



# How You Can Help Pollinators

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Wisconsin Department of Natural Resources

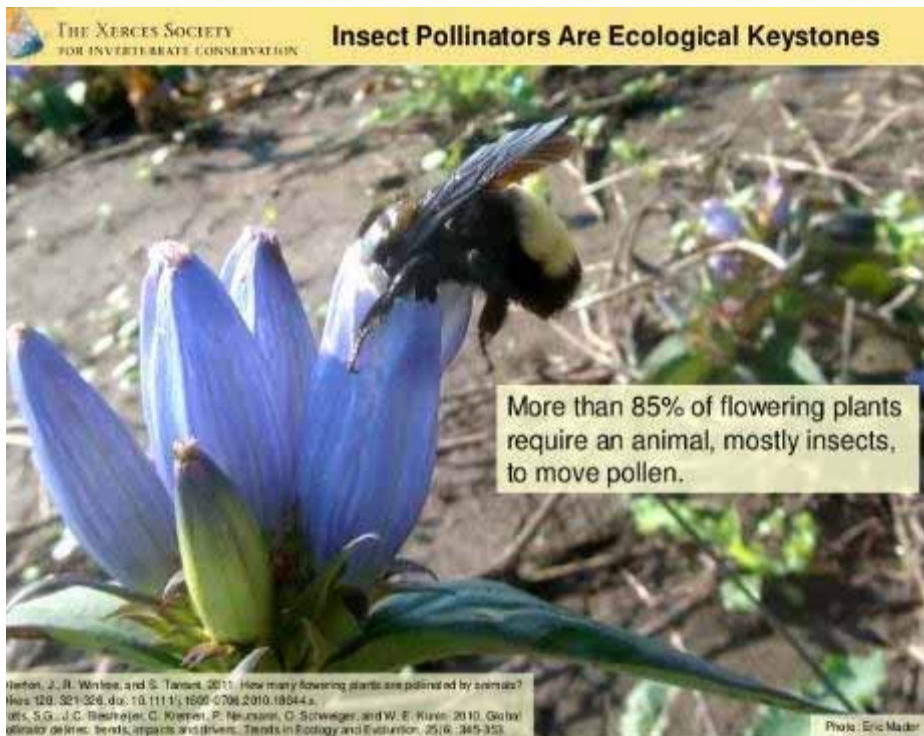
# Who are the pollinators

- Birds
- Bats (SW USA)
- Bees & Wasps
- Butterflies & Moths
- Flies
- Beetles



# The most efficient pollinators: **Bees**

- 25,000 species worldwide; 4,000+ in N.A.; 400+ in Wisconsin
- Pollinate 85% of flowering plants, 35% of global crop production



# Bees as Pollinators

- Gathering pollen & nectar to feed offspring
- Vast majority are solitary (single female / nest)
- Hairy bodies



One honeybee species in the U.S.

- *Apis mellifera*
- Introduced from Europe in 1622





*U.S.'s smallest bee (Perdita minima) face to face with a female large carpenter bee (Xylocopa varipuncta).*

# Importance of Pollinators



## Benefits to Other Wildlife:

- Pollinator-produced fruits and seeds
- Pollinators are food for other wildlife
- Pollinator habitat supports other insects that are food for songbirds & other wildlife



# Why Pollinators Need Your Help

- **Honey Bee decline**





# Widespread Native Butterfly Declines

- More than 17% (141+ spp.) of North American butterflies at risk
- Habitat specialists and formerly common and widespread species



# Butterfly Status in WI

- About 140 butterfly species occur in WI
  - 2 federally endangered, 5 on state T/E list
  - 12 are considered SGCN
- 1,200+ moth species in WI
  - 2 state endangered
  - 13 are SGCN & about 60 SINS



# Widespread Bumble Bee Declines

- At least 25% of North American species at risk of extinction
- Threats: Disease, habitat loss, pesticide use, global change



Source: Hatfield et al. 2014 Xerces Society-IUCN status review; Cameron et al. 2011, PNAS

# Native Bees Status in WI

- 20 bumble bee species found historically in WI
  - one is listed as federally endangered
  - seven are considered SGCN
  - three are classified by the state as SINS
- Appx. 25% of the 400+ known native bees species in WI are SINS



# ESA Listed/Petition Pollinator Species

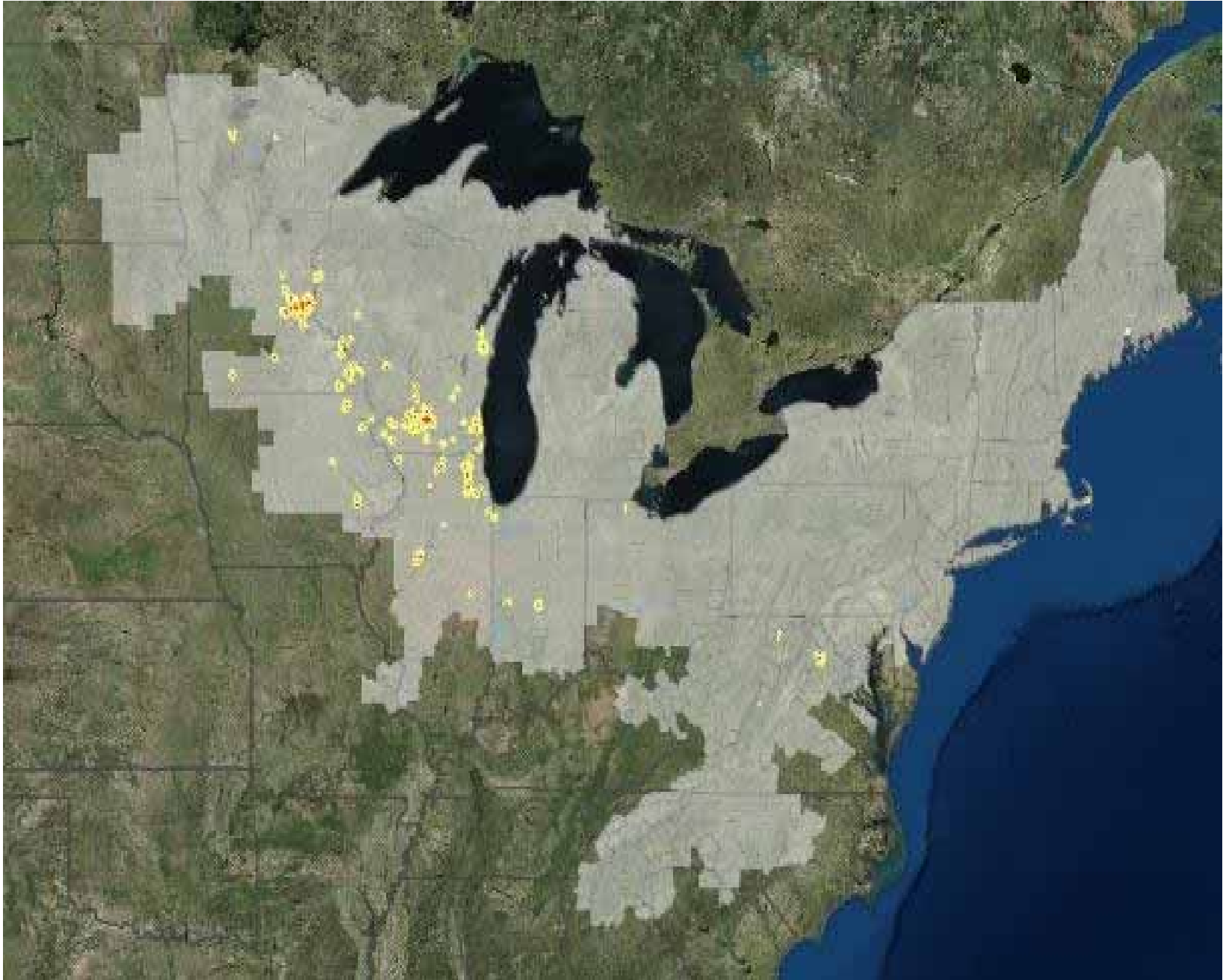
- Karner Blue (End. Dec 1992)
- Poweshiek Skipperling (End. Oct 2014)
- Rusty-patched Bumble Bee (End. Mar 2017)
- USFWS schedule (through FFY23) conducting status assessments and making species listing determinations
  - Yellow-banded bumble bee (FFY18)
  - Monarch butterfly (FFY19)
  - Regal fritillary (FFY22)



