Welcome!

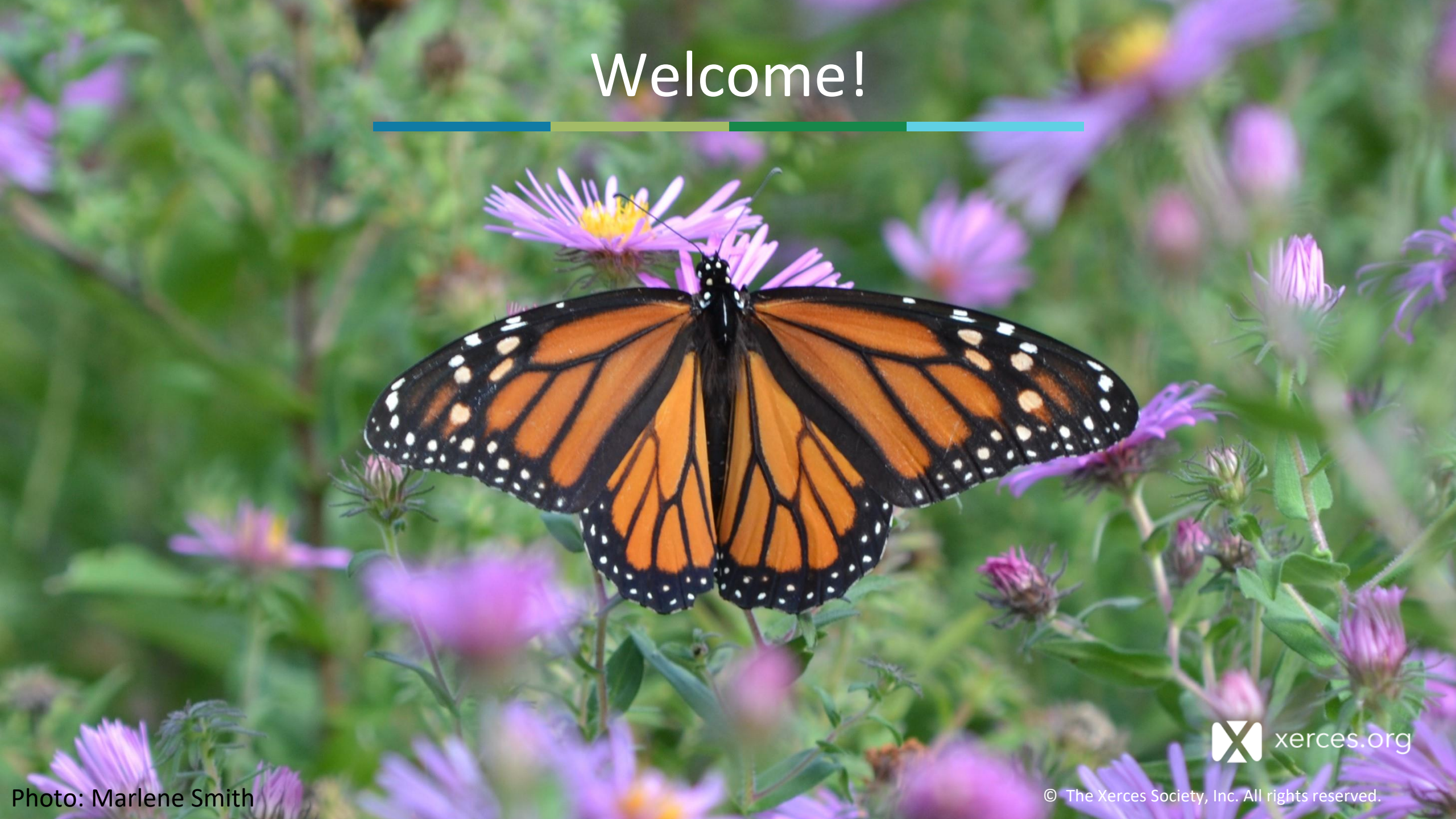


Photo: Marlene Smith

xerces.org

Eastern Monarchs 101

Marlene Smith, Xerces Ambassador

The Xerces Society for Invertebrate Conservation

Northwood Civic Association
February 7, 2024

xerces.org

The Xerces Society

The Xerces Society for Invertebrate Conservation is an international nonprofit organization that protects the natural world through the conservation of invertebrates and their habitats

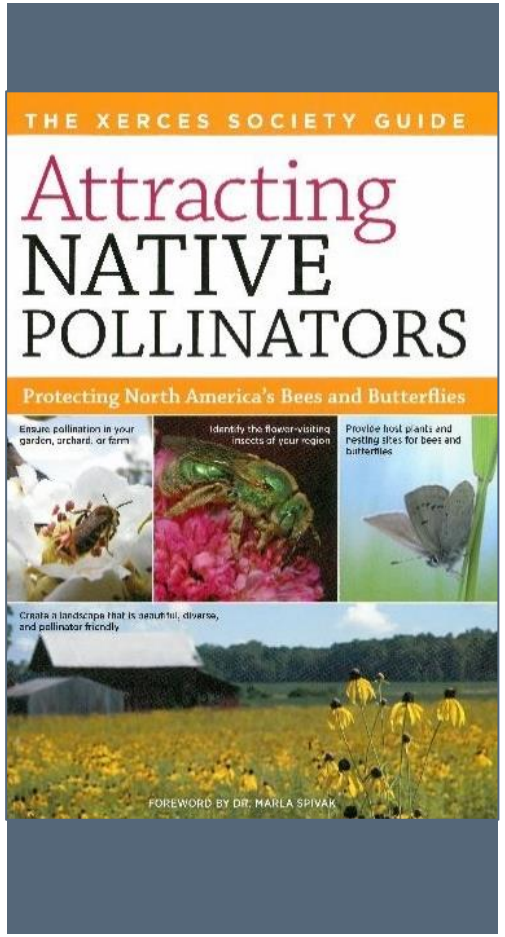
Named for the Xerces Blue butterfly

Last seen flying in 1943

xerces.org

Protecting the Life That Sustains Us

- Conservation
- Advocacy
- Research
- Education



Photos: Paul Jepson; Dick Dewey; Xerces Society/Brianna Borders

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The Monarch: An Icon on the Edge

What to expect:

- The Monarch Life Cycle
- Monarch Migration
- Threats to Monarchs
- Host Plants for Monarchs
- Nectar Plants for Monarchs
- What You Can Do
- Resources

Photo: Marlene Smith

xerces.org

Monarch Life Cycle (*Danaus Plexippus*)

From egg to adult takes approximately 1 month (20-35 days)

Adult: 2-5 weeks while breeding;
6-9 months when overwintering

Chrysalis
8-15 days

Egg
3-5 days

Caterpillar 9-16 days

Photos: Marlene Smith

xerces.org

Monarch Eclosing

10-minute time lapse

Video: Bill Smith

For life cycle timeline and more photos, visit
https://extension.umd.edu/sites/extension.umd.edu/files/2022-11/Fall 2022 final.pdf

xerces.org

The Amazing Monarch!

Male Monarch

Female Monarch

Photos: Marlene Smith

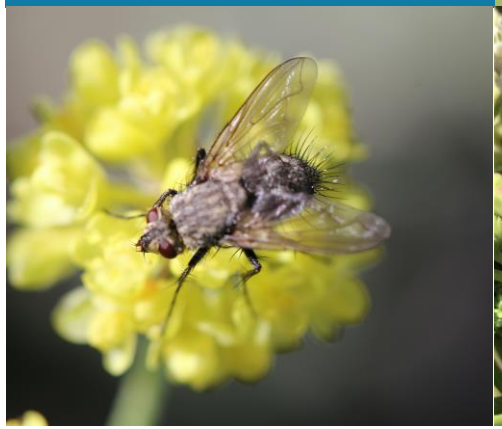
Viceroy (mimicry)

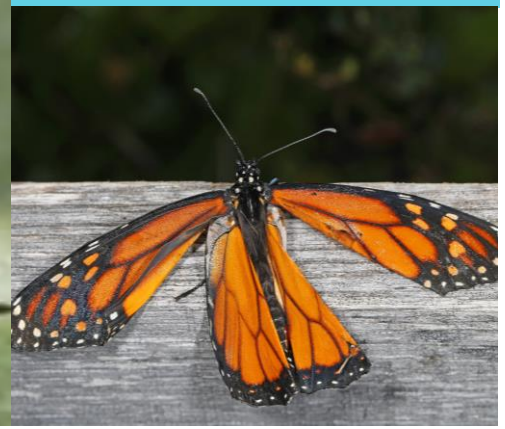
Photo: Seigfreid.JPG, CC

xerces.org

Natural Monarch Enemies

Tachinid Fly	Wasp	Ant	OE
Parasite	Predator	Predator	*Ophryocystis elektroscirrha* Pathogen



Photoss: Stephanie McKnight, Xerces; Kathryn Prince , Xerces; David Cappaert, Bugwood.org; Judy Gallagher, Flickr (CC BY 2.0)

