

# Roadside Habitat for Monarchs - tools for managers

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[monarchjointventure.org/roadsidehabitat](http://monarchjointventure.org/roadsidehabitat)



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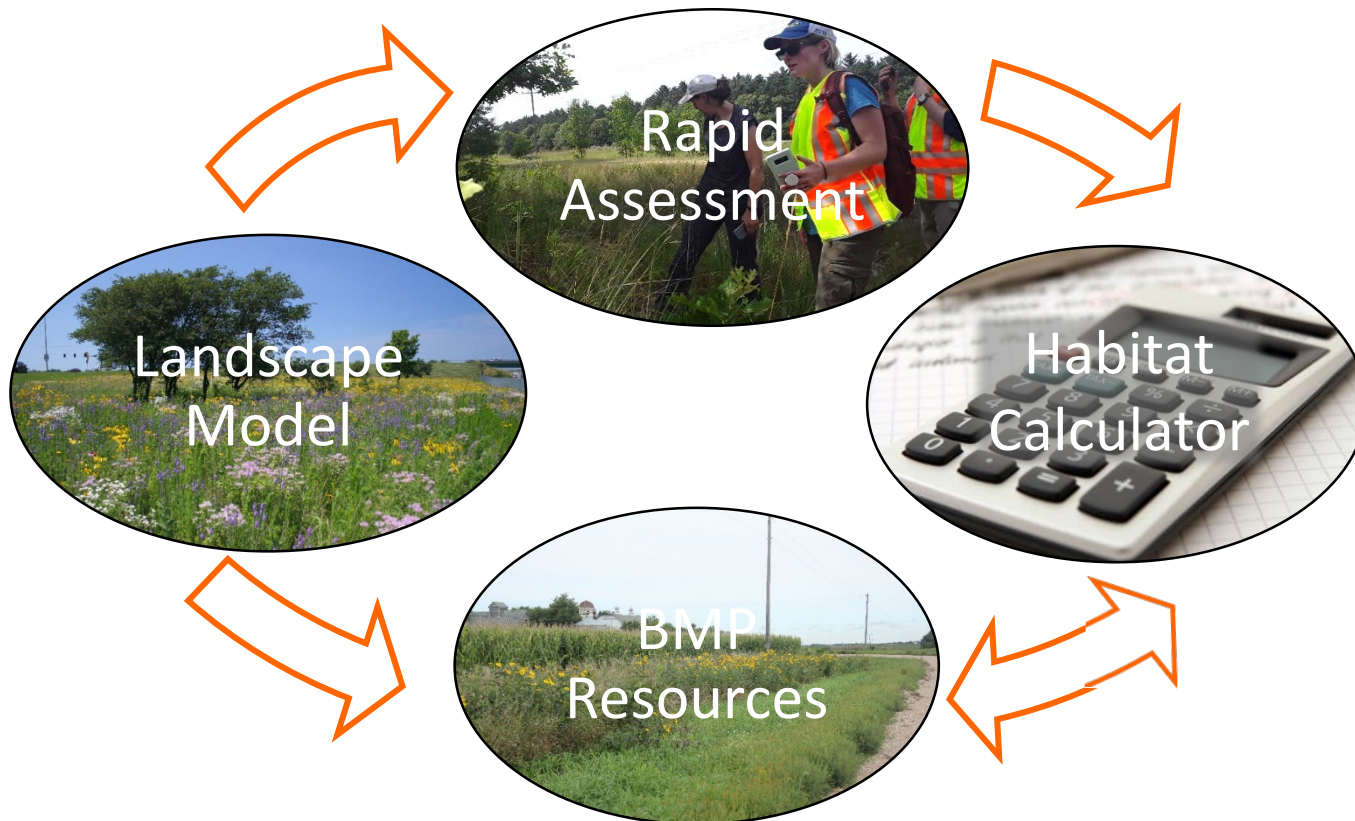
# Roadside Habitat for Monarchs

- Quality can be very good!
- Highly variable and patchy
- Affected by mowing, invasives, history
- How do we know what we have where?
- How do we promote, maintain, and improve what we have?





