

INVITING BUTTERFLIES INTO YOUR GARDEN



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This publication updates and replaces the 1986 NGC publication "Butterfly Gardening" with an emphasis on monarch butterflies.

BUTTERFLY CONSERVATION

Do you ever wonder 'Where have all the butterflies gone?' Butterfly populations are declining worldwide primarily due to loss of habitat (caused by modern agricultural and forestry practices, development and cropland conversion) and consequently, the loss of food sources provided there. Today, butterflies are becoming increasingly scarce, with many endangered and some actually extinct. So great has been the decline in the number of monarchs in the last two decades (90% in recent years), that the U.S. Fish and Wildlife Service has launched a major campaign aimed at saving the declining monarch butterfly.

Butterflies are a part of the web of life. They support birds and amphibians, as well as insects. No matter what stage of its life cycle (egg, caterpillar, chrysalis or adult), the butterfly is a source of food for some other creature. When you create a garden that attracts butterflies, you create a habitat for a variety of beneficial insects, birds, bees and other wildlife.

The butterfly's primary contribution is to pollinate flowers, including fruit and vegetable blossoms that provide nectar for a variety of adults. Many species of native plants provide food and nectar for butterflies and their larvae. One of the best ways to help butterflies survive is to provide adequate habitat in our own gardens and neighborhood communities. You, too, can help conserve butterflies by planting the nectar and larval plants they need to survive during all stages of their life.

Which of the habitat essentials – food, water and shelter – are you providing right now? What are you already attracting to your garden? Learn what local butterflies visit your area and their feeding habits. Visit your garden on a warm, sunny day in the late morning or early afternoon to observe the butterflies feeding. Butterflies and plants, along with the habitats they live in, form one of the most intricate and balanced relationships known in nature.

Allow at least a small part of your garden to go "wild" with minimal management. An example of this concept is to let your edibles, including herbs planted in the ground or in containers, blossom and go to seed. **Emphasize caterpillar food plants** that also perform double-duty as nectar plants, and plant them in an area that can grow undisturbed. Plant enough for the caterpillars to devour during their various instar stages. Many butterflies are plant specific, indicating that the female butterfly will only lay her eggs on one particular genus of plants. An example is the monarch which has a special plant relationship with native *Asclepias species* and will only lay her eggs on milkweed. There are many Internet resources for milkweed:

- The *Xerces Society for Invertebrate Conservation* provides a search feature by *Asclepias species* and state: <http://www.xerces.org/milkweed-seed-finder/>
- *Monarch Watch* provides a list of milkweeds state-by-state: <http://monarchwatch.org/bring-back-the-monarchs/milkweeds-by-state/>
- *Monarch Joint Venture* offers a milkweed fact sheet: <http://monarchjointventure.org/images/uploads/documents/MilkweedFactSheetFINAL.pdf>

A second factor affecting butterflies is the misuse and overuse of pesticides and herbicides. These types of lawn care and plant maintenance products contain chemicals that will kill butterflies and other beneficial insects in both their adult and larval phases of the life cycle. Systemic pesticides, as well as the use of *Bacillus thuringiensis* (BT), should also be avoided. In order to successfully invite butterflies into your garden, you need to endure the caterpillars and the holes they chew in their host larval plants. By eliminating toxic chemicals from the butterfly area, you will enjoy your habitat garden's long season of bloom and find it alive with butterflies, beneficial insects, bees, birds and other critters.

As stated in the Spring 2015 issue of *The National Gardener*, "Spectacular as it is, protecting the monarch is not just about saving one species. The monarch serves as an indicator of the health of pollinators and the American landscape. Monarch declines are symptomatic of environmental problems that pose risks to our food supply, the spectacular natural places that help define our national identity and our own health. Conserving and connecting habitat for monarchs will benefit other plants, animals and important insect and avian pollinators."

Monarchs cannot survive without milkweed. Habitats for monarchs can be anywhere, as long as there is milkweed growing there! *Monarch Joint Venture* showcases the following types of habitats:

- **Gardens:** Butterfly gardens within developed areas (residential areas, parks, schools and cultural institutions) provide much needed habitat for butterflies. These butterfly havens may be a few

square feet within an urban backyard, or a larger managed garden attached to an educational institution, cultural center or a corporate office park. In addition to these butterfly habitats benefiting butterflies and other pollinators, they serve to educate children and adults on conservation issues, engage them in scientific inquiry and may lead to increased involvement in conservation activities. Schools that involve children in creating and caring for a habitat are important partners in this effort.

- **Managed Corridors:** The U.S. Department of Transportation indicates there are almost 9 million miles of highways in the United States. In addition, there are more than 5 million acres of land within utility rights-of-way. These easements or rights-of-ways associated with these linear tracts, when managed appropriately, can provide critical habitat for monarchs and other pollinators. Begin by removing invasive and undesirable species and replacing with a mix of native flowers including native milkweed with overlapping bloom times. Minimal, well-timed management that limits impacts to all pollinators, including butterflies, while eliminating woody species, is also needed. Mowing should be limited to times when plants have died back or are dormant. Mowing at any time (even in the winter) kills insects. In the summer, some insects can't get away from the mower, especially eggs and caterpillars. In the winter, insects may be dormant in leaf litter or plant stems. Mowing in patches ensures that pollinators can recolonize the mowed areas. Roadways and utility corridors are highly visible areas. Consider adding a sign or informational brochures in highly frequented areas, such as rest stops, to educate the public about your conservation efforts.
- **Agricultural Areas:** Agricultural fields used to be an important source of milkweed for monarch caterpillars. Milkweed historically grew alongside crops, and provided abundant food for monarch caterpillars. With the introduction of herbicide tolerant crops, management shifted from a till-based approach to the widespread use of herbicides. This practice has diminished much of the native milkweed growing in agricultural areas, since milkweed can survive some tilling, but cannot survive herbicides. Farmers have an important role to play in the conservation of monarchs and pollinators in general. Native flowers, including milkweed planted in fallow fields, hedgerows and farm field margins, provide food for butterflies. Use of low-till and no-till farming techniques allow more milkweed to grow alongside crops. Avoidance of pesticides and minimal, well-timed herbicide applications is a must for pollinator-friendly farming.
- **Natural and Restored Areas:** Nature preserves, parks or areas not actively being used for another purpose may be ideal as a butterfly habitat. Restored areas are lands that have been specifically replanted or re-purposed for conservation. Audubon Preserves or Wildlife Refuges are excellent examples of habitat for a variety of wildlife including butterflies. Natural areas may also be located in high traffic areas. Trail margins in prairies, campsites and picnic areas present opportunities to enhance butterfly habitat. Minimal management and disturbance, including the avoiding of mowing until butterflies have migrated from the area, is essential. Mowing kills insects any time of the year. Mowing in patches ensures that pollinators always have access to undisturbed patches of habitat, and that surviving insects can recolonize the mowed area. Avoid using pesticides and herbicides both.