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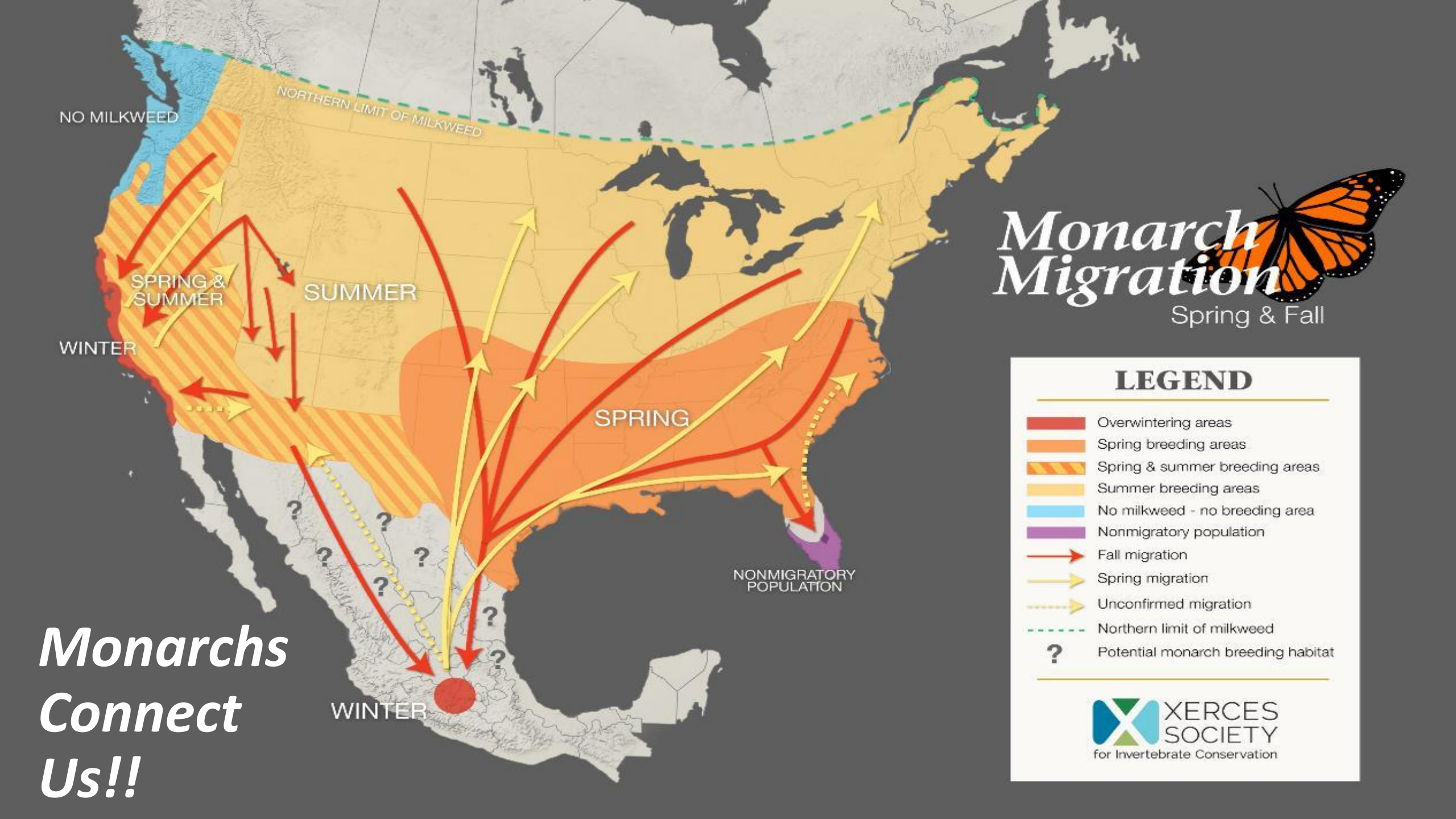
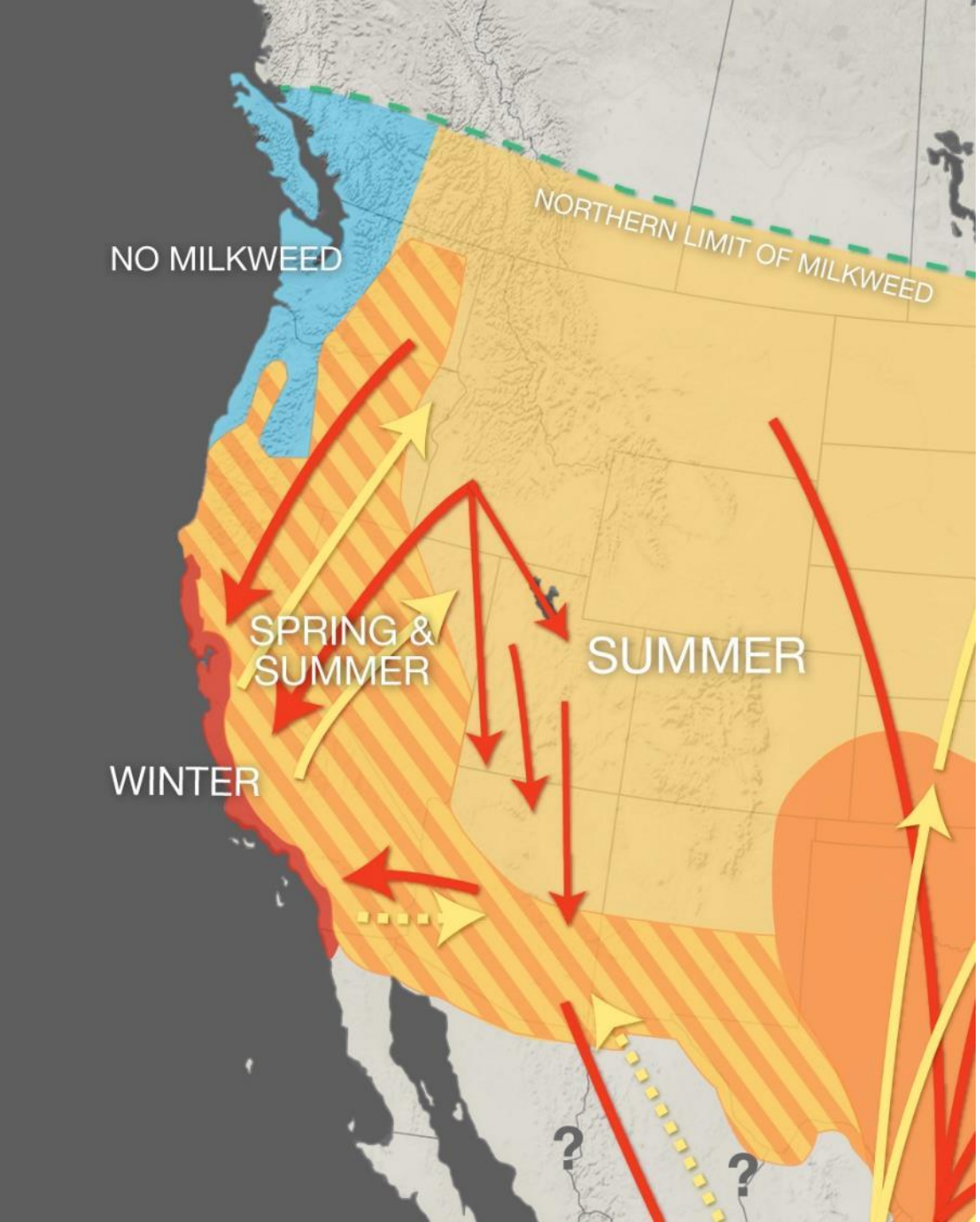


Monarchs Connect Us!!



