



MONARCH CONSERVATION GARDENS

Design strategies for prime monarch habitat in the Midwestern home garden

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POPULATION DECLINE



Eastern migratory monarch population has declined by 80% in the last 50 years.

- Climate change
- Pesticide use
- Problems in overwintering grounds (storms, logging, etc.)
- Loss of habitat

850 million milkweeds have been eliminated from the Midwest since the 1990s.

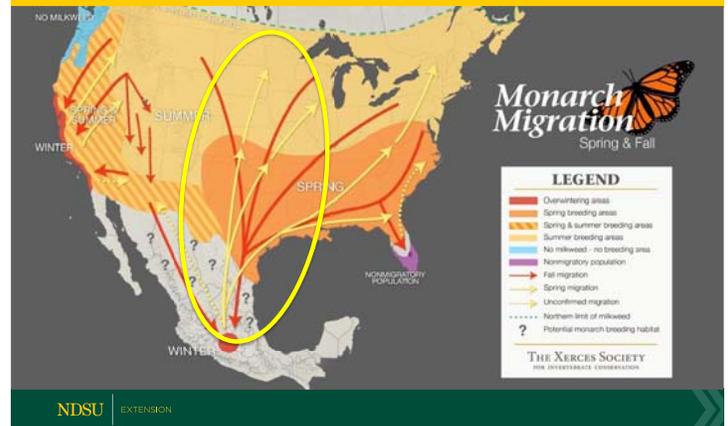
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MIGRATION

It takes 3-4 generations of monarchs to move up the migration range and return to the overwintering site in Mexico each year.

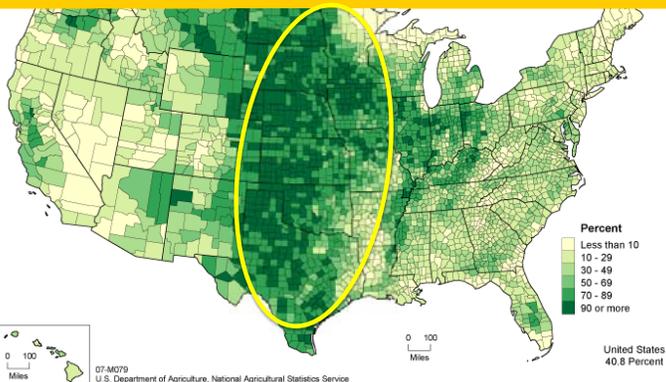
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MIGRATION RANGE



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AGRICULTURE IN MIDWEST



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FRAGMENTED PRAIRIE

Meeting the food needs of a global population demands the continuing conversion of native prairie to prime farmland.

The result of this conversion is increasingly fragmented prairie with an empty matrix that grows larger and larger.

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OUR NEIGHBORHOODS ARE A BARREN DESERT



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FRAGMENTED PRAIRIE CONT.

The home gardener has an opportunity to positively affect monarch populations by filling in the empty matrix with monarch conservation gardens.

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THE MONARCH CONSERVATION GARDEN

The effectiveness of gardens as habitat depends on the garden's ability to perform three functions:



Recruit egg-laying adults



Support larval development



Fuel adult migration

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RECRUIT EGG-LAYING ADULTS

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CREATE VISUAL CUES

Monarchs make decisions about where to forage and lay eggs based on visual cues.

In the garden, visual cues that influence Monarchs include bloom color, plant health, plant configuration, and more!

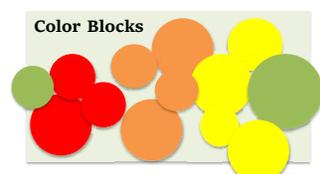


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COLOR

In the garden, bloom color isn't as important as abundance, as monarchs can learn associations between any bloom color and nectar reward.

Use color strategically by installing multiple plants of the same species or cultivar in color blocks to enhance the garden's visual cues.

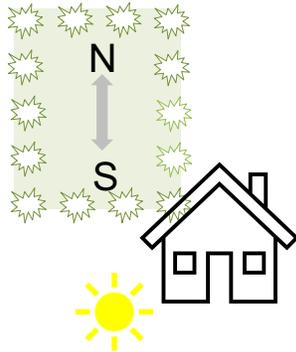


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ORIENTATION

Make sure to install conservation gardens far enough from structures that they remain highly visible and out of the shade.

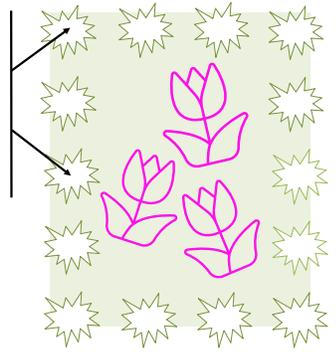
A north-south rectangular orientation has the greatest chance of being detected by monarchs as they move in the same direction during their migration.



