



The Federal "Pollinator Partnership Action Plan" for gardens suggests:

Form a Team of family members, neighbors, coworkers, Master Gardeners, 4-H, school, Scout or church groups to plan, install and maintain the garden.

- Pick a spot that is sunny, easily accessible, in plain sight for public viewing, and near a water source.
- Keep it simple at first, even just a 10'x10' space. You can always expand later.
- Test the soil and augment, if necessary. Utilize existing features, like a row of shrubs or a large sign for wind breaks when possible.



Design Your Garden, Remembering:

To include native milkweed and other butterfly host plants. Also, all pollinators need nectar throughout the growing season, so choose a wide variety of flowering plants that will bloom throughout the season, with at least 2-3 species each season.

Map Your Garden using colors to designate different species, including spaces for features such as a bird bath, bench, sign, or walking path. Group plants in small clusters of at least 3-5 plants per species. Make sure to space the plants far enough apart to avoid crowding when grown. Also make sure short plants are not obscured by tall plants. If your garden space is limited, experiment with potted plants or raised beds.

Before You Plant schedule a day that works well for your team. Assign duties and the right tools: rakes, wheelbarrows, old newspapers, hoes, gloves, and mulch. You'll want to cover the garden with 2-3 inches of mulch.

Plant either in Spring or Fall when not at risk of frost and moisture is available. If using plugs, spread old newspapers (avoid colored ink and glossy-type papers) on the ground where you have prepared the soil. After you've planted plugs, add straw or mulch to retain water in the soil and prevent weed growth. Water the newly planted plugs. If seed is used, follow the planting instructions on the package(s). Label the plantings. Water the entire garden after planting is complete and regularly thereafter.



Planning & Planting for Pollinators

In May 2015, the White House released a *National Strategy to Protect Pollinators and Their Habitat*. It had three overarching goals for **Honey Bees** (reduce colony losses,) **Monarch Butterflies** (increase Eastern population to 225 million by 2020,) and restoring and enhancing **7 million acres for Pollinator Habitat**.

A Partial List of Pollinator Plants for Our Area

For a complete list of Monarch Fueling Zone Project "Yellow Zone" plants visit: <http://pollinator.org/monarchfueling.htm>

NORTHBOUND
(MAY TO JUNE)

- Blackeyed Susan**
Rudbeckia hirta
- Golden Ragwort**
Packera aurea
- Highbush Blueberry**
Vaccinium corymbosum
- Lyreleaf Sage**
Salvia lyrata
- Mapleleaf Viburnum**
Viburnum acerifolium
- Meadow Garlic**
Allium canadense
- Pale Purple Coneflower**
Echinacea pallida
- Pinkshell Azalea**
Rhododendron vaseyi
- Rhodora**
Rhododendron canadense
- Yellow Thistle**
Cirsium horridulum

SOUTHBOUND
(AUGUST TO SEPTEMBER)

- Azure Blue Sage**
Salvia azurea
- Common Sunflower**
Helianthus annuus
- Cutleaf Coneflower**
Rudbeckia laciniata
- Dense Blazing Star**
Liatris spicata
- Nuttall's Lobelia**
Lobelia nuttallii
- Showy Goldenrod**
Solidago speciosa
- Smooth Oxeye**
Heliopsis helianthoides
- Spotted Joe Pye Weed**
Eupatorium maculatum
- Tenlobe False Foxglove**
Agalinis obtusifolia
- White Panicle Aster**
Symphotrichum lanceolatum
- Wild Bergamot**
Monarda fistulosa



Learn more about native plants at mydelawareriver.clearchoicescleanwater.org

For Kids of All Ages...

- Journey North:** learner.org/jnorth
- PlantNative.org**
- Pollinator Partnership Action Plan:** WhiteHouse.gov
- Pollinator Partnership Eco-Regional Planting Guides:** pollinator.org/guides.htm
- MillionPollinatorGardens.org**
- MonarchJointVenture.org**
- Monarch Larva Monitoring Project:** mlmp.org
- MonarchWatch.org**
- United States Forest Service:** http://www.fs.fed.us/wildflowers/pollinators/Monarch_Butterfly/teacherandstudent/index.shtml
- The Wild Center:** wildcenter.org/science/all-about-monarchs-2/
- Xerces Society:** xerces.org

A Special Thanks to...