Western Population

Breeds in western states and into Canada

Not in Maritime NW

Overwinters along Pacific Coast from northern California to Baja California

Small numbers may also overwinter in Mexico

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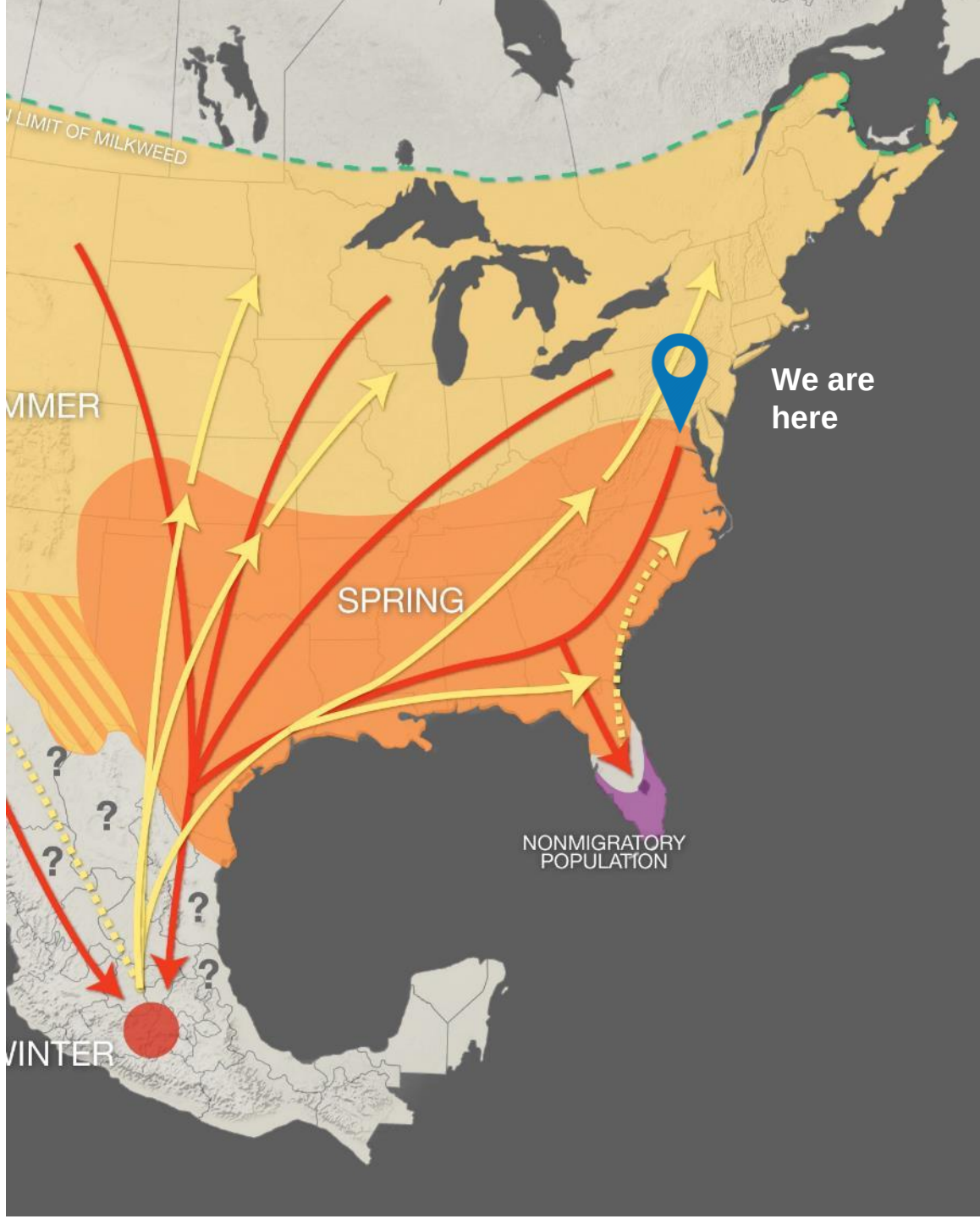
Eastern Population

Breeds across Great Plains, eastern states, and into Canada

Overwinters in mountains of central Mexico

Nonmigratory population in Florida



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Overwintering Sites in Mexico

Every year, migratory monarchs travel up to 2,000 miles (3,000 km) from the eastern United States and Canada to spend the winter among the forests of central and western Mexico.

Monarch butterflies at Mexico's Sierra Chincua butterfly sanctuary

xerces.org

Photo: Xerces Society / Carly Voight

Overwintering Sites

But wait! There's more!!

Although the majority of eastern monarchs migrate to Mexico, there is new evidence that some fly to Florida

Coastal areas from the South Carolina coast south and along the Gulf, may host monarchs year-round

Monarchs may also migrate to Cuba, the Yucatan, and Guatemala (i.e., the Caribbean, Central and South America)

Monarchs need a "Goldilocks zone" of "just right" cool weather, storm protection, water, sunshine, nectar

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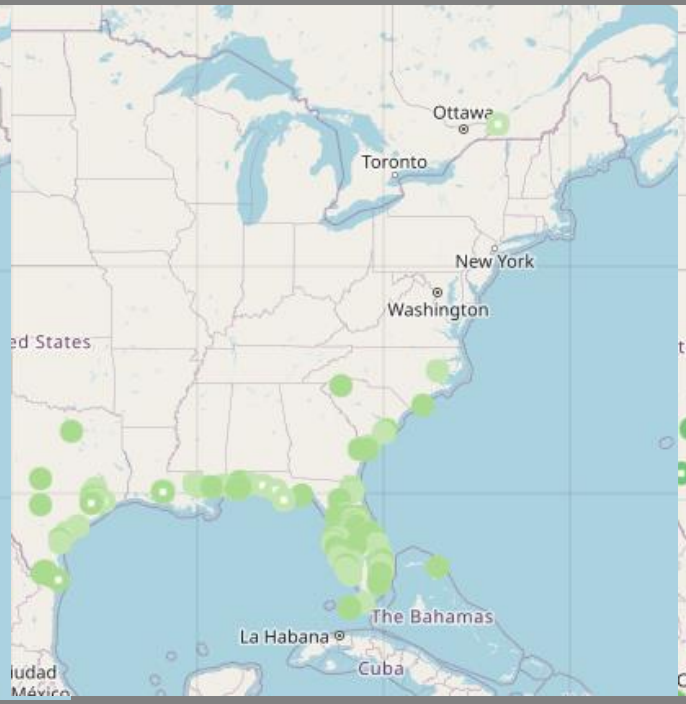
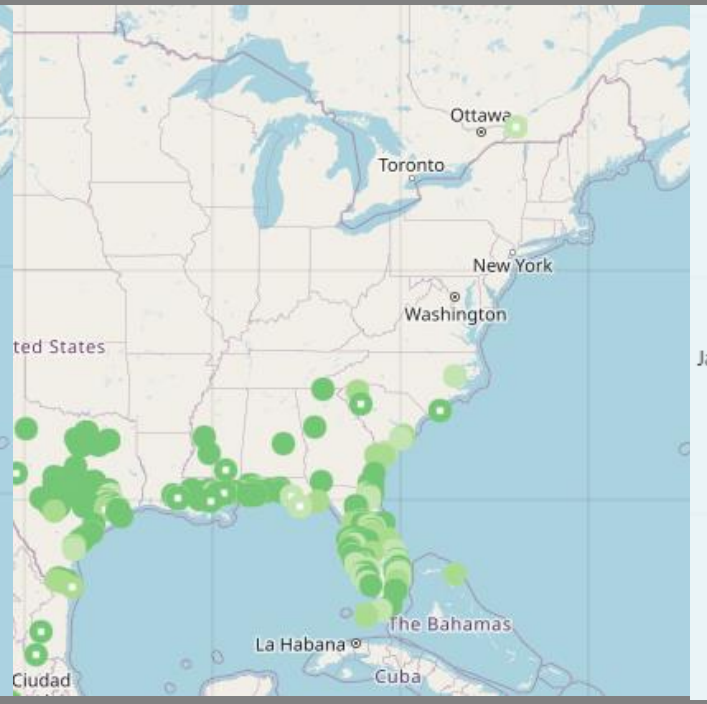
Journey North Maps Spring 2023

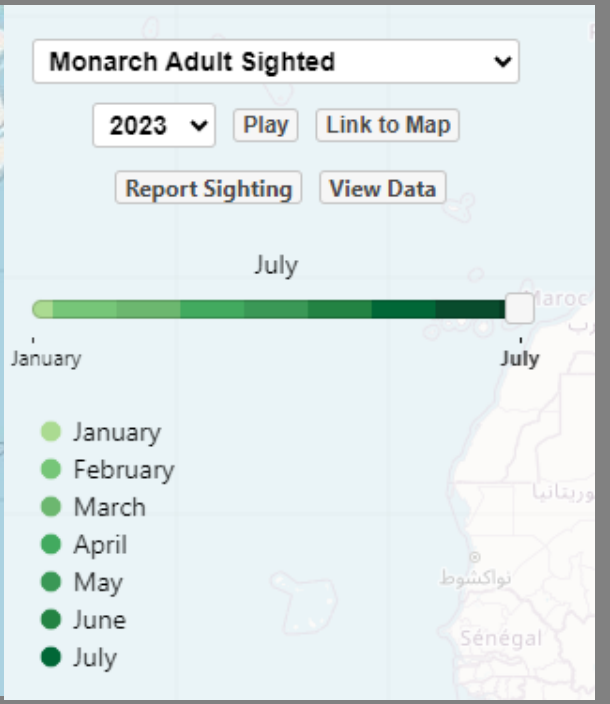
January 2023



February 2023

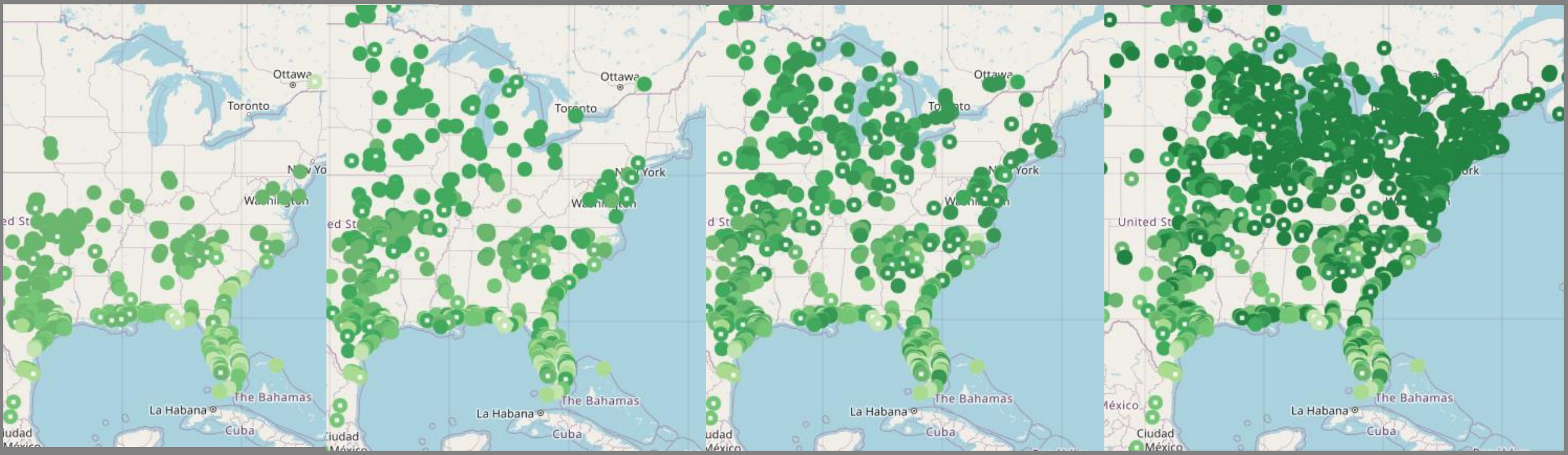


March 2023



https://maps.journeynorth.org/

Journey North Maps Spring 2023



April 2023

May2023

June 2023

July 2023

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https://maps.journeynorth.org/

How old is this monarch?

