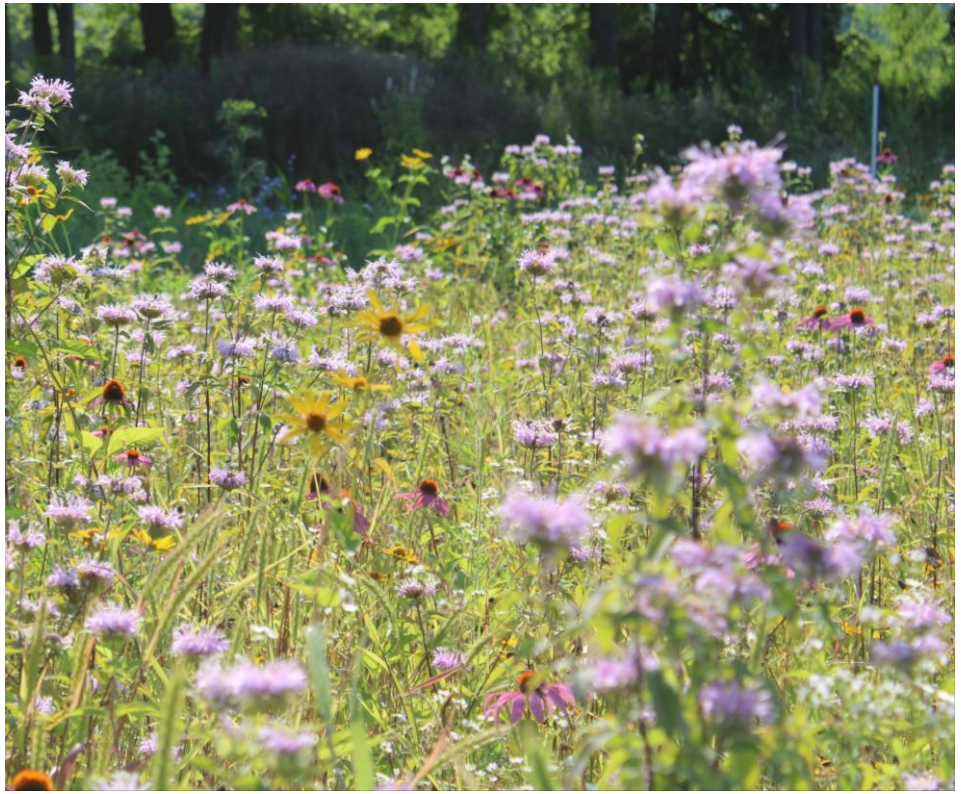


Tree and Shrub Site Preparation (490) and Establishment (612)

- Treatment of sites to enhance the success of natural or artificial regeneration of desired trees and/or shrubs (490).
- Establishing woody plants by planting seedlings or cuttings, by direct seeding, and/or through natural regeneration (612).
- Adding flowering trees and shrubs provides additional benefits to pollinators.

Wildlife Habitat Planting (420)

- Establishing wildlife habitat by planting vegetation or shrubs.
- This practice is used to accomplish one or more of the following purposes:
  - Improve degraded wildlife habitat for the target wild species or guild.
  - Establish wildlife habitat that resembles the historic, desired, and reference native plant community.
- **This practice is commonly used to create pollinator habitats with herbaceous plants.**



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Supporting Pollinators in the Meadow

- How can we help pollinators and other beneficial insects in the meadow?
  - **Create or enhance habitat!**

- Pollinator habitat needs:
  1. Food (host plants and floral resources)
  2. Shelter (nesting & overwintering)
  3. Safety from pesticides (direct and drift)

- If creating new pollinator habitat, you must be prepared to commit the time and effort needed for successful site preparation and maintenance.

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1. Food: Host Plants and Floral Resources

Floral Resources:

- Include a diverse mix of native grasses and wildflowers that vary with size, shape, color, & bloom period.
- At least 3 species for each bloom period to provide a continuous source of pollen and nectar during the growing season.
- Include plants that will support pollen specialist bees!