By including various native *Asclepias species* in urban backyard gardens or larger gardens in the community, managed highway and utility corridors, agricultural areas as well as nature preserves, parks and restored areas, you will discover the joys of helping other pollinators too. Please plant milkweed to support monarch populations and their incredible migration! **“Leap into Action”** by planting milkweed to help a variety of beneficial insects, bees, butterflies and other pollinators who use it as a valuable nectar resource.

NOTE: Commercially raised butterflies and butterfly releases are discouraged. The unregulated sale and shipment of live butterflies has prompted the *North American Butterfly Association*, the *Lepidopterists' Society*, The *Xerces Society* and other groups to issue a public statement against this practice. The concerns include spread of disease and inappropriate genetic mixing of different populations. Jeff Glassberg, President of the *North American Butterfly Association* states: “Raised under unnatural conditions, farmed butterflies provide fertile ground for the spread of the many diseases that affect butterflies. By shipping them around the country and by placing them into the environment, we run the risk of decimating populations of our native butterflies by disease epidemics.” Further, many butterflies are released out of range or season, condemning them to a quick death; and the high price commanded for monarchs makes them targets for poachers in their winter range. Teachers are encouraged to use butterflies netted or reared from local habitats for educational purposes. In the event that institutions choose to acquire commercially reared butterflies for educational purposes, the *Xerces Society* recommends that they not be released into the wild after adults emerge unless they originated locally. Instead, of releasing into the wild, they can be studied and enjoyed in captivity, as they are in butterfly houses.



Plants & Practices to Attract Butterflies



Larval/Host Plants

Particular plants are needed for a female butterfly to place her eggs on that provide the right food source for her larvae. The female butterfly searches your garden for the specific larval food plants on which she must lay her eggs. Some butterflies, like the Monarch, will lay a single egg on a leaf, while other butterflies may lay clusters of eggs together. Many larval plants perform double-duty as nectar plants.

<u>BOTANICAL NAME</u>	<u>COMMON NAME</u>	<u>BUTTERFLY ATTRACTED</u>
Annuals, Perennials & Biennials:		
<i>Aristolochia species</i>	Pipevine	Pipevine Swallowtail
<i>Asclepias species</i>	Milkweed	Monarch, Queen
<i>Asters species</i>	Asters	Pearl Crescent, Northern Crescent, Field Crescent
<i>Ceanothus species</i>	Ceanothus	California Tortoiseshell, variety of Duskywings
<i>Eriogonum species</i>	Buckwheat	Gray Hairstreak, Avalon Scrub-Hairstreak, Acmon Blue, Lupine Blue, Mormon Metalmark
<i>Helianthus species</i>	Sunflowers	Bordered Patch, variety of Checkerspots
<i>Lupinus species</i>	Lupines	Boisduval's Blue, Melissa Blue, Silvery Blue
<i>Malva species</i>	Hollyhocks & Mallow	Painted Lady, West Coast Lady, Gray Hairstreak, Common Checkered Skipper, Mallow Scrub-Hairstreak
<i>Passiflora species</i>	Passion Vines	Gulf Fritillary, variety of Heliconians, Variegated Fritillary
<i>Petroselinum species</i>	Parsley	Anise Swallowtail, Black Swallowtail
<i>Phylas species</i>	Fogfruits	Phaon Crescent, Common Buckeye, White Peacock
<i>Senna species</i>	Senna	Little Yellow, Sleepy Orange, Cloudless Sulphur, Orange-barred Sulphur
<i>Trifolium species</i>	Clover, red & white	Orange Sulphur, Clouded Sulphur, Eastern Tailed-Blue
<i>Viola species</i>	Violets	Variety of Fritillaries, including Great Spangled Fritillary, Variegated Fritillary, Atlantis Fritillary
Grasses:		
<i>Carex species</i> (Carex); <i>Festuca species</i> (Fescue);		Variety of Skippers, including Common Ringlet, Umber Skipper, Woodland Skipper, Fiery Skipper, Sachem Skipper, Dun Skipper
<i>Muhlenbergia rigens</i> (Deer Grass)		
Trees:		
<i>Celtis occidentalis</i>	Hackberry Tree	American Snout, Question Mark, variety of Emperors
<i>Liriodendron tulipifera</i>	Tulip Tree	Eastern Tiger Swallowtail
<i>Prunus species</i>	Wild Black Cherry	Eastern Tiger Swallowtail, Coral Hairstreak, Red-spotted Purple, Spring Azure
<i>Quercus species</i>	Oak Trees	California Sister & Mournful Duskywing
<i>Salix species</i>	Willow Shrubs/Trees	Mourning Cloak, Lorquin's Admiral, Western Tiger Swallowtail, Viceroy, Sylvan Hairstreak
Weeds:		
<i>Chenopodium album</i>	Lamb's Quarters	Common Sootywing, Pygmy Blue
<i>Urtica species</i>	Nettles	Red Admiral, Milbert's Tortoiseshell, West Coast Lady

Nectar Plants

Plants that provide a food source to a variety of adult butterflies year-round with continuous bloom in a variety of colors (red, yellow orange, pink and purple) with blossoms that are flat-topped or tightly clustered tubular flowers:

<u>BOTANICAL NAME</u>	<u>COMMON NAME</u>	<u>SEASON OF BLOOM</u>
<i>Achillea species</i>	Yarrow	Spring, Summer & Fall
<i>Echinacea species</i>	Purple Coneflower	Summer
<i>Erigeron species</i>	Seaside Daisy	Spring & Summer
<i>Lantana species</i>	Lantana	Spring, Summer & Fall
<i>Lavandula species</i>	Lavender	Spring & Summer
<i>Limonium species</i>	Statice	Spring, Summer & Fall
<i>Monarda species</i>	Bee Balm	Summer
<i>Salvia species</i>	Sage	Spring, Summer & Fall
<i>Scabiosa species</i>	Pincushion Flower	Spring, Summer, & Fall
<i>Sedum species</i>	Stonecrop	Fall
<i>Solidago species</i>	Goldenrod	Summer
<i>Tithonia rotundifolia</i>	Mexican Sunflower	Summer
<i>Verbena species</i>	Verbena	Spring, Summer & Fall
<i>Zinnia elegans</i>	Zinnias	Summer

CREATING YOUR OWN BUTTERFLY HABITAT GARDEN

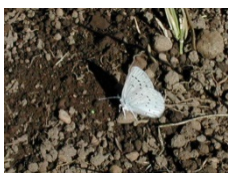
1. **Choose a sunny location.** Butterflies need sun for orientation and to warm their wings for flight. Some butterflies can withstand colder temperatures, such as mourning cloaks and red admirals. For such species, consider providing some shaded areas or dappled shade. Other butterflies cease all activity in cold, cloudy weather and look for shelter from predators waiting for sunshine to return. Butterflies require a minimum temperature of 58 degrees to warm their bodies, bask in the sun and take flight.

2. **Shelter the garden from wind** with a screen of shrubs, hedgerow or a fence. Flowering shrubs that also provide nectar make ideal windbreaks. A hedgerow refers to narrow planting strips along field borders, fence lines and waterways. Hedgerows include a variety of plantings of shrubs and perennials that provide a long bloom period from early spring through fall in order to attract pollinators and beneficial insects, plus help to control weeds. The diversity of plants provides a season-long supply of food. The plants growing in the hedgerows provide sources of nectar and pollen, as well as egg laying and nesting sites for many insects. The pollinator plants include a diverse mix of grasses and forbs (wildflowers) as understory plants for the shrubs and larger perennials.

3. **Add rocks** or flat stones to absorb the sun's heat and serve as a perch for butterflies to warm their wings. A creek bed, created with a variety of different sized river rocks for storm drainage, is a popular spot for butterflies to bask in the sun when dry and sunny.



4. **Include damp sand, gravel or mud puddle as a source of mineral nutrients.** Butterflies often gather on wet sand and mud to partake in "puddling", drinking water and extracting salt minerals from damp puddles. The *National Wildlife Federation* suggests placing coarse sand in a shallow pan and then inserting the pan into the soil of your habitat. Be sure to keep the sand moist.



5. **Choose a diversity of native plants** that will create a long series of bloom as a food source and plant in large clumps. Native plants are the best source for nectar and pollen since native plants and native pollinators, including butterflies, co-evolved and support each other. The clumps of flowers and grasses attract more pollinators than individual plants do. One's selection of plants is influenced by the local butterfly population native to your geographic area. Check with your local or state native plant society to be sure that the plants you use to attract butterflies to your garden are native to your region. The more you learn about butterflies, the more butterflies you will see!

6. **Include plants that provide both nectar for the adult butterfly and leaves, flowers and seeds for the larvae to feed.** Contrary to public opinion, butterfly caterpillars do not chew their way through the garden eating everything in sight. They stay on the host plants, pruning as they eat and grow, giving back frass (caterpillar droppings) as fertilizer. While host plants may look ragged, they will grow back. To ensure local butterflies will take up residence in your garden rather than just pass through, concentrate on a variety of host plants that serve as larval food for the caterpillars, and also perform double-duty as nectar plants for a variety of other pollinators. If you plant it, they will come!



7. **DO NOT SPRAY ANY PESTICIDES** in your garden. If it kills an insect of any kind, it kills butterflies and other beneficial insects in both their adult and larval phases. Even pesticide alternatives are fatal to caterpillars. Butterflies are not pests! Avoid herbicides, too. Be willing to accept some plant damage and to live with flying and crawling insects in your garden. Insects keep the garden in balance by pollinating plants, keeping each other's numbers in check and providing food for birds and other predators. Remember, you are trying to create a successful habitat for all wildlife that includes butterflies in all stages of their life cycle, beneficial insects, amphibians, birds, etc.

8. **Allow at least a small part of it to go wild with minimal disturbance.** Leave a corner in your garden untended for additional habitat. When caterpillars stop eating, they wander away from the host plant to attach to twigs, dead branches, rocks, windowsills, foundations, etc. to form their chrysalises. Because chrysalises and butterfly eggs often hide in shrubs, brush piles, leaves, twigs and branches, they are often tossed out with the garden trimmings. Take time to carefully check before pruning and raking. An undisturbed brush pile provides habitat for butterflies to find shelter from weather. Think of your landscape and garden as a buzzing sanctuary, thriving in a carefree, diverse garden that is informal, yet neither messy nor neglected. A garden that is vibrant with bees, frogs, birds, butterflies, hummingbirds and other wildlife is far more attractive than empty clipped hedges, lawns and neat flower beds. Relax your neat and tidy standards. Another reason why butterflies and tidy gardens do not mix! **"Leap into Action"** by following these eight easy steps to successfully invite butterflies into your garden!



CONTAINER GARDENING FOR BUTTERFLIES

Making a butterfly container is a wonderful way to entice butterflies and pollinators to our homes and communities. Containers also serve a purpose in providing schools, adult living centers, hospitals and other facilities, an easy way to have a small contained garden where butterflies can visit and reproduce.

Planting wildflowers and native plants that grow in your area are one of the best ways to attract butterflies. The Xerces Society has a Pollinator Conservation Resource Center on their website where you can find regional information about plant lists, habitat conservation guides, pollinator conservation seed mixes and more.

Asclepias (Milkweed) plants are a must for monarch butterflies. Some native milkweed seeds need freezing to germinate. Find information about what variety grows well in your area.