# Rusty-Patched Bumble Bee in WI

- Found early April through early October
- In open grassland, meadow, parks & garden habitats
- Builds underground nests (annual colonies)
- Needs constant supply of nectar and pollen
- Threats
  - Disease, pesticides, habitat loss, and small population dynamics





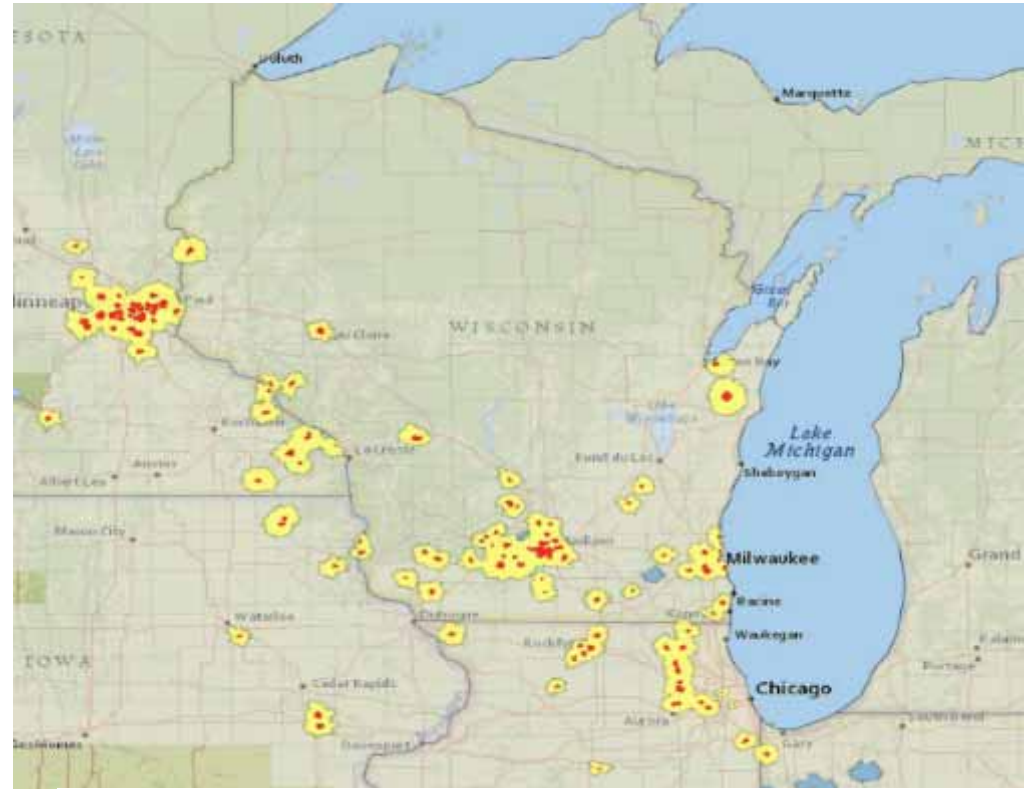




# Rusty Patched Bumble Bee Guidance

- High & Low Potential Zones
  - 48 HPZ
  - 21 LPZ
- Rusty Patched Bumble Bee Guidance on Endangered Species Act Implementation

<https://www.fws.gov/midwest/endangered/insects/rpbb/guidance.html#map>



USFWS High and Low Potential Zone maps (updated 8/17/2017; does not include Aug-Sept 2017 data)

U.S. Fish and Wildlife Service  
U.S. Department of the Interior



Conservation Management Guidelines for the  
Rusty Patched Bumble Bee (*Bombus affinis*)  
Version 1.6  
February 27, 2018