Host Plants:

- Include plants that will support a specialist or declining species – i.e., Monarch Butterfly!
  - Examples: Common milkweed (*Asclepias syriaca*), Butterfly Weed (*A. tuberosa*), and Four-leaved milkweed (*A. quadrifolia*).

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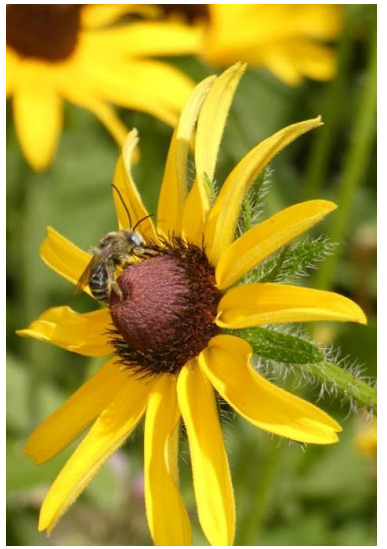
1. Common Plants in a Pollinator Planting

- Native Wildflowers and Grasses!
  - Milkweed
  - Monarda
  - Goldenrods
  - Lobelia
  - Little bluestem
  - Mountain mint
  - Ironweed
  - Blazing star
  - Sneezeweed
  - Hyssop
  - Partridge pea
  - Black eyed Susans



1. Pollinators Need Plant Diversity!

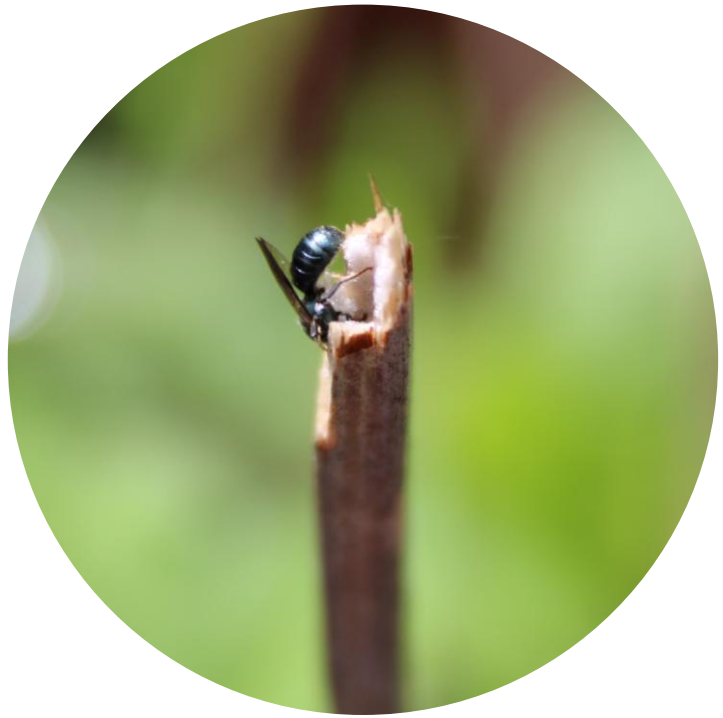
Select a diverse mix of native plants that vary in size, shape, color, and bloom period!

Photos: USGS Bee Lab

2. Shelter (Nesting & Overwintering)

- Pollinators and other beneficial insects require suitable shelter for nesting and overwintering opportunities.

- **How to help?**
  - Avoid pesticides near habitat, never spray plants while in bloom.
  - Leave leaf litter.
  - Limit soil disturbance: ~70% of bees nest underground!
  - Select plants with hollow or pithy stems to support stem nesting bees (remember, ~30% of bees are stem nesters!).
  - Add native grasses, especially bunch grasses.