There are many Internet resources for milkweed:

- The *Xerces Society for Invertebrate Conservation* provides a search feature by *Asclepias* species and state: <http://www.xerces.org/milkweed-seed-finder/>
- *Monarch Watch* provides a list of milkweeds state-by-state: <http://monarchwatch.org/bring-back-the-monarchs/milkweeds-by-state/>
- *Monarch Joint Venture* offers a milkweed fact sheet: <http://monarchjointventure.org/images/uploads/documents/MilkweedFactSheetFINAL.pdf>
- *National Wildlife Federation* lists twelve native milkweeds for monarchs: <http://www.nwf.org/Pollinators/Monarch/Milkweed-Resources.aspx>

Butterflies are attracted to bright flowers, including some herbs. Look for plants that are red, orange, pink or purple in color. The shape of the flowers is also important. Flowers with flat surfaces like the *Asteraceae* family are popular because they allow the butterfly to feed and rest.

The advantage to creating a butterfly garden in containers is that it doesn't take a lot of space. They can be placed on a deck or balcony as long as they have the right plants. A combination of larval and nectar plants is suggested. See page 5 for a list of suggested plants to create a successful combination.

Here are easy tips to create a container garden for butterflies:

1. Start with a sturdy plastic container.
2. Place broken pieces of clay pots on the bottom of the container for drainage, or use three inches of styrofoam peanuts.
3. The container needs a variety of soils, such as garden soil, potting soil and compost to grow healthy plants.
4. Mix equal parts of the soils well and add water to moisten.
5. Plant your tallest plant such as *Salvia*, milkweed, dill or fennel in the middle of the container for height.
6. Place your seeds or plants around the inside edge of the container where you want shorter flowers to grow.
7. Place the container in an area to receive sun or part-shade and wind protection.
8. Now watch as female butterflies come to visit, lay their eggs that grow into caterpillars, and soon more butterflies will appear for everyone to enjoy.

A combination of larval plants (*Asclepias* and *Festuca*) and nectar plants (*Lantana*) are pictured in a wine barrel as a container garden for butterflies.



If you plant it, they will come.

FIVE STEPS FOR A CERTIFIED MONARCH WAYSTATION



Monarchs require *Asclepias species* commonly known as milkweed. Milkweeds are the only plants female monarchs lay their eggs on and the monarch caterpillars can eat. Monarchs in the United States are in serious decline because of loss of habitat due to spraying of herbicides and development, both of which destroy native milkweed.

The good news is that we as individuals can help! *Monarch Watch*, a program at the University of Kansas with a focus on the monarch butterfly, its habitat and its spectacular fall migration, sponsors a Monarch Waystation program. Waystations are one way we can increase public awareness of the plight of monarchs and contribute to efforts to save them. The challenge is to create successful habitat by planting milkweeds and a variety of nectar plants in our gardens. By creating habitat for monarchs, you will also attract other butterflies and pollinators.

Here is how to get started:

1. Determine size and location: Butterfly plants need sun. There is no required size, but *Monarch Watch* suggests a minimum of 100 square feet. The total area may be split into several locations.
2. Plant ten (10) or more milkweed plants. A monarch waystation requires a minimum of 10 milkweed plants, preferably two or more species. Milkweeds that bloom at different times increase the chances for seeing monarchs over a longer period.
3. Plant a minimum of four (4) nectar plants. Providing nectar throughout the growing season will increase your chances of attracting monarchs as well as other butterflies and pollinators. Nectar plants may be trees, shrubs or wildflowers. Fall-blooming plants, such as asters and sedums, are especially important to monarchs and other butterflies that may sometimes migrate. Native perennials to your geographic area attract more butterflies in general.
4. Management practices encouraged include the following:
 - Manage the density of plants – relatively close together but not crowded, in order to provide shelter for caterpillars and chrysalises from predators and weather elements.
 - Eliminate the use of insecticides and herbicides.
 - Remove old growth before the growing season, preferably in spring.
 - Caution: Some butterflies overwinter in the garden as eggs, caterpillars or chrysalises. Fall clean-up may destroy next year's butterflies.
5. Complete the certification application. Register your garden as a **Certified Monarch Waystation** by completing the form at: <http://www.monarchwatch.org/waystations/certify.html>. Applications may be submitted online or printed to mail or fax. A processing fee is required for each certification. Your habitat will be included in an online registry of worldwide Monarch Waystations.

NOTE: You don't have to start from scratch. If you have an existing habitat that meets the requirements, or which can be modified to qualify, you can (and should) apply for certification.

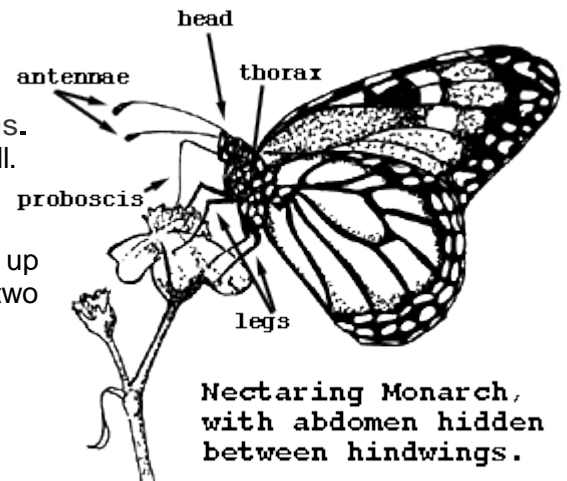
Additional online resources:

- Butterflies and Moths of North America – www.butterfliesandmoths.org
- Monarch Migration (and to report monarch sightings) – www.journeynorth.org
- Monarch Joint Venture – www.monarchjointventure.org
- Wild for Monarchs – www.wildones.org/learn/wild-for-monarchs
- Pollinator Partnership – www.pollinator.org

BUTTERFLY ANATOMY

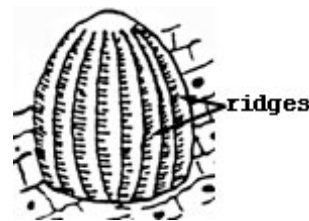
ADULT

The body of an adult butterfly is divided into the same major parts as the larva: head, thorax and abdomen. There are four main structures on the adult head: eyes, antennae, palpi and proboscis. The two antennae and two palpi give butterflies a sense of smell. Organs on the back at bottom of legs, "taste" sweet liquids. The straw-like proboscis is the butterfly's tongue, through which it drinks nectar and water for nourishment. When not in use, the butterfly curls up its proboscis. All butterflies have four wings: two hindwings and two forewings. Veins give the wings structure, strength and support.