# Monarchs

## Host Plants

Monarch caterpillar and adult



milkweed,  
*Asclepias tuberosa*

## Nectar Plants



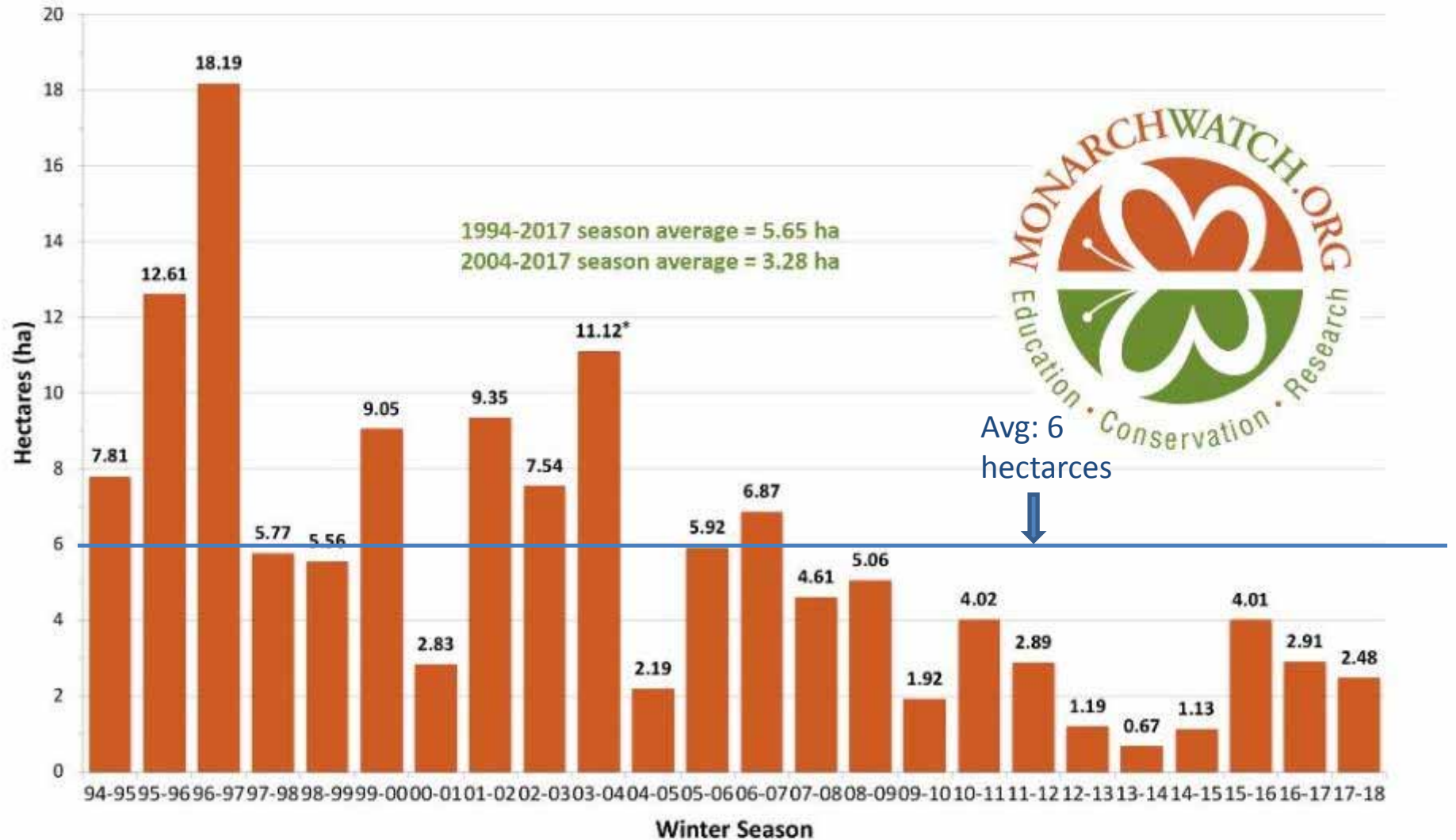


U.S. Fish & Wildlife Service

# Monarch Butterfly: Fall & Spring Migrations



## Total Area Occupied by Monarch Colonies at Overwintering Sites in Mexico



Data for 1994-2003 collected by personnel of the Monarch Butterfly Biosphere Reserve (MBBR) of the National Commission of Natural Protected Areas (CONANP) in Mexico. Data for 2004-2017 collected by World Wildlife Fund Mexico in coordination with the Directorate of 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

# Mid-America Monarch Conservation Strategy

- A regional partnership MAFWA, NWF, USFWS, USGS, state agencies & NGOs
- Conserve & restore eastern migratory Monarch populations.
- To develop a regional plan setting habitat goals (e.g. milkweed stems on the landscape).
- 6 hectare goal for Monarchs on their winter grounds in Mexico.
- 50% of wintering Monarchs from the Corn Belt.

[http://www.mafwa.org/?page\\_id=2347](http://www.mafwa.org/?page_id=2347)



# Threats to Pollinators

- Habitat Loss & Nutritional Deficiency
- Parasites & Pathogens
- Pesticide Exposure
- Extreme Weather
- Invasive Species



# How You Can Help Pollinators

## Pollinator Protection in Wisconsin



The Wisconsin Pollinator Protection Plan is now ready for public comment. Below, you can view or download the complete document, which includes economic and scientific background, or the portions with recommended best management practices.

[Complete Pollinator Protection Plan](#)

[Best Management Practices for Gardens and Lawns](#)

[Best Management Practices for Beekeeping](#)

[Best Management Practices for Farms](#)

[Best Management Practices for Prairies, Roadsides and Open Spaces](#)



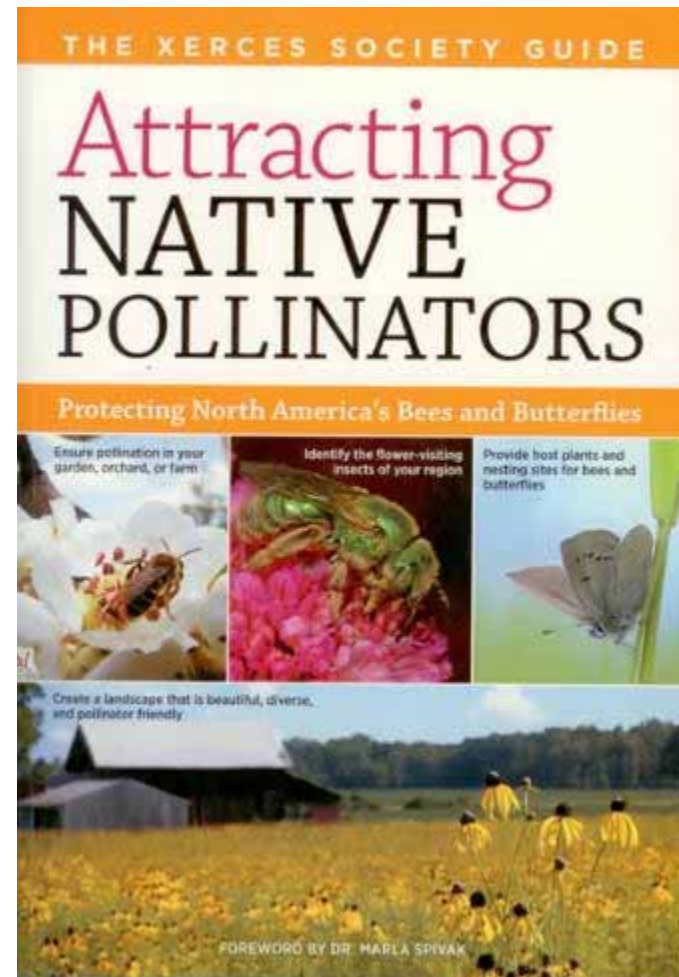
### *On this page:*

- [What is pollination?](#)
- [What are the threats to pollinators?](#)
- [What can gardeners and homeowners do?](#)
- [What can farmers do?](#)
- [What can pesticide applicators do?](#)
- [Wisconsin Pollinator Protection Plan](#)
- [Useful websites](#)
- [Contact information](#)

<https://datcp.wi.gov/Documents/PPPComplete.pdf>

# Things Pollinators Need

- Nesting Habitat
- Floral Resources
- Overwintering Habitat
- Water





# Nesting Habitat



## Solitary bee

- Most bee species do not form colonies
- Individual females nest in stems, ground, or dead wood

# Nesting Habitat

The photos below illustrate some ground nests and typical habitat.



# Nesting Habitat

*The photos below illustrate some wood- and cavity-nest sites.*



# Bumble Bees Nest Colonies

- Social colonies founded by single queen
- Annual colonies--last only one season
- Nests have ~100-400 workers
- Nest in abandoned rodent burrows or under lodged grasses

*Conserve brush piles,  
unmown areas*



*Bombus vagans* on clover

Photos: Elaine Evans, Nancy Adamson, Eric Mader



© Premaphotos Wildlife / naturepl.com

Floral resources near nests – diversity and timing



# Helping Pollinators: Bee Lawns



## Green Carpet OR Carpet with Flowers?

Flowers are the only “grocery store” for bees and other pollinators, yet their sources of nectar and pollen have dwindled. What if we add flowers to some of Minnesota’s many square miles of turf? Parks, golf course roughs and less-used parts of your lawn could support pollinators.

