

# Creating a garden for **monarchs** and their friends

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Town of Montreal West



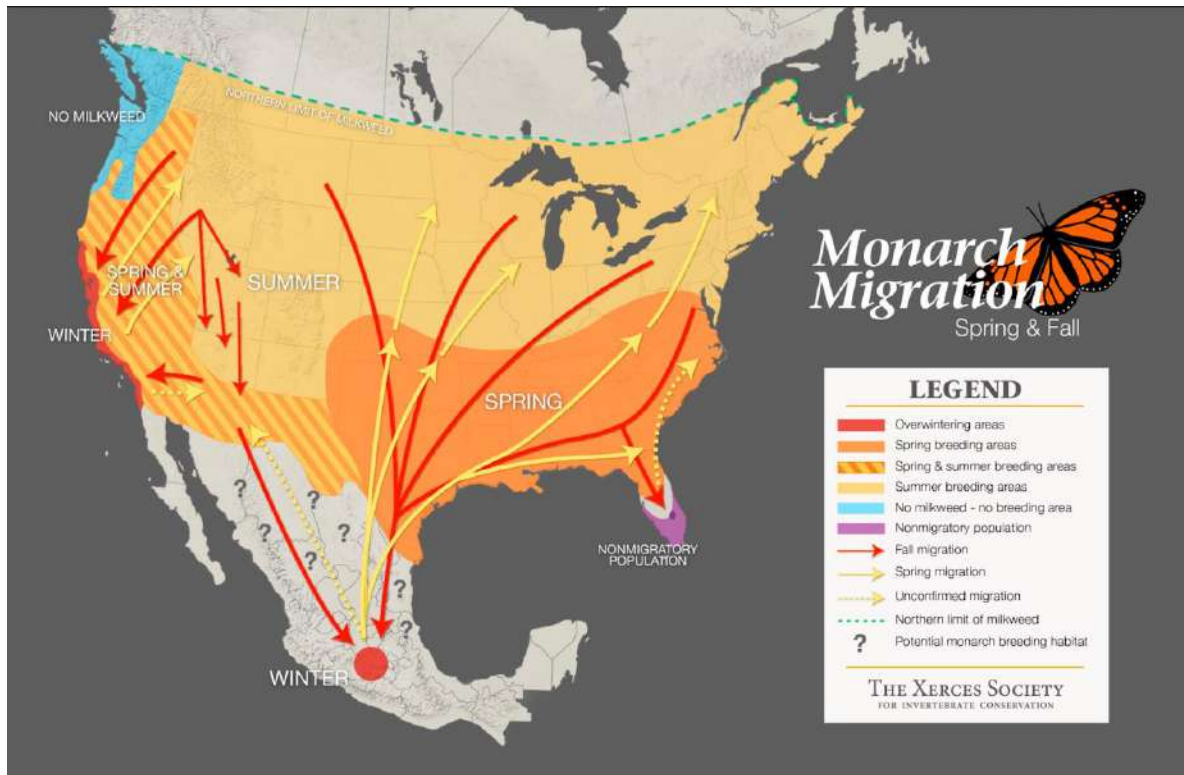
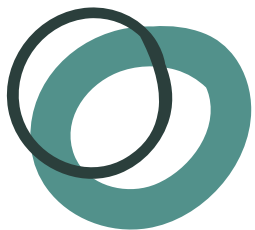
# What is the monarch butterfly?



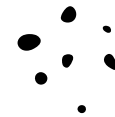
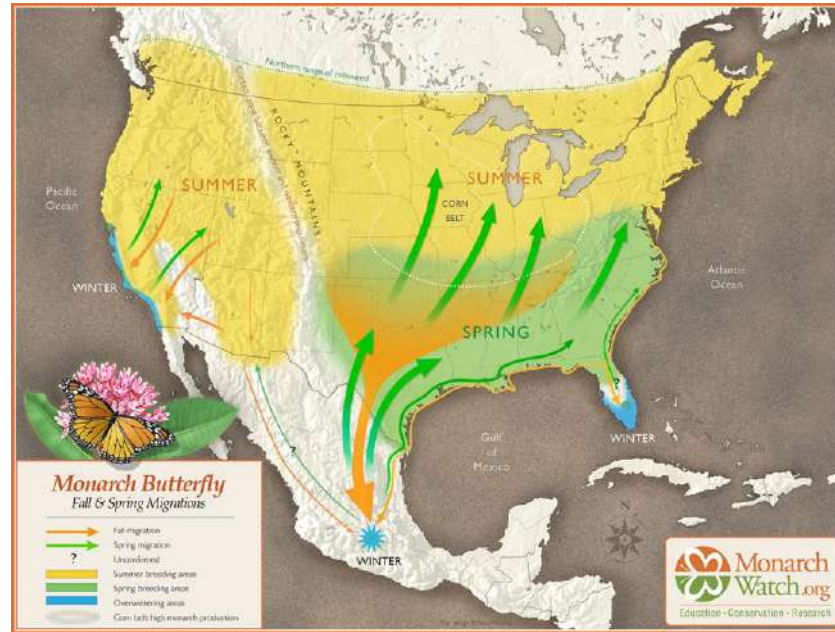
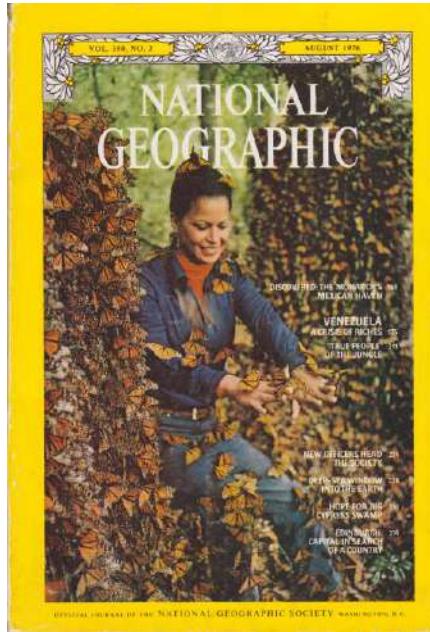
The **Monarch** is one of the most iconic species of butterfly in the world with its bright orange, black and white markings