The male monarch butterfly pictured has a black spot on each hindwing that is made up of specialized scales. The female monarch's black webbing is thicker with spotless hindwings.

EGG

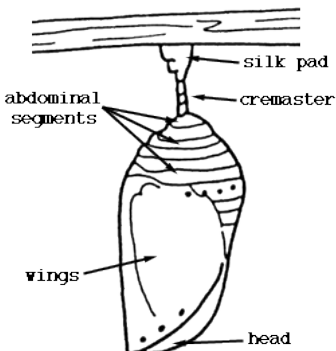
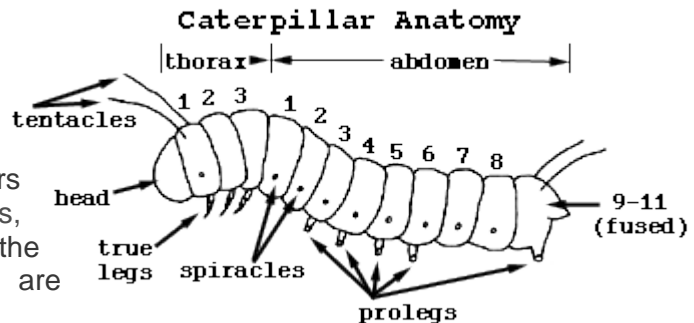


Each butterfly egg is surrounded by a hard outer shell to protect developing larva. The raised areas on an egg shell are called ridges. They are formed inside the female before she lays the egg.

LARVA (Caterpillar)

Larvae have three distinct body parts: head, thorax and abdomen. The head has a pair of very short antennae, mouthparts (upper lip, mandibles, and lower lip) and six pairs of very simple eyes, called ocelli. Even with all of these eyes, the caterpillar's vision is poor. The antennae help guide the weak-eyed caterpillar and the maxillary palps, which are sensory organs, direct food into the larva's jaws.

Each thoracic segment has a pair of jointed, Or true legs, while some of the abdominal segments have false legs, or prolegs. There are usually five pairs of prolegs. The prolegs have tiny hooks on them that hold the larva onto its silk mat or leaf. The fleshy tentacles at the front and rear ends of Monarch larvae are not antennae, but they do function as sensory organs.



PUPA (Chrysalis)

When it pupates, a butterfly larva splits its exoskeleton and wiggles out of its larval skin. When this skin moves far enough down the body, the cremaster appears. The cremaster is a spiny appendage at the end of the abdomen. The butterfly hooks its cremaster into a silk pad spun by the larva just before pupation; it will hang from this until it emerges as an adult. The freshly exposed pupa is very soft and delicate until it hardens. You can see many different body parts on the pupa, including the wings, abdomen, legs and eyes.

Resource: <http://www.monarchwatch.org/biology/index.htm>

SEED AND PLANTS SOURCES

Native seeds for pollinators are part of the *Xerces Society's Pollinator Conservation Resource Center*: <http://www.xerces.org/pollinator-seed/>. This module lets you query by state and region to find appropriate native plant nurseries and seed sources recommended for that area. The *Xerces Society's* conservation pledge to *Bring Back the Pollinators* includes a variety of native seed mixes that provide foraging and nesting resources for a diversity of pollinators.

Milkweeds support monarch butterflies, native bees, honey bees and other beneficial insects. *Asclepias*, commonly known as milkweed, is the ONLY host plant for the monarch butterfly. The female monarch lays its eggs on milkweed that hatch into caterpillars (larvae) that feed on milkweed. Without milkweed, monarchs may become extinct.

There are many different species of *Asclepias*. Plant milkweed that is native to your geographic area. For potential resources to learn what is native for your location, check with any of the following:

- A local Naturalist
- Department of Natural Resources
- Local parks department
- Local Native Plant Society

You may also utilize the Internet as a valuable resource by visiting the following websites:

- The *Xerces Society for Invertebrate Conservation* provides a search feature by *Asclepias* species and state: <http://www.xerces.org/milkweed-seed-finder/>
- *Monarch Watch* provides a list of milkweeds state-by-state: <http://monarchwatch.org/bring-back-the-monarchs/milkweeds-by-state/>
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- *Monarch Joint Venture* offers a milkweed fact sheet: <http://monarchjointventure.org/images/uploads/documents/MilkweedFactSheetFINAL.pdf>

To purchase milkweed for your area, visit www.monarchwatch.org sponsored by the University of Kansas. They will only send milkweed seed and milkweed plugs that are native to your area. Milkweed from both *Monarch Watch* and the *Xerces Society* are Neonicotinoid-free.

Neonicotinoids are a relatively new class of insecticides (systemic agricultural insecticide resembling nicotine) that share a common mode of action that affect the central nervous system of insects, resulting in paralysis and death. "The hallmark of neonicotinoids is that they are systemic," Keith Delaplane, a professor of entomology at the University of Georgia. That means they travel throughout a plant via its vascular system and distribute the chemical to all parts of the plant tissue 24/7, including its nectar and pollen." **Please always ask vendors for information about seed origin and try to plant seed that is as locally sourced as possible.**

Some local nurseries sell milkweed. Make sure the plants you purchase are Neonicotinoid-FREE. Please do your homework and ask questions to make sure any seeds or plants you are purchasing have not been treated with any pesticide, larvicide (like BT), insecticide, etc. If a chemical kills an insect, it is guaranteed to kill butterflies.

Depending on where you live, you may find milkweed pods on milkweed in the open. Roadside ditches in the Midwest are an excellent resource area to find seed pods and collect seed. Make sure they are chemical-free. If there is a Butterfly Garden in your area that has milkweed planted in it, ask if you may obtain a seed pod in the fall. Always make sure the area you're taking it from is chemical-free.