Photo: Marlene Smith

xerces.org

Late season monarch in my habitat……

October 19, 2023

October 20, 2023 (on blue mist flower)

Photos: Marlene Smith

xerces.org

Eastern Monarch Population Status

1997 = 45 acres

1 hectare ~ 2.5 acres

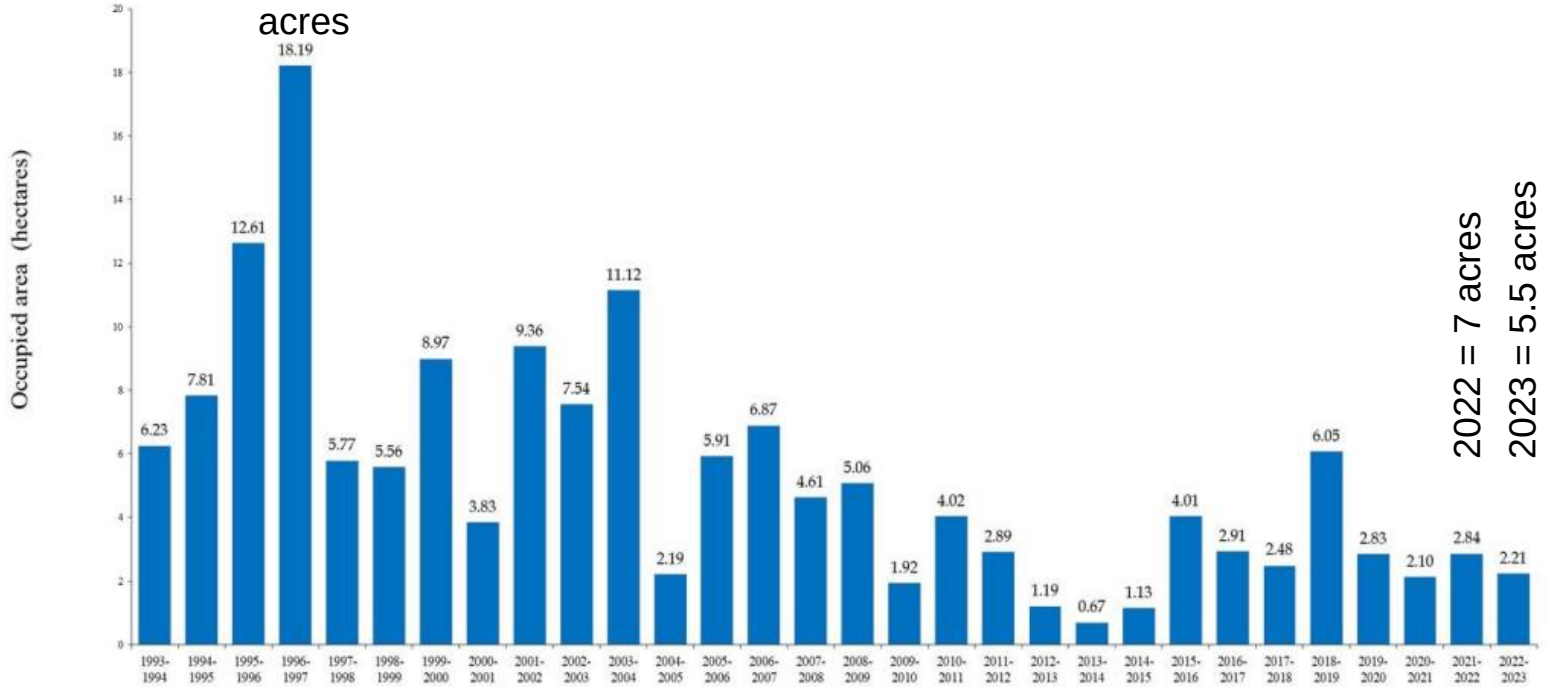

Figure 2. Forest area occupied by the monarch butterfly colonies in Mexico from 1993-1994 to 2022-2023.

Forest Area Occupied by Monarch Colonies

Monitored in hectares of forest occupied

22% decline from 2021/22 to 2022/23

88% decline since population high in 1996/1997

https://files.worldwildlife.org/wwfcmsprod/files/Publication/file/3oj167d505_WWF_Monarch_Butterfly_Report_2022_2023_FINAL.pdf

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Monarchs in the News!

Article | Open access | Published: 27 June 2023

Overwintering and breeding patterns of monarch butterflies (*Danaus plexippus*) in coastal plain habitats of the southeastern USA

Michael R. Kendrick & John W. McCord

Scientific Reports **13**, Article number: 10438 (2023) | Cite this article

ARTICLE | VOLUME 25, ISSUE 5, 104310, MAY 20, 2022

Oriented migratory flight at night: Consequences of nighttime light pollution for monarch butterflies

Adam F. Parlin [3] • Samuel M. Stratton [3] • Patrick A. Guerra [4] • Show footnotes

Open Access • Published: April 27, 2022 • DOI: https://doi.org/10.1016/j.isci.2022.104310 •

DO NORTH AMERICAN MONARCH BUTTERFLIES TRAVEL TO CUBA? STABLE ISOTOPE AND CHEMICAL TRACER TECHNIQUES

Lincoln Brower

2004, Ecological Applications

WWF

OUR WORK GET INVOLVED ABOUT US

STORIES

Troubling news for monarch butterfly populations

Presence of monarch butterflies in their wintering habitat drops 22% in one year

JOURNAL ARTICLE

Migration of Eastern North American monarch butterflies via the South-east and the Atlantic: evidence from stable isotopes, thin layer chromatography, DNA and phenotype Get access >

Cristina Dockx ✉, Keith A Hobson, Marcus Kronforst, Kevin J Kardynal, Carmen Pozo, Jack Schuster, Delbert A Green, II, Margaret Dix, Sumitha Nallu, Steve Lynch

Biological Journal of the Linnean Society, Volume 139, Issue 3, July 2023, Pages 294–325, https://doi.org/10.1093/biolinnean/blac146

Published: 16 June 2023 **Article history** ▾

Rethinking Monarchs: Does the Beloved Butterfly Need Our Help?

The Eastern monarch butterfly has long been thought to be in peril, but new studies indicate that its U.S. populations are not in decline. Scientists say the biggest threat the species faces is from well-meaning people who rear the butterflies at home and release them.

BY JANET MARINELLI · JANUARY 15, 2024

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Human-Related Threats to Monarchs

- Loss of overwintering sites; critical part of annual life cycle
- Loss of milkweeds; primary food for caterpillars
- Loss of nectar for adults; need nectar-rich flowers to fuel breeding and migration
- Overuse of pesticides

Photos: Xerces Society / Candace Fallon

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Loss of Overwintering Sites

Overwintering sites are critical part of annual cycle

Mexico

Logging

Extreme weather

California

Development

Neglect of groves

Eucalyptus aging

Photos: Lisa Massie

xerces.org

Loss of Breeding Habitat

Milkweeds are primary food for caterpillars

Milkweed has been lost from the landscape due to:

Meadows and prairies being converted to agriculture or urban development

Herbicide use on farms

Insecticide contamination

Non-native milkweed growing in gardens

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Photos: Xerces Society / Stephanie McKnight; Xerces Society / Candace Fallon

Loss of Nectar Sites

Need nectar-rich flowers to fuel breeding and migration

Quantity reduced due to habitat loss and herbicide use

The need for nectar plants varies by region based on the timing of the migration

Spring & fall nectar plants are needed further south

Summer nectar plants are needed further north

Photos: Joel Olives, Flickr; Scott Seigfried

xerces.org

Photo: Xerces Society/Matthew Shepherd

Pesticides

Insecticides are everywhere, often at levels that are harmful to pollinators

Don’t use them unless no alternative

Avoid systemic products

Read guidance carefully

Even when label instructions are followed, there is limited protection for pollinators

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Provide What Monarchs Need – Habitat!