### Bee Lawn Research and Demonstration

This trial compares five methods of adding three low-growing flower species into grass. Do some plots show more blooms than others today? Can you find any pollinators foraging?



This demonstration is funded by:



University of Minnesota  
ARBORETUM



UNIVERSITY OF MINNESOTA  
EXTENSION

College of Food, Agricultural and Natural Resources  
University of Minnesota

- <https://www.beelab.umn.edu/bees/beelawn>

# Shoreline Pollinator Planting



## Healthy Lakes 350 ft<sup>2</sup> Native Planting Companion Guide



<http://healthylakeswi.com/best-practices/>

# Pesticide Use Sensitivities

- Herbicide

- Avoid broadcast spraying when possible
- Spot treat (e.g. back pack sprayer, weed wipe, etc)



- Insecticides

- Avoid flowers in bloom
- Targeted approach
- Mosquito & gypsy moth control

2013 incident in Oregon Target Parking lot

- Misuse of dinotefuran (Safari) killed about 50,000 pollinators



# Mowing Sensitivities

- Pollinators using the area (i.e. Monarch caterpillars)
  - Avoid mowing ditches or site when monarch larvae might be present and other pollinators
- Prescribed mowing plan - timing, technique, and scale
  - Non-blooming seasons
  - Escape mower blades
    - Flushing bar
    - Reduced speeds (< 8 mph)
    - Cut high (min. of 12-16 in.) and/or in patches to leave some habitat



# Ways to Help Monitor Pollinators

- WI Bumble Bee Brigade
- New CBM project for WI's native bumble bees



# Bumble Bee Brigade Methods

- Project is photography-based
- No handling of bees
- All species must be verified with photo vouchers
- 3 photos (dorsal, side & face) best for ID



# Where to sing up

- <http://wiatri.net/inventory/bbb/>



# Ways to Help Monitor Monarchs

- MLMP <https://monarchlab.org/mlmp>

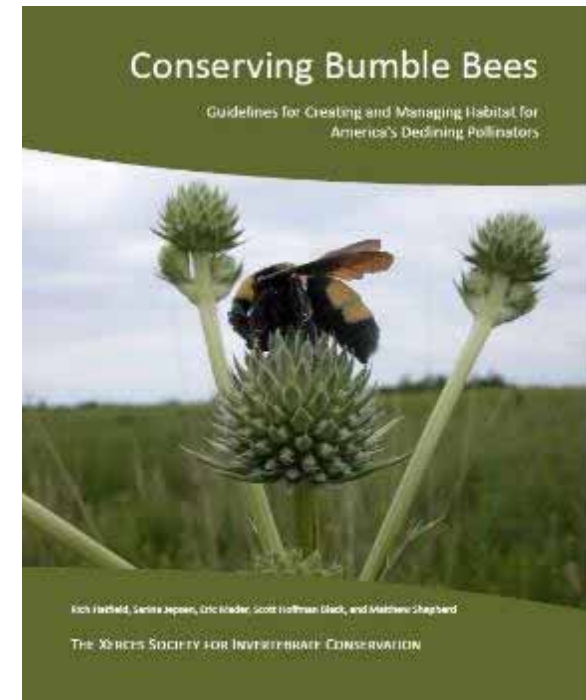
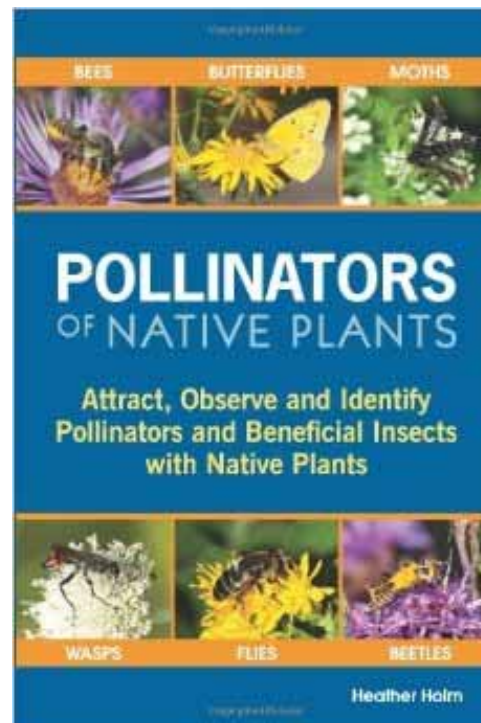
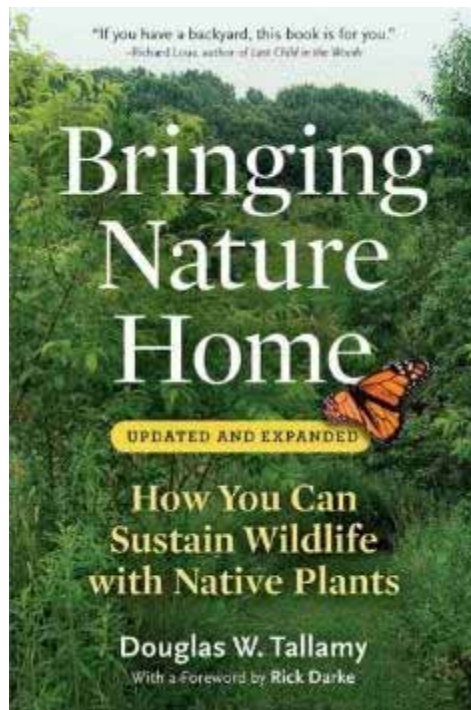
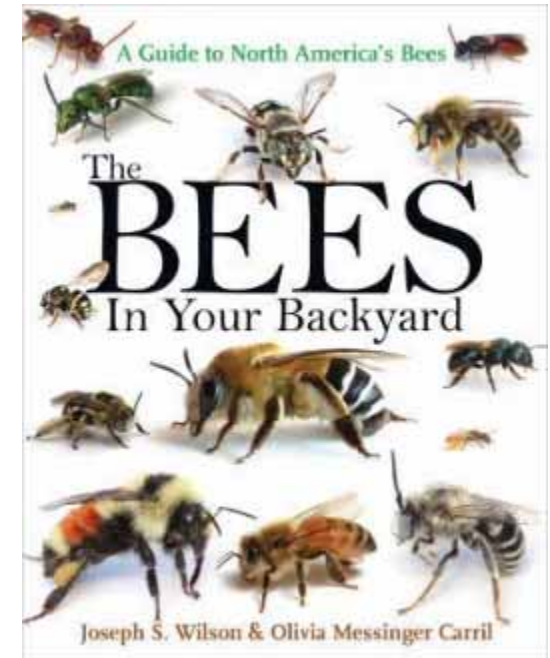


- Integrated Monarch Monitoring Program
- <https://monarchjointventure.org/our-work/partner-projects/monarch-conservation-science-partnership-integrated-monitoring-strategy>



# Resources

- <https://wisconsinbutterflies.org/>
- <http://bugguide.net>
- <http://www.discoverlife.org/>