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2. Shelter: Hollow or Pithy Stems

- Butterfly Weed
- Common Milkweed
- Swamp Milkweed
- Cardinal Flower
- Common Golden Alexanders
- Culver’s Root
- Field Thistle
- Great Blue Lobelia
- Hairy Horsemint

- Hollow Joe Pye Weed
- Purple Joe Pye Weed
- Spotted Joe Pye Weed
- Purple Giant Hyssop
- Wild Bergamot
- Scarlet Bee Balm
- New York Ironweed
- Tall Ironweed
- Swamp Rose Mallow

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2. Shelter: Native Grasses for Nesting & Overwintering

- Big Bluestem (*Andropogon gerardi*)
- Canada Wild Rye (*Elymus canadensis*)
- Little Bluestem (*Schizachyrium scoparium*)
- Indian Grass (*Sorghastrum nutans*)
- Bottlebrush Grass (*Elymus hystrix*)
- Purple Love grass (*Eragrostis spectabilis*)
- Eastern Gamagrass (*Tripsacum dactyloides*)
- Switch Grass (*Panicum virgatum*)

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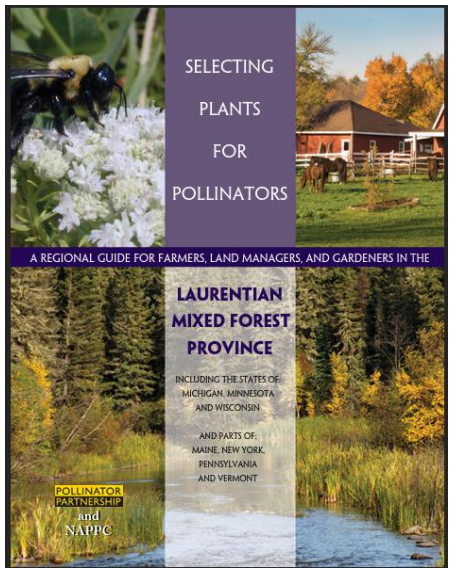
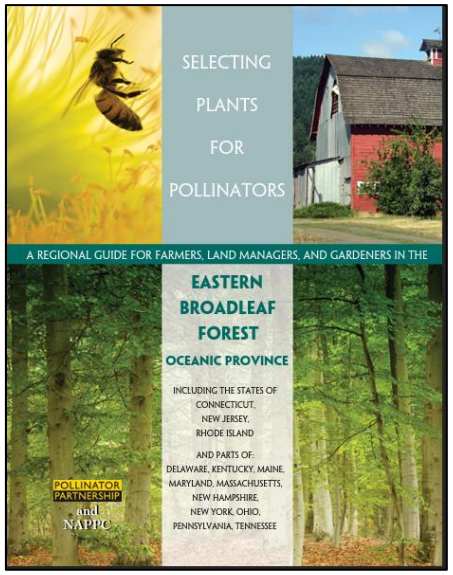
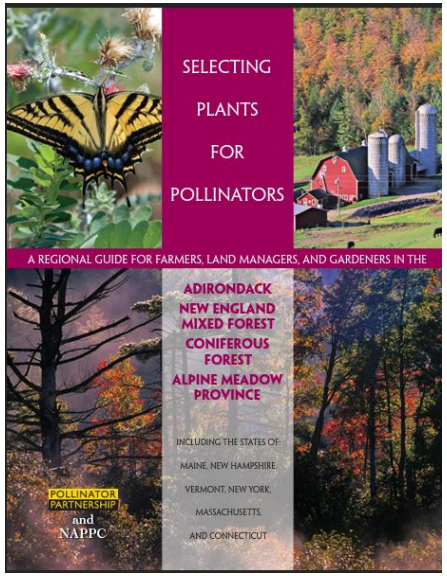
Native Plants in Your Region