"Bring Back the Pollinators" principles can be adopted anywhere by adding:

- Host milkweed for caterpillars and nectar plants for adults
- Shelter / hanging space for chrysalises
- Avoiding pesticides
- Sharing the word by adding a sign

Photo: Matthew Shepherd

xerces.org

Photos: Lisa Massie

Photos: Marlene Smith

Plant Milkweed

Plant Milkweeds for Eggs & Caterpillars

Eggs are laid on milkweed, the only host plant for Monarch caterpillars

Caterpillars feed on milkweed and will move to fresh plants as needed

No milkweed = No monarchs

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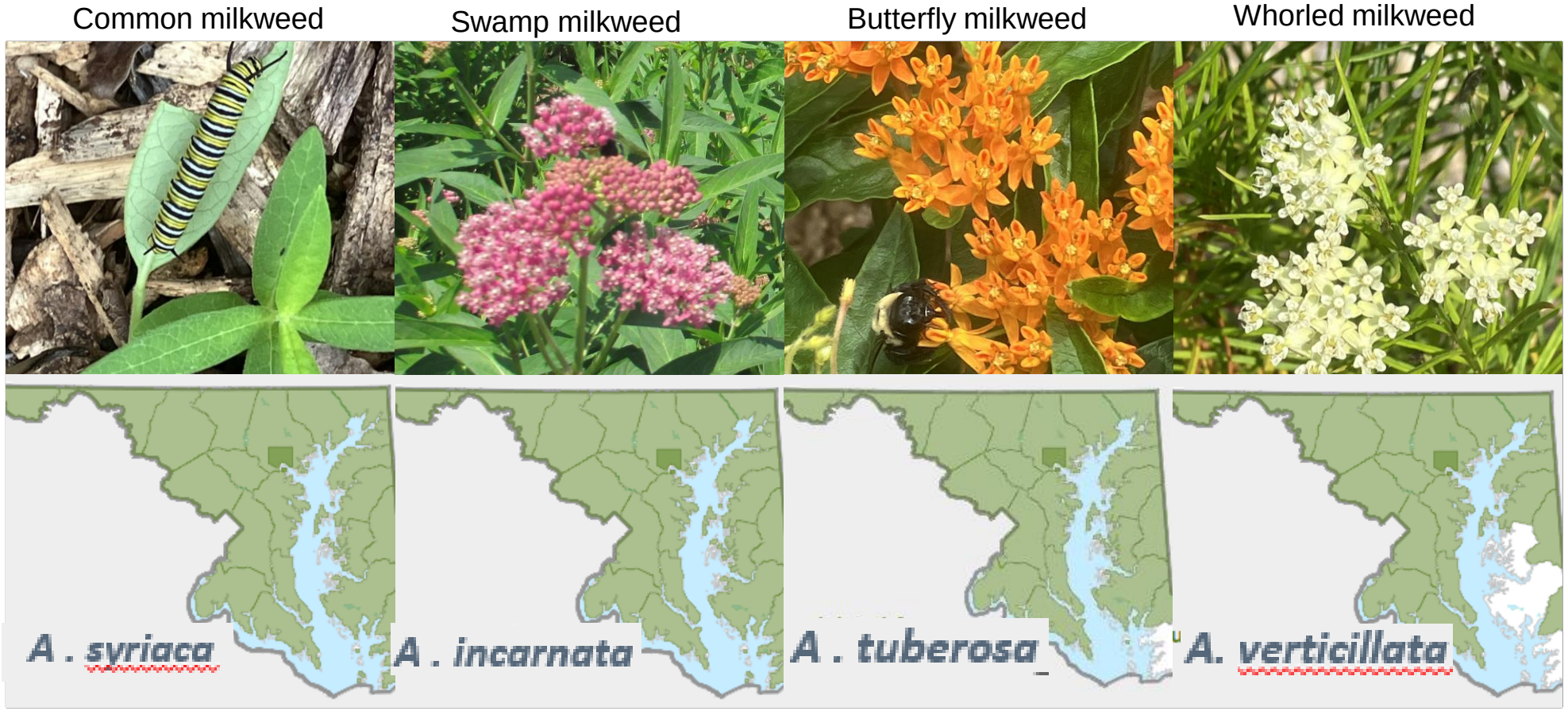
The Right Type of Milkweed

Regionally appropriate, native milkweeds



Photos: Marlene Smith / Maps: Maryland Biodiversity Project

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The Wrong Type of Milkweed

Tropical milkweed, *A. curassavica*, is non-native and shouldn't be planted

- Evergreen
- Grows through winter, disrupts breeding and migration cycle
- Harbors/supports OE parasite of monarchs

Photo: Matthew Shepherd

xerces.org

Photo: Lisa Massie

Plant Nectar Plants

Early spring, summer, and fall flowering plants are important for adults during spring and fall migration

- Plant for all pollinators, including monarchs.
- Aim to provide an “ongoing pollinator buffet”.
- Consider color, diversity, and bloom sequence (plant a 3x3 garden, which means 3 plants of 3 species for 3 seasons)
- Landscape context (even small spaces matter)
- **Plant native plants!**

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Photos: Lisa Massie

Native Plants

Have evolved in our region and are adapted to our climate

Thrive with minimal maintenance and require significantly less irrigation than non-native plants

Over 90% of herbivore insects are specialists and rely on specific native plants for food

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Monarchs Prefer Native Plants

Provide bloom throughout the breeding and migration seasons

Summer Bloomer	Summer Bloomer	Summer to Fall Bloomer	Summer to Fall Bloomer
Asclepias incarnata	***Monarda fistulosa***	***Solidago caesia***	***Liatris spicata***
Swamp milkweed	**Wild bergamot**	**Wreath goldenrod**	**Dense blazing star**




Photos Marlene Smith

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Provide Shelter for Pupation

Photos Marlene Smith

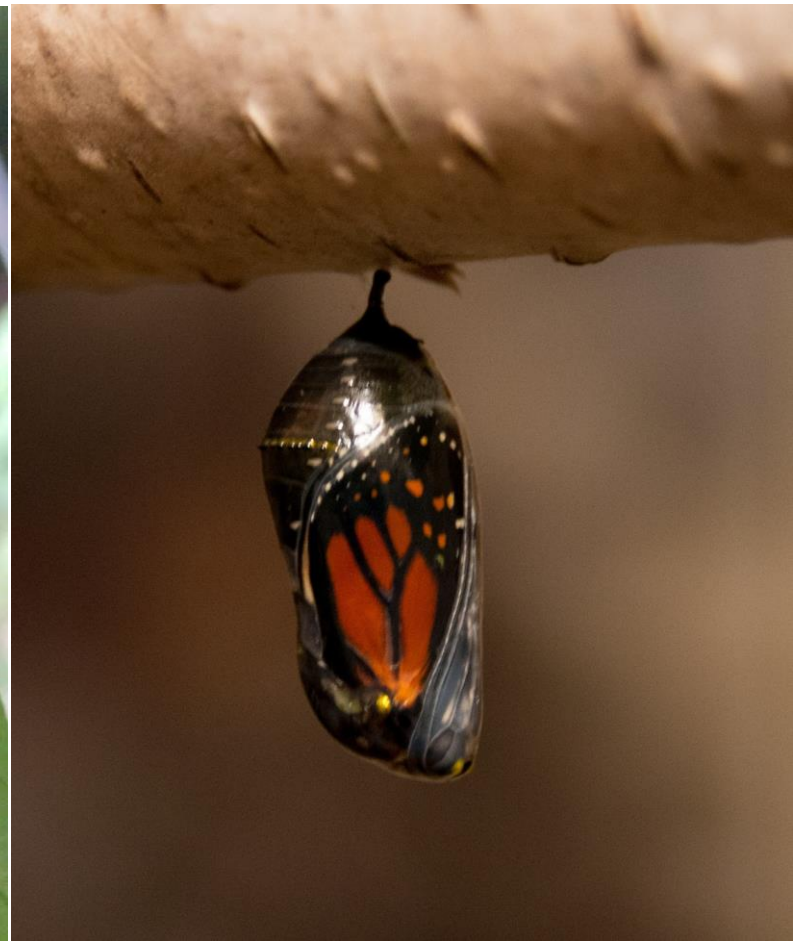

Photo Xerces Society / Edward K. Boggess

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We All Can Make Space for Monarchs

Gardens, Parking Strips, Office Landscapes, Natural Areas

Photos: Matthew Shepherd, Mace Vaughan, Kathryn Prince, Rod Gilbert

xerces.org

Infographic: Hungarian Entomological Society

Biodiversity is Key

Biodiversity refers to the number of different species present in the community

Communities with high biodiversity survive environmental change well

xerces.org

Bee’s (or Butterfly’s)-Eye View of a Neighborhood

Graphic: Xerces Society / Sara Morris

xerces.org

The “imperfect garden”

Learn about the pollinators in your garden and accept their handiwork

Leafcutter bees and many butterflies and moths use plant leaves, stems, flowers

Photo: Lisa Massie

Video: Marlene Smith

Snowberry Clearwing moth

Hemaris diffinis

Video: Alina Harris

xerces.org

Captive Rearing

Okay to rear a few for pleasure / fascination

- Captive rearing is not a successful conservation strategy
- Problems with OE parasites
- Adults can be less fit or smaller

Photo: Tricia J, Flickr

xerces.org

What More Can You Do?

Photo: Marlene Smith

xerces.org

Xerces Community Science

Monarch Nectar Plant Observations

Please share your monarch butterfly nectar plant observations with the Xerces Society!

Observations must include at least one photograph of the monarch and/or nectar plant.

Learn more about this project here: https://xerces.org/monarch-nectar-plants/.

If you have monarchs nectaring on native plants, scan this QR code to report.