Don't forget to check with your local garden club to see if someone might have Milkweed seed for you. Garden club members are full of information, plants and seeds that they enjoy sharing – just ask!

PROPAGATING MILKWEED FROM SEED

Tina Placek, Native Plant Specialist, describes her personal experiences growing milkweed from seed. Propagating milkweed from seed can be challenging! Throughout the years both success and failures have been experienced. Most people love the rewards of propagating any plant from seed. What makes milkweed difficult is once it starts to germinate and grow, it has a tendency to dampen off. Most home gardeners are not professional propagators. Many have gotten hooked on seed germination after working in a native plant nursery or after completing Master Gardener courses.

Collection: Gather seed pods in summer after milkweed has bloomed. I have found it is best to pick the seed pod when it starts to split open. Put the pods into a paper sack (never store any seed pod in plastic.) The seed pods will still be moist and need to dry out completely to prevent the seed from mildew. If you have the time, it is best to always clean the seed immediately to avoid any insect infestation in the seed pod. If you do not have the time to do it right away, just keep them stored in a paper sack. I do not strip the milkweed plant of all its seed pods. Typically, I sprinkle the seed and rake them into the soil as a way to thank the mother plants and promote future milkweeds in the garden.

Cleaning: There are several ways to clean the seed pods. One way is to grasp hold of the pod on the silk end and try to run your fingers over the seed so the seeds simply fall off. Sometimes shaking the seed in a paper sack will work. The problem is when the silk flies everywhere! My favorite (and the quickest) way is to scatter the seeds of one pod onto a burnable surface and CAREFULLY light the silk (**WARNING:** the silk will immediately ignite – the first time I tried this, I singed my hair!)

Storing and Planting: You can store the seeds once they are cleaned and dried in damp sphagnum peat moss or coarse sand. I prefer the moss because I have had the seeds actually sprout in it. The seeds can be stored in the refrigerator until spring (preferably 90 days); then planted in a seed-starter potting mix when temperature is above 70 degrees (Cullina, 2000). Place the seeds in a flat or pots and place in a warm sunny window or greenhouse. Make sure the soil is kept evenly moist and not too wet. I normally sprinkle sand over the top to help with dampening off. Water the seeds by either sprinkling water on top so as not to wash the seeds away, or water from the bottom. Another alternative is to plant the seeds after cleaning by directly sowing into a flat, and place the flat in an unheated greenhouse. The seeds need to go through a cold cycle before sprouting.

Transplanting: Once the seeds have their second set of leaves, it is time to transplant them into individual pots. I have only transplanted seedlings in a greenhouse, and once the plants start growing vigorously, I gradually harden them off to the outside. New plants need to be kept watered and do not want to dry out. Fertilize the new plants once every two weeks with a light fertilizer. Make sure your milkweeds are planted in a sunny location and in well-drained soil. General Rule: *Make sure you plant your specific milkweed in the right location and soil.* There are some varieties that require more moisture in a garden bed and may prefer part-sun.

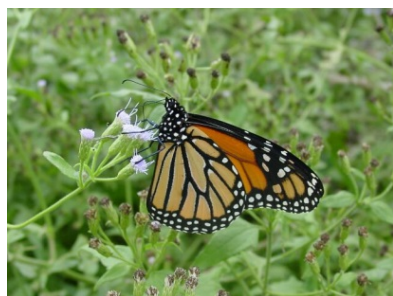
Enjoy growing your milkweeds! Not only are you adding a spectacular native plant to your garden, but you are helping save the beautiful monarch butterfly plus other pollinators who value the nectar from its blooms.

Tina Placek, Native Plant Specialist, Springhouse Gardens, Nicholasville, KY

Reference: Cullina, W. (2000). *New England Wildflower Society Guide to Growing and Propagating Wildflowers of the United States and Canada*. Houghton Mifflin Harcourt, Publisher.

REGIONAL BUTTERFLIES OF NATIONAL GARDEN CLUBS, INC.

Monarch (*Danaus plexippus*): New England, Rocky Mountain and South Central Regions



3.5 – 4" Large orange butterfly with black veins and black margins containing double rows of white dots. When flying, it often sails with its wings held in a "v" formation.

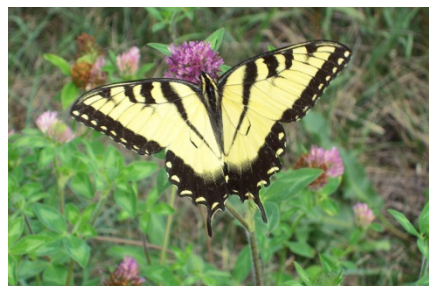
Host/Larval Plant: *Asclepias species* (Milkweed). It is the milky sap consumed by monarch caterpillars that makes monarchs distasteful to predators throughout its life.

Habitat: Open areas with milkweeds, including roadside ditches, gardens, meadows, grass prairies, weedy fields, canyons and agricultural areas. During migration, they may be found anywhere from alpine summits to cities. Their

declining numbers vary depending upon each year's environmental conditions.

One of the best known butterflies, the monarch is the only butterfly that migrates annually both north and south similar to birds, on a regular basis. However, no one single individual makes the entire round-trip journey. Monarchs east of the Continental Divide usually migrate south in the fall to overwinter in the Mexican Mountains, while monarchs west of the Continental Divide typically overwinter along the central/southern California coast. In spring, monarchs head north, breeding along the way with their offspring returning to the starting point. The U.S. Fish and Wildlife Service has launched a major new campaign aimed at saving the declining monarch butterfly whose numbers have declined by an estimated 90 percent in recent years due to agricultural practices, development and cropland conversion. The monarch is the state butterfly/insect of Alabama, Idaho, Illinois, Minnesota, Texas, Vermont and West Virginia. Plant milkweed native to your geographical area to help save the monarchs!

