

MID-ATLANTIC MONARCH & POLLINATOR HABITAT KITS

Planting Guide



Protecting the Life that Sustains Us
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The Xerces Society is a science-based nonprofit organization focused on protecting the natural world through the conservation of invertebrates and their habitats.



Acknowledgements:

Plants for the Mid-Atlantic Pollinator Habitat Kit Program are grown by our project partners at Pinelands Nursery in Columbus, NJ.



Pinelands Nursery & Supply is one of the largest native plant nurseries in the US, supplying millions of plants for restoration throughout the Mid-Atlantic states. With seed collection in New Jersey, Virginia and New York, we propagate plants that are genetically adapted to local conditions.



Monarch butterflies nectaring on purple coneflower in a habitat kit planting installed at a community garden in New York. Photo by Mid-Atlantic Habitat Kit Project Partner, Anna Victoria.

PARTNERS IN POLLINATOR CONSERVATION

Thank you for your interest and work in conserving monarch butterflies, native bees, and beneficial insects. Protecting and restoring habitat is a crucial step in the conservation of these important animals. Your contribution makes a difference. By planting this kit, you are an essential partner in pollinator conservation!

WHAT'S IN THIS GUIDE?

This guide provides information and instructions on how to establish and care for the plants in Xerces' Mid-Atlantic Monarch and Pollinator Habitat Kits including requirements for preparing a project site so it is ready to plant immediately after receiving your habitat kit, planting procedures, management needs, and other important considerations and helpful tips. Xerces' habitat kits are intended to create permanent habitat for long-lasting conservation benefits. To achieve this goal, it is important for habitat kit project partners to have a detailed planting and management plan in place. Carefully read this guide and follow the instructions and timelines provided to meet project partner agreement terms, ensure successful plant establishment, and maximize long-term conservation benefits of your habitat planting.

WHAT'S IN THE KIT?

Xerces' habitat kits contain regionally and ecologically appropriate native plants with high value to pollinators, including milkweed, the larval host plant for monarch caterpillars, and a variety of nectar plants attractive to monarch butterflies. The nectar-and pollen-rich flowering plants in the kits will support many other local pollinators and beneficial insects and provide numerous other conservation benefits such as increasing biodiversity, providing habitat for other wildlife, enhancing climate resilience, and landscape beautification.

Plant Materials and Signage

Mid-Atlantic habitat kits contain a combination of herbaceous (forbs and grasses) and woody (shrubs or trees) plants with kit options designed for different site conditions.

- ☼ Herbaceous plants are grown and distributed in 2 inch deep x 2 inch diameter flats, with 50 plugs/flat.
- ☼ Shrubs are grown in 4 inch deep x 2.25 inch diameter tubes and distributed in small pots.
- ☼ Plant height for each species will vary at the time of habitat kit distribution, but typically range from 6-24 inches.
- ☼ The number of plants per kit and the intended coverage area is listed in the kit descriptions.
- ☼ Each kit also includes two pollinator habitat signs, one in English and one in Spanish, to designate your planting as a protected habitat.

For more information, visit Xerces' [Mid-Atlantic Monarch and Pollinator Habitat Kit Program webpage](#) for habitat kit options, descriptions, and plant species lists for the current year.



Habitat kit plugs and flats. Photo by Mid-Atlantic Habitat Kit Project Partner. Gisela Ferrer

MAKE A PLAN

Having a plan in place for each step of the habitat kit installation process and post-planting care is critical for successful plant establishment, plant health and survivability, and maintaining diverse habitat plantings that support pollinators long-term. Develop a plan for your habitat kit planting to ensure that plants can be installed immediately and maintained accordingly. Important considerations for a planting and maintenance plan include:

- ⊗ Organize work days and labor.
- ⊗ Have a long-term schedule confirmed for planting and post-planting management including monitoring, watering, weeding, and other required maintenance activities.
- ⊗ Gather supplies: Planting tools, mulch, animal guards, posts for habitat signs, irrigation, etc. See the list of common supplies.
- ⊗ Be ready to pick-up or receive your habitat kits. Review the details for the kit you are getting and make a plan for transporting the plants from the nursery to the project site. Make sure the vehicle you are using to transport plants can fit the number of flats in your kit without damaging plants.
- ⊗ For kits that are being shipped, ensure that someone will be present to receive and unpack the plants. Remove plants from shipping boxes immediately for proper storage until planting.
- ⊗ Be ready to plant. ***Plants must be installed within two weeks of receiving the kit.*** The site should be prepared and ready to plant before receiving the habitat kit. Eliminate weeds and competing vegetation, remove obstructions, and create a clean bed for planting.
- ⊗ Be ready to water plants frequently, especially in the first year of establishment.
- ⊗ Implement maintenance activities in a timely manner to ensure plants establish successfully and persist over time. Frequent monitoring is important for early detection and prevention of problems that can have negative impacts if not addressed.

TRANSPORTING AND STORING PLANTS

Important! Plan accordingly for transporting the kit to your project site. Make sure the vehicle you are using to pick-up and transport can accommodate the number of flats in your kit so that flats will fit properly without damaging the plants. Do not stack flats. Stacking damages plants.

The bed of a car with the back seats laid down is often sufficient for smaller kits, and the bed of a pickup truck is often big enough for a large kit. However, we strongly recommend measuring your vehicle before driving all the way to the nursery to ensure you have enough space.

Plants must be installed within two weeks of receiving the kit. Installing plants immediately is recommended to reduce plant loss or damage. Have a plan in place for temporary storage of plants, if needed. Flats should be kept somewhere outside in an area safe from theft, where plants will receive sunlight and be protected from wind or other disturbances that can damage the small plants until they are planted. Water the plants frequently, as they will dry out quickly in the flats.

TAKE PHOTOS

Take photos frequently to document your habitat planting throughout the season. Habitat kit project partners are required to take and submit photos as part of the terms of agreement for participating in the habitat program. Project partners must submit photos of their plantings immediately after the kits are installed to verify that the plants were planted. Photos of the habitat planting are also required in the final report to show progress and demonstrate that the plantings are receiving proper care over time.

PLANT ESTABLISHMENT REQUIREMENTS AND PROCEDURES

Common Tools and Supplies:

- ⊗ Predetermined location with proper conditions to temporarily store plants if needed
- ⊗ Labor (organize a planting, watering, and maintenance crew/volunteers)
- ⊗ Mowing equipment
- ⊗ Measuring tape, survey flags
- ⊗ Weeding tools
- ⊗ Water source/irrigation supplies
- ⊗ Planting tools (hand shovels, spades, dibble sticks)
- ⊗ Untreated wood chip mulch
- ⊗ Temporary fencing/plant protectors
- ⊗ Posts and hardware to hand habitat signs
- ⊗ Project journal
- ⊗ Camera

Planting Time and Location

Install plants into a well prepared planting area within two weeks of receiving your habitat kit. The area proposed for planting must match the growing requirements and environmental conditions required by the plant species in the kit.

Pesticide Protection Requirements

Habitat plantings must be located in areas free of pesticide application and protected from pesticide drift, especially insecticides and fungicides. Install plants in locations that ARE NOT subject to unintended pesticide drift/overspray from other areas of the site or off-site applications. Do not apply pesticides (other than herbicides) in the habitat created with Xerces' habitat kits. Herbicides may be carefully used to spot-treat invasive species using a targeted approach so that no desirable plants are harmed. Herbicides may only be used to manage problem weeds in the habitat kit plantings where non-chemical methods are not feasible and are applied using the most targeted application method available.

Site Preparation

Before planting remove undesired plants, weeds, and invasive species from the planting area and borders to eliminate competition and reduce invasion from nearby sources. After initial weed removal is complete, monitor and assess the site. Implement follow-up weed control to continuously eliminate weedy regrowth and prevent reseeding. If desirable plants are present, they can be left on site, but should not prohibit the establishment of kit plants. Have a long-term invasive species management plan in place.