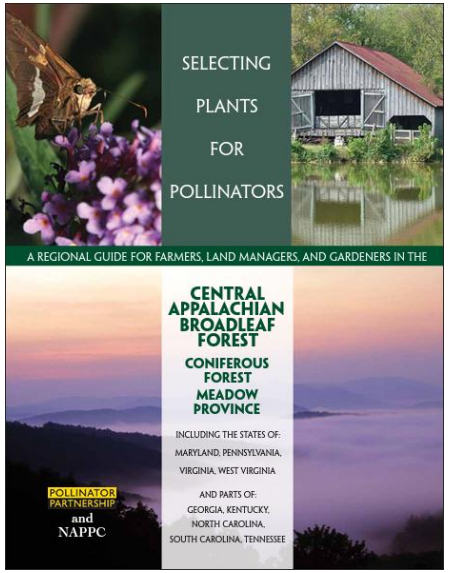
- New York Flora Atlas: https://newyork.plantatlas.usf.edu/
- The Biota of North America Program (BONAP): http://www.bonap.org/
- Ecoregional Revegetation Application (ERA): http://www.nativerevegetation.org/era/
- USDA PLANTS Database: https://plants.usda.gov/home
- National Wildlife Federation Native Plant Finder: https://www.nwf.org/NativePlantFinder/Plants
- Pollinator Partnership's Ecoregional Guides: https://www.pollinator.org/guides

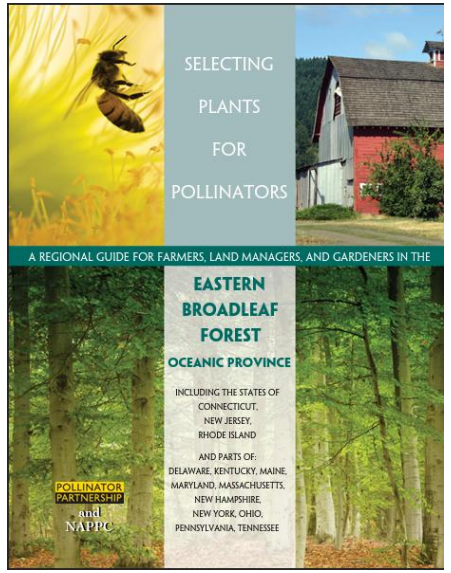
Pollinator Partnership's Ecoregional Guides











https://pollinator.org/guides#zip

More guides available here!

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3. Safety from Pesticides

- Pollinators and their habitat need to be safe from pesticides (herbicide, insecticide, fungicide, etc.)!

- To keep pollinators safe from pesticides, NRCS requires plantings to be:
  - 40 ft away from ground-based pesticide applications
  - 60 ft away from air blast sprayers
  - 125 ft away from crops/fields treated with neonicotinoids (neonics)

- Be aware of neighboring properties and select locations that are safe from pesticide drift.

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Creating Pollinator Habitat in Pastures, Grasslands, and Associated Lands

Conventional Site Preparation and Maintenance

This fact sheet provides general guidance on establishment and cost estimates for converting grasslands, pastures, or associated lands comprised primarily of non-native grasses into a diverse mix of native forbs and grasses which can support a diversity of pollinator species. This fact sheet describes conventional farming practices and is designed for use with Conservation Reserve Program (CRP) CP42 Pollinator Habitat or Wildlife Habitat Planting (420).

Setting Expectations—Establishment Takes Time and Patience!

- Conventional site preparation (site prep) will take *at least* one full growing season. The time and effort required to successfully prepare a site will vary depending on starting conditions and history of the site. Eliminating the existing vegetation and exhausting the historical seedbed is a crucial step prior to seeding the desired native species. Poor or failed habitat plantings are often the result of inadequate site prep.
- The phrase, "Sleep, creep, and leap!" describes plant establishment during the first three years after sowing. During the first two years of establishment, perennials will invest most of their energy into growing a strong root system, leading to minimal aboveground growth. With proper site prep, much of the noticeable first year vegetation will be annuals and biennials from the native seed mix, with only small amounts of persistent grasses or weeds from the soil seedbank.
- In years two and three, the native perennials will begin to bloom, and with time and proper management, will dominate the site. By the end of the third year, a successful pollinator habitat planting will have approximately 85% cover of native species, with *a minimum* of three species per bloom period (early, mid, and late season).

Implementation

- When planning and implementing pollinator habitat, it is crucial that ample consideration and effort is given for site prep *prior to planting*. The thoroughness of site prep will directly affect the project's success and will require a year or more of attention. The goal of site prep is to eliminate the existing vegetation and reduce or remove dormant seeds in the soil. This ensures seeds will receive the necessary seed to soil contact and have adequate space to grow, which is necessary for successful establishment during the seedling phase.