# TOOLS FOR MANAGERS



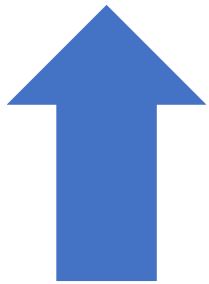




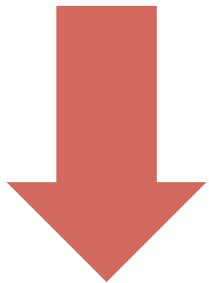
*Roadside restoration in Illinois*

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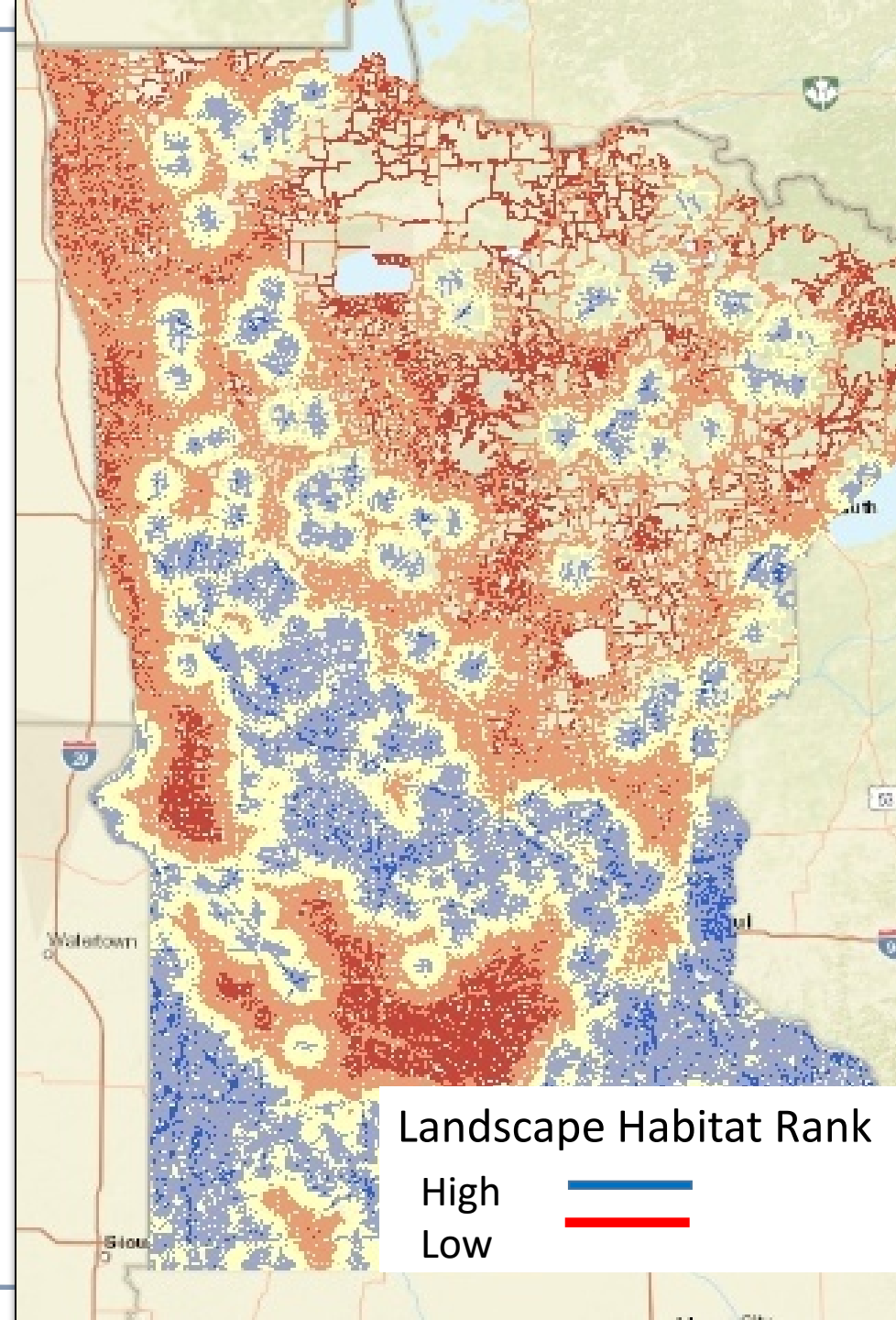
# Landscape Prioritization Model