# Monarch migration across North America

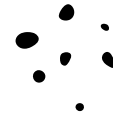
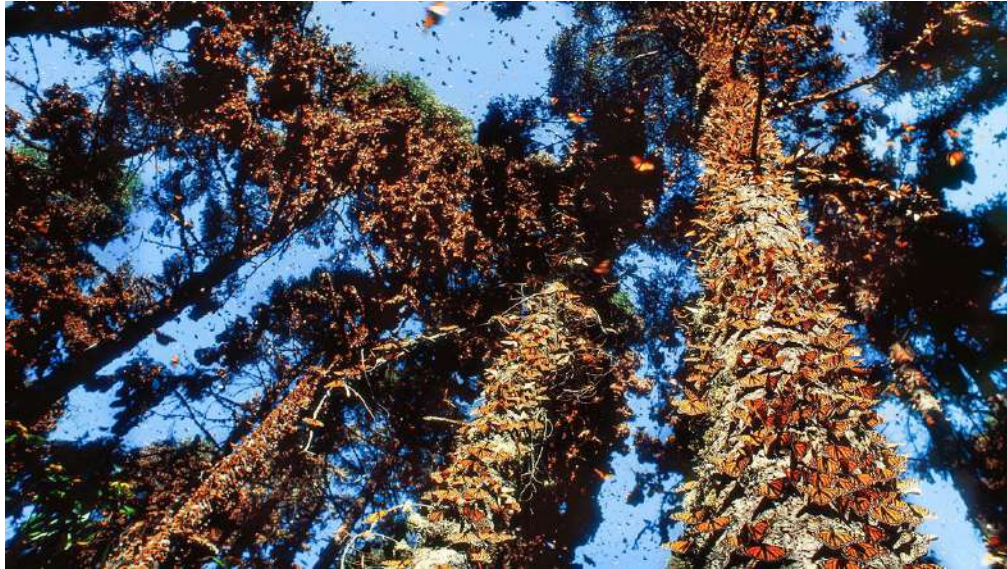
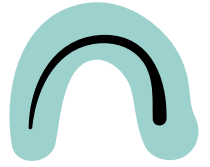
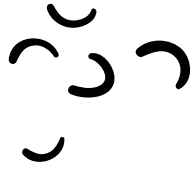


# The role of citizen science and the monarch's overwintering sites

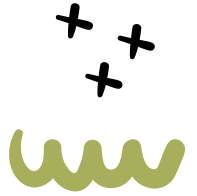




# Monarchs overwintering in highlands of Central Mexico



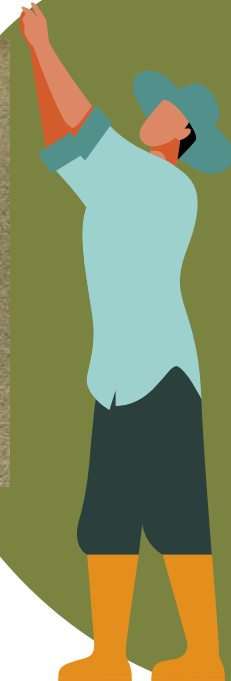
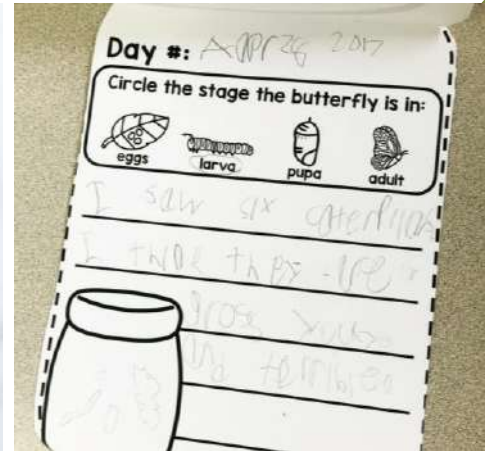
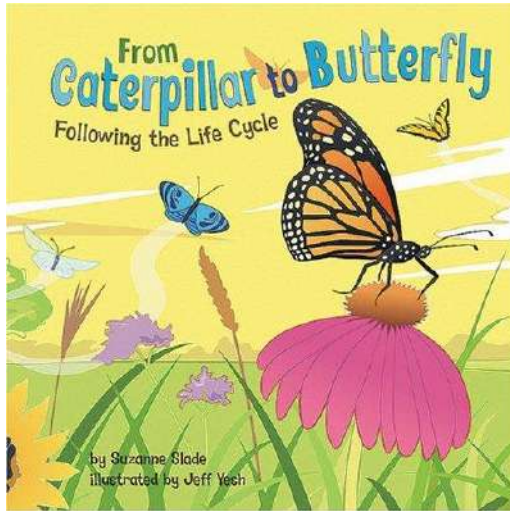
# Monarchs and the changing environment



The **absence or presence** of the monarch can tell us a lot about our changing environment

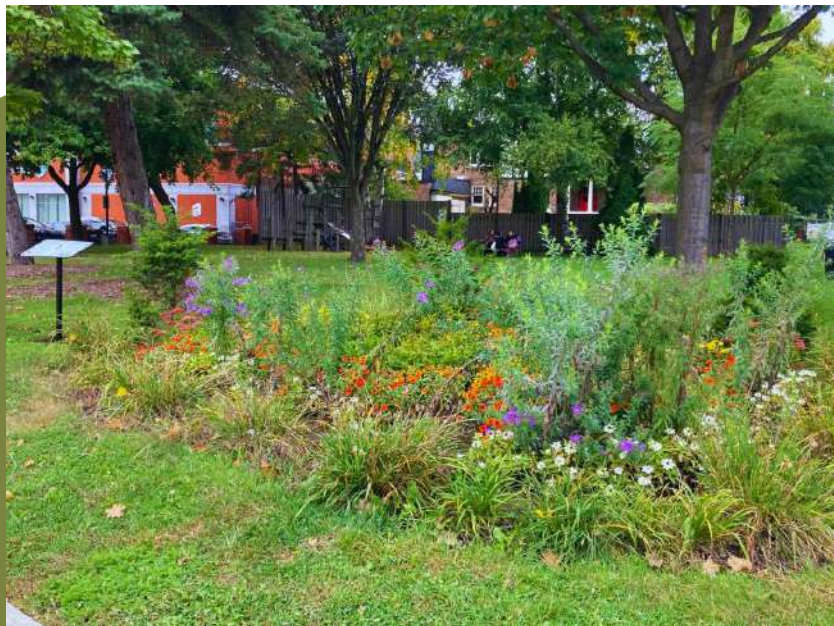


# Monarch butterfly education begins early on





# And this education continues...



## JARDIN ÉDUCATIF DES PAPILLONS MONARQUES DE MONTRÉAL-OUEST



### Qu'est-ce que le papillon monarque ?

Le monarque est l'une des espèces de papillons les plus emblématiques au monde. Leur habitat s'étend du sud du Canada jusqu'au Mexique, où ils vivent pendant l'hiver canadien. Au cours des 20 dernières années, la population de monarques a diminué de plus de 90 %.

### Comment le jardin aide-t-il l'espèce?

Le jardin abritera les papillons monarques tout au long de leur cycle de vie. Le jardin disposera d'une variété de plantes, y compris des asclépiades et des plantes à nectar telles que l'asclépiade papillon et l'aster de Nouvelle-Angleterre, qui sont toutes essentielles au cycle de vie du monarque.



Pour en savoir plus sur la façon dont vous pouvez aider le papillon monarque, scannez ce code QR !



## MONTREAL WEST MONARCH BUTTERFLY EDUCATIONAL GARDEN



### What is the Monarch Butterfly?

The Monarch is one of the most iconic butterfly species in the world. Their habitat ranges from southern Canada all the way to Mexico, where they live during the Canadian winter. In the last 20 years, the Monarch population has declined by over 90%.