During site selection, talk with your local USDA Service Center to ensure that your site(s) meet CP42 size requirements and includes necessary buffers from pesticide exposure. Avoid sites with a history of hard to control weed species or those located near such areas.

- A site is considered properly prepared and ready to be seeded when less than 5% of the original vegetation or undesirable species remain. However, aggressive (i.e., species with fast spreading rhizomes) and invasive vegetation must be closely monitored and removed immediately, even at less than 5 %.

1. Mow site in spring once the field is accessible (dry enough to handle equipment) and remove thatch. Allow vegetation to grow and then have a certified pesticide applicator apply a non-selective, non-persistent herbicide per label instructions.
2. Monitor the site every two to three weeks throughout the spring and summer. Follow-up herbicide applications and mowing/string trimming will be required to eliminate persistent/undesirable vegetation as it reappears and before it goes to seed. Remove thatch.
3. Sites with low to moderate weed pressure typically require one to two follow up treatments, while sites with high weed pressure will typically require at least three additional treatments to eliminate persistent/undesirable vegetation.
4. Assess the site in late summer.
   a.) **If at least 95% of the original vegetation and undesirable species have been eliminated**: rake off residue and prepare for seeding. For erosion control and additional weed suppression, consider sowing oats (*Avena sativa*) as a nurse crop between Aug. 15th and Sept. 15th at 30-50 lb/ac. Sow the native seed mix into the standing oats in late fall.

   b.) **If unacceptable weed competition is still present**: continue site prep and repeat the entire process (steps 1-4) until the original vegetation has been eliminated and the seedbed exhausted. If sowing oats as a winter cover crop, remove all residue and sow oats between Aug. 15th and Sept. 15th at 80-125 lb/ac. Use the higher rate if broadcast seeding.

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Creating Pollinator Habitat in Pastures, Grasslands, and Associated Lands

Organic Site Preparation and Maintenance—Buckwheat Edition

The goal of this fact sheet is to provide general guidance on the establishment and cost estimates of organically converting grasslands, pastures, or associated agricultural lands that are predominately comprised of well-established cool season grasses into pollinator habitat. Using buckwheat as a smother crop for CP42 Pollinator Habitat or Wildlife Habitat Planting (420) is recommended for sites that are sunny, well-drained, gently sloped, and have low to moderate weed pressure.

Setting Expectations—Establishment Takes Time and Patience!

- Organic site preparation (site prep) with buckwheat will require more time and effort than conventional methods, typically requiring one to three years, depending on the starting conditions and history of the site. It is strongly recommended to avoid selecting sites with a history of high invasive or weed pressure for organic site prep. Carefully evaluate if organic site prep is a suitable method for the site. Once planted, weed pressure during the first year of establishment can vary significantly, depending on the thoroughness of the site prep prior to seeding.
- The phrase, "Sleep, creep, and leap!" describes plant establishment during the first three years after sowing. During the first two years of establishment, perennials will invest most of their energy into growing a strong root system, leading to minimal aboveground growth. With proper site prep, much of the noticeable first year vegetation will be annuals and biennials from the native seed mix, with only small amounts of persistent grasses or weeds from the soil seedbank.
- In years two and three, the native perennials will begin to bloom, and with time and proper management, will dominate the site. By the end of the third year, successful pollinator habitat plantings will have approximately 85% cover of native species, with *a minimum* of three species per bloom period (early, mid, and late season).

Implementation

- When planning and implementing pollinator habitat, it is crucial that ample consideration and effort is given to site selection and prep *prior to planting*. The thoroughness of site prep will directly affect the project's success. When organic site prep is chosen, most sites will require more than one year of prep prior to planting. The goal of site prep is to eliminate the existing vegetation and reduce or remove dormant seeds in the soil. This ensures seeds will receive the necessary seed to soil contact and have adequate space to grow, which is necessary for successful establishment during the seedling phase.