- Wider ROW
- By Natural Lands (fewer chemicals, weeds)
- Habitat potential: milkweed + nectar sources



- Traffic Volume (collisions and salt, zinc, phosphorus, nitrogen)



Landscape Habitat Rank

High

Low







*Milkweed in an Oklahoma Roadside, Photo by Kristen Baum*

# Rapid Assessment

- 150 ft x ROW width
- Zig zag survey
- Milkweed tally
- Nectar plant cover, # types
- Weeds, invasives, incompatibles: cover
- Management (mow)
- Monarchs (optional)



The background image shows a roadside scene with a dense line of green bushes and trees in the middle ground. The foreground is filled with tall, green grass and some yellow wildflowers. The sky is filled with large, white and grey clouds, with patches of blue visible between them.

## Example

- >500 sites in one summer: MN and OK
- Milkweed at 46% (OK) - 76% sites (MN)
- High milkweed density = 512 plants/ac (MN)
- Monarch eggs or larvae: 56% of sites with milkweed (MN)

*Milkweed in an Oklahoma Roadside, Photo by Kristen Baum*



# Monarch Habitat Evaluator

- Tablet, phone, or paper
- States customize survey
- States manage own data
- Runs in *Esri Survey123*
- Automatically calculates Habitat Quality Scores from data collected

