# Conservation Mowing of Roadsides in New England

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A report prepared for the New England Transportation Consortium

August 9, 2024

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# Conservation Mowing

This manual outlines mowing regimens that benefit pollinator health. It includes information on the benefits of conservation mowing, how to start a conservation mowing program, and approaches for inventorying roadside vegetation.

## 1.1. Benefits Of Conservation Mowing

Mowing helps to maintain roadside vegetation, reduce the spread of invasive species and woody plants, improve driver sight lines, and provide areas for vehicles to pull off safely. Vegetation in recovery areas – also called clear zones – is mowed regularly to keep it short for drivers who need to regain control of their vehicles. Conservation mowing involves reduced mowing regimens outside clear zones to cultivate pollinator-friendly habitats. In addition to the benefit to pollinators, conservation mowing reduces expenses and provides other environmental benefits, such as greater erosion control and reduced runoff pollution.

**Figure 1-1**. The appearance of milkweed on the roadside because of reduced mowing mid-summer creates important habitats for monarch butterflies.

**Adverse Ecological Effects of Regular Mowing for Native Plant Communities**

- Weakens and suppresses stands of native species present at a site. Low mowing heights expose bare soil and damage the crowns of native grasses. Regular mowing removes tall reproductive structures, such as flowering stems, resulting in no seed formation or dispersal of native plants.
- Promotes cool season turfgrasses rather than native plant communities because biologically turfgrass is adapted to low mowing regimens with high regrowth ability. It also stimulates low-

growing annual or biennial species, resulting in a reduction of structural complexity, floral diversity, biomass litter dynamics, and soil enrichment.

- Decreased plant diversity results in fewer resources for wildlife, especially invertebrate communities, detrimentally impacting their abundance and richness.
- Mowing increases the likelihood of pest and weed invasions because of disturbance. Regular mowing increases the occurrence of invasive species and allergenic plants by distributing their propagules, especially during the seed dispersal phase. Intense mowing also causes common ragweed—one of the most allergenic plant species found in North America and Europe—to colonize disturbances. Thus, it increases the pollen load in the air, the severity of hay fever symptoms, the number of people affected, and medical costs.
- Incurs considerable economic costs. Even small reductions in mowing result in cost savings.
- Contributes to excess greenhouse gas emissions.

**Benefits of Reduced Mowing**

- Reducing mowing is a simple and effective way to improve habitats and enhance overall environmental stewardship. This will result in an increased diversity of plants, invertebrates, and soil microbes and significant cost savings.
- It helps the proliferation of mowing-intolerant native species and leads to nutrient-rich flowering. This flowering provides pollen and nectar for pollinators and facilitates the dispersal of mature seeds of native species.
- Longer stems create sheltered microclimates that attract beetles and other small insects. Sparrows, goldfinches, and other migrating birds also feed on the seeds.
- Altering the timing of vegetation management practices contributes significantly to monarch butterfly preservation – one of the conservation actions promoted under the Candidate Conservation Agreement with Assurances (CCAA).
- Reduced disturbance leads to less spread of invasive species. More vibrant plant communities create appealing roadsides that stimulate the senses and decrease driver fatigue.
- Helps improve water quality because taller vegetation can capture and contain more stormwater runoff.
- Unmowed roadsides contribute to reduced snow drifting in winter. Lower labor and fuel costs.
- Reduced greenhouse gas emissions – a strong motivator for reducing the intensity of roadside management.
- Contrary to popular opinion, conservation mowing does not equate to increased animal collisions (NASEM, 2023). Conversely, white-tailed deer and moose prefer to forage on fresh plant growth. Therefore, mowing outside the clear zone could result in animal foraging in those areas and in turn result in more opportunities for vehicle-animal collisions.

## 1.2. Starting a Conservation Mowing Program

As noted in "Pollinator Habitat Conservation Along Roadways, Volume 11: Northeast" (Hopwood et al., 2023), conservation mowing requires roadside maintenance crews to understand the life cycles of pollinators to aid in the timing, frequency, and height of mowing.

Each state DOT should develop detailed guidelines regarding mowing schedules and strategies, considering many factors to achieve the best habitats. The following guidelines can be used as a reference to help New England DOTs create a three-year conservation mowing plan. The transition can be gradual, with new areas added over three years.