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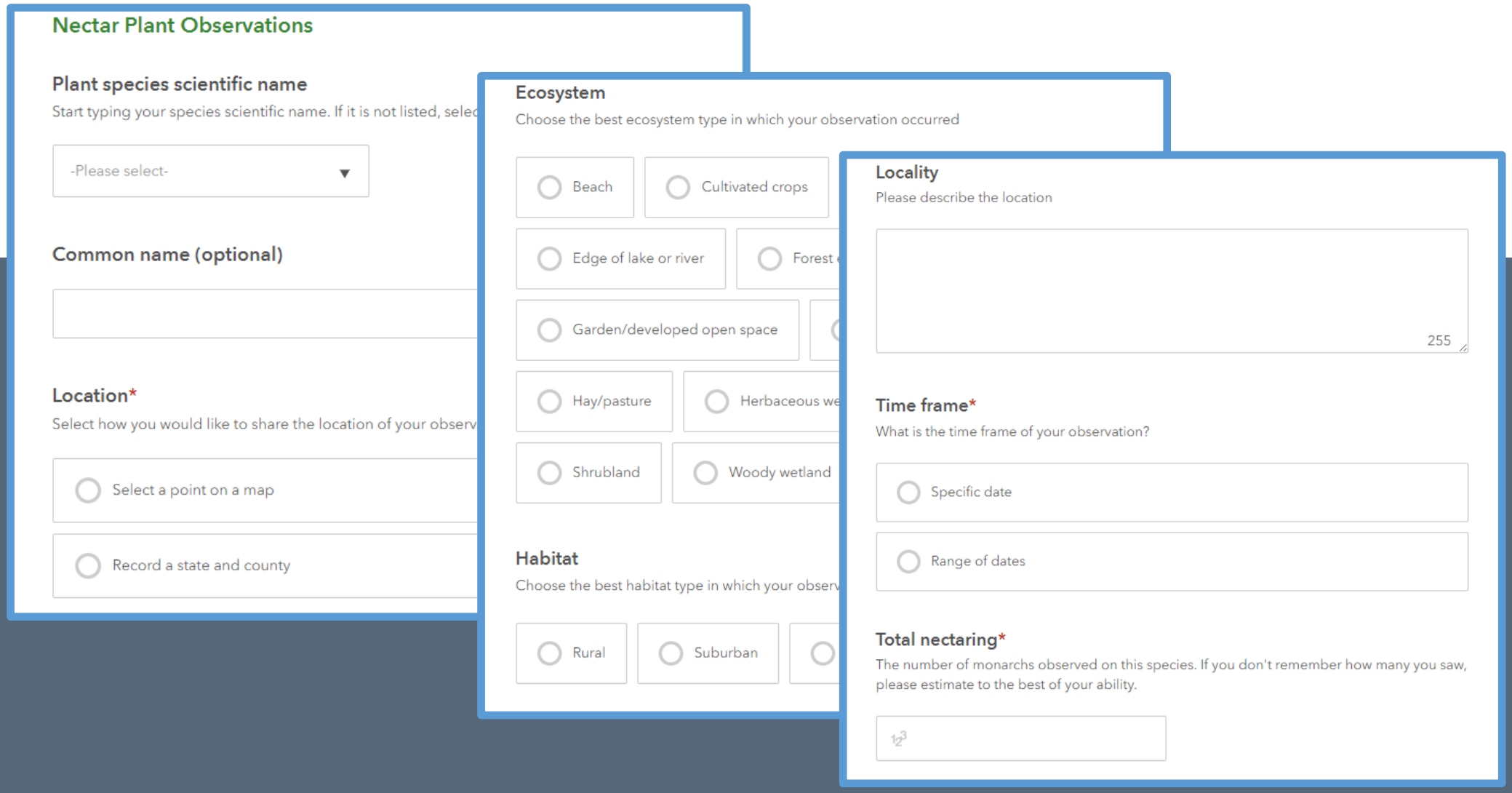
Xerces Community Science



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Community Science

Other Organizations

Monarch Watch

Monarch Joint Venture

Journey North

Project Monarch Health

Monarch Larva Monitoring Project

iNaturalist

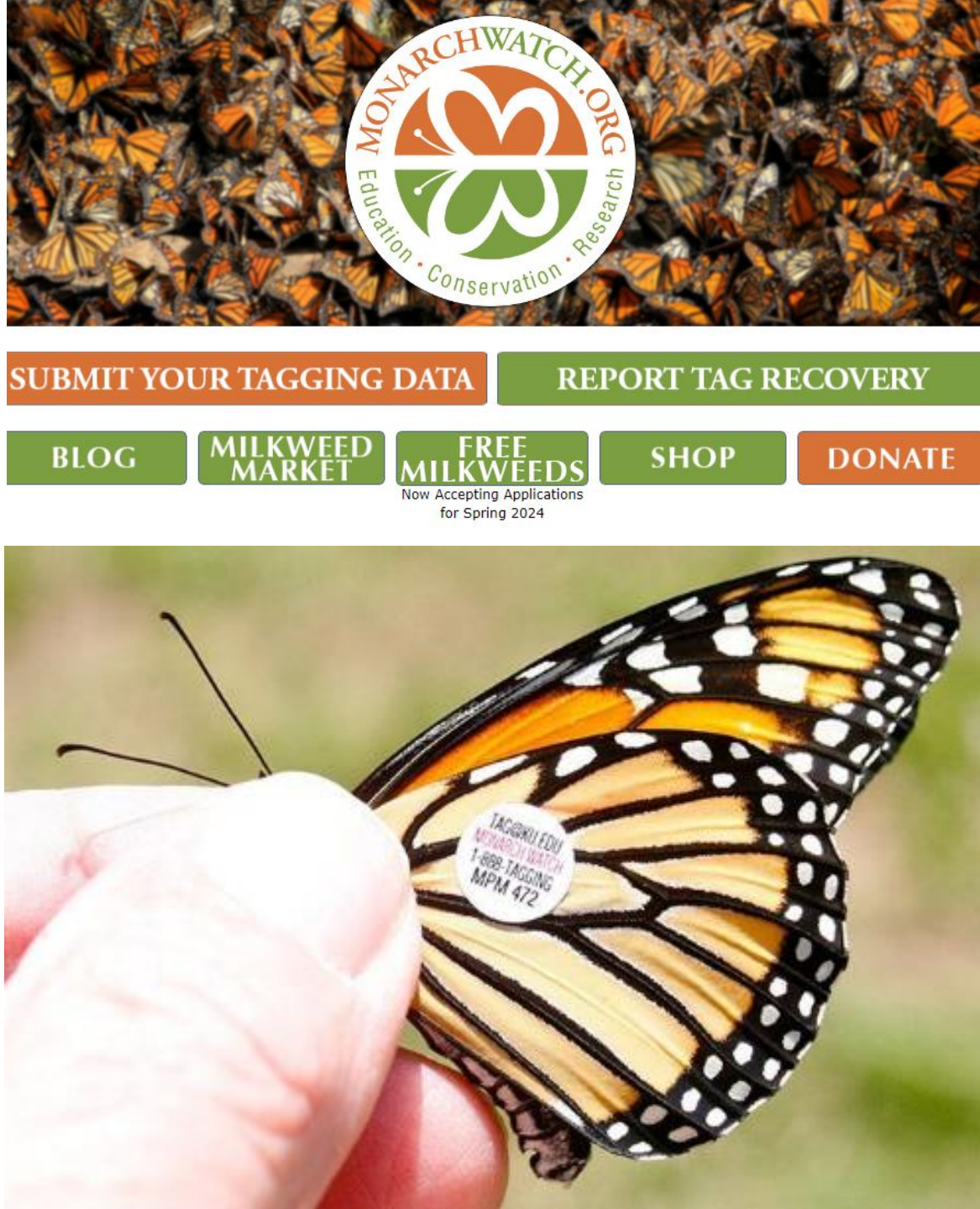


Photo: Monarch Watch

xerces.org

Photo: Xerces Society / Suzanne Granahan

Bring Back the Pollinators

Sign the Pollinator Protection Pledge and follow the four principles:

Grow pollinator-friendly flowers

Provide nests & egg-laying sites

Avoid using pesticides

Share the word

BringBackThePollinators.org

xerces.org

BEE CITY USA®

AN INITIATIVE OF THE XERCES SOCIETY

BEE CAMPUS USA™

AN INITIATIVE OF THE XERCES SOCIETY

Bee City USA

Bee City USA & Bee Campus USA bring people together to make their communities better places for pollinators—native bees, in particular—by increasing the abundance of native plants, providing nest sites, and reducing pesticides.

Affiliates commit to create habitat, reduce pesticide use, and host outreach activities.