Planting Configuration and Design Tips

Plan the design and layout of your habitat planting in advance. Map and measure the area and plant spacing in advance. The layout and configuration of habitat kit planting will vary based on the project site. Below are some basic design suggestions:

- ⊗ Considering planting several of the same species near each other, for example, 3-10 plants of the same species are planted in clumps. This is often more aesthetically pleasing, and helps pollinators who prefer larger displays of blooms.
- ⊗ Plant shorter species along walkways, paths and set-back taller species from these areas, as taller species can flop over into open spaces.
- ⊗ Special considerations for milkweed plants: There is evidence that monarchs prefer small and medium sized milkweed patches to contiguous large patches, possibly predator avoidance behavior. Planting milkweed in several patches distributed across the site is highly recommended. Vary the size and density of patches to mimic naturally occurring populations. Over subsequent years of growth, multiple stems may sprout, expanding outward many feet or more from the original plug.
- ⊗ For examples, see [PA DCNR's Garden Template](#) and [Wild Ones Native Garden Designs Website](#). Note: These guides are provided as a visual reference, habitat kits will not have the same species of plants.

Managing Root-Bound Seedlings

Root-bound plants (or pot-bound) are plants that have grown too large for their containers, resulting in circular root growth, where roots coil around the root ball and become entangled rather than extending out into the soil (see photos below). This can be prohibitive to roots absorbing soil nutrients, leading to poor plant establishment, stunted growth, and reduced survivability. If you find rootbound plants in your kit, do not worry, it is common for container-grown plants, especially perennials with extensive, deep root systems.

For rootbound plants, follow the steps below to untangle and loosen roots before transplanting into the soil.

1. Water plants at the base while in the container before removing. Avoid top-watering plants with hoses or sprayers as sharp stream of water can damage young plants.
2. Gently remove the plant from the plug tray or container. Push plugs out of the cells from the bottom to remove. Do not pull on the stem to remove plants from their container, as this can damage the plant.
3. Inspect roots. If plants are root bound, loosen the roots apart at the bottom by gently massaging them and teasing them apart from the soil slightly. If the roots are tightly coiled or severely matted, soaking the roots in water can help to loosen them up, making them easier to tease apart without damaging the plant.

1

BEFORE: Sometimes when plugs have been in trays for a long time, their roots coil up around the soil and become entangled. This will make it hard for the plants to settle into new soil when transplanted into the ground and can inhibit growth.



Extremely rootbound → → → → → → → → Not at all rootbound

2

AFTER: Before planting, it's important to gently massage any root bound plants at bottom of the plug and to loosen and break up the roots to promote contact with the soil for successful establishment and growth.



Extremely rootbound → → → → → → → → Not at all rootbound

GETTING READY TO PLANT

Pre-Planting Plant Staging and Layout

Before installing your habitat kit, make sure site preparation of the planting area is complete. All weeds and existing vegetation have been removed and the bed is created and ready to plant. **Do not plant habitat kits into weedy beds.**

Layout Everything Before You Plant

Map out a planting plan for the configuration and location of plants. Consider plant characteristics (e.g., plant shorter with smaller spread near paths, sidewalks, driveways, or other areas that need to be kept clear). Measure and mark plant placement and layout plants. See photos below.

1.
Prep

Native plants don't need fertilizer. However, clearing weeds and mulching before planting (shown below) is critical for weed and moisture management during establishment. It's also fine to mulch after planting.



2.
Layout

Map everything out before planting. Choose shorter plants for the front and taller plants for the back. This way you can see how much space plants will take up and how many of each species you will need.



3. Plant

We recommend planting clusters of 3-10 plugs of the same species. This makes it easier to tell the kit plants apart from weeds later on, because you can see what was planted on purpose. Follow the planting instructions below.