During site selection, talk with your local USDA Service Center to ensure that your site(s) meet CP42 size requirements and includes necessary buffers from pesticide exposure. Avoid sites with a history of hard to control weed species or those located near such areas.

- A site is considered properly prepared and ready to be seeded when <5% of the existing vegetation or undesirable species remain. However, aggressive (i.e., species with fast spreading rhizomes) and invasive vegetation must be closely monitored and removed immediately, even at less than 5 %.

1. In early spring, mow vegetation and remove thatch once the field is dry enough to handle equipment. Lightly cultivate (1-2" depth). Wait 2-3 weeks and lightly cultivate again to break up soil clumps while terminating weed seedlings. Assess and repeat if needed.
2. Once soil is at least 65ºF (~late May to mid-June), lightly harrow or rake the soil surface to remove thatch. Immediately sow buckwheat via seed drill or broadcast, but do not plant before heavy rainfall or in saturated soil, as buckwheat seeds are prone to rot. If rainfall is inadequate, lightly irrigate to encourage buckwheat germination, but avoid overwatering. After 1 week, check and reseed bare patches.
   a.) **If utilizing a seed drill**: sow at 0.5-1" depth with 50-60 lb/ac in 6-8" rows.
   b.) **If broadcast seeding**: sow at 70-80 lb/ac and cultipack to ensure good seed to soil contact.
3. Mow 1st buckwheat crop 7-10 days after flowering (~6 weeks after seeding) and remove thatch. Assess weed pressure and lightly cultivate any areas with persistent weeds as needed. Sow the 2nd buckwheat crop, irrigate as needed, and quickly reseed any bare patches. Monitor and eliminate weeds before they go to seed (hand pull, string trim, etc.). Note: Buckwheat's quick and robust growth are what make it an effective smother crop. This characteristic also means that it *should not be allowed to set seed*. Timely mowing and management are important when using this species as part of a site prep plan.
4. Mow 2nd buckwheat crop 7-10 days after flowering and leave plant debris on the soil surface. Assess site.
   a.) **If at least 95% of the original vegetation has been eliminated and no other persistent weeds are observed below the buckwheat**: mow and rake off residue. For erosion control and weed suppression, consider sowing oats (*Avena sativa*) as a nurse crop between Aug. 15th and Sept. 15th at 30-50 lb/ac. Sow the native seed mix into the standing oats in late fall.

   b.) **If unacceptable weed competition is still present**: leave plant residue and repeat the entire process (steps 1-4) the following spring. If sowing oats as a winter cover crop, remove all residue and sow oats between Aug. 15th and Sept. 15th at 80-125 lb/ac. Use the higher rate if broadcasting the seed.