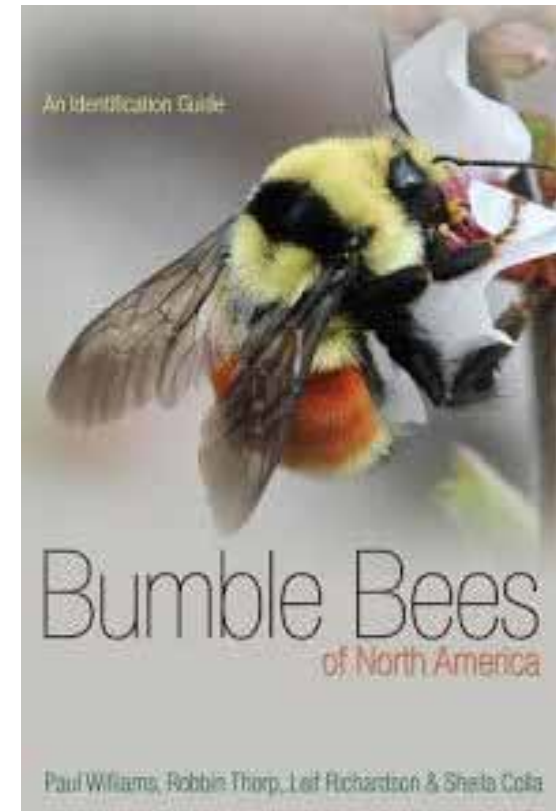
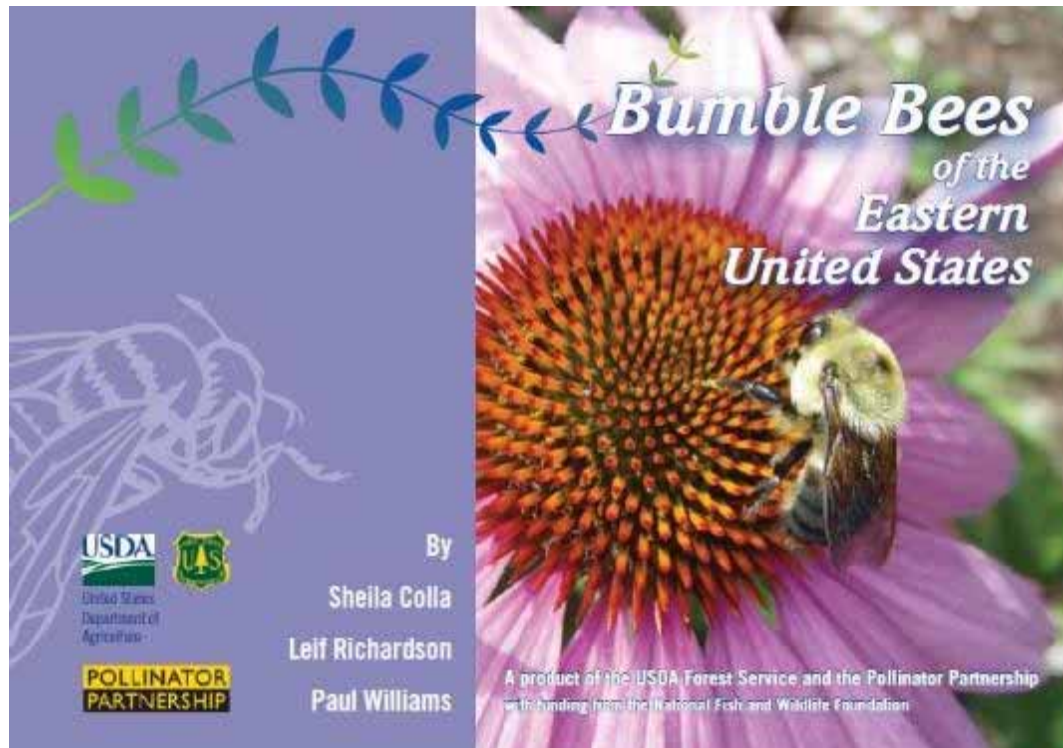


Any Questions??????



[Email: Jay.Watson@wisconsin.gov](mailto:Jay.Watson@wisconsin.gov)

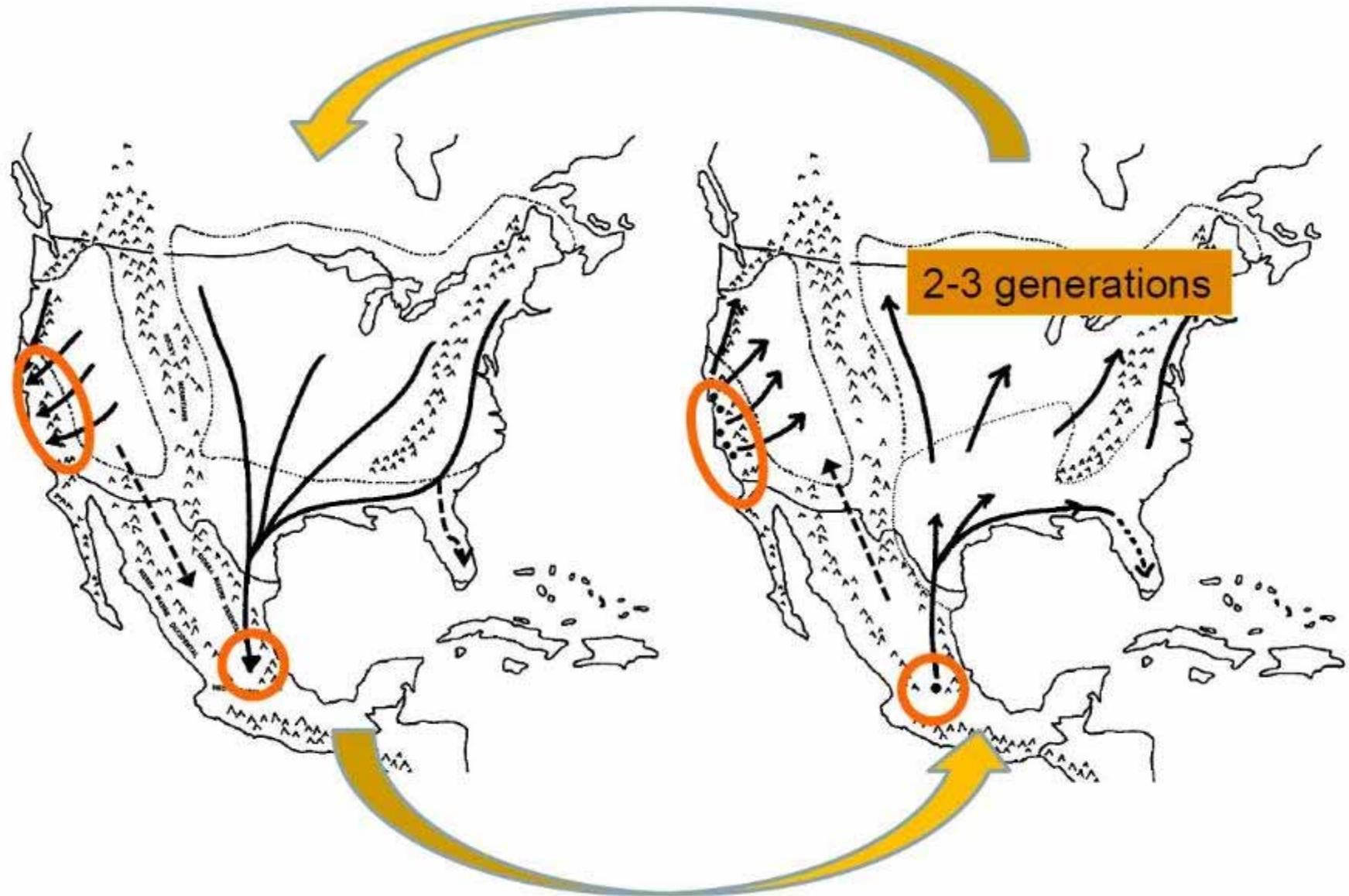
# Bumble Bee ID Resources





# Annual Cycle

(migrating south, overwintering, migrating north, breeding)



