

# WELCOME

Protecting Pollinators is Everybody's Business  
- Creating Bee-Friendly Greenspace





# Why are pollinators in need of protection and what can we do?



*Olson Memorial Library, Eagle River*

*December 5<sup>th</sup> 2019*

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# Native Bee Diversity in North America



# Native pollinators vs European honey bee

- European honey bee is not adapted to the Wisconsin climate.
- European honey bee hives can be moved to different fields.
- Native pollinators have evolved along native plants and are perfectly synchronized.
- Native Pollinators are active in cooler and wetter conditions and are very efficient:  
1 Acre of apples can get pollinated by 250 mason bees vs 15,000 – 20,000 honey bees





# Why are pollinators important?

## We are dependent on pollinators:

- 35% of crop production, worldwide
- Over \$18 to \$27 billion of produce in U.S. (\$217 billion worldwide)
- Most of our vitamins and minerals
- One in three mouthfuls of food and drink we consume



Eilers et al 2011. Contribution of Pollinator Mediated Crops to Nutrients in Human Food Supply. PlosONE

Morse RA, Calderone NW. 2000. The value of honey bees as pollinators of U.S. crops in 2000. Bee Culture 128: 1–15.

Klein et al. 2007. Importance of pollinators in changing landscapes for world crops. Proc. R. Soc. B 274: 303-313.

Photo: USDA-ARS/Peggy Greb



## Whole Foods produce department with bees



Photo: Whole Foods Market



## Whole Foods produce department without bees



Photo: Whole Foods Market

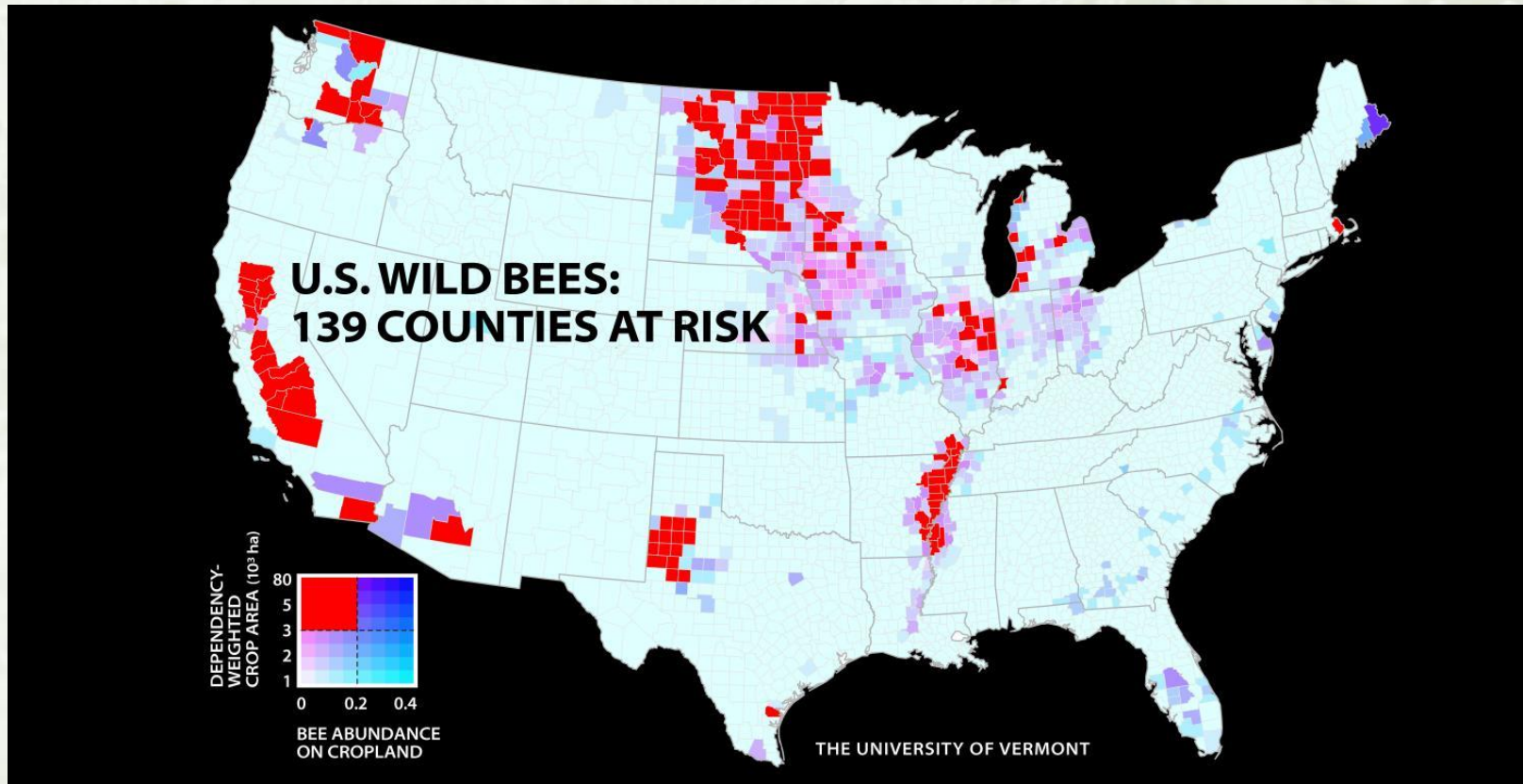


# Pollinator Decline