### How is the garden helping the species?

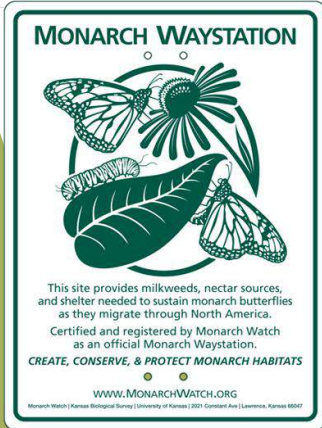
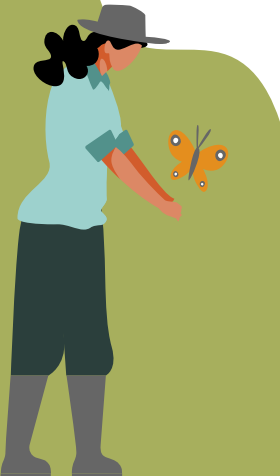
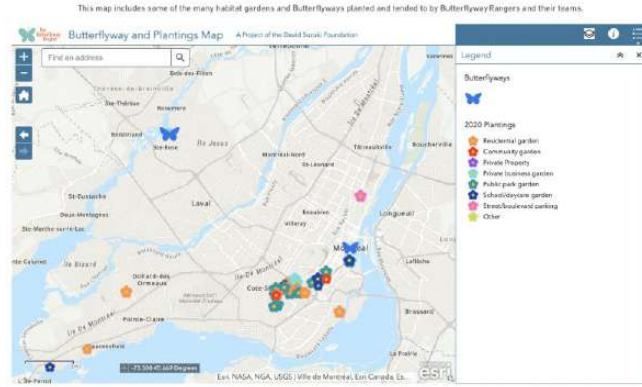
The garden will provide shelter for Monarch butterflies throughout all stages of life. The garden will be home to a variety of plants, including milkweed and nectar plants such as the Butterfly Milkweed and the New England Aster, all of which are essential to the life cycle of the Monarch.

To learn more about how you can help the Monarch butterfly, scan this QR code!





# Monarch butterflies have become a conservation icon

# A thriving and growing interest within our communities



ENVIRONMENT

## Quebec communities help endangered monarchs with butterfly-friendly plants



By **Brayden Jagger Haines** • Global News

Posted July 25, 2022 1:22 pm - Updated July 25, 2022 7:22 pm

Global News, 2022

<https://globalnews.ca/news/9013357/off-island-montreal-help-endangered-monarch-butterfly-plants/>

The screenshot shows the website for the National Flight of the Monarch Day event. At the top, there is a navigation menu with options like Home, About, Programs, and more. Below the navigation is a large banner image of a monarch butterfly on a yellow flower. The main content area features the title "NATIONAL FLIGHT OF THE MONARCH DAY" and a list of activities including "Tasting & Learning with Insect-Friendly Plants", "Flight of the Monarch Day", and "Insect-Friendly Plants". There is also a "BACK TO LEARNING" link and a logo for the "Monarch Teacher Network of Canada".

The screenshot shows the navigation bar for the Eastern Townships website. It includes the text "EASTERN TOWNSHIPS" and a series of menu items: "THE TOWNSHIPS", "TASTE THE TOWNSHIPS", "WEEKEND AND TRIP IDEAS", "THINGS TO DO", "WHERE TO STAY", and "PACKAGES". There are also icons for a person, a magnifying glass, and a hamburger menu.



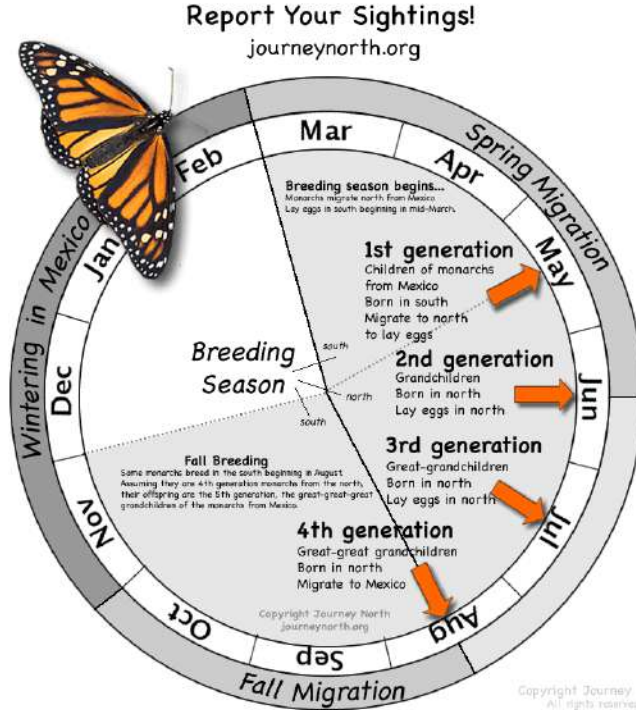
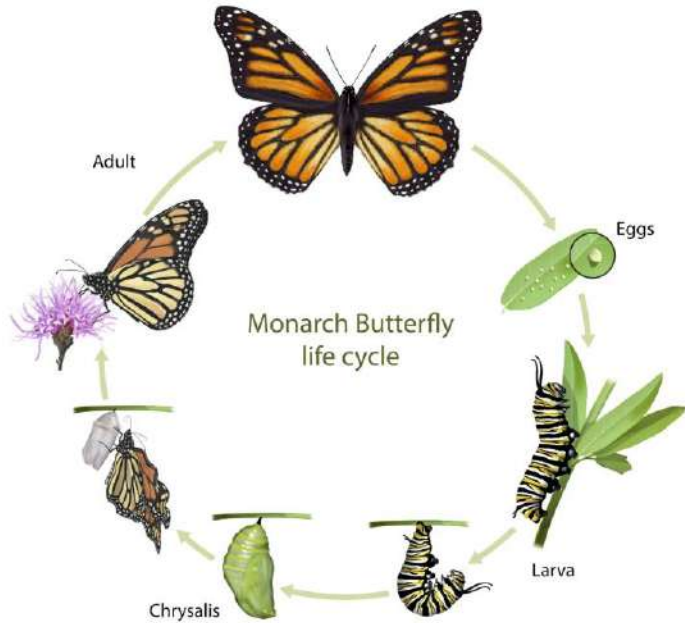
### MONARCH BUTTERFLY FESTIVAL

THIS EVENT IS OVER.  
SEPTEMBER 2021 (DATE TO BE CONFIRMED)

During this free event featuring monarch butterflies, visitors will discover fascinating insects and plants. Several activities on the menu: free tasting of insects, interpretive booths on insects, animated pathways, monarch butterflies in flight, and more! You can sponsor your monarch butterfly and thus actively participate in the flight. Your gesture will have several beneficial effects. For more details on the event and program, visit our web site.