- The Town of Highland, NY**
TownofHighlandNY.com
- Debra Conway**
History Prose & The Delaware Company
Town of Highland Historian
- Dorene Warner**
W Design: WDesignGroup.com
- Bugwood.org**



This brochure was made possible through the Upper Delaware Council's Technical Assistance Grant.
UpperDelawareCouncil.org
845-252-3022



Common Milkweed
©ROB ROUTLEDGE, BUGWOOD.ORG.

THE **Monarch Butterfly**
Fostering the flyway by the byway



Monarch butterflies are in trouble. In the last 20 years, their population has dwindled from more than a billion to just 150 million. This drastic decline prompted biologists in 2014 to petition the United States Fish and Wildlife Service to list Monarchs as a "Threatened Species."



Monarchs on the Move...

Each year our Northeastern Monarchs migrate from their Summer breeding grounds — as far North as Southern Canada — across an astonishing 3,400+ miles to overwintering roosts in the Oyamel fir forests high in the mountains of central Mexico, West of Mexico City.

Anecdotal evidence suggests the Delaware River serves as a flyway for a portion of this iconic Continental migration.

On a Wing and a Prayer

Each Spring, females lead the Northeastern butterflies North from Mexico into parts of Texas where they lay their eggs. The 1st generation lives 2-6 weeks as adults, flying North as far as they can.

The 2nd generation continues the journey, lays eggs, and dies. The 3rd and 4th generation hatch through the Spring and Summer, finishing the journey North.

In the Fall, a special “super generation” hatches and flies South, all the way to the Oyamel forests in Mexico, that they never knew themselves, but, amazingly, known only to their ancestors a few generations before. They spend the Winter resting from their 2-month flight. These butterflies live for 6-9 months.

Although the butterflies are adapted to cool temperatures, if temperatures drop to the mid-to low 20's (F) the butterflies begin to freeze to death. Monarchs are essentially tropical butterflies and cannot tolerate sub-freezing temperatures for very long.

Overwinter

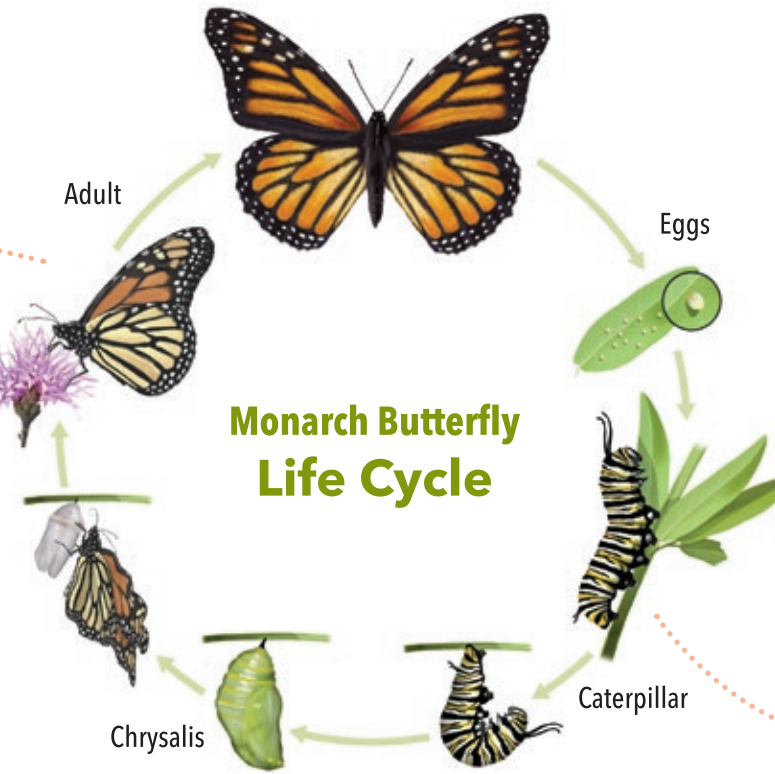
Monarchs' Many Problems

For our Northeastern Monarchs, illegal logging of the rare and valuable Oyamel firs has greatly reduced the overall size of their wintering habitat to about ten acres. Plus, the thinning of the forest is also of concern to scientists because this changes the delicate micro-climate to which the butterflies have adapted.