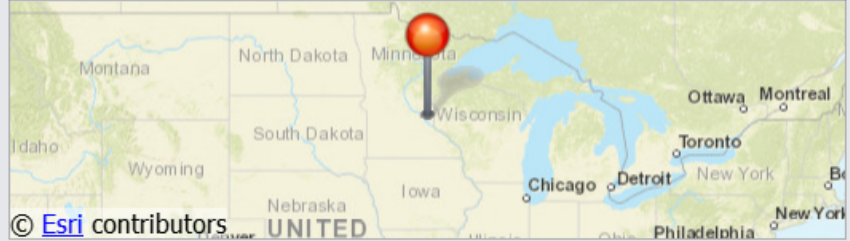
Survey123 for ArcGIS

## NCHRP Roadside Survey

### Roadside Location & Site Details

Geometry \*

44.995°N 93.113°W ± 206 m



Start Time \*

Time

Date \*

Date

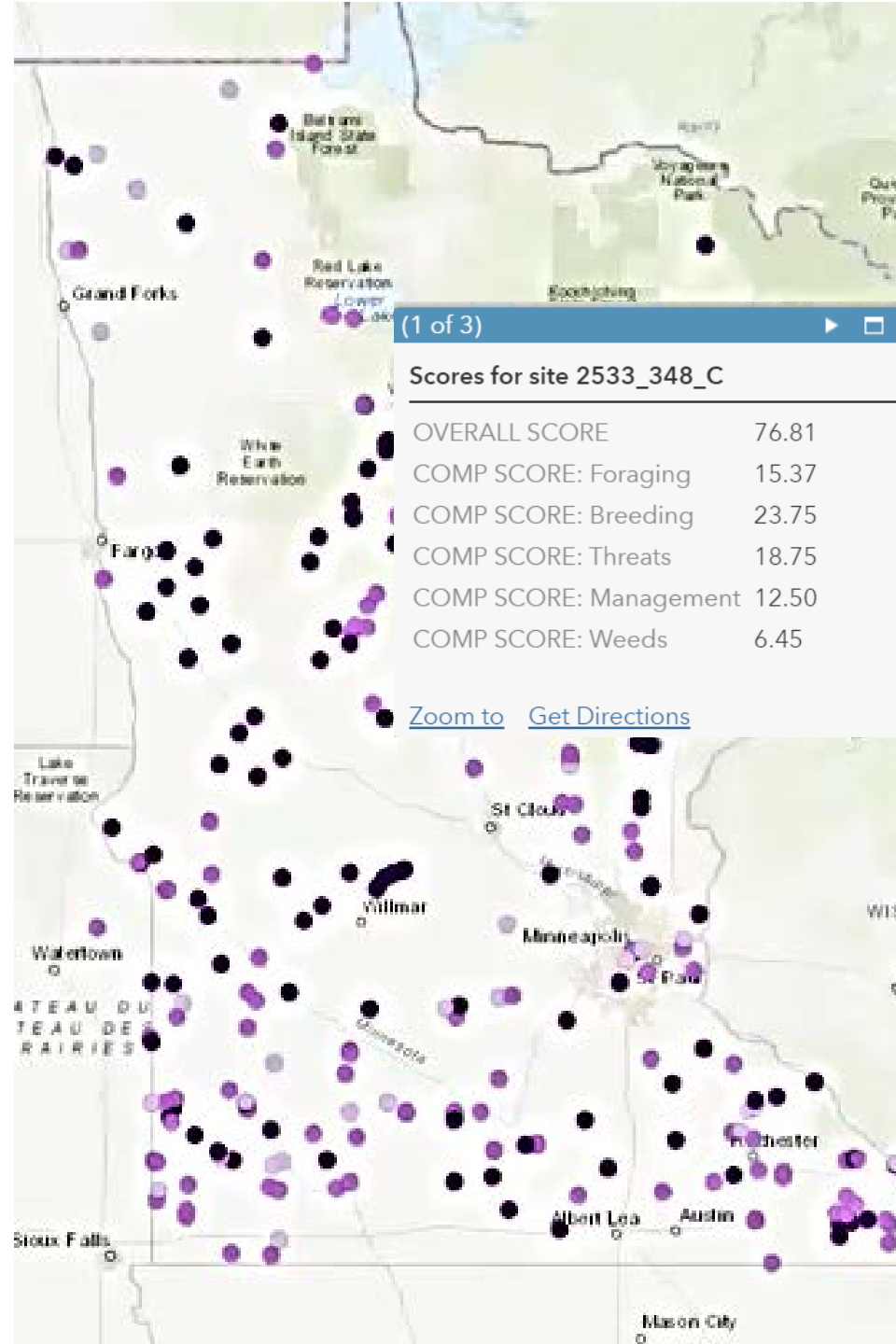
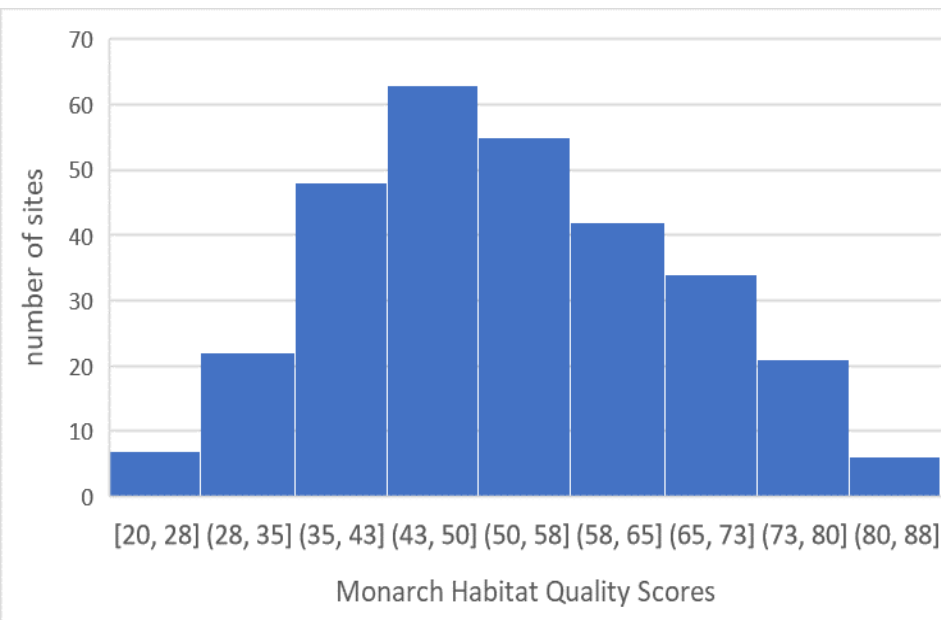
Observer Name \*