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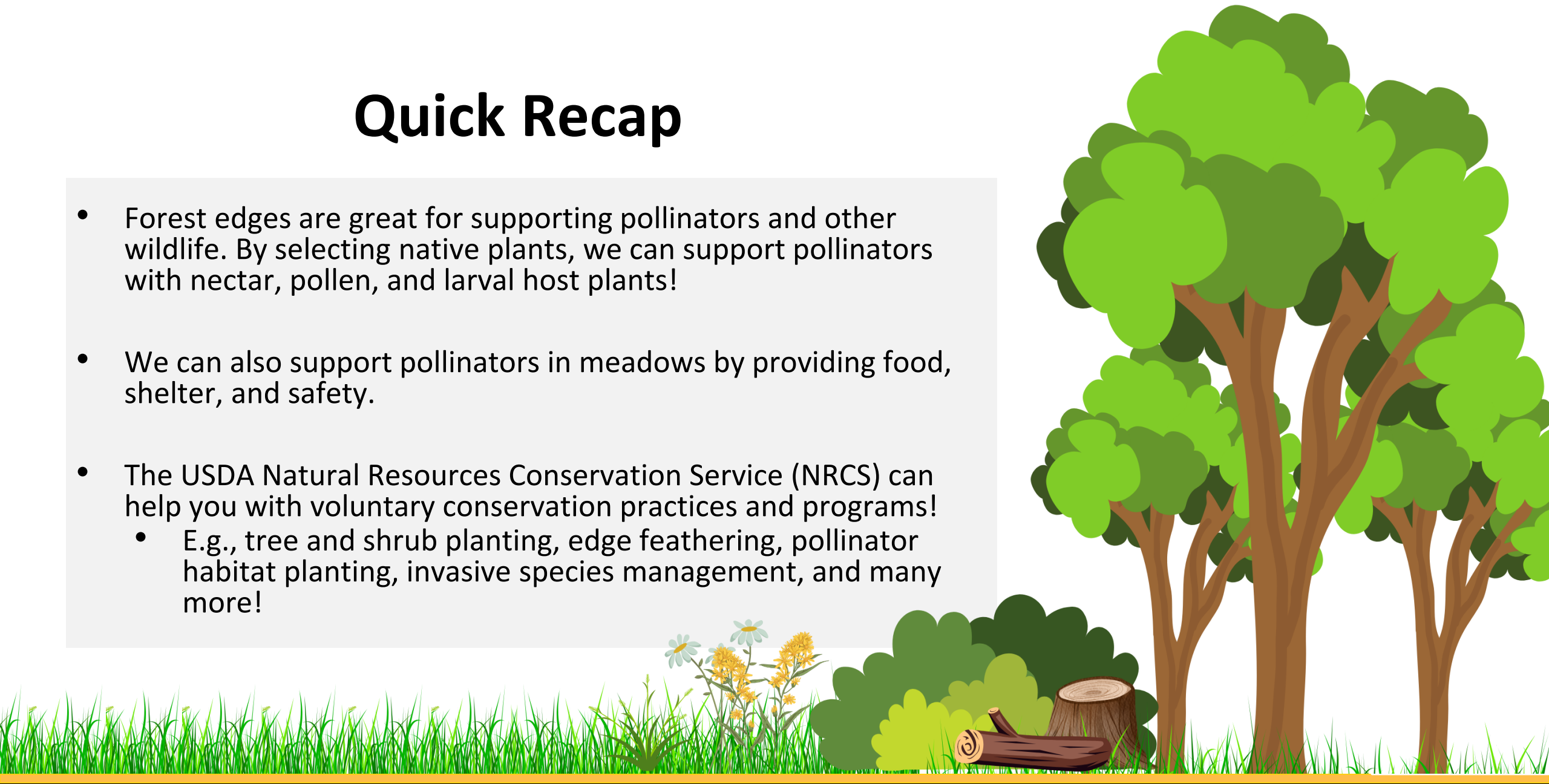
Quick Recap

- Forest edges are great for supporting pollinators and other wildlife. By selecting native plants, we can support pollinators with nectar, pollen, and larval host plants!
- We can also support pollinators in meadows by providing food, shelter, and safety.
- The USDA Natural Resources Conservation Service (NRCS) can help you with voluntary conservation practices and programs!
  - E.g., tree and shrub planting, edge feathering, pollinator habitat planting, invasive species management, and many more!

