



Monarchs in the Southeast

**A GUIDE ON THE LIFE
HISTORY, COMMON
THREATS, AND
CONSERVATION MEASURES
YOU CAN IMPLEMENT TO
SUPPORT MONARCHS!**





Table of Contents

01 Introduction

02 Life History 

04 Population Trends

05 Common Threats

07 How to Support Monarchs 

08 Native Plant List

09 Community Science

10 References





Introduction

The monarch butterfly (*Danaus plexippus*) is an iconic species loved by adults and children alike. Its striking orange and black colors and strong yet delicate wings are always delightful to see fluttering through gardens and fields. Monarchs embark on one of the most impressive migrations known in North America. Sadly, this iconic butterfly has steadily declined over the past 25 years, and its future in North America is uncertain. However, landowners and residents can take action to support this spectacular species. Monarchs are important for conservation in the Southeast because supporting them positively impacts many additional species, including other native pollinators, the Northern Bobwhite, grassland birds, and other wildlife.



Egg



Larva



Pupa



Adult



Life History

Monarchs are part of the Nymphalidae family, which contains brush-footed butterflies and is the most prominent butterfly family worldwide, with over 6,000 species. The monarch is native to North America but was introduced in various other places such as Australia, New Zealand, some Pacific Islands, and Spain.

The monarch undergoes a complete metamorphosis with four stages: egg, larva, pupa, and adult. The monarch larva, or caterpillar, only consumes plant material from milkweed plants (primarily *Asclepias* species), which means that the availability of milkweed is critical to the survival and stability of this butterfly. It takes about 30 days for a monarch to complete its metamorphosis from egg to adult butterfly. The larva will move through five different instars, or stages between molts, somewhere between 9 to 14 days, and stay on milkweed plants until it is ready to pupate into a chrysalis.

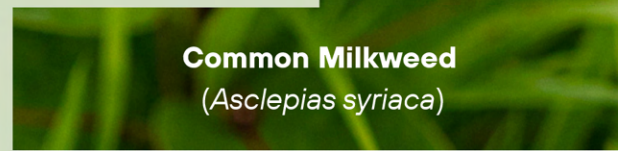
The ability to survive from larva to adult butterfly is hard to measure. Still, in studies conducted in controlled environments, survivability was about 76%, although we can surmise that in the wild, it is a lot less. Monarch survival rate has historically been low, and it varies year to year within a landscape depending on weather and other factors. Research has shown higher survival rates on sites planted with milkweed and other native plants, so providing quality habitat is essential.

The monarch migration in the eastern population is accomplished over four to five generations of butterflies over the course of a year. The fourth or fifth generation are the monarchs that live the longest (up to nine months) and travel to central Mexico to overwinter. This overwintering generation, sometimes called the "super generation," is born into a state of reproductive diapause, which allows them to live longer than monarchs in the breeding generations of the spring and summer. During the winter, these monarchs gather in dense colonies and roost in Oyamel fir (*Abies religiosa*) trees in mountainous areas in central Mexico. The Mexican government has set aside some of these locations as land preserves. Beginning in March, the overwintering generation will return to the US and produce eggs that will be the first new generation of monarchs.

While monarch caterpillars only consume plant material from milkweeds, adult butterflies require nectar from flowering plants for food during the breeding season. Creating habitat for monarchs in the Southeast centers on planting or protecting native milkweed and regionally appropriate flowering forbs, trees, and shrubs. Monarchs will also use deciduous and coniferous trees as cover during the night and bad weather.



Scan to learn
more about
Monarch
Migration





Population Trends

The monarch butterfly population in North America has been declining since at least the 1990s due to a series of threats. Habitat loss and degradation of their overwintering and breeding habitat, insecticide use, extreme weather events, parasites, and predators all impact the monarch.