Region (choose your state) \*

Important! Plant dropdowns won't work without choosing your region.

# Habitat Quality Scores

- Spatial distribution of habitat scores
- Can also view in spreadsheets



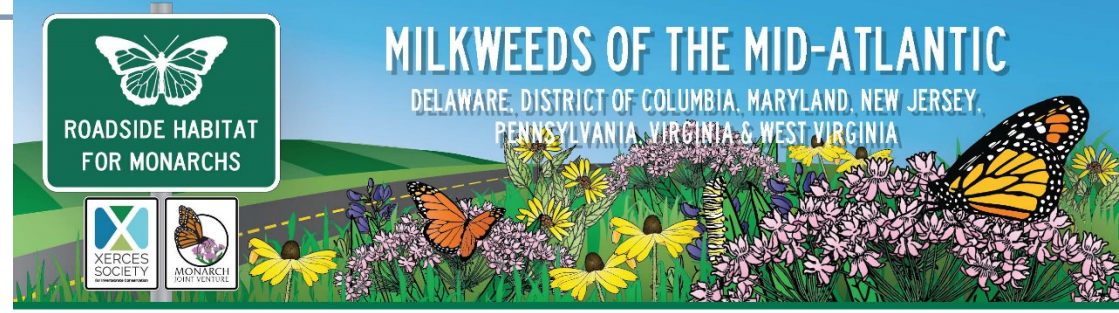






# Milkweed Identification Guides

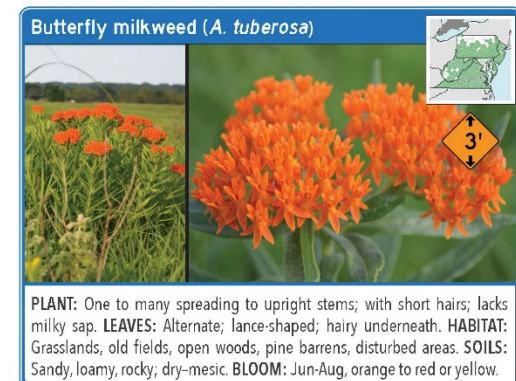
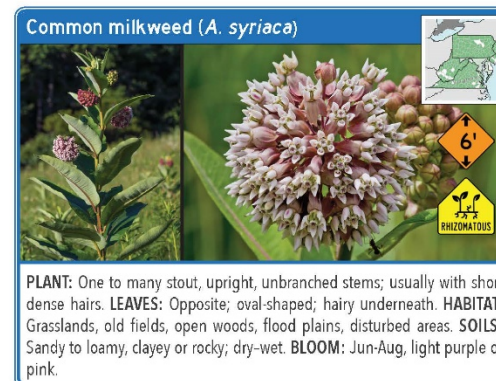
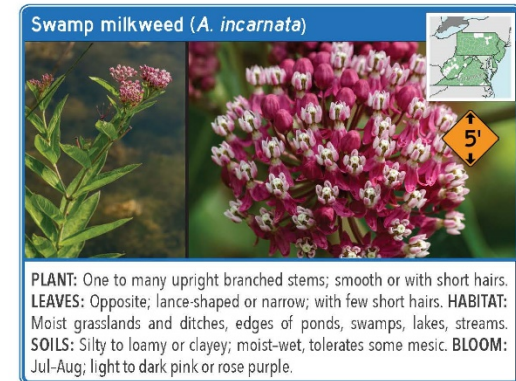
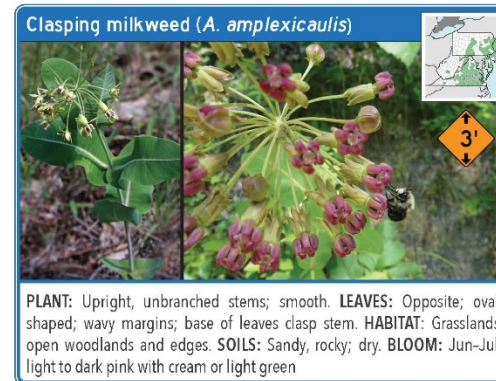
- Easier to manage if you can ID it!
- One-pagers for field
- 16 Regions of US