DESIGN: Layout

Plant milkweeds in a one-meter border surrounding a patch of nectar-producing flowers. Monarchs are more likely to see milkweed plants on the perimeter of the garden than within mixed plots.

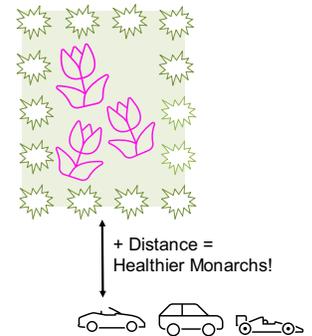
Adult butterflies can easily find adjacent nectar sources when they emerge from their chrysalis.



SUPPORT LARVAL DEVELOPMENT

DESIGN: Location

- Monarchs do not detect sodium or metals in host plants
- Larvae at risk of sodium toxicity when feeding on roadside milkweeds
- Establish gardens away from roadsides
- The farther away from busy roads, the healthier the plants and larvae will be



MILKWEED



Milkweed (*Asclepias spp.*) is a monarch host plant because it supports the life cycle from egg to pupa.

Monarch larvae are specialist herbivores that feed exclusively on milkweed leaves to make themselves toxic to predators.

COMMON MILKWEED



Asclepias syriaca

- Pale pink to mauve
- Nodding umbel
- Broadly oval leaves
- Spreads aggressively by runners AND by seed
- Garden thug in small environments

MILKWEED SELECTION

What is there besides common milkweed?



Butterfly milkweed
(*Asclepias tuberosa*)

Prairie milkweed
(*Asclepias sullivantii*)

Showy milkweed
(*Asclepias speciosa*)

Swamp milkweed
(*Asclepias incarnata*)

SWAMP MILKWEED

- More attractive
- Pink, magenta, red
- Long narrow leaves
- Found along prairie potholes, wet ditches
- Grown in irrigated home garden, low spots
- No rhizomes!
- Deep taproot



Asclepias incarnata

BUTTERFLY WEED



Asclepias tuberosa

- Orange flowers
- Best in well-drained soils
- Well-behaved in a garden setting
- Taproot
- Heat and drought-tolerant
- More eggs laid on swamp than butterfly

FUEL MIGRATION

ELEMENTS: WATER



Migration is thirsty work!

Add a water source near nectar flowers; proximity reduces energy spent searching for water.

In the home garden, this can take the form of a small pond, bird bath, or saucer of water

ELEMENTS: SHELTER



Adult butterflies use trees for shelter during the night and rest periods during long migratory flights. Larvae attach their chrysalises to stable structures.

Consider adding elements of shelter to the monarch garden such as sturdy trellises, a bench, or a woody shrub.

NECTAR SOURCES



- Unlike the larvae, adult monarchs do not feed on milkweed leaves. They visit flowers to sip nectar.
- Monarchs can travel between 50 and 100 miles per day.
- Sugar = fuel for long migratory flights.

NECTAR SOURCE SELECTION

- Monarchs begin arriving in ND in late June.
- Choose multiple species of nectar sources to bloom during the entire migratory season.
- Milkweeds also provide nectar for adults.
- Butterfly milkweed (*Asclepias tuberosa*) is one of the earlier-blooming native species.

JULY

Wild Bergamot



Monarda fistulosa

Black-eyed Susan



Rudbeckia spp. (*R. hirta* is native)

JULY CONT.

Purple Coneflower



Echinacea pallida

Joe Pye Weed



Eutrochium maculatum

AUGUST

Meadow Blazingstar



Liatris ligulistylis

Smooth Blue Aster



Symphotrichum laeve

SEPTEMBER

New England Aster



Symphotrichum novae-angliae

Showy Goldenrod



Solidago speciosa

CONCLUSION: THREE CRITICAL CONCEPTS

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1. STRATEGY

- Use visual cues (color, orientation, and design) to create optimal monarch habitat in the home garden.
- Monarch conservation gardens are customizable to their site needs.
- Even small spaces can attract and support large populations.

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2. IMPACT

- The goal of monarch conservation is to fill in the empty matrix with suitable prairie habitat.
- The home gardener can make a huge positive impact with seemingly little space and effort.

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3. EDUCATION

- Follow NDSU Extension Pollinator Conservation on Facebook to keep up with pollinator news and projects.
- Watch for upcoming monarch and milkweed publications from NDSU Extension.

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