In their breeding grounds and along their flyways, real estate development, land management practices and chemically-aided agriculture has also destroyed their habitat and main food source: **milkweed**.

Monarch Life Stages

Ideal Monarch habitat must meet the needs of all four stages of the Monarch's life cycle: Egg, Caterpillar (larvae), Chrysalis (pupae), and Adult.



Female Monarchs lay eggs on milkweed plants because their caterpillars eat only milkweed leaves. Once the caterpillar is fully developed, it might leave the host milk weed to find a safe place to form its chrysalis. And once the adult emerges, it uses its straw-like mouth to suck nectar from a number of different flowering plants. So... **Monarchs need both milkweed and nectar-rich plants during their entire breeding and migratory cycle.**

As Northeastern-bound Monarchs depart their Mexican colonies beginning in March, females begin laying eggs in Texas and other southern states in mid-March through early-April. These eggs take about a month or more to reach maturity, and then those adults fly Northward, laying eggs on other milkweeds along their way — and still needing other nectar plants to fuel their flight — until they reach the Northernmost portions of their range in early to mid-June.

No Milkweed... No Monarchs

Mowing for Monarch Management

Ill-timed mowing at any place along the flyways can result in high levels of Monarch mortality. Eggs, larvae, pupae and even adults may be killed directly by the mower or the mowing may destroy the landscape features that provide food sources, structural diversity, nesting and breeding areas for Monarchs and other pollinators.

Monarch Joint Ventures' best mowing practices:

- 1 Avoid mowing the entire habitat** to leave refuge areas for wildlife using the site at the time of mowing. This will allow for the recolonization of the mowed site. Leave areas that may be good nesting or overwintering sites (leaf litter, dead stems, other ground cover) for pollinators or other wildlife. Marking known areas may prevent accidental mowing.
- 2 Timing of mowing is critical.** In New York and Pennsylvania, the “Management Window” is prior to May 1, between June 20 to July 10, and after October 1 for best Monarch habitat protection. Some areas may benefit from Summer management to promote Fall milkweed growth (and thus Monarch reproduction.)
- 3 If possible, avoid mowing while native plants are in bloom or before they have dispersed seed.**
- 4 Limit mowing to no more than twice per year, and even less if possible.** Mowing too frequently disrupts plant growth and the ability of forbs to compete with grass species.
- 5 Use a flushing bar and cut at reduced speeds to allow wildlife to escape prior to mowing.**
- 6 Use a minimum cutting height of 8-12 inches** (shorter heights may be needed for early establishment mowing). Mowing at this height will effectively remove seed producing parts of the most invasive plants while minimizing impact to native plants and many insects.
- 7 Avoid mowing at night when insects are inactive and unable to escape.**

Create Habitat



Groups such as Monarch Watch encourage capturing and tagging Monarchs to associate the location of capture with the point of recovery for each butterfly. The data from these recaptures are used to determine the pathways taken by migrating Monarchs, the influence of weather on the migration, their survival rate, and more.



Bring Home the Butterflies

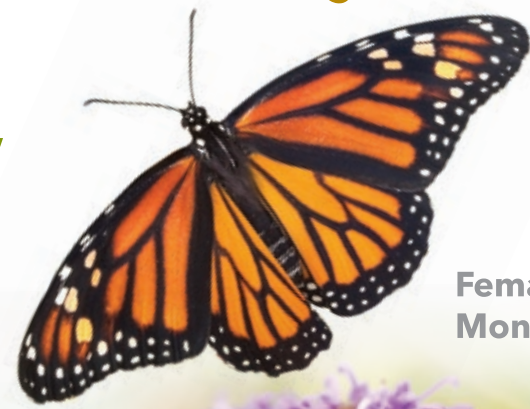
And the Birds & Bees, and Bats & Beetles and Other Pollinators

The charismatic Monarch butterfly is one of the best-known butterflies of North America, due in large part to its near-miraculous cross-continental migration to Mexico.

But its numbers are in serious decline—down about 82 percent from the 20-year average—which is symptomatic of the overall health of the American landscape and all its pollinators. Monarch declines are indicative of environmental problems that also pose risks to food production, the spectacular natural places that help define our national identity, and our own health. Conserving and connecting habitat for Monarchs will benefit many other plants and animals, including critical insect and avian pollinators, as well as future generations of Americans.