**Who makes mowing decisions?**

Each state structures its roadside maintenance departments differently. Individual maintenance districts are sometimes responsible for determining their mowing programs. In others, mowing schedules are determined centrally. Either way, whoever determines a particular state's mowing schedule should communicate to those performing mowing regimens that implementing conservation mowing will require observing existing plant communities to prioritize when and how to mow sections of roadside.

**Federal Highway Administration (FHWA) Recommendations for Conducting Inventories of Roadside Vegetation**

The FHWA online publication "Roadside Best Management Practices that Benefit Pollinators: Handbook for Supporting Pollinators through Roadside Maintenance and Landscape Design" (Hopwood et al., 2016), recommends DOTs to conduct roadside inventories to manage their roadside green assets. A roadside vegetation inventory involves the mapping of the composition and condition of the current roadside vegetation, including native plants, turfgrass, and invasive and noxious weeds. Roadside vegetation inventories inform management plans that can benefit pollinators in several ways. Identification of vegetation plant communities assists roadside managers in making informed decisions about how to manage such areas to promote native seed banks to emerge and existing native plant communities to flourish. Roadside inventories can also map out existing weed and invasive populations and identify emerging weed problems. Inventory data can then be used to help target management operations that reduce costs and to evaluate the effectiveness of native plant community and weed management techniques. Finally, inventories can help inform and direct future plantings when used to identify rights-of-way candidates for revegetation efforts.

However, New England DOT roadside maintenance managers may find implementing the FHWA recommendations too intricate and cumbersome. Therefore, the more simplified approach has a more realistic chance of being implemented.

## 1.3. Roadside Vegetation Inventory

Scout for three easy-to-identify plant communities of invasive, native, and introduced species in the first year of a three-year mowing plan.
**Invasive plants.** Mowing of invasive species can lead to the spread of invasive species via residual seeds, roots, and plant parts on mowing blades. Therefore, reduced mowing approaches should not be applied to extensive invasive species infestations. Each DOT should follow its own invasive species removal protocols.

Many areas supporting native species are mostly self-sustaining and can be maintained as established habitats by only occasional herbicide spot-spraying of invasives. This would eliminate the need for annual mowing.

**Figure 1-2**. Autumn olive (*Elaeagnus umbellata*) along Rt. 6 near Willimantic, CT.

Conservation areas along Rt. 6 in Connecticut have already established plant communities with rich assortments of native species. However, some invasive species are present in many areas and would likely proliferate if the sites were not mowed frequently. Therefore, to promote stable native habitats that can exist for some years without much input, spot treatment with herbicides should eliminate patches of these invasive species.

**Native plant communities.** Native plant communities are usually composed predominantly of warm-season bunch grasses and flowering forbs. They arise from seed germination in seed banks and seed dispersal from surrounding areas. Many native species are already present but are suppressed by mowing before they can set seed. The New England roadsides already contain seed banks for native plant species, and many sites have good regeneration potential. When the native seed bank is already present, it is appropriate to promote its natural regeneration.



**Figure 1-3**. Native forb populations to identify in **early to mid-summer:** yellow wild indigo (*Baptisia tinctoria*), common milkweed (*Ascepias syriaca*), Foxglove beardtongue (*Penstemon digitalis*).

**Figure 1-4.** Grasslands with native warm-season grasses are easy to detect during the **late summer-fall period** when their inflorescences are showy if the sites are not mowed.

**Figure 1-5**. Native forbs to identify in the **fall**: many asters (*Symphyotrichum* spp.*)* and goldenrods (*Solidago* spp.) are indicators of native communities that can be detected in the fall.

**Issues to Consider When Conducting Roadside Inventories**

1.3.1. Prioritize roadsides along the migratory route of the Monarch butterfly.

1.3.2. Milkweed patches can be easily detected during flowering in June and July if the roadside has not been mowed. These areas should be prioritized for reduced mowing.

1.3.3. When defining road segments, prioritize roadsides with adjacent farms—for example, cranberry bogs in Massachusetts and blueberry farms in Maine—that may benefit from increased feeding and nesting opportunities from the roadside pollinator habitats.

**Introduced Plant Communities.** Introduced plant species are non-native plants that become established and spread beyond their place of introduction. They are considered naturalized but do not spread invasively. Introduced plant communities can occur either interspersed among native grasses and forbs or among turfgrass communities. While native plants are often the most environmentally appropriate—adapted to the prevailing soil and climate—roadsides support many introduced species. These species also create abundant floral resources and should be viewed as important forage for pollinators and other insects.