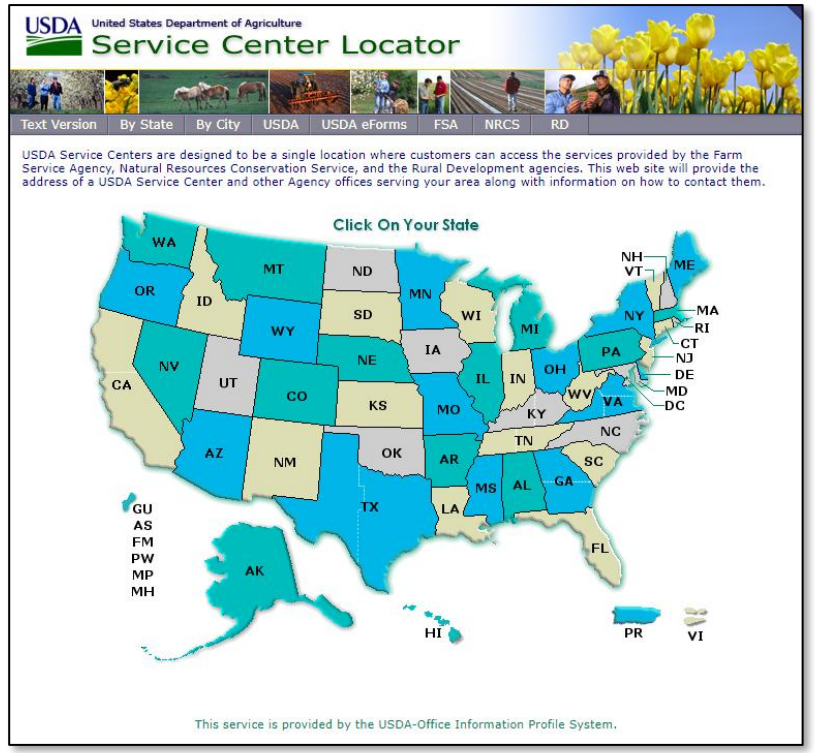


How do I contact NRCS?

- Send me an email: **Lacey.Smith@usda.gov**

or

- Contact your local office directly



https://offices.sc.egov.usda.gov/locator/app

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What Happens Next?

Planning: Discussing your goals with staff to create a conservation plan.

Application: With help from the NRCS staff, complete an application for financial assistance programs.

Eligibility: NRCS will file the paperwork to ensure you are eligible for assistance.

Ranking: NRCS ranks applications according to local resource concerns.

Implementing: If selected, signing the contracting and begin conservation practices.

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Resources:

- Kadawatha, A.D.; Mecaskey, J.M.; Swab, R.M.; Burns, J.H. Edge Feathering Across Forest-Meadow Ecotones Increases Light Heterogeneity and Understory Plant Diversity. *Forests* **2025**, *16*, 441. https://doi.org/10.3390/f16030441
- https://www.fs.usda.gov/wildflowers/pollinators/documents/HummingbirdBrochures/HummingbirdGuideEast.pdf
- Theodorou, P., Kühn, O., Baltz, L. M., Wild, C., Rasti, S. L., Bucksch, C. R., Strohm, E., Paxton, R. J., & Kurze, C. (2022). Bumble bee colony health and performance vary widely across the urban ecosystem. Journal of Animal Ecology, 91, 2135–2148. https://doi.org/10.1111/1365-2656.13797
- Brebner, J. S., Makinson, J. C., Bates, O. K., Rossi, N., Lim, K. S., Dubois, T., Gómez-Moracho, T., Lihoreau, M., Chittka, L., & Woodgate, J. L. (2021). Bumble bees strategically use ground level linear features in navigation. *Animal Behaviour*, **179**, 147–160. **https://doi.org/10.1016/j.anbehav.2021.07.003**
- Tallamy and Shropshire (2008). Ranking Lepidopteran Use of Native versus Introduced Plants (https://www.jstor.org/stable/29738829)
- Fowler, J. (2020). Pollen Specialist Bees of Eastern United States (https://jarrodfowler.com/specialist_bees.html)
- Creating a Pollinator Garden for Native Specialist Bees of New York and the Northeast (https://cornell.app.box.com/v/pollinator-gardens-native-bees
- Iowa DNR: Edge Feathering. https://www.iowadnr.gov/Portals/idnr/uploads/Wildlife%20Stewardship/edge_feathering.pdf

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Additional Resources

- New York's Bee Diversity by Cornell Pollinator Network (https://cals.cornell.edu/pollinator-network/ny-bee-diversity)
- Native Flowers, Grasses, Shrubs, Trees, and Vines by NY DEC (https://www.dec.ny.gov/docs/lands_forests_pdf/factnatives.pdf)
- FWS (2023). Threats to Pollinators (https://www.fws.gov/initiative/pollinators/threats)
- New York Flora Atlas: https://newyork.plantatlas.usf.edu/

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Thank you!

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Have questions or would like pollinator-related conservation planning support?
Let me know!

Lacey@Pollinator.org or Lacey.Smith@usda.gov