# Benefits of Native Bees

**Native bees are very efficient:**

- Active earlier & later in the day
- Collect both pollen & nectar
- Buzz pollinate



mining bee  
on blueberry

Photo: Nancy Adamson



# Rusty Patched Queen



# Monarch Life Cycle

## Individual Life Cycle





Showing the 5 larval instars of monarch caterpillars. Photo courtesy of Karen Oberhauser

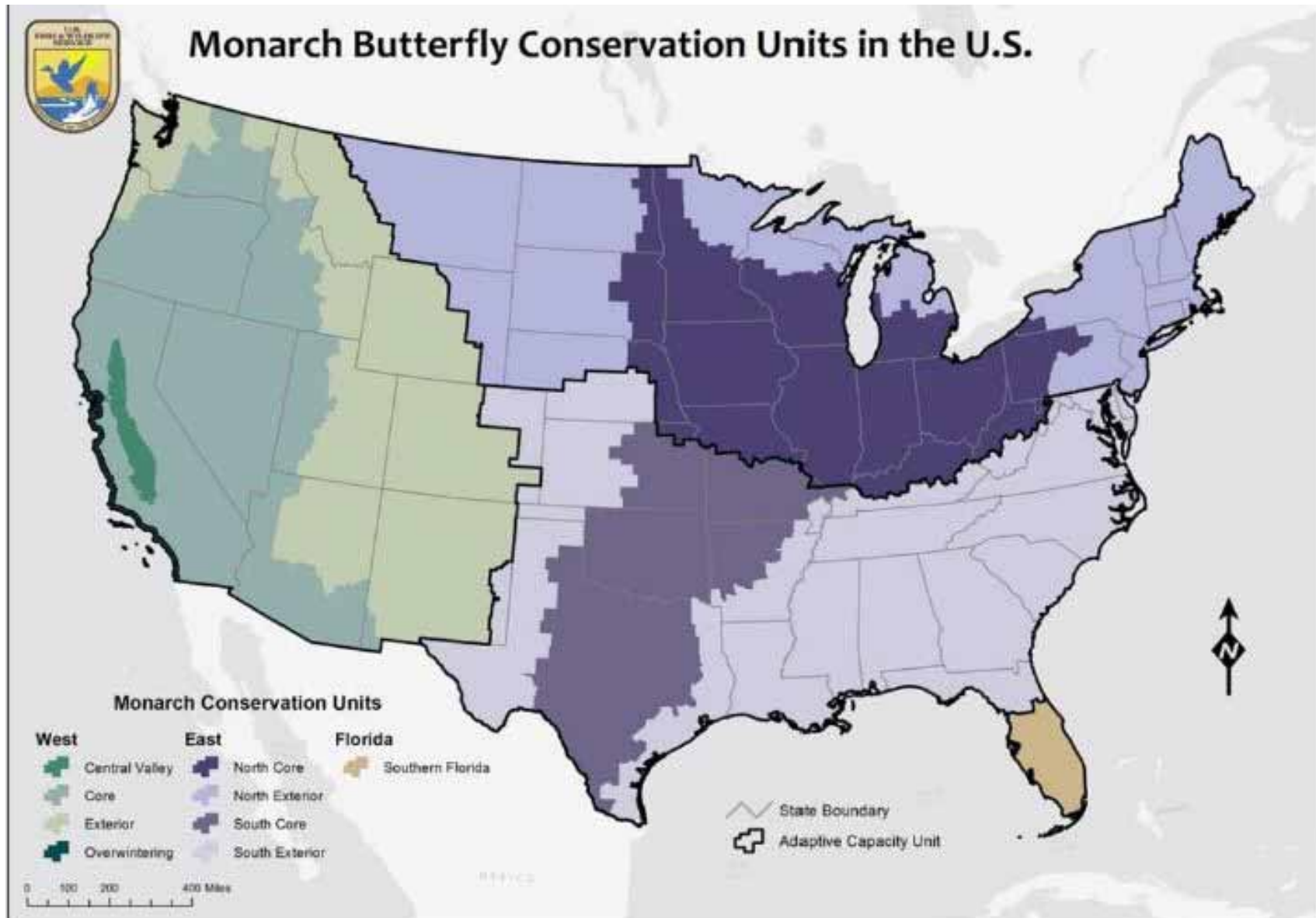


Figure 2. Monarch Butterfly Conservation Units in the continental United States. Courtesy of USFWS.

## Goal of the Wisconsin pollinator plan:

To provide guidance for those interested in improving the health and habitat of managed and wild pollinators.





MAKE A DIFFERENCE, TODAY.

# DIRECT GIFTS

ENDANGERED RESOURCES FUND



DONATE ONLINE OR VIA MAIL

# EAGLE LICENSE PLATE

HELP DRIVE SUCCESS FOR ENDANGERED SPECIES



PHOTO BY RYAN BRADY

# Wisconsin Monarch Conservation Summit



You are invited to participate in a summit to discuss the development of a collaborative statewide monarch conservation strategy for Wisconsin.

**Wednesday May 10<sup>th</sup> at 1:00 - 5:00 p.m.**

(social gathering 5:00-7:00 p.m.)