Eastern Tiger Swallowtail (*Papilio glaucus*): Central Atlantic, South Atlantic and Deep South Regions



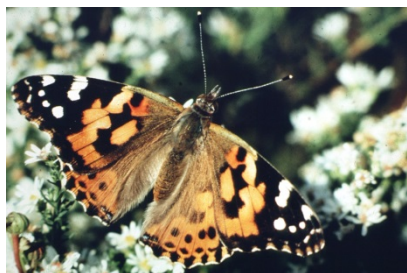
2.5 – 4.5" Very large butterfly with broad yellow wings edged by black with four stripes resembling a tiger pattern with distinctive tails.

Host/Larval Plants: Leaves of various trees including *Prunus serotina* (Wild Black Cherry); *Liriodendron tulipifera* (Tulip Tree); *Magnolia virginiana* (Sweet Bay Magnolia). Caterpillars eat leaves and rest on silken mats on upper surface of leaves. Chrysalises overwinter.

Habitat: Deciduous and mixed woodlands, forest edges, wooded river valleys, parks and suburbs. Often found flying high among treetops, they

descend for nectar, puddle in damp places in the soil and to drink water. The Eastern tiger swallowtail is the state butterfly/insect of Delaware, Georgia, North Carolina, South Carolina and Virginia. It is commonly seen from spring to fall producing two broods in the north, and three life cycles in southeastern states.

Painted Lady (*Vanessa cardui*): Central and Pacific Regions



2 – 2.25" Medium-sized butterfly salmon-orange with black blotches, black-patterned margins and forewing tips with clear white spots.

Host/Larval Plants: *Cirsium* (Thistles), *Aster species* and *Malvaceae* family (Mallows).

Habitat: Any open areas including meadows, parks and mountaintops.

Painted ladies live on five continents, hence, it is known as the planet's cosmopolitan butterfly. They cannot survive freezing temperatures. Each year, painted ladies repopulate north from Southwestern U.S. and Mexico, often in dramatic numbers so impressive that everyone notices. Unlike the monarch's round-trip migration, the movements of the painted lady are essentially one-way and the extent of the territory they reach varies widely from year to year. They usually produce two or more broods and produce all year in southern deserts.

OFFICIAL STATE BUTTERFLIES

State	Butterfly	Scientific Name	Host Plant	Botanical Name
AL	Monarch	<i>Danaus plexippus</i>	Milkweed	<i>Asclepias</i> spp.
AZ	Two-Tailed Swallowtail	<i>Papilio multicaudata</i>	Arizona Sycamore	<i>Plantanus wrightii</i>
AR	Diana Fritillary	<i>Speyeria diana</i>	Violets	<i>Viola</i> spp.
CA	California Dogface	<i>Zerene eurydice</i>	False Indigo	<i>Amorpha californica</i>
CO	Colorado Hairstreak	<i>Hypaurotis crysalus</i>	Gambel Oak	<i>Quercus gambelii</i>
DE	Eastern Tiger Swallowtail	<i>Papilio glaucus</i>	Tulip Tree	<i>Liriodendron tulipifera</i>
GA	Eastern Tiger Swallowtail	<i>Papilio glaucus</i>	Black Cherry	<i>Prunus serotina</i>
FL	Zebra Longwing	<i>Heliconius charitonius</i>	Passion Vine	<i>Passiflora</i> spp.
HI	Kamehameha	<i>Vanessa tameamea</i>	Mamaki	<i>Pipturus albidua</i>
ID	Monarch	<i>Danaus plexippus</i>	Milkweed	<i>Asclepias</i> spp.
IL	Monarch	<i>Danaus plexippus</i>	Milkweed	<i>Asclepias</i> spp.
KY	Viceroy	<i>Limenitis archippus</i>	Willows, Poplars	<i>Salix, Populus</i> spp.
MD	Baltimore Checkerspot	<i>Euphydryas phaeton</i>	White Turtlehead	<i>Chelone glabra</i>
MN	Monarch	<i>Danaus plexippus</i>	Milkweed	<i>Asclepias</i> spp.
MS	Spicebush Swallowtail	<i>Papilio troilus</i>	Spicebush	<i>Lindera benzoin</i>
MT	Mourning Cloak	<i>Nymphalis antiopa</i>	Willows, Elms	<i>Salix, Ulmus</i> spp.
NG	Karner Blue	<i>Lycaeides melissa samuelis</i>	Lupine	<i>Lupinus perennis</i>
NM	Sandia Hairstreak	<i>Callophrys mcfarlandi</i>	Bear Grass	<i>Nolina texana</i>
NC	Eastern Tiger Swallowtail	<i>Papilio glaucus</i>	Sweet Bay	<i>Magnolia virginiana</i>
OK	Black Swallowtail	<i>Papilio polyxenes</i>	Dill, Carrot family	<i>Anethum graveolens</i>
OR	Oregon Swallowtail	<i>Papilio oregonius</i>	Tarragon	<i>Artemisia dracunculus</i>
SC	Eastern Tiger Swallowtail	<i>Papilio glaucus</i>	Black Cherry	<i>Prunus serotina</i>
TN	Zebra Swallowtail	<i>Eurytides marcellus</i>	Common Pawpaws	<i>Asimina triloba</i>
TX	Monarch	<i>Danaus plexippus</i>	Milkweed	<i>Asclepias</i> spp.
VT	Monarch	<i>Danaus plexippus</i>	Milkweed	<i>Asclepias</i> spp.
VA	Eastern Tiger Swallowtail	<i>Papilio glaucus</i>	Black Cherry	<i>Prunus serotina</i>
WV	Monarch	<i>Danaus plexippus</i>	Milkweed	<i>Asclepias</i> spp.
WY	Sheridan's Green Hairstreak	<i>Callophrys sheridanii</i>	Wild Buckwheat	<i>Eriogonum</i> spp.

NOTE: States not listed do not have an "official" state butterfly or butterfly adopted as its state insect by the state's legislature as of publication date (October 2015.) Perhaps a potential project for states not listed?



Monarch butterflies nectaring on *Phlox paniculata*

BUTTERFLY GARDENS, HOUSES OR VIVARIUMS TO VISIT

A **butterfly vivarium** (Latin, literally for “place of life”; plural: *vivaria* or *vivariums*) is an area, usually enclosed, for keeping and raising butterflies or plants for observation or research. Often a portion of the ecosystem for a butterfly habitat is simulated on a smaller scale, with controls for environmental conditions. Visit <http://www.butterfly-houses.com/> for butterfly habitat places by state.