Driven by local desire to help pollinators.

beecityusa.org

xerces.org

X Kids Program

Activity booklet with badge upon completion

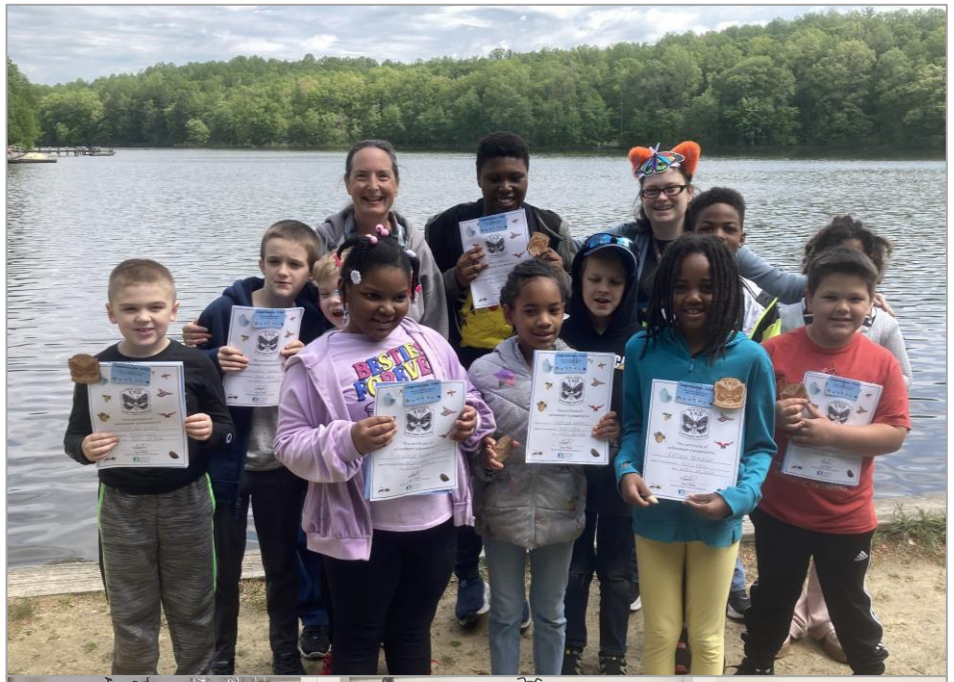
Target = grades 3–5

Individuals and groups

Available in English and Spanish

xerces.org/xkids

Questions? xkids@xerces.org



Photos: Marlene Smith

Learn More About Monarchs

xerces.org

Download from xerces.org

Fact sheets & brochures

Guidelines & reports

xerces.org

Pollinator Conservation Resources: Mid-Atlantic Region

(Photo: Xerces Society / Mace Vaughan)

Welcome to our Pollinator Conservation Resources for the Mid-Atlantic Region! Here you'll find region-specific collections of publications, native plant and seed suppliers, and other resources to aid in planning, establishing, restoring, and maintaining pollinator habitat—as well as materials to help you learn about the species of invertebrates and native plants you might encounter. For more resources, see our Publications Library or learn about our Pollinator Conservation Program.

Pollinator-Friendly Parks

To support the work being done by park managers across the country, the Xerces Society has recently released Pollinator-Friendly Parks: Enhancing Our Communities by Supporting Native Pollinators in Our

https://xerces.org/pollinator-resource-center/mid-atlantic

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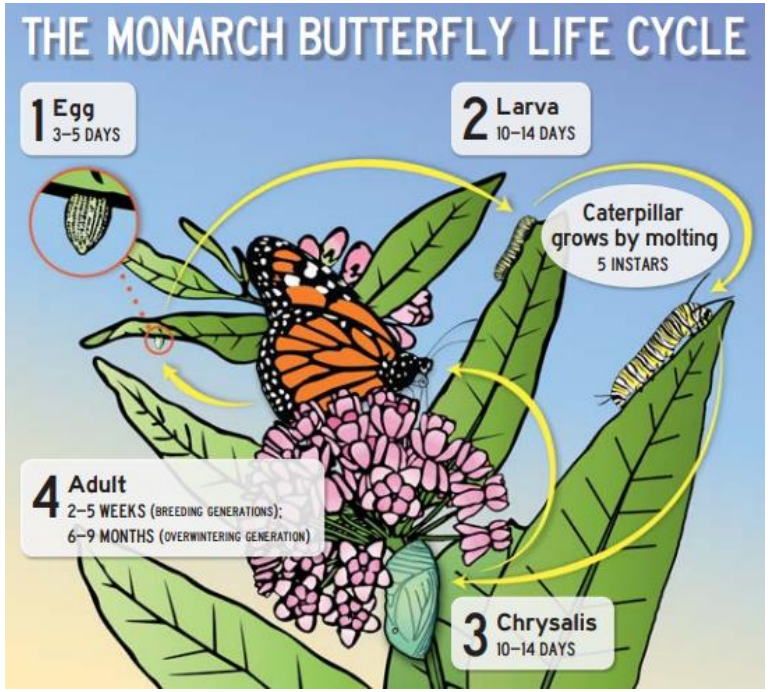
Milkweeds of the Mid-Atlantic



https://xerces.org/publications/fact-sheets/roadside-habitat-for-monarchs-milkweeds-of-mid-atlantic

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Monarch Nectar Plants: Mid-Atlantic

https://xerces.org/publications/plant-lists/monarch-nectar-plants-mid-atlantic

Bloom		Common Name	Scientific Name	Flower Color	Max. Height	Water Needs	Notes
		Forbs			(Feet)	Low, Medium, or High	All species are perennials unless otherwise noted. Monarchs are present April through July and again from late August to November in the Mid-Atlantic.
Summer	1	Common milkweed	*Asclepias syriaca*	Pink	8	M	Monarch caterpillar host plant. Drought tolerant. Considered undesirable in livestock forage.
	2	Joe-pye weed	*Eutrochium fistulosum*	Pink/purple	7	M	Great nectar plant that attracts many pollinator species.
	3	Swamp milkweed	*Asclepias incarnata*	Pink	4	M	Monarch caterpillar host plant.
	4	Wild bergamot	*Monarda fistulosa*	Purple/pink	3	L	Aromatic foliage. Flowers attract butterflies, bees, and hummingbirds.

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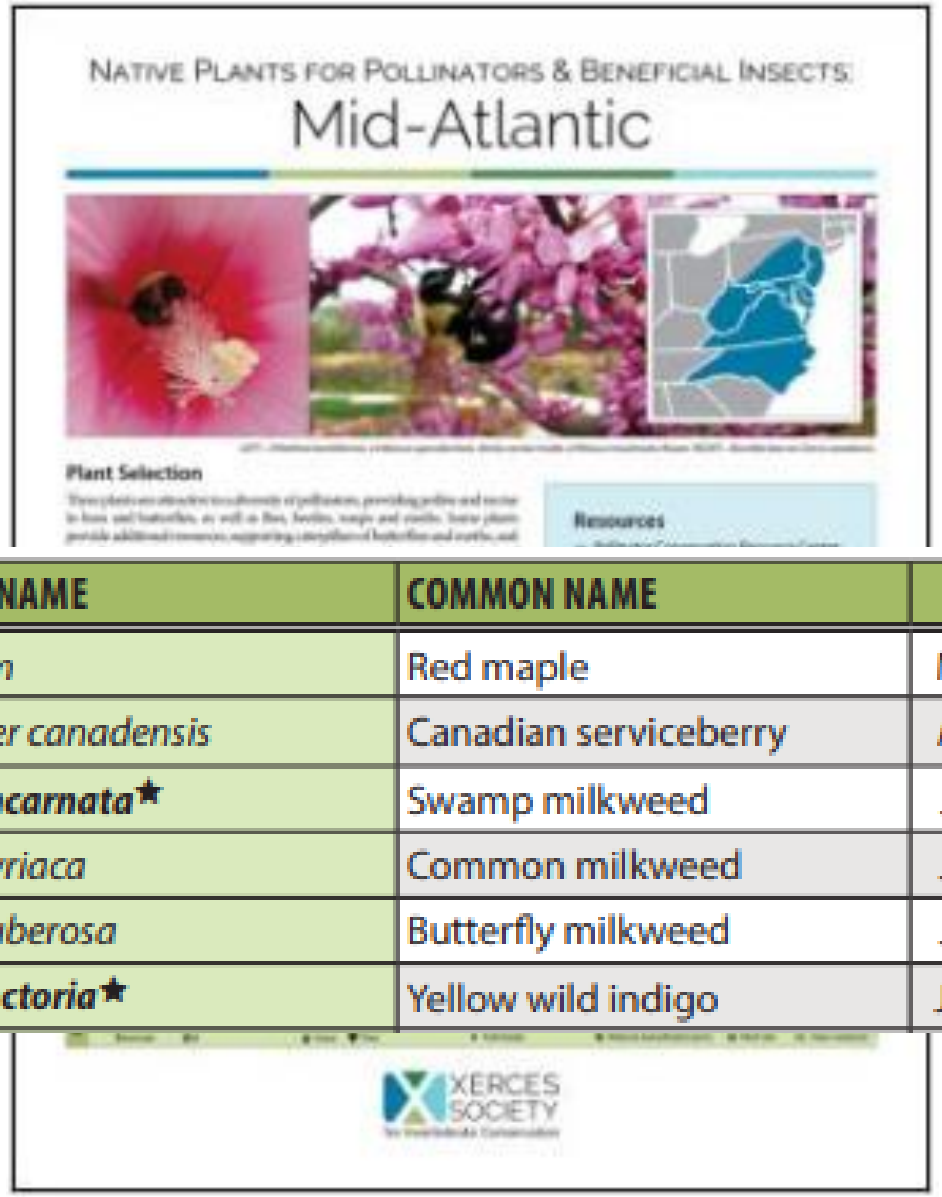
Native Plants for Pollinators & Beneficial Insects:

Mid-Atlantic



https://xerces.org/publications/plant-lists/native-plants-for-pollinators-and-beneficial-insects-mid-atlantic