**Figure 1-6**. Pollinator habitats can be enhanced by the presence of non-native or introduced species, such as white clover (*Trifolium repens*), and yellow bedstraw (*Gallium verum*), which offer abundant pollen and nectar for pollinating insects.

**Figure 1-7**. Turfgrass can be identified by inflorescences (such as the fescue inflorescences above) that typically arise after several weeks of non-mowing. In many turfgrass communities, there are introduced forbs that provide pollinator resources.

## 1.4. Fact Sheets

Fact sheets quickly and efficiently distribute information, data, and research to audiences. In this case, they were created to communicate information about the transition to new roadside revegetation practices to two audiences: DOT personnel and the public.

***Recommendations for Conservation Mowing*** summarizes the reduced-mowing practices for the DOT personnel.

To access printable versions of this fact sheet when using this manual online, use the following link: Fact Sheet – Conservation Mowing.pdf

 Access the fact sheet using the QR on the left.

***New England Roadsides Can Support Pollinators***.

The proliferation of native and introduced forbs and grasses is observed because of conservation mowing. These plantings look different from the mowed swaths of turfgrass, which drivers and passengers are used to seeing along roadsides. The Fact Sheet discusses seasonal changes of the roadsides as a result of conservation mowing to educate the public about the new looks of the roadsides.

To access printable versions of this fact sheet when using this manual online, use the following link: Fact Sheet – New England Roadsides Can Support Pollinators.pdf

 Access the fact sheet using the QR code on the left.

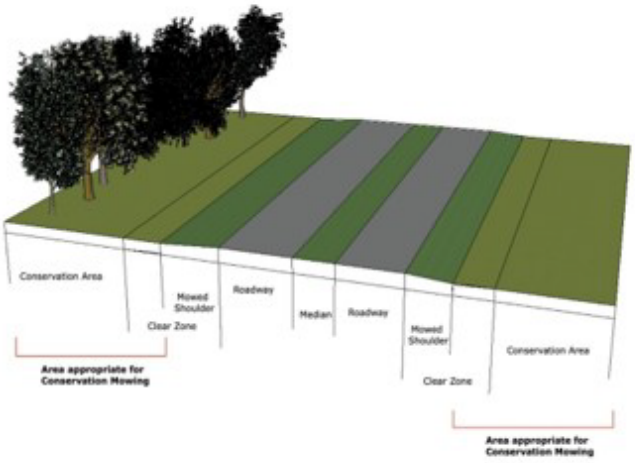
***How Roadsides Can Support the Eastern Monarch Butterfly*** discusses the lifecycle of this iconic species, its unique relationship with milkweed and the importance of including milkweed in roadside habitats.

 Access the fact sheet using the QR code on the left.

To access printable versions of this fact sheet when using this manual online, use the following link: Fact Sheet – How Roadsides Can Support the Eastern Monarch Buterfly.pdf

# Recommendations for Conservation Mowing

**Conservation Mowing** involves reduction of mowing frequency and alteration of mowing schedules to encourage the growth and establishment of native plants and their seed banks currently existing along roadsides. Native plants provide pollinators and other beneficial insects habitats rich with pollen, nectar, and shelter and nesting opportunities. Compared to turfgrass, native grasses and wildflowers have deeper roots, which improve soil structure and provide greater erosion control. In addition, reduced mowing results in decreased equipment emissions and likely lower labor and operational costs.




**ROADWAY CROSS-SECTION** – light green areas are appropriate for conservation mowing; dark green zones receive repeat mowing

**Conservation Mowing Calendar for New England**

| | March | April | May | June | July | August | Sept | Oct | Nov |
|---|---|---|---|---|---|---|---|---|---|
| **Windows for Annual Mowing** | Yes | Yes | Until May 15 | June 1-20 Mow only milkweed | No | No | No | After Oct 15 | Yes |

## Conservation Mowing Best Practices

The goal of Conservation Mowing is to ensure that roadside maintenance does not restrict driver safety or interfere with native plant growth and flowering periods. The window for Conservation Mowing in New England is **late fall after October 15th and early spring before May 15th**. Spring mowing is the optimal time to allow seeds to ripen and disperse in the fall and to provide wildlife sheltering opportunities in the dormant vegetation during winter months. For this fact sheet, the section of roadside beyond the 30 foot of the Clear Zone will be referred to as the **Conservation Area**. The **Area appropriate for Conservation Mowing** encompasses the Conservation Area and the portion of the Clear Zone beyond the Mowed Shoulder, which will receive repeated mowing to prevent potential hazards for errant drivers. Medians and ramp sections wider than 60 feet would also be areas appropriate for Conservation Mowing.