American Museum of Natural History

Central Park West at 79th Street, New York, NY 20024

<http://www.amnh.org/calendar/the-butterfly-conservatory>

Butterfly Pavillion

6252 West 104th Avenue, Westminster, CO 80020

<http://www.butterflies.org/>

California Academy of Sciences in Golden Gate Park

55 Music Concourse Drive, San Francisco, CA 94118

<http://www.calacademy.org/exhibits/osher-rainforest>

Callaway Gardens & Cecil B. Day Butterfly Center

17800 US Highway 27, Pine Mountain, GA 31822

<http://www.callawaygardens.com>

Denver Botanic Gardens at Chatfield

8500 West Deer Creek Canyon Road, Littleton, CO 80128

<http://www.botanicgardens.org/our-gardens/chatfield/butterflies-chatfield>

Desert Botanical Garden Spring Butterfly Exhibit

(Seasonal)

1201 N. Galvin Parkway, Phoenix, AZ 85008

<http://dbq.org/>

Fairchild Tropical Botanic Garden & Lisa D. Anness Butterfly Garden

10901 Old Cutler Road, Coral Gables, FL 33156

<http://www.fairchildgarden.org/horticulture/plant-collections/exhibits/anness-butterfly-south-florida-garden-exhibit>

Lady Bird Johnson Wildflower Center

4801 La Crosse Avenue, Austin, TX 78739

<http://www.wildflower.org/feature/?id=100>

Magic Wings Butterfly Conservatory & Gardens

281 Greenfield Road, South Deerfield, MA 01373

<http://www.magicwings.com/index.php>

Museum of Science, Boston

1 Science Park, Boston, MA 02114

<http://www.mos.org/exhibits/butterfly-garden>

National Butterfly Center

3333 Butterfly Park Drive, Mission, TX 78572

<http://nationalbutterflycenter.org>

Panhandle Butterfly House

8581 Navarre Parkway, Navarre, FL 32566

<http://panhandlebutterflyhouse.org/>

Rancho Santa Ana Botanic Garden
1500 North College Avenue
Claremont, CA 91711
<http://www.rsabg.org/>

Reiman Gardens & Butterfly House
1407 University Blvd.
Ames, IA 50011
<http://www.reimangardens.com>

San Diego Zoo Safari Park Butterfly Jungle (Seasonal)
15500 San Pasqual Valley Road
Escondido, CA 92027
<http://sdzsafaripark.org/butterflyjungle/>

Sertoma Butterfly House
4320 S. Oxbow Avenue, Sioux Falls, SD 57106
<http://sertomabutterflyhouseandmarinecove.org>

Six Flags Discovery Kingdom (formerly *Marine World*)
1001 Fairgrounds Drive S.W., Vallejo, CA 94589
<http://sixflags.com/discoverykingdom/attractions/butterfly-habitat>

Smithsonian Butterfly Garden
9th Street between Constitution Avenue & The National Mall, Washington, D.C. 20004
<http://www.mnh.si.edu/museum/butterfly.html>

Sophia M. Sachs Butterfly House, a Division of the Missouri Botanical Garden
Faust Park, 15193 Olive Blvd., Chesterfield, MO 63017
<http://www.missouribotanicalgarden.org/media/fact-pages/butterfly-house.aspx>

The Butterfly Place (Seasonal)
120 Tyngsboro Road, Westford, MA 01886
<https://butterflyplace-ma.com/>

Tucson Botanical Gardens (Seasonal)
2150 North Alvernon Way, Tucson, AZ 85712
<http://www.tucsonbotanical.org/events/butterfly-magic/>

Turtle Bay Exploration Park Butterfly House (Seasonal)
844 Sundial Bridge Drive
Redding, CA 96001
<http://www.turtlebay.org/visit>

United States Botanic Garden
National Butterfly Garden (**10-year project of NGC dedicated September 2006**)
Maryland Avenue at 3rd Street, Washington, D.C. 20001
<http://www.usbg.gov/national-garden>

*“Just living is not enough said the butterfly,
One must have sunshine, freedom and a little flower.”
Hans Christian Anderson*

REFERENCES, RESOURCES AND WEBSITES

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- **The Butterfly Gardener's Guide** by Claire Hagen Dole, 2003, Brooklyn Botanic Garden, Inc. (All Region Guides)
- **The Habitat Garden Book** by Nancy Bauer, 2008, Coyote Ridge Press
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- **The National Gardener** – Spring 2015 issue

Websites

- *Bring Back the Monarchs* - <http://monarchwatch.org/>
- *Butterflies and Moths of North America* – www.butterfliesandmoths.org
- *Butterfly Garden and Habitat Program* - <http://naba.org/>
- *Create Habitat for Monarchs* - <http://monarchjointventure.org/>
- *Garden for Wildlife* - http://nwf.org/how-to-help/garden-for-wildlife.aspx?s_subsrc=Web_Footer_CWH_WildlifeGardening
- *Milkweeds, A Conservation Practitioner's Guide* by Brianna Borders & Eric Lee-Mader – http://www.xerces.org/wp-content/uploads/2014/06/Milkweeds_XerSoc_june2014.pdf
- *Million Pollinator Garden Challenge* - <http://millionpollinatorgardens.org/>
- *Monarch Joint Venture* – www.monarchjointventure.org
- *Monarch Migration (and to report monarch sightings)* - www.journeynorth.org
- *Monarch Watch* – www.monarchwatch.org
- *National Wildlife Federation* – www.nwf.org
- *North American Butterfly Association* – www.naba.org
- *Pollinator Partnership* – www.pollinator.org
- *Twelve Native Milkweeds for Monarchs* - <http://blog.nwf.org/2015/02/twelve-native-milkweeds-for-monarchs/>
- *United States Dept. of Agriculture Forest Service – Wildflowers/Pollinators*
- www.wikipedia.org – List of U.S. State Butterflies & List of U.S. State Insects
- *Wild for Monarchs* – www.wildones.org/learn/wild-for-monarchs
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NOTE: Photos provided by Marian McNabb and Julie A. West

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