SCIENTIFIC NAME	COMMON NAME	BLOOM	LIFE	FORM	SUN	SOIL	ADDITIONAL DETAILS ⓘ
Acer rubrum	Red maple	Mar–Apr	P			W	
Amelanchier canadensis	Canadian serviceberry	Apr–May	P			M	
Asclepias incarnata ★	Swamp milkweed	Jun–Sep	P			W	
Asclepias syriaca	Common milkweed	Jun–Aug	P			D–M	
Asclepias tuberosa	Butterfly milkweed	Jun–Aug	P			D	
Baptisia tinctoria ★	Yellow wild indigo	Jun–Aug	P			D	

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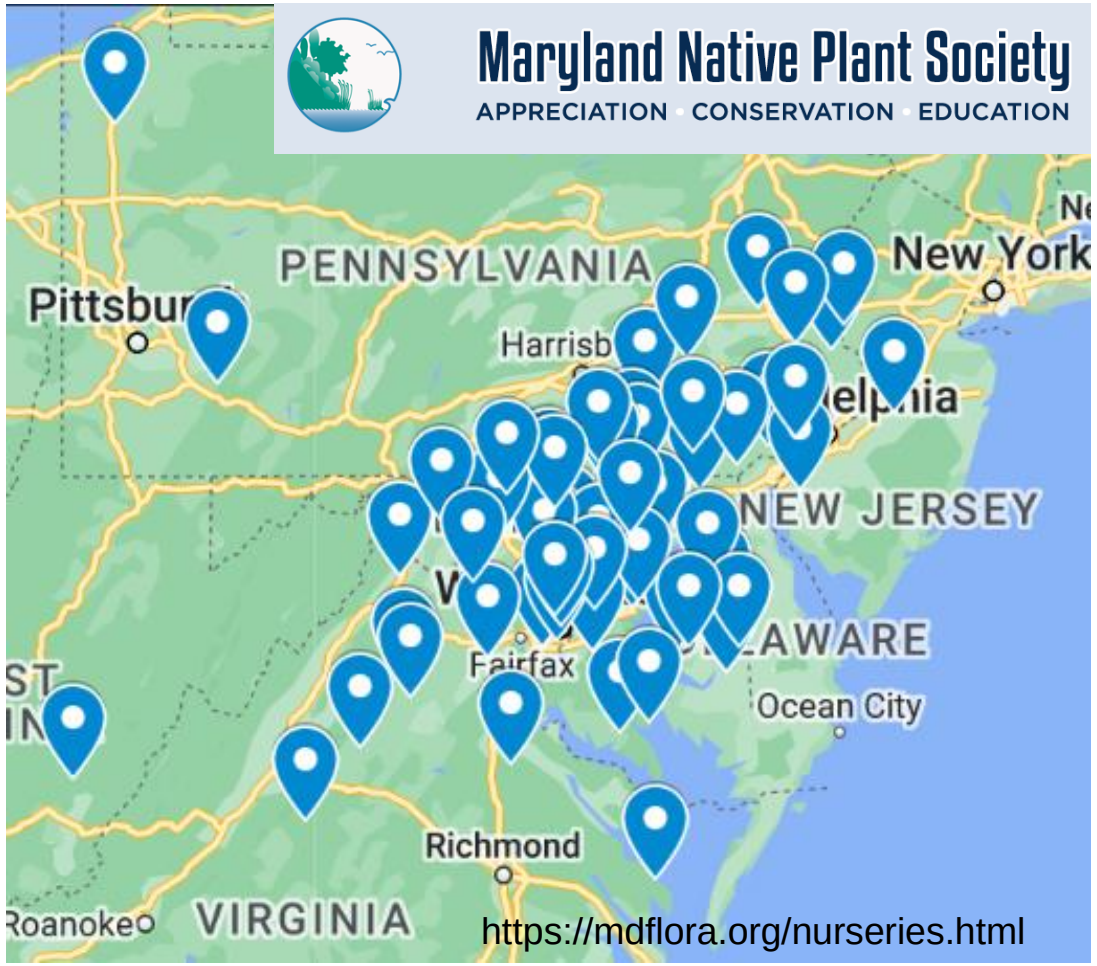
Local Native Plant Sources



Map: Maryland Native Plant Society

Photo: Marlene Smith

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Connect With Us!

Information & registration at:
xerces.org/events/webinars
Watch recordings at:
youtube.com/xercessociety

Information at:
xerces.org/bug-banter
Listen and download from:
buzzsprout.com/2237087
Or wherever you get your podcasts

xerces.org

Make a Difference!

We are a donor-supported nonprofit. The work we do depends on everyone! Make a difference for the invertebrates you love by becoming a Xerces member today!

xerces.org/donate

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Xerces is 501(c)(3) nonprofit and contributions are tax-deductible.

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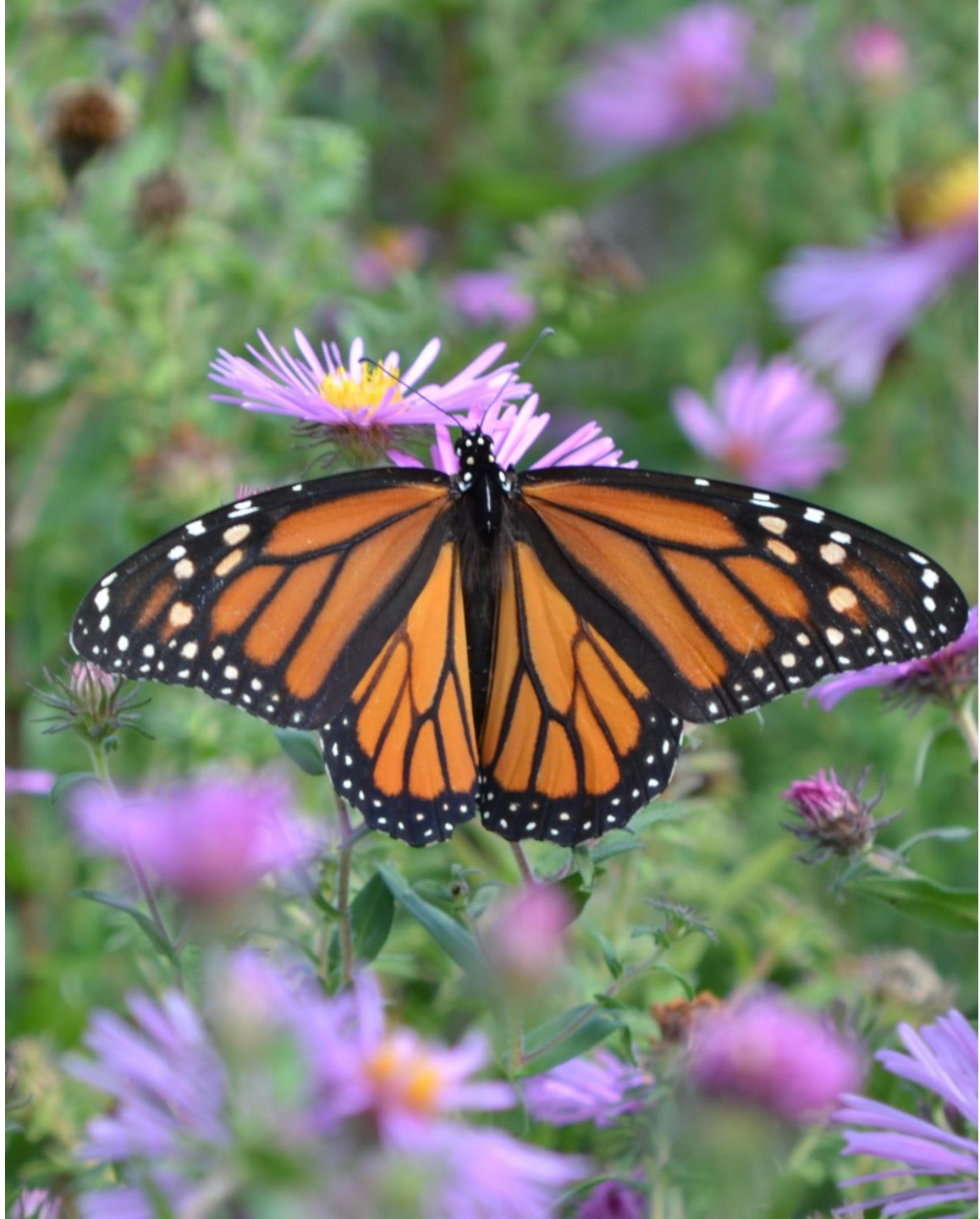

Photo Marlene Smith

Take Away Messages

- Monarchs are AMAZING creatures!
- We are still learning about their migrations and over wintering sites.
- What you do in your space matters!
- Enhancing habitats and reducing pesticides provides direct benefits to your space and are vital in reversing monarch declines.
- You can contribute to monarch knowledge through community science programs.

xerces.org

Thank You to Xerces' Partners

We don't work in isolation—the Xerces family is large and diverse

- Over 17,000 Xerces Society members in 15+ countries.
- Scores of private foundations that provide funding.
- More than 100 scientists at universities around the world.
- Dozens of federal, state, and local agencies.
- Hundreds of farmers and land managers that have worked with us on habitat projects.
- Over 50 companies supporting us.
- Thousands of people who act to protect invertebrates in their neighborhoods.

xerces.org

Questions?

Email monarchs@xerces.org

xerces.org

Photo: Marlene Smith