Why should we care about pollinators?

- 85% of all flowering plants depend on insect/animal pollinators.
- In the United States, over 100 crop plants depend on insect/animal pollinators. Honeybees alone add more than \$15 billion in value to agricultural crops per year.
- Most natural ecosystems would collapse without insect/animal pollinators.
- And if that's not enough, CHOCOLATE depends on insect/animal pollinators.



Female Monarch



Male Monarch on Asters



Viceroy

All Aflutter to Help?

What You Can Do to Create a Backyard Zoo

Plant milkweed and nectar-rich plants that bloom from early Spring into late Fall.

Help pollinators find and use them by planting in clumps, rather than single plants. Include plants native to your region. Natives are adapted to your local climate, soil and native pollinators. Do not forget that night-blooming flowers help support moths and bats.

Avoid modern hybrid flowers, especially those with "doubled" flowers. Often breeders unwittingly leave out the pollen, nectar and fragrance of these blossoms while creating the "perfect" blooms.

Avoid using pesticides, but if you *must*, use the least-toxic material possible, especially near the Delaware River, its tributaries or other water sources. Read labels carefully before purchasing, as many pesticides are especially dangerous to bees. Use the product properly, spraying at night when bees and others are not active.

Include larval host plants in your landscape.

If you want colorful butterflies, grow plants for their caterpillars. They *will* eat them, so place them where unsightly leaf damage can be tolerated. Accept that some host plants are less than ornamental if not outright weeds.

Create a damp salt lick for butterflies and bees.

Use a dripping hose, drip irrigation line or place your bird bath on bare soil to create a damp area. Mix a small bit of table salt (sea salt is better) or wood ashes into the mud.

Spare that limb! By leaving dead trees, or at least an occasional dead limb, you provide essential nesting sites for native bees. Make sure these are not a safety hazard for people walking below. You can also build a bee box or bee condo by drilling holes of varying diameter about three to five inches deep in a piece of scrap lumber mounted to a post or under eaves.

Add nectar resources by providing a hummingbird feeder.

To make artificial nectar, use four parts water to one part table sugar. Never use artificial sweeteners, honey or fruit juices. Place something red on the feeder. And clean your feeder with hot soapy water at least twice a week to keep it free of mold.

Butterflies need resources other than nectar.

They are attracted to unsavory food stuffs, such as moist animal droppings, urine and rotting fruits. Try putting out slices of overripe bananas, oranges and other fruits, or a sponge in a dish of lightly salted water to see which butterflies come to investigate. Sea salt provides a broader range of micro-nutrients than regular table salt.

Learn more about pollinators. Get some guidebooks and learn to recognize the pollinators in your neighborhood. Experiment with a pair of close-focusing binoculars for butterflies, bees and hummingbirds.

Advice provided by:  

Flying Colors

How to identify:

Male Monarchs have thin veins on their wings and pronounced black spots.

Female Monarchs are characterized by thick veins on wings and no black spots.

Viceroy butterflies can be distinguished from Monarchs by their smaller size and the post median black line that runs across the veins on their hindwings.

Take the White House's "Million Pollinator Garden Challenge" and plant a butterfly garden in your back yard, school yard or permitted public places—especially along the Delaware River flyway and the Upper Delaware Scenic Byway—so the butterflies have plenty of opportunities to breed or get fueled up for their fantastic Fall flight to Mexico.



Conservation efforts start in your own back yard

Availability of milkweed and nectar plants along the Monarch migration routes is critical to the recovery of the Monarch populations. Female Monarchs lay their eggs **ONLY** on milkweeds—sometimes only one egg per stalk—because the larvae (or caterpillars) eat only milkweed leaves while developing.

Northeast Region Milkweed Species

While there are 73 species of native milkweeds in the United States, it is recommended that only those species native to your region—such as those pictured here—be included in EVERY pollinator garden.



Swamp Milkweed – *Asclepias incarnata*
Damp, marshy areas.



Butterfly Milkweed – *Asclepias tuberosa*
Well drained soils.



Common Milkweed – *Asclepias syriaca*
Well drained soils.



Whorled Milkweed – *Asclepias verticillata*
Fields and open areas.



Poke Milkweed – *Asclepias exaltata*
Woodland areas.

In the Market for Milkweed?

Go to MonarchWatch.org