**Thursday May 11<sup>th</sup> at 8:30 a.m. - 4:30 p.m.**

**Chula Vista Resort, Wisconsin Dells, Wisconsin**

*This event is made possible by a USFWS and NWF grant and the efforts of many partners:*



# Who are the pollinators

## Animal pollinators

- Birds
- Fruit bats (Tropics)



## Animal pollinators



- Birds
- Fruit bats (Tropics)
- Insects
  - Butterflies and moths
  - Beetles



# Animal pollinators



- Birds
- Fruit bats (Tropics)
- Insects
  - Butterflies and moths
  - Beetles
  - Flies
  - Wasps

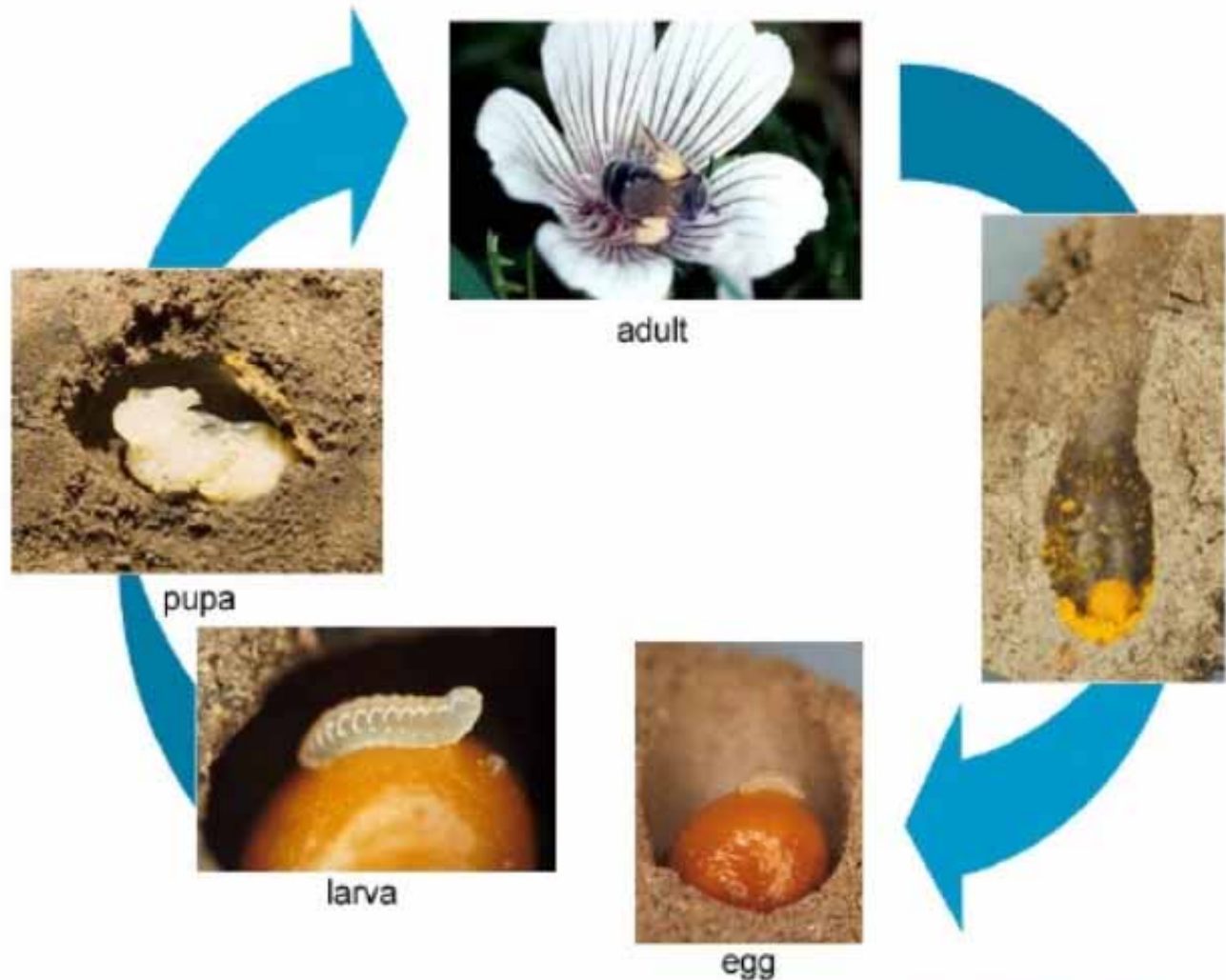


# Honey Bee decline



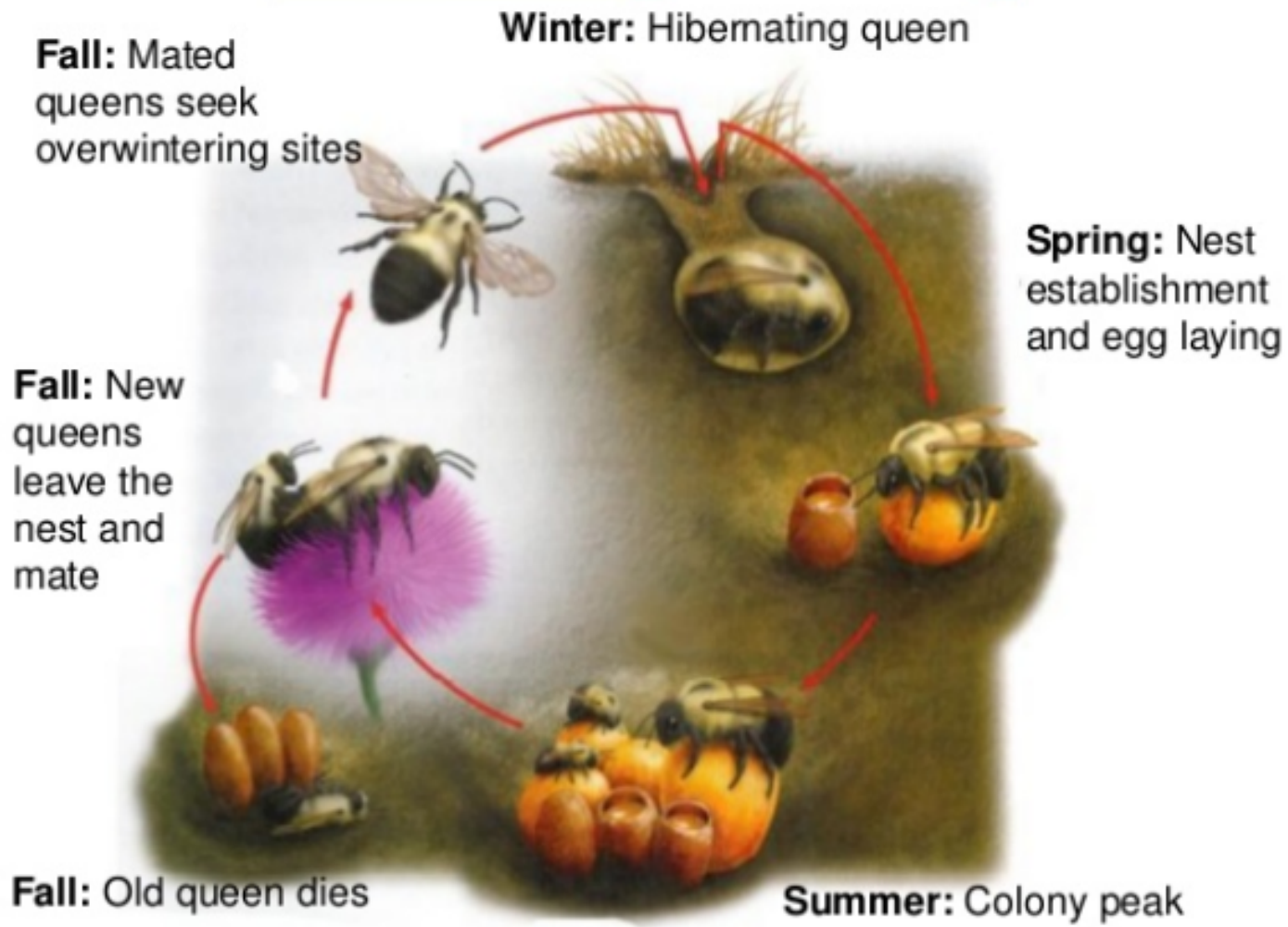
# Typical solitary bee life cycle—most overwinter as larvae or pupae, but some overwinter as adults