Milkweeds (*Asclepias* spp.) are herbaceous perennial plants named for their milky sap. These plants occur in a wide range of habitats, including intact natural communities on roadsides and highly disturbed roadsides. As required host plants for monarch (*Danaus plexippus*) caterpillars, milkweeds play an essential role in the butterfly's life cycle (see reverse). Vegetation management that allows milkweeds to persist can support monarchs. This guide can help you recognize the most common native species found on roadsides in your region.



The most common milkweeds in roadsides in the Mid-Atlantic Region (in alphabetical order):



(Continued on next page.)



# Monarch Butterflies, Weeds, and Herbicides

- Two-page fact sheet
- Integrates information about monarchs, weeds and herbicides



## Rectangular Snip

Monarch butterflies are in decline in North America, and restoring monarch habitat, including roadsides, is important to the species' recovery<sup>1</sup>. Monarch caterpillars require milkweed (primarily in the genus *Asclepias*) to complete their development. A diversity of milkweed species is found on roadsides<sup>2,3</sup>, and monarchs lay their eggs readily on milkweed plants in roadsides<sup>4</sup> and consume nectar from milkweed flowers.

Roadsides provide more than just milkweed; they can also provide diverse nectar sources to feed adult monarchs and other pollinators. Nectar fuels adult monarchs in their breeding, migration, and overwintering. Adult monarchs feed on nectar from a variety of blooming plants, including wildflowers and shrubs, throughout the growing season. Spring flowers support monarchs as they leave their overwintering grounds to breed, and summer flowers support several generations of breeding monarchs. Fall-blooming flowers are also important, as monarchs migrating to overwintering grounds require lots of nectar to build fat reserves to support their long-distance flights and sustain them through the winter.

Noxious and invasive weeds can degrade habitat for monarchs by displacing valuable nectar plants and milkweed. Herbicides are a tool employed by many transportation departments and other land managers to control noxious and invasive weeds or encroaching woody vegetation. However, some herbicide uses have nontarget effects that reduce the quality of roadside habitat for monarchs by removing flowering plants and milkweed plants or reducing plant diversity over time. This guide highlights best management practices to reduce the impacts of herbicides on monarchs.

## Best Management Practices

Roadside managers and other vegetation managers can reduce the impacts of herbicide use on monarch butterflies by:

1. using herbicides within an integrated approach that incorporates a range of methods to prevent and manage weeds and non-compatible vegetation,
2. limiting nonselective broadcast applications, which can damage host or nectar plants,
3. using herbicides as efficiently as possible to reduce the amount applied,
4. reducing off-site movement of herbicides, and
5. limiting direct exposure of monarchs to herbicides when possible.