Photos by Mid-Atlantic Habitat Kit Project Partner, Isa Higgins

PLANT INSTALLATION AND ESTABLISHMENT

1. Regular shovels, hand augers, and dibble sticks are adequate for transplanting these herbaceous plugs. Follow the steps below.
2. Create a clean, smooth, level planting bed.
3. Lightly tamp soil to firm the soil before digging holes. This will ensure plants are secure and do not collapse into holes.
4. Stage the plugs in position with proper spacing prior to digging holes.
5. Follow steps for managing root-bound plants before planting if needed.
6. Pre-dig holes 2-3 times larger than the container (holes should have sloping sides, wider at top)
7. Pre-irrigate holes. If soil is compacted, degraded, or depleted, add well aged compost to each hole before installing plants.
8. Carefully and gently remove the plant from the container keeping the soil around the roots intact. Tap the outside of the container to loosen the edge. Carefully slide the plant out of the tray cell. To avoid damaging the plant, do not yank plants out of the tray.
9. Set each plant in the middle of the hole. Avoid planting too deep. If the root collar sits below the top of the hole, backfill the hole with soil. The root collar should be flush or slightly above ground level.
10. Secure the plants in an upright position, backfill and tamp soil to secure plant in place. Ensure plants are at proper depth with the root collar flush with or slightly above soil (ground) level. Do not expose the root crown above ground!
11. Irrigate and mulch with untreated wood chips immediately after installing plants.
12. Protect plants from animal browse/deer damage. If possible, install temporary exclusion fencing around the entire planting.

Irrigation

Irrigate newly installed plants immediately after planting. Continue to irrigate so plants consistently receive at least 1 inch of water per week for the first year of establishment (adjust accordingly during natural rain events or drought conditions). Irrigate as required in subsequent years. Use long, deep watering at the base of the plant (or use drip irrigation if available) to encourage deep root system development. Avoid shallow irrigation and overhead watering that would encourage weed growth or cause splash back that can spread disease or cause leaf scorch. Once plants are fully established, irrigation can be removed or greatly decreased.

Mulching

Adding a layer of mulch to newly installed plantings is recommended to reduce weed competition and to retain moisture during the establishment phase. Use untreated wood chips. To prevent rodent damage, do not mulch within one foot of seedling. Once plants are established, mulching is not required unless there are special circumstances.

Protect Plants from Animal Damage

Planting habitat in areas that are permanently or temporarily fenced or otherwise protected from deer is ideal and especially recommended for areas with high deer pressure. Individual or small groupings of plants can be protected by installing shelters/cages around young plants until plants are well established. Below are basic specifications for constructing plant protectors:

1. Durable materials such as woven-wire metal, UV-resistant plastic fencing, or similar materials are most
2. Cages should be a minimum of 4 ft. tall or 5 ft. tall in areas of heavy deer pressure and a minimum of 3 ft. in diameter to accommodate multi-stemmed plants.
3. Securely anchor cages with durable stakes.
4. Check temporary exclusions and cages frequently and reset or repair as needed.
5. Once plants are established, fencing can be removed.

Install Habitat Signs

Attach your habitat signs to a durable post in a location where it will not be obscured by plant growth. If using a post with ready-made holes, plug empty holes with a bolt and nut to avoid wildlife safety concerns (e.g., injury/trapping birds that perch on the post).

Long-Term Weed Control

Weed control is one of the most important factors in successful establishment and survival of plugs and seedlings.

Control competing vegetation before and after planting. Weed control may be accomplished through hand pulling, hoeing or other hand tools, mowing, string-trimming, or targeted spot-application of herbicide when non-chemical methods are not feasible. Take care to not damage desirable plants. Once plants are established they will be more competitive against weeds.

Monitoring and Recordkeeping

Consistent monitoring and assessment of the habitat plantings will allow for early detection of problems and timely management intervention. This will also help to write the project report required by the terms of the project partner agreement.

Xerces staff are here to help! We are excited to partner with you on creating monarch and pollinator habitat. Please feel free to contact Xerces' Mid-Atlantic Pollinator Habitat Kit Program Monarch coordinators, Kass Urban-Mead and Kelly Gill, at eastregion.pollinators@xerces.org if you have any questions or need additional guidance. To learn more and find additional resources visit www.xerces.org.