- ① Active adult only a few weeks—most of life as pupae or larva
- ② Females build & provision nests alone
- ③ May aggregate nests for protection from predators & parasites, & to ease finding a mate

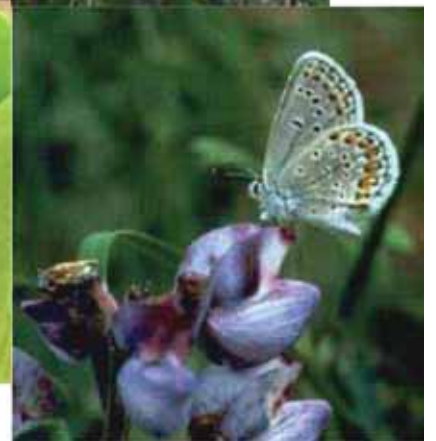




# Life cycle of a bumble bee colony



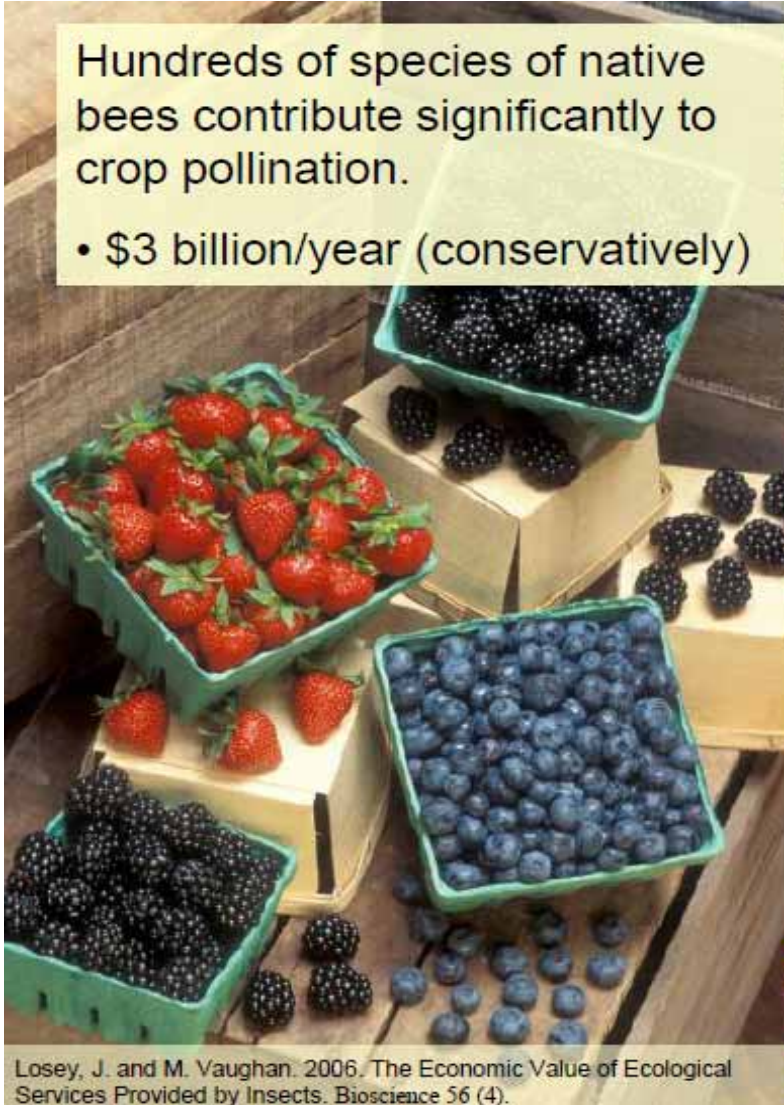
# Consider Specific Host Plants



# The Economic Value of Native Bees

Hundreds of species of native bees contribute significantly to crop pollination.

- \$3 billion/year (conservatively)



Losey, J. and M. Vaughan. 2006. The Economic Value of Ecological Services Provided by Insects. *Bioscience* 56 (4).

Photos: USDA-ARS/Scott Bauer & Edward McCain

# Bumble Bee Brigade Methods

- First year is a pilot w/2 ways to get involved
  - Conduct small area surveys (30m or less in dia.)
  - Submit incidental observations



# Floral Resources

- Pollen and nectar sources
- Diversity of flowering plants blooming the entire season, early spring through late fall
- Important for flowers to be near nests

Tom Lynn

# What we can do for pollinators

- Educate and advocate
  - Register habitat with MJV, Monarch Watch, Wild Ones, NWF, Xerces; put up signs.
- Management: avoid mowing ditches when monarch larvae might be present and other pollinators; advocate for limiting insecticide spraying
- Plant milkweed and nectar sources, using native plants from locally-sourced seed.
- Participate in citizen science programs and contribute data that will inform pollinator conservation (e.g. monarch & bee)





# Foraging Habitat

## Generalists vs Specialists

- Native plant diversity critical
  - Appx. 30% of bees native to WI are pollen specialists
- Spring bloom critical for bumble bees



*Macropis nuda* bees collect floral oils from specialized glands of the spotted loosestrife (*Lysimachia punctata*).



# Over 100 Milkweed Species in N. A.

- ~80% decline in monarch butterflies since ~2000 in corn/soybean ag regions and ~60% decline in milkweeds
- Tremendous diversity in milkweeds--great potential to expand use

purple milkweed, *A. purpurascens*



poke milkweed, *A. exaltata*



swamp milkweed, *A. incarnata*



green milkweed, *A. viridiflora*



fourleaf milkweed, *A. quadrifolia*



Pleasants, J. M., Oberhauser, K. S. 2012. Milkweed loss in agricultural fields because of herbicide use: effect on the monarch butterfly population. *Insect Conservation and Diversity*. doi: 10.1111/j.1752-4598.2012.00196.x.

Photos: Nancy Adamson

WI has 12 native species of which 5 are common

# WI Pollinator Protection Plan Goals

- Expand the quality and quantity of habitat for managed and wild pollinators
- Minimize stressors on managed and wild pollinators
- Increase managed bee hive health and survival
- Outreach (Spread the word on pollinator friendly practices)

# Pollinator Conservation

- Providing a high diversity of species that offer flowers throughout the growing season
- Nesting, egg-laying, and hibernation resources
- Consider specialist species (e.g. specific host plant)
- Minimize use of pesticides - keep away from pollinator habitats
- Recognize & protect existing habitat
- Provide new or enhance existing habitat
  - Prairie plantings, shrubs, trees, etc.
- Refer to BMPs



BEST MANAGEMENT PRACTICES FOR  
**Improving Pollinator Habitat in  
Prairies, Roadsides & Open Spaces**

# Strategies to Help Pollinators

## Protecting & Restoring Pollinator Habitat