The **Conservation Mowing height** should vary depending upon the season. Clippings from fall mowing will disperse and decompose over the course of the winter, so **fall mowing should be at minimum 4 inches.** With spring mowing, however, clippings could smother spring emerging plants. Therefore, it is advised that **spring mowing heights should be higher, between 6-8 inches**.

Reduced mowing may also help to limit the proliferation of invasive species by decreasing the potential for mowing equipment to spread invasive plant stems and seeds and by fostering more widespread and better-established native plant communities with deeper, more extensive root systems. Therefore, **Conservation Areas should be mowed no more than once a year or once every other year.** For zones populated with woody saplings, it is recommended to mow once a year to prevent woody plants from establishing.

### Mowing the Shoulder

Roadways require a 30-foot **Clear Zone** for vehicle recovery. Within the Clear Zone, the **Mowed Shoulder** next to the roadway pavement is mowed frequently to prevent possible vegetation fire hazards from errant drivers leaving the road and to prevent obstruction of signs and object markers. The width of the Mowed Shoulder is determined by each DOT and is often dictated by the width of the flail mowers used. Since spring and summer are the growth periods for most plants, mowing of the Shoulders is recommended during these seasons.

While functional, Mowed Shoulders also create the impression of intentional, active management. In addition, the mowed edges minimize vehicle-insect conflict because insects will tend to remain within the habitats of taller, unmowed vegetation.

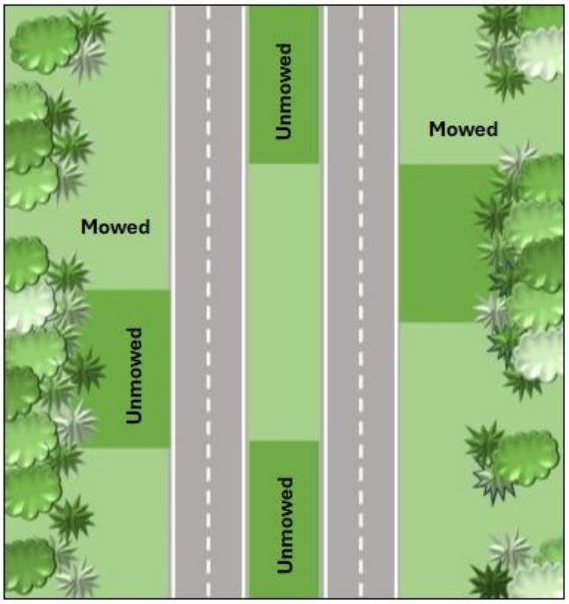
### Maintaining Sight Lines

To maintain clear sight lines, vegetation should be routinely mowed at intersections, around signage, and on medians and ramp sections less than 60 feet wide.

### Staggered or Mosaic Mowing

**Staggered Mowing** helps preserve corridors of habitat often eliminated when long stretches of roadsides are mowed, requiring pollinators to expend precious energy reserves searching for resources, which research shows threatens their lives and has contributed to declines in their populations. Staggered mowing involves mowing roadsides into segments near one another on alternate sides of roadways, leaving continuous, easily accessible patches of nutrient rich refuge areas for insect migration. **It is recommended to leave about 30% of an area uncut during annual cycles of staggered mowing.**

**Rotating sides:** Long portions of roadsides on alternate sides of roadways may be mowed at different times of the year to ensure that habitat always exists for pollinator to forage, shelter, and nest. Each side can be mowed entirely every 2 or 3 years.




### Mowing to Benefit Monarch Butterflies

Milkweed (*Asclepias* spp.) is a critical resource for monarch butterflies, which lay their eggs exclusively on its leaves to allow their caterpillars to feed upon its leaves and ingest the plant's milky sap, making them toxic for ingestion by birds. The milkweed leaves need to be fresh to produce sap. **By mowing milkweed at a height of 6 - 8" between June 1-20**, milkweed delays flowering, puts out new growth, and produces fresh sap, which benefits monarch butterflies migrating back to Mexico in the fall. However, best practices recommend leaving a third of a site's population unmowed during this June window to allow butterflies to lay eggs while the mowed milkweed regenerates. **For further information about monarchs, see fact sheet *"How Roadsides Can Support the Eastern Monarch Butterfly".***

Campanelli, J., Urban, L., and Kuzovkina, Y.A. (2024). New England Transportation Consortium. University of Connecticut. Department of Plant Science and Landscape Architecture.