# A monarch butterfly's life cycle





# Monarchs are host plant specialists



Common Milkweed  
*Asclepias syriaca*



Swamp Milkweed  
*Asclepias incarnata*

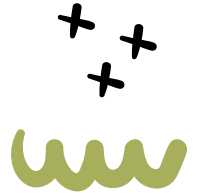


Butterfly Milkweed  
*Asclepias tuberosa*





Milkweed contains a network of **latex canals**, which contains toxic sap called **cardenolides**

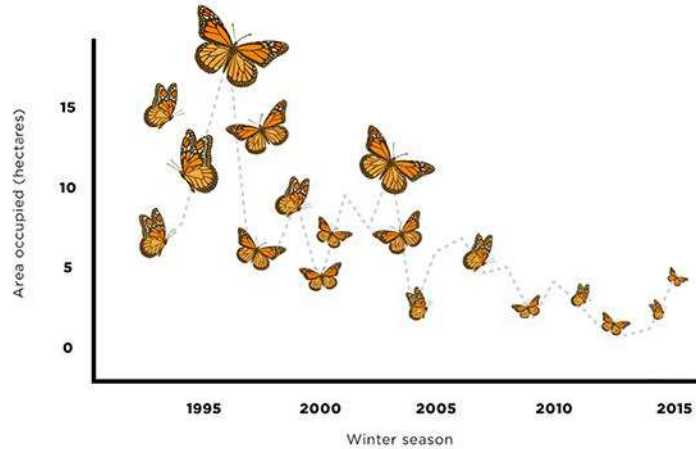


Monarchs have adapted to find a way around the milkweed's defenses

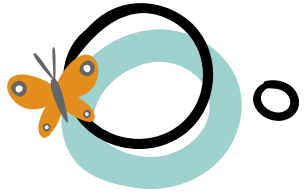




# The monarch population is declining



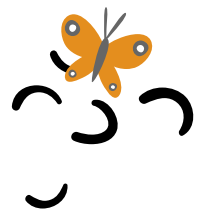




# Monarch populations are counted at overwintering sites







## Orange

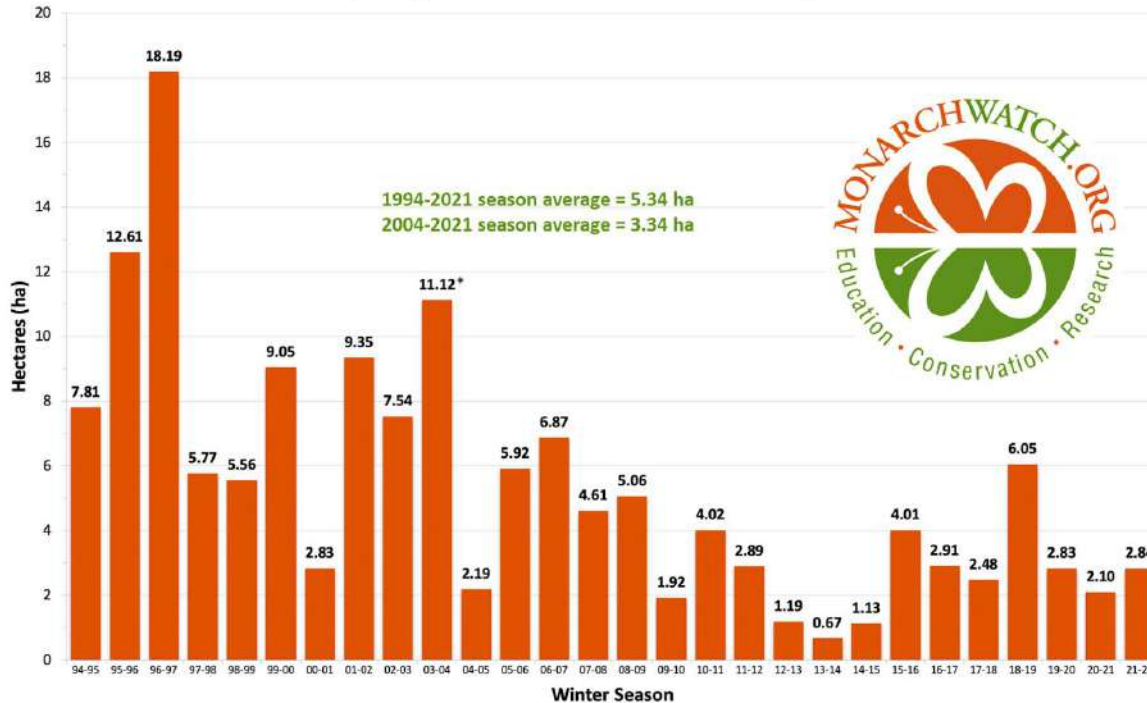
= Overwintering monarchs on trees



# Monarch population has declined over the past decades



Total Area Occupied by Monarch Colonies at Overwintering Sites in Mexico

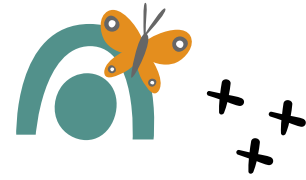


1994-2021 season average = 5.34 ha  
2004-2021 season average = 3.34 ha



1994-2003 data collected by personnel of the Monarch Butterfly Biosphere Reserve (MBBR) of the National Commission of Natural Protected Areas (CONANP) in Mexico. 2004-2021 data collected by World Wildlife Fund Mexico in collaboration with the National Commission of Natural Protected Areas (CONANP), the National Autonomous University of Mexico (UNAM), and the MBBR. \* Represents colony sizes measured in November of 2003 before the colonies consolidated. Measures obtained in January 2004 indicated the population was much smaller, possibly 8-9 hectares. CT

# Why are monarch populations declining?



Logging of overwintering grounds



Loss of milkweed to monocultural agriculture





# Why are monarch populations declining?



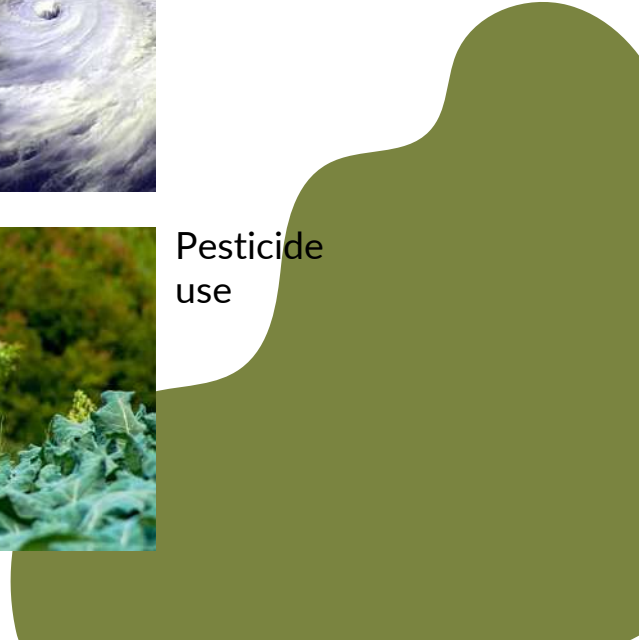
Loss of habitat due to urbanization



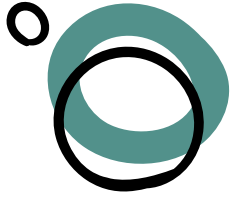
Climate change



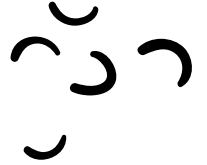
Pesticide use







# Planting milkweed is key to the North American Monarch Conservation Plan



COMMISSION FOR ENVIRONMENTAL COOPERATION

Publication

An estimated **1.8 billion** additional milkweed needed!