In 2014, the monarch was petitioned for listing under the Endangered Species Act (ESA), and in December 2021, the International Union for Conservation of Nature (IUCN) listed the migratory monarch butterfly as endangered on its Red List of Threatened Species. After receiving a petition and much deliberation, the IUCN changed its listing from endangered to vulnerable in December 2023. In the United States, the IUCN Red List has no legal force. However, it does offer international recommendations for safeguarding species.

As of December 2024, the US Fish & Wildlife Service announced a proposed rule to list the monarch butterfly as threatened accompanied by a 4(d) rule and critical habitat designation. It is estimated that there is a 48%-69% risk of extinction for the eastern population in North America in the next 60 years. The western population has a 99% risk of extinction in the next 60 years.

The eastern Monarch population estimates are calculated by measuring the area (in hectares) occupied by monarchs at the overwintering grounds in Mexico every winter. This metric provides biologists with a reasonably accurate population estimate each year. Scientists found, through isotopic analysis, that 30% of North America's population originates in the Midwest, 15% comes from the Northeast, and 8% of the total monarch population migrates from the Southeast. **However, recent research suggests that the Southern US can significantly contribute to the fall monarch migratory population.**

Common Threats

Predators



Predators, primarily other insects that predate on monarch eggs and larvae, can be responsible for the mortality of monarchs. Some of the monarch's natural predators are parasitoid tachinid flies, parasitoid wasps, ants, spiders, wasps, lacewing larvae, Chinese mantids, paper wasps, and various birds such as black-backed orioles and black-headed grosbeaks.

The monarch butterfly has evolved with high levels of predation, with only one in ten eggs surviving to adulthood, which could be why a monarch female produces 300-500 eggs in her lifetime. Removing predatory insects from monarch habitat is not recommended because a diversity of insects, including predators, is vital to monarch survival. Research has shown that sites with higher amounts of insect diversity have higher survival rates of monarchs.

Pesticides and Toxins



Pesticides, particularly insecticides, are a significant threat to monarchs and other insect pollinators. Even if an insecticide does not outright kill monarch butterflies, it can still have sub-lethal effects that can be detrimental to monarch survival. This is the case with a class of insecticides called neonicotinoids or neonics, which were introduced in the early 2000s. Neonics are systemic insecticides, meaning that they are absorbed by plants and distributed throughout the entire plant. This can include the pollen, nectar, leaves, and stems, making the whole plant toxic to insects. Studies show they impact the overall fitness and health of specific insect pollinators if consumed. Neonics are widely used and readily available for agricultural purposes as well as home landscapes. Even some pesticides approved for organic agriculture can endanger pollinators. Consider ceasing or altering insecticide use at home to support monarchs and other pollinators.

Tropical Milkweed



Tropical Milkweed (*Asclepias curassavica*) is not inherently bad for monarchs. However, evidence suggests a correlation between Tropical Milkweed, OE, and monarch population decline. Tropical Milkweed is likely to stay green through the winter in locations that do not have harsh winters. This phenomenon increases the likelihood of OE proliferating in places where Tropical Milkweed is prevalent, which can contribute to population decline. Additionally, areas with high Tropical Milkweed populations and warmer climates can create year-round breeding monarch populations that do not migrate, which is occurring in the coastal Carolinas as well as Florida.

The planting of Tropical Milkweed and the subsequent increase of OE infection rates in non-migratory monarch populations is a severe conservation issue for our region. To combat this problem, native milkweeds should be grown, sold, and planted in these areas.

Ophryocystis elektroscirrha (OE)



Ophryocystis elektroscirrha (OE) is a protozoan parasite that occurs naturally and infects monarch larvae. OE does not necessarily cause mortality, but instead, it can lower the fitness of monarch adults, reducing their chance of surviving migration. The coastal Southeast has some of the highest infection rates of OE in the country, likely due to the year-round breeding populations that do not migrate. One possible reason for these populations to not migrate could be due to the prevalence of Tropical Milkweed (*Asclepias curassavica*).



Scan to watch a short video about OE and how it negatively impacts monarch butterflies!