Specific management practices to reduce risk to monarchs from herbicide applications include:

### Applicator Training

- Train staff and contractors to distinguish noxious and invasive weeds and encroaching woody vegetation from similar species to reduce unintended damage to nontarget plants. For instance, training may help crews to distinguish the invasive Canada thistle (*Cirsium arvense*) from the native tall thistle (*Cirsium altissimum*), an important fall blooming native nectar plant for migrating monarchs in the central states.
- Train applicators in herbicide application techniques that reduce damage to nontarget plants.
- Create specifications that would hold contractors accountable to using proper techniques.

### Assessment

- Inventory roadside vegetation regularly to identify emerging noxious and invasive weed issues or encroaching woody



# Frequently Asked Questions



Indiana DOT

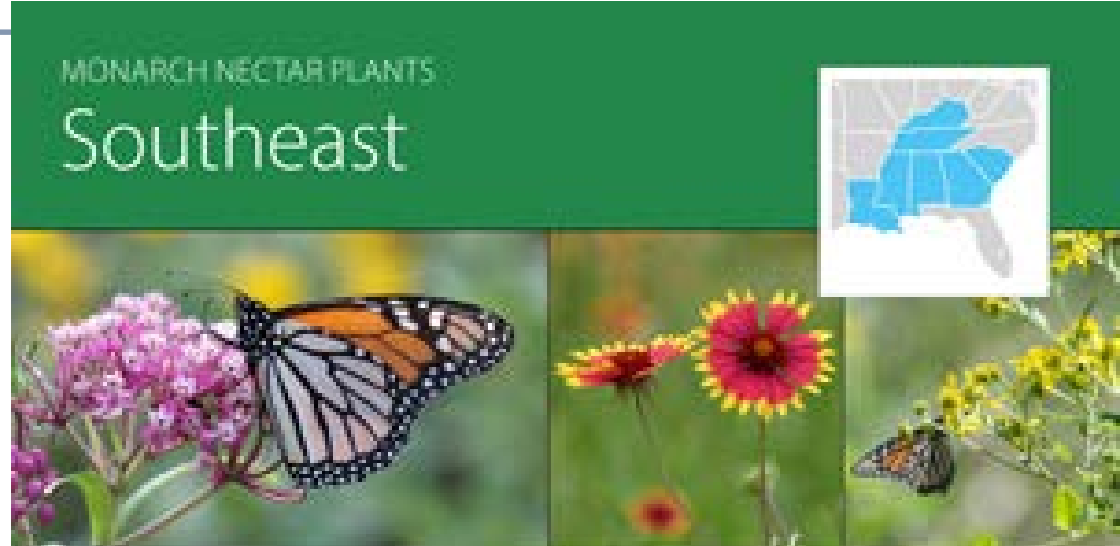


Jeff Norcini



# Connecting to Resources

- Regional nectar plant guides
- Mowing BMPs
- Case studies



## MONARCH JOINT VENTURE

Partnering across the U.S. to conserve the monarch migration

[www.monarchjointventure.org](http://www.monarchjointventure.org)

*The Monarch Joint Venture is a partnership of federal and state agencies, non-governmental organizations, and academic programs that are working together to protect the monarch migration across the lower 48 United States.*

### MISSION

Recognizing that North American monarch (*Danaus plexippus*) conservation is a responsibility of Mexico, Canada and the U.S., as identified in the North American Monarch Conservation Plan, this Joint Venture will coordinate efforts throughout the U.S. to conserve and protect monarch populations and their migratory phenomena by developing and implementing science-based habitat conservation and restoration measures in collaboration with multiple

### Mowing and Management: Best Practices for Monarchs

Understanding when monarchs are present allows land managers to time management practices like burning, mowing, grazing, or targeted pesticide application when they are least likely to harm monarchs. Monarchs can be harmed when eggs and caterpillars on milkweed plants or adult monarchs seeking nectar from flowers are present during management, or when habitat is removed at critical points in their life cycle. The following recommendations are intended to reduce harm to monarchs based on breeding and migration activity (see *How was this map made?* below). Use the management windows below in conjunction with recommendations for other species to inform the timing of management in your area.