About Topics Goals Get involved DEM Tools and Resources Publications Media Newsletter Events

Home Publications North American Monarch Conservation Plan



## North American Monarch Conservation Plan

June 2, 2008 51 pages

# 26 in Top Publications

This plan provides an updated account of the species and its current situation, identifies the main risk factors affecting it and its habitat throughout the flyway and summarizes the current conservation actions taken in each country. Against this background, it offers a list of key transnational collaborative conservation actions, priorities and targets to be considered for adoption by the three countries.

### Additional Information

Document Type: Project publication  
Theme: Climate Change, Ecosystems  
Language: Spanish, French

DOWNLOAD BACK



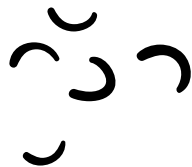
# Get your garden recognized!



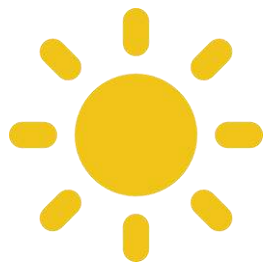
## Monarch Waystation Program



*Create, Conserve, & Protect  
Monarch Habitats*  
monarchwatch.org



# The Monarch Waystation certification guidelines:



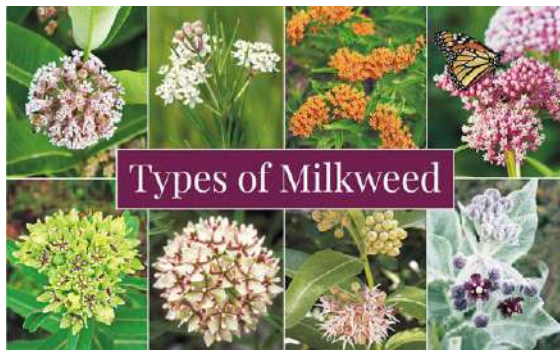
1. Full sun



3. Nectar sources



4. Plants not too far apart



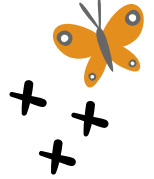
2. Two or more types of milkweed







# Research by Baker and Potter



ORIGINAL RESEARCH article

Front. Ecol. Evol., 05 December 2019

Sec. Conservation and Restoration Ecology

Volume 7 - 2019 | <https://doi.org/10.3389/fevo.2019.00474>

This article is part of the Research Topic

North American Monarch Butterfly Ecology and Conservation

[View all 35 Articles >](#)

## Configuration and Location of Small Urban Gardens Affect Colonization by Monarch Butterflies



Adam M. Baker and



Daniel A. Potter\*

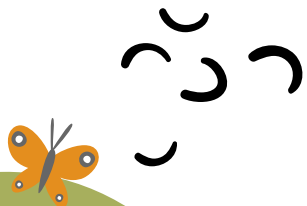
Department of Entomology, University of Kentucky, Lexington, KY, United States

Ecological theory predicts that specialist insect herbivores are more likely to locate and colonize host plants growing in relatively sparse or pure stands compared to host plants growing amongst diverse non-host vegetation. We tested the hypothesis that increasing the apparency and accessibility of milkweed (*Asclepias*

1. Do monarchs use small gardens?
2. What garden characteristics promote its use?
3. Can we improve small gardens?







# How was the research conducted?



## Garden characteristics

- Milkweed density
- Nectar plant density
- Size of garden
- Plant spacing

## Landscape characteristics

- % of hardscape
- Number of structures
- Proximity to structures
- Accessibility (for monarchs)



Some gardens were structured



Some gardens were non-structured

Some gardens were surrounded by hardscape



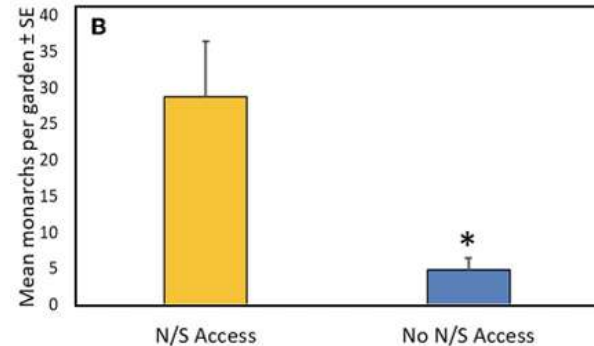
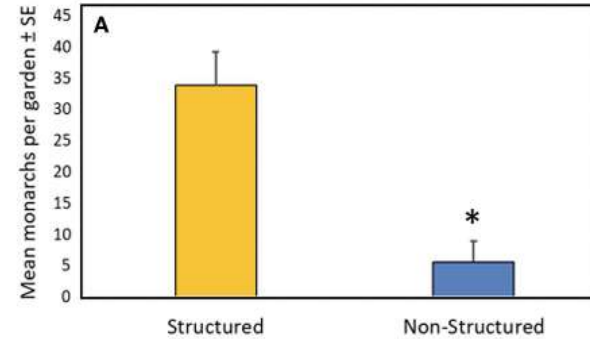
Others were in more open areas



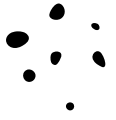


# What did the researchers find?

1. Yes, monarchs use small gardens!
2. Structured gardens, with host plants set off by mulch (also done in Montreal West), had more monarchs
3. Gardens with a direct north-south access had more monarchs
4. Isolated plants are more attractive to monarchs than if clustered



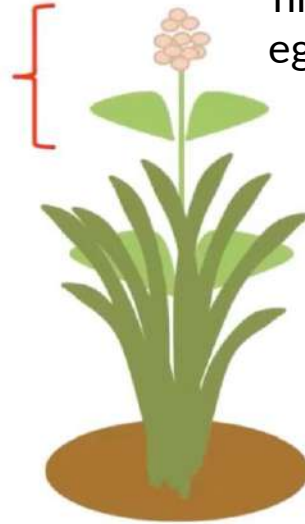
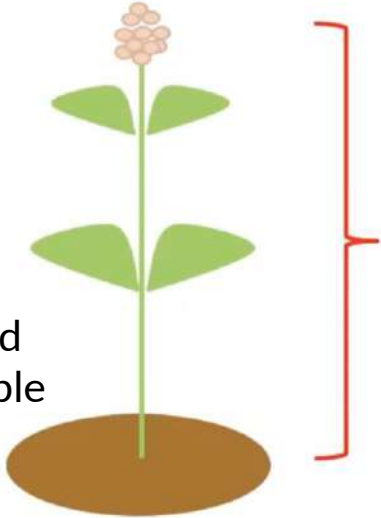
# Isolated vs. Clustered milkweeds