How to Support Monarchs

Native plants are the cornerstone of monarch and pollinator habitat. To properly support the monarch, select regionally native milkweed species and nectar plants. The next page shows a list of options (mainly by genus) because several species within the same genus may be native to your area. Work with a local biologist, native seed vendor, or native plant nursery to choose species. Avoid purchasing plants treated with systemic pesticides.

Want to Establish Monarch Habitat?

Connect with your local Quail Forever biologist or NRCS Field Office if you are interested in any of the following:

- gaining more information about supporting monarchs and other pollinators,
- need assistance planning a large-scale pollinator habitat restoration project,
- or would like to learn about cost-share programs.



Scan to find
your local Quail
Forever Farm
Bill Biologist



Rearing Monarchs

Raising monarch butterflies is a rewarding experience and is a great educational tool. However, research has shown that rearing monarchs does not help conservation efforts. Often, reared monarchs are less fit, weaker, and cannot orient themselves well for migration. The best action that homeowners can take to support monarchs is to create habitat by planting a diversity of native blooming plants and milkweed.

The best action that homeowners can take to support monarchs is to create habitat.

Plants that Support Monarchs

Host Plant

Milkweed, *Asclepias* spp.
(only those native to your area)

Nectar Plants • Herbaceous

Aster, *Symphyotrichum* spp.
Beardtongue, *Penstemon* spp.
Blanket-flower, *Gallardia* spp.
Smooth Oxeye, *Heliopsis helianthoides*
Mountainmint, *Pycnanthemum* spp.
Black-eyed Susan, *Rudbeckia hirta*
Blue Mistflower, *Conoclinium coelestinum*
Blazing Star, *Liatris* spp.
Thistles, *Cirsium* spp.
Joe Pye Weed, *Eutrochium* spp.
Goldenrod, *Solidago* spp.
Beebalm, *Monarda* spp.
Wingstem, *Verbesina* spp.
Sunflowers, *Helianthus* spp.

Nectar Plants • Woody

Eastern Redbud, *Cercis canadensis*
Sumac, *Rhus* spp.
Common Buttonbush, *Cephalanthus occidentalis*
Eastern Baccharis, *Baccharis halimifolia*

Plants Top to Bottom:

1. Field Thistle (*Cirsium discolor*)
2. Narrowleaf Sunflower (*Helianthus angustifolius*)
3. Common Milkweed (*Asclepias syriaca*)
4. Appalachian Blazing Star (*Liatris squarrulosa*)
5. Cup Plant (*Silphium perfoliatum*)



Participate in Community Science

Helping the conservation community better understand monarch biology and habitat needs is critical to supporting this inspiring species. Participating in community science is a wonderful way to involve children and other interested groups in monarch conservation. Luckily, many national, international, and local research projects exist, so get involved if you can!

The first step is to decide which community science program would be the best for you by considering your time and availability, geography, and interests. Below are some examples of research projects that you could participate in, but there are more:



Monarch Watch - Monarch Watch provides a hands-on experience. Through this program, you can help tag monarchs. Tagging is done only during the fall season and helps to track migration to Mexico.

Journey North - This is a great way to report one-time observations. This option is a good option for children and schools. The online map shows real-time migration!

iNaturalist- This app allows people to report one-time observations on any species and provide identification suggestions based on the photos you submit.

Project Monarch Health - This program studies the OE parasite. To participate, you would receive training to test monarchs for OE by catching them, pressing tape to the abdomen, and sending the sample to be analyzed.

Integrated Monarch Monitoring Program - The Monarch Joint Venture coordinates this program. It requires 1-4 hours monthly or weekly, focusing on habitat. This program tracks long-term changes in distribution and abundance in monarchs and their habitat.



Scan to visit the Monarch Watch website.



Scan to visit the Journey North website.



Scan to visit the iNaturalist website.



Scan to visit the Project Monarch Health website.



Scan to visit the IMMP website.

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Scan the QR Code to learn more about the conservation efforts being made by the Natural Resource Conservation Service (NRCS) to conserve Monarch Butterflies on Working Lands.