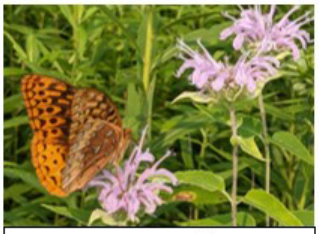
# New England Roadsides Can Support Pollinators

### Pollinator Decline

Pollinators, including bees, butterflies, moths, flies, and beetles, play a vital role in the health of our ecosystems. They are required for the reproduction of over 75% of the world's plants and nearly 35% of global agricultural plants. Pollinators support the global agriculture industry by aiding in the production of fruits, vegetables, and nuts, thus contributing significantly to the world's food supply.

Pollinator populations are declining due to habitat loss, excessive pesticide use, climate change, and the spread of invasive species.

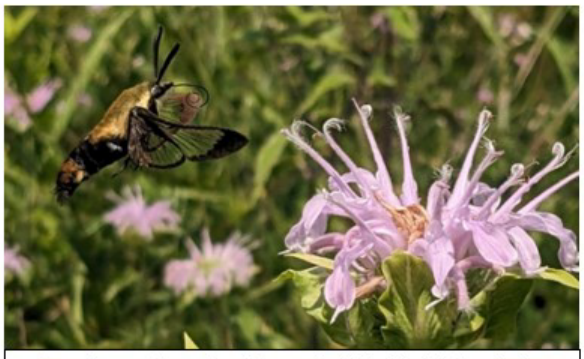
Eastern tailed-blue butterfly (*Cupido comyntas*)



Great spangled fritillary (*Argynnis cybele*)

### Roadsides as Corridors

Roadsides, when properly managed, can serve as corridors for pollinators. These linear spaces along highways and secondary roads offer refuge and foraging habitats and connect fragmented landscapes. The vegetation provides important resources for pollinators, such as food, shelter, and breeding



Snowberry clearwing (*Hemaris diffinis*) with bee balm

Roadside native plant community

### Converting Turfgrass to Native Vegetation

Traditionally, roadsides have been planted with non-native cool season turfgrass because it provides quick establishment and more immediate erosion control while tolerating repetitive mowing.

State Departments of Transportation (DOTs) are adopting measures, such as reduced mowing, which allows for the growth of wildflowers and grasses. Often, roadsides already harbor a bank of dormant and suppressed native seeds and plant material that can generate growth. With the implementation of reduced mowing, roadsides can transition into beneficial habitats for pollinators. In addition, reduced mowing practices result in decreased emissions and savings for DOTs.

Planting native wildflowers and grasses amplifies benefits of roadside meadows, such as stormwater runoff filtration and carbon capture capabilities. Compared to turfgrass, native plants have deeper, more extensive root systems, allowing water percolation into the soil, which filters out runoff pollutants. Native plants take in carbon dioxide ($CO_2$) for photosynthesis through their leaves, converting the carbon into energy and storing it in plant parts.

Urban, L., Campanelli, J., and Kuzovkina, Y.A. (2024). New England Transportation Consortium. University of Connecticut. Department of Plant Science and Landscape Architecture.

## Seasonal Changes of Roadside Vegetation in New England

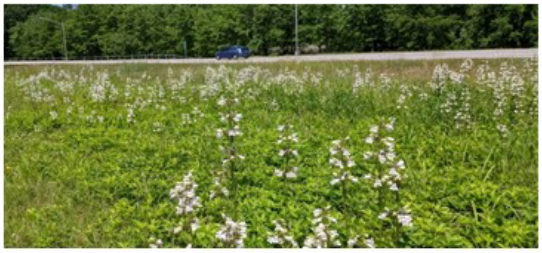
As DOTs implement new roadside management practices, the appearance of the landscape will change. Roadsides will transition from traditionally short, mowed turfgrass to taller, less manicured landscapes featuring native grasses and wildflowers. This shift will be clearly visible along roadsides. Additionally, the increased height of the vegetation will highlight seasonal changes more prominently.

### Spring

Roadside meadows come out of dormancy. Grasses begin to grow taller, and early native wildflowers are beginning to bloom. As the temperatures warm and pollinators become more active, these plants play a crucial role in providing nectar and pollen. In addition to wildflowers, trees and shrubs start to bloom as well.