Harder to find and lay eggs on this plant

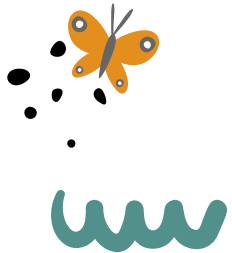
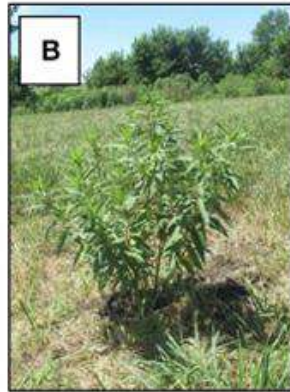
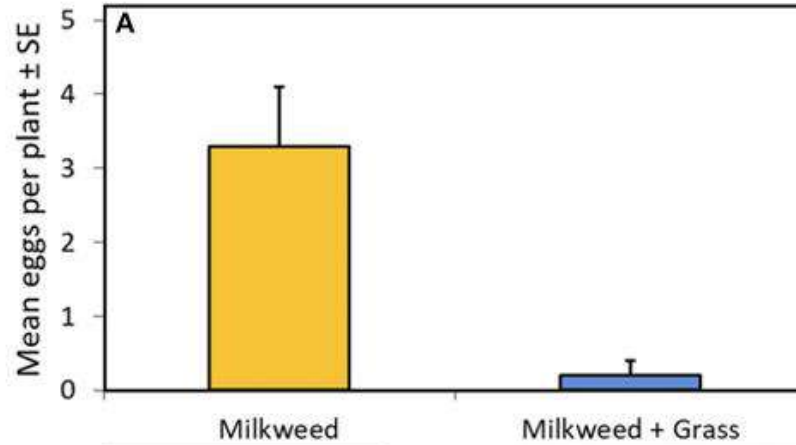
Easy to find and accessible plant

Vs.

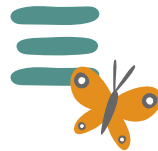
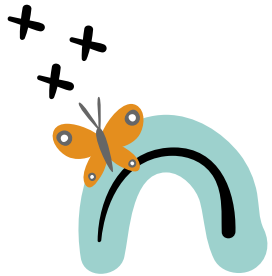




# What did they find?

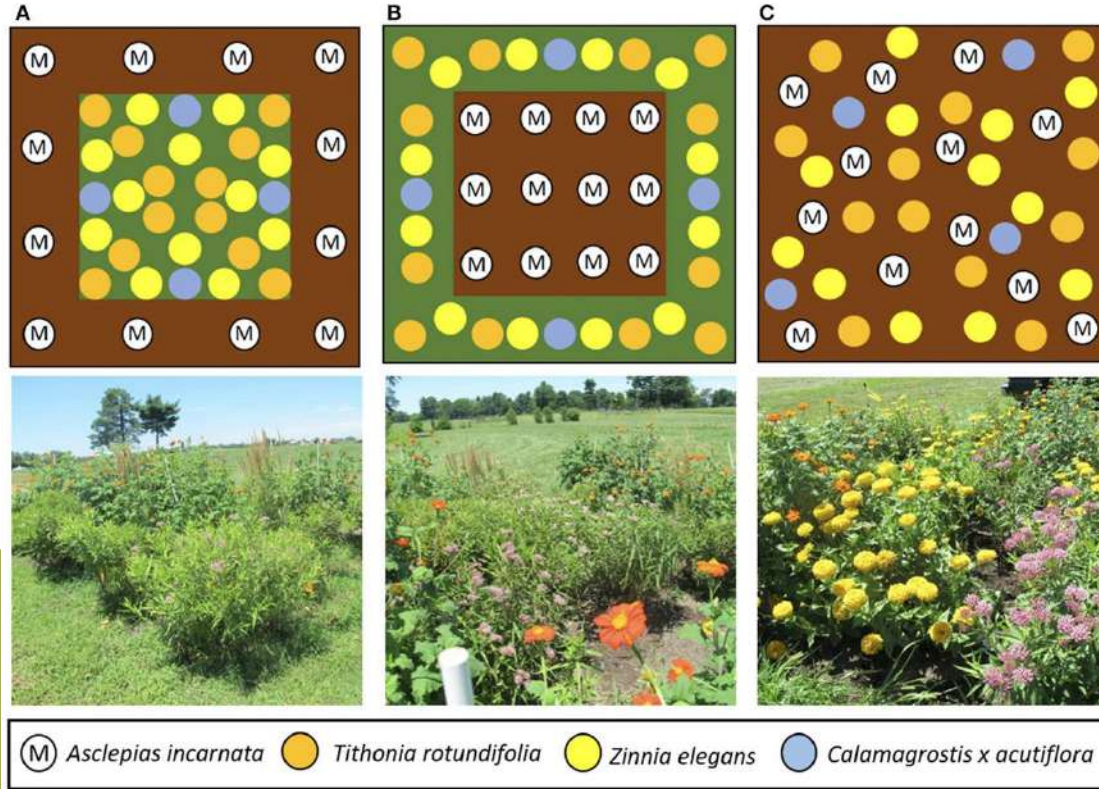


# Varying garden designs



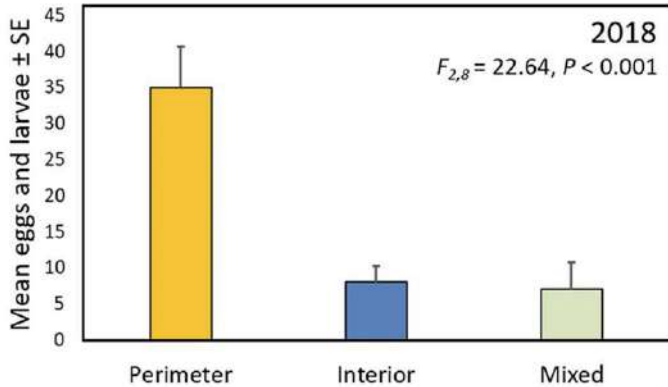
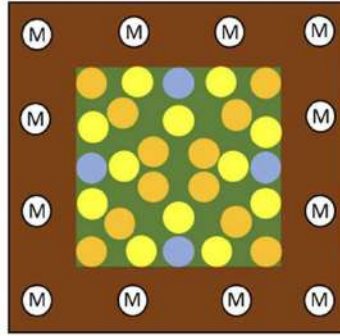
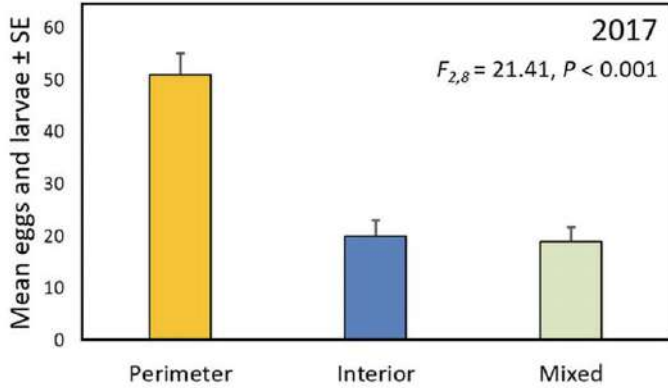
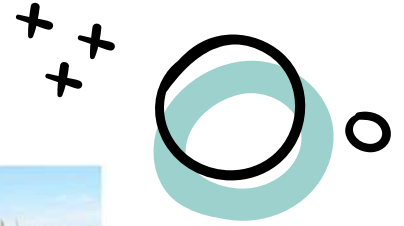