### Recommended Management Timing

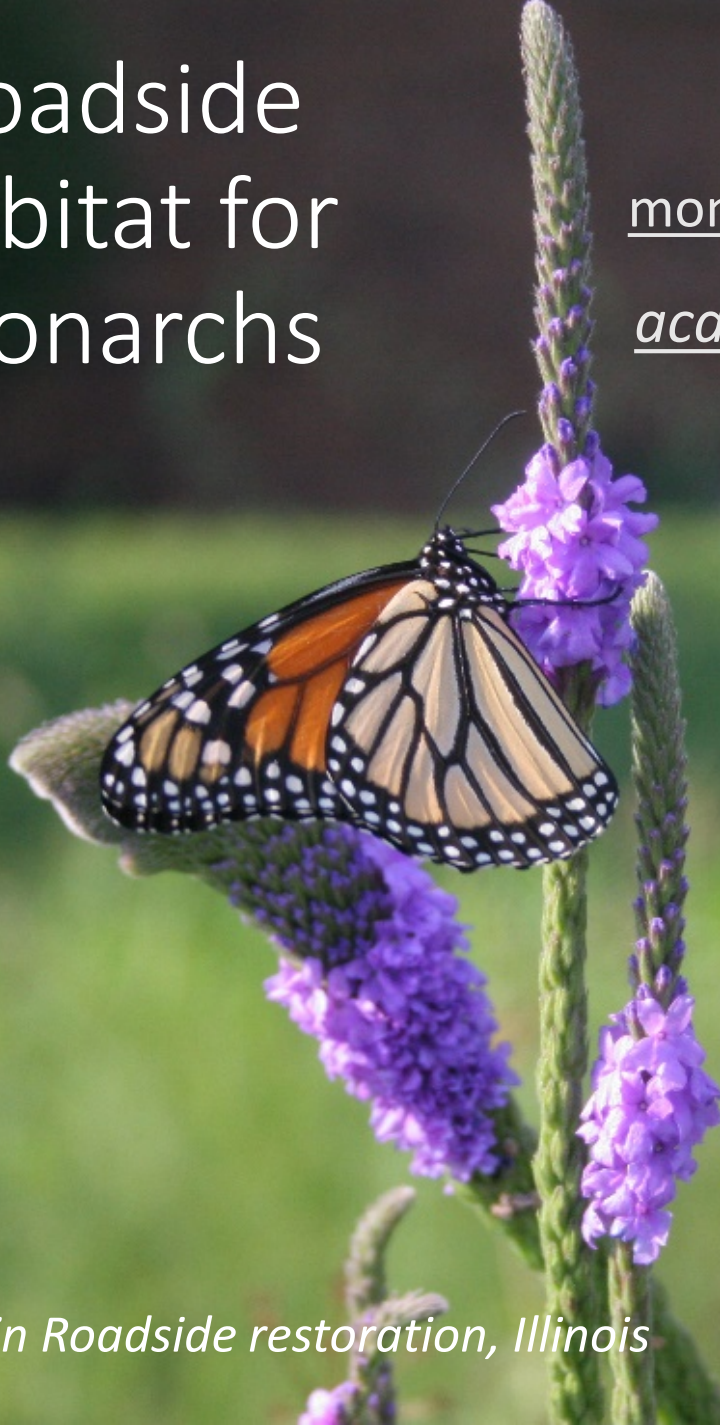


# Roadside Habitat for Monarchs

[monarchjointventure.org/roadsidehabitat](http://monarchjointventure.org/roadsidehabitat)

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Contact us!



*Monarch in Roadside restoration, Illinois*

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