**Spring Blooming Native Wildflowers**: lupine, iris, geranium, and beardtongue

**Trees & Shrubs**: dogwoods, willows, rhododendrons, and northern spicebush



**Foxglove beardtongue (*Penstemon digitalis*)**

### Summer

Roadside meadows reach their peak flowering period with some species continuing to bloom through September.

**Summer Blooming Native Wildflower**: blue vervain, rudbeckia, evening primrose, bee balm, aster, Joe-Pye weed, ironweed, milkweed, and boneset.

**Shrubs**: viburnum, mountain laurel, meadowsweet, sweet pepperbush, buttonbush, and sumac

**Joe-Pye weed *(Eutrochium maculatum)***

### Autumn

As the growing season nears its end, plants divert their energy to seed production. The landscape changes from vibrant greens to muted neutrals, creating a backdrop of bare stems with seeds and dried grasses.

Pollinator activity starts to decrease, and many insects seek overwintering shelter. When roadsides are not mowed in the fall, the vegetation will provide shelter for overwintering insects and small animals.

**Autumn Blooming Native Wildflowers**: American witch hazel and various species of goldenrods and asters

**Little bluestem (*Schizachyrium scoparium*)**

### Winter

During the winter season, the roadside meadow enters a phase of dormancy. Despite the outer appearance of brown and seemly dead vegetation, some stems can be filled with life waiting for the arrival of spring. Numerous insects and other organisms rely on the dried stems and plant debris for shelter and protection from the cold.

Unmowed roadsides provide refuge for many wildlife species, aiding their survival.

**Various dried grasses and wildflower stems**

# How Roadsides Can Support the Eastern Monarch Butterfly

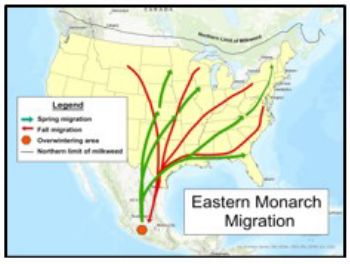
## Monarch Butterfly

The monarch (*Danaus plexippus*) is a milkweed butterfly with orange, black marking on its wings and is native to North, Central and South America.

The **Eastern monarch butterfly** population contains individuals whose breeding grounds are east of the Rocky Mountains, including regions in New England. Eastern monarchs undertake an impressive multigenerational migratory journey, traveling approximately 3,000 miles from central Mexico to Southern Canada through the Eastern United States during the summer, and then return to Mexico for the winter.

Monarchs can be anticipated in New England from June to September, with their peak presence occurring in August.

Monarch butterflies live for approximately 3-5 weeks during their migratory journey north, with multiple generations being born each summer. The final generation, born in late summer or early fall, extends its lifespan by ceasing to reproduce and channeling its energy to fly south to their overwintering grounds in central Mexico. There, they spend the winter clustered together with others in large colonies known as a "flutters."




## Monarchs and Milkweed

Monarchs have a unique relationship with plants in the genus *Asclepias* commonly known as milkweed. Seventy-three species of milkweed grow native in the U.S, but only 7 are native to the Northeast. Monarch butterflies lay their eggs exclusively on milkweed because the caterpillar can only eat its leaves.

Milkweed latex contains specialized chemicals called cardiac glycosides, which are absorbed by the caterpillars as they consume the leaves. This latex makes them unpalatable and toxic to many predators, such as birds, safeguarding them during their vulnerable growth stages. This natural defense mechanism is a component in the monarch's survival.

Unfortunately, factors like suburban sprawl and current agriculture practices result in losses of habitats containing wild milkweed in the landscape, which significantly threaten monarch butterfly reproduction. Preserving milkweed habitats, while also providing diverse nectar-rich flowering plants, can assist in the survival of monarchs and their successful migration.

## Roadside Vegetation

As monarch butterflies migrate, they rely on wildflowers to restore their energy reserves. Highway roadsides can serve as corridors for monarch migration, providing long, linear expanses of habitat, feeding sources, and breeding grounds. These resources are abundant when roadsides are revegetated using native plants and managed as conservation zones through reduced mowing.

## Monarch's Importance

Monarchs play important roles in ecosystems. First, they are valuable pollinators, aiding in the reproduction of many plant species. Second, while the milky sap in milkweed stems and leaves make monarch caterpillars and butterflies toxic to some, for others, they serve as a food source. Finally, they provide an important service, as they are ecological indicators. The health and migratory patterns of populations can reflect broader environmental changes including the impacts of climate change, pollution, and habitat destruction while providing insights into the health of our ecosystems.