# Researchers used experimental gardens





# What did they find?



# Research recap for your own garden



01

Yes, monarchs are using small gardens

02

Plant spacing can promote monarch colonization

03

Make gardens as open and accessible as possible

04

Plant milkweed on garden's perimeter



# Which milkweeds should we use?



Journal of Insect Conservation (2018) 22:405–418  
<https://doi.org/10.1007/s10841-018-0069-5>

ORIGINAL PAPER

Colonization and usage of eight milkweed (*Asclepias*) species by monarch butterflies and bees in urban garden settings

Adam M. Baker<sup>1</sup> · Daniel A. Potter<sup>1</sup>



1. Are all these species equally attractive to the egg-laying mothers?
2. Are all of them equally suitable as a food source for the caterpillars?
3. How do they behave in a garden setting? Will they be big and invasive?
4. How do they support other pollinator species, like bees?



# Researchers used these 8 milkweed species



*A. tuberosa*



*A. syriaca*



*A. incarnata*



*A. fascicularis*



*A. viridis*



*A. latifolia*



*A. verticillata*



*A. speciosa*



# What did they find?



*A. incarnata*  
Swamp  
milkweed



*A. speciosa*  
Showy  
milkweed



*A. syriaca*  
Common  
milkweed



*A. tuberosa*  
Butterfly  
milkweed



*A. incarnata*  
Swamp  
milkweed

Some species  
are more  
“well-behaved”  
than others



<i>Asclepias</i> spp.	Monarch larvae + eggs <sup>1</sup>	
	2016	2017
<i>A. fascicularis</i>	3.0 ± 0.7 <sup>b</sup>	6.6 ± 1.1 <sup>ab</sup>
<i>A. incarnata</i>	15.2 ± 3.0 <sup>a</sup>	7.8 ± 0.8 <sup>ab</sup>
<i>A. latifolia</i>	1.0 ± 0.4 <sup>c</sup>	1.4 ± 0.07 <sup>cd</sup>
<i>A. speciosa</i>	11.2 ± 1.7 <sup>a</sup>	16.8 ± 6.3 <sup>a</sup>
<i>A. syriaca</i>	8.0 ± 0.8 <sup>a</sup>	12.6 ± 3.4 <sup>a</sup>
<i>A. tuberosa</i>	2.0 ± 1.3 <sup>bc</sup>	5.4 ± 1.7 <sup>b</sup>
<i>A. verticillata</i>	1.2 ± 0.6 <sup>c</sup>	0.0 ± 0.0 <sup>d</sup>
<i>A. viridis</i>	1.0 ± 0.3 <sup>c</sup>	1.4 ± 0.5 <sup>c</sup>

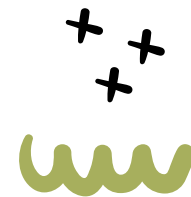
# Milkweed isn't just for monarchs!







# Bees also like milkweed!



Common milkweed



Swamp milkweed



Butterfly milkweed



Whorled milkweed

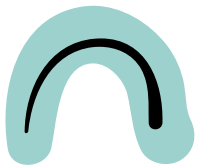


Showy milkweed

# Recap on milkweeds for your garden

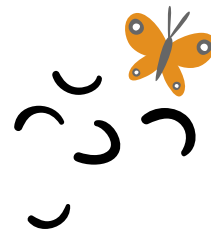
1. Tall, broadleaved milkweeds were the most attractive for recruiting monarchs
2. All 8 studied species were nutritionally suitable for monarchs
3. Some milkweeds can be more tailored for small gardens
4. Bees love milkweed because it's also a great source of nectar

*Make sure to plant multiple species of milkweed in your garden because they are going to be offering different services*





# Montreal Insectarium horticulturist suggestions:



## 1 • Common milkweed

*Asclepias syriaca*

Native perennial in Québec  
**Monarch host plant**

If you garden in pots, choose **bloodflower** (*Asclepias curassavica*), a tropical milkweed, instead. Treat this species the way you would an annual, or grow it as an indoor winter plant, after cutting it back.

## 2 • Spotted Joe Pye weed

*Eutrochium maculatum*

Native perennial in Québec

## 3 • Canada goldenrod

*Solidago canadensis*

Native perennial in Québec

## 4 • Meadow blazing-star

*Liatris ligulistylis*

Perennial, native in the  
Canadian Prairies

## 5 • Butterfly bush

*Buddleja davidii*

Shrub, not very hardy in  
the Montréal region

Apply mulch in the fall to protect the roots or grow this plant as an annual.

## 6 • Mexican sunflower

*Tithonia rotundifolia*

Annual

## 7 • Garden heliotrope

*Heliotropium arborescens*

Tropical shrub

Grow this common species as an annual.

## 8 • Common yarrow

*Achillea millefolium*

Native perennial

## 9 • Lantana

*Lantana camara*

Tropical shrub

Grow this species as an annual or as a houseplant during winter.

## 10 • New England aster

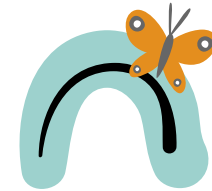
*Symphotrichum novae-angliae*

Native perennial in Québec





# What did we use at Montreal West?



New England Aster



Common Yarrow



Eastern Red Columbine



Wild Bergamot



Anise Hyssop



Mountain Mint



Common Milkweed



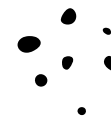
Swamp Milkweed




Butterfly Milkweed



Butterfly Bush



# Other types of plants...



## Trees and shrubs

Common name	Latin name	Nectar or Host	Annual, Biennial or Perennial	Hardiness zone	Blooming period
Butterfly bush	<i>Buddleja davidi</i>	Nectar	Non-hardy perennial often used as an annual		July to September
Paper birch	<i>Betula papyrifera</i>	Host	Perennial	2	
Crabapple (resistant to scab)	<i>Malus</i> cv.	Nectar and Host	Perennial	3 to 5 depending on cultivar	May
Pin cherry tree	<i>Prunus pensylvanica</i>	Host	Perennial	2	
Common lilac	<i>Syringa vulgaris</i>	Nectar	Perennial	3	May to June
Elm	<i>Ulmus</i> spp.	Host	Perennial	2 to 5 depending on species	

## Herbs and aromatic plants

Common name	Latin name	Nectar or Host	Annual, Biennial or Perennial	Hardiness zone	Blooming period
Dill	<i>Anethum graveolens</i>	Host	Annual		
Fennel	<i>Foeniculum vulgare</i>	Host	Annual		
Hyssop	<i>Hyssopus officinalis</i>	Nectar	Perennial	4	July to September
Parsley	<i>Parsifolium crispum</i>	Host	Annual and biennial		

## Climbing plants

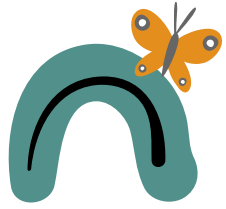
Common name	Latin name	Nectar or Host	Annual, Biennial or Perennial	Hardiness zone	Blooming period
Morning glory	<i>Ipomoea tricolor</i>	Nectar	Annual		June to September
Hyacinth bean	<i>Labiab purpureus</i>	Nectar and Host	Non-hardy perennial used as an annual		August to October
Perennial pea	<i>Lathyrus latifolius</i>	Nectar	Non-hardy perennial used as an annual		July to September
Black-eyed Susan	<i>Thunbergia alata</i>	Nectar	Non-hardy perennial used as an annual		June to September

## Herbaceous plants

Common name	Latin name	Nectar or Host	Annual, Biennial or Perennial	Hardiness zone	Blooming period
Common yarrow	<i>Achillea millefolium</i>	Nectar	Perennial	2 to 3	June to September
Dyer's chamomile	<i>Achillea tinctoria</i>	Nectar	Perennial	3	May to July
Bloodflower	<i>Asclepias curassavica</i>	Nectar and Host	Non-hardy perennial used as an annual		July to September
Swamp milkweed	<i>Asclepias incarnata</i>	Nectar and Host	Perennial	3	July to August
Common milkweed	<i>Asclepias syriaca</i>	Nectar and Host	Perennial	3	July to August
Swan river daisy	<i>Brachycome ibridifolia</i>	Nectar	Annual		July to September
Perisian knapweed	<i>Centaura deisbata</i>	Host	Perennial	3 to 4	July to September
Spider flower	<i>Cleome hassleriana</i>	Nectar and Host	Annual		July to September
Tickseed	<i>Coneopsis grandiflora</i>	Nectar	Perennial	3 to 4	July to August
Common cosmos	<i>Cosmos bipinnatus</i>	Nectar	Annual		July to October
Dahlia	<i>Dahlia</i> cv.	Nectar	Non-hardy perennial used as an annual		July to October
Common foxglove	<i>Digitalis purpurea</i>	Nectar	Biennial or Perennial depending on cultivar	4	July to August
Purple coneflower	<i>Echinacea purpurea</i>	Nectar	Perennial	3	June to September
Small globe thistle	<i>Echinops ritro</i>	Nectar	Perennial	3	June to September
Spotted Joe-pye weed	<i>Eupatorium maculatum</i>	Nectar	Perennial	2 to 3	July to September
Sunflower	<i>Helianthus annuus</i>	Nectar	Annual		July to September
Common heliotrope	<i>Heliotropium arborescens</i>	Nectar	Non-hardy perennial used as an annual		July to October
Herb treemallow	<i>Lavatera trimestris</i>	Nectar	Annual		June to September

Spiked gayfeather	<i>Liatris spicata</i>	Nectar	Perennial	3	July to August
Sweet alyssum	<i>Lobularia maritima</i>	Nectar	Annual		May to October
Lupine	<i>Lupinus</i> cv.	Nectar	Annual or Perennial depending on cultivar	3 to 4	June to September
Flowering tobacco	<i>Nicotiana x sanderae</i>	Nectar and Host	Annual		June to September
Forest tobacco	<i>Nicotiana sylvestris</i>	Nectar and host	Annual		June to September
Star cluster	<i>Penia lancolata</i>	Nectar	Annual		May to October
Petunia	<i>Pandunia x hybrida</i>	Nectar	Annual		June to September
Orange coreflower	<i>Rudbeckia fulgida</i>	Nectar	Perennial	3 to 4	July to September
Black-eyed Susan	<i>Rudbeckia hirta</i>	Nectar	Annual		June to October
Mealy sage	<i>Salvia farinacea</i>	Nectar	Annual		June to September
Caucasian scabiosa	<i>Scabiosa caucasica</i>	Nectar	Perennial	3 to 4	June to September
Canada goldenrod	<i>Solidago canadensis</i>	Nectar	Perennial	3	August to September
Signet marigold	<i>Tagetes tenuifolia</i>	Nectar	Annual		June to September
Mexican sunflower	<i>Tithonia rotundifolia</i>	Nectar	Annual		June to September
Nasturtium	<i>Tropaeolum</i> cv.	Nectar	Annual		July to October
Tall verbena	<i>Verbena bonariensis</i>	Nectar	Non-hardy perennial used as an annual		June to September

# Attracting hummingbirds would also be great!

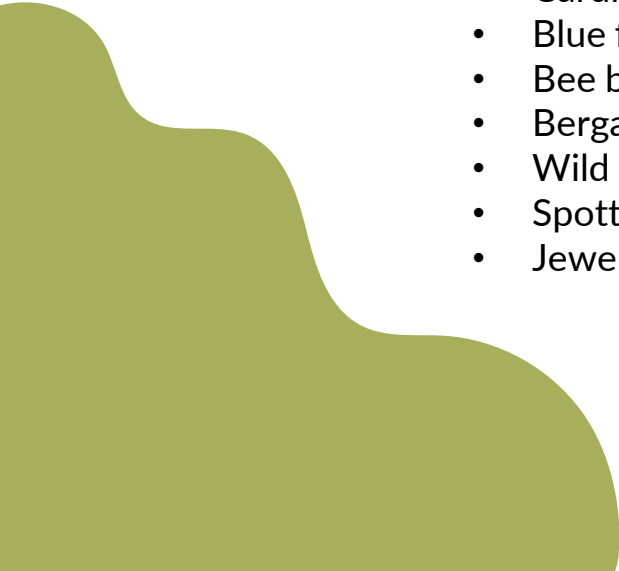


Plant species with brightly-colored and/or tubular flowers, such as:

- Cardinal flower
- Blue flag iris
- Bee balm
- Bergamot
- Wild columbine
- Spotted Joe pye weed
- Jewelweed

...or annuals such as:

- Begonia
- Cosmos
- Geranium
- Petunia
- Zinnia
- Nasturtium







# Sustainable gardening practices

- Avoid lawn and garden chemicals
- Use a rake instead of a leaf blower
- Reduce nighttime outdoor lighting
- Use water wisely

<https://espacepouurlavie.ca/en/basic-principles-organic-gardening>



# Key take home points

- If you put your milkweed in the perimeter of gardens and set it up by mulch and make it apparent, we will increase colonization of monarchs
- Gardens that have a north-south line of sight intact are more attractive than gardens that do not
- For small gardens, the a) swamp, b) butterfly, c) whorled milkweed are great choices, while the common milkweed is great for larger areas
- Cultivars were as attractive as straight species to bees, with some being MORE attractive (e.g. swamp milkweed cultivars)
- Employ sustainable gardening practices





# Thank you!

Do you have any questions?

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