**Roadsides populated with milkweed are important habitats for monarchs.**

Urban, L., Campanelli, J., and Kuzovkina, Y.A. (2024). New England Transportation Consortium. University of Connecticut. Department of Plant Science and Landscape Architecture.

## Monarch Life Cycle

The monarch butterfly undergoes four stages in its life cycle: egg, larva (caterpillar), pupa (chrysalis), and adult (butterfly).

Adult female monarchs lay eggs on milkweed leaves and secrete a small amount of glue to attach the eggs directly to the plant.

The eggs, about the size of a pinhead and cream-colored in the beginning, turn black on top about 4 days before the caterpillar emerges.

Monarch egg on milkweed leaf

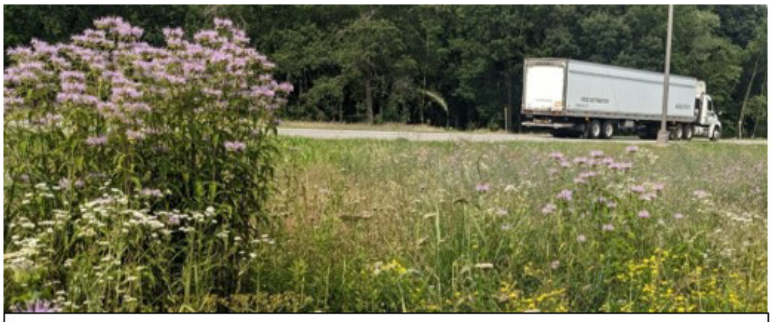
Over the next 2 weeks, the caterpillar goes through 5 life stages called instars, shedding its skin to accommodate growth. During the final instar, the caterpillar encloses itself within a chrysalis.

Monarch chrysalis

After approximately 9 days, the adult monarch butterfly becomes visible through the chrysalis which signals it is about to emerge.

Upon emergence, the monarch's wings are wrinkled and wet, so they flap them to pump in fluids and dry them in the sun. As an adult butterfly, the monarch engages in multiple mating sessions during its lifespan. A female can lay between 300-500 eggs in her lifetime.

Monarch caterpillar on milkweed seedpod

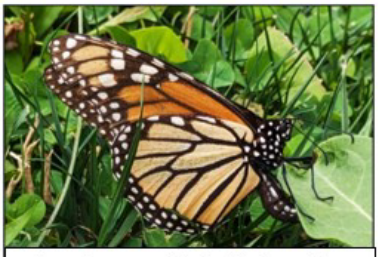


Rt. 6 roadside meadow in Mansfield, CT

## Threats to Monarchs

Several factors contribute to the drastic decline of monarch populations, but changes in land use is of primary concern. This includes logging and deforestation in Mexico that impact areas which are vital for their winter survival, as well as transformation of most breeding grounds into farmland, where herbicides are used to eradicate the monarch's host plant.

Furthermore, climate change is a key driver in monarch population decline, causing droughts, wildfires, and temperature fluctuations, which affect the monarch migration due to a lack of resources including nectar-rich plants like milkweed to lay eggs upon.



Female monarch butterfly depositing eggs on common milkweed

## Monarchs: Endangered Status

The monarch butterfly, renowned for its unique migration habits and attractive orange and black markings recently has faced significant challenges. The Eastern monarch butterfly population decreased by 85% from 2019 to 2024 (MonarchJointVenure.org, 2023).

## How the general public can support monarch health.

**Plant native milkweed species in home gardens.** Small patches can be used as stepping-stone habitats where monarchs feed, grow, reproduce, and then travel further.

Be sure to choose milkweed species carefully as some can spread aggressively, such as common milkweed (*Asclepias syriaca*).

**Create habitats rich in nectar-producing flowers**, which offer food resources for adult monarchs and other pollinators.

**Minimize the use of pesticides** to help protect monarchs and their habitats.

**Participate in citizen science programs**, such as monitoring monarch populations and migration patterns, to advance our understanding of these iconic insects and to assist conservation efforts.

**Raise awareness** and become actively involved in New England conservation initiatives tailored to the monarch butterfly's unique migration cycle.

For more information on monarch butterflies, visit:
https://xerces.org/monarchs
https://monarchwatch.org/
https://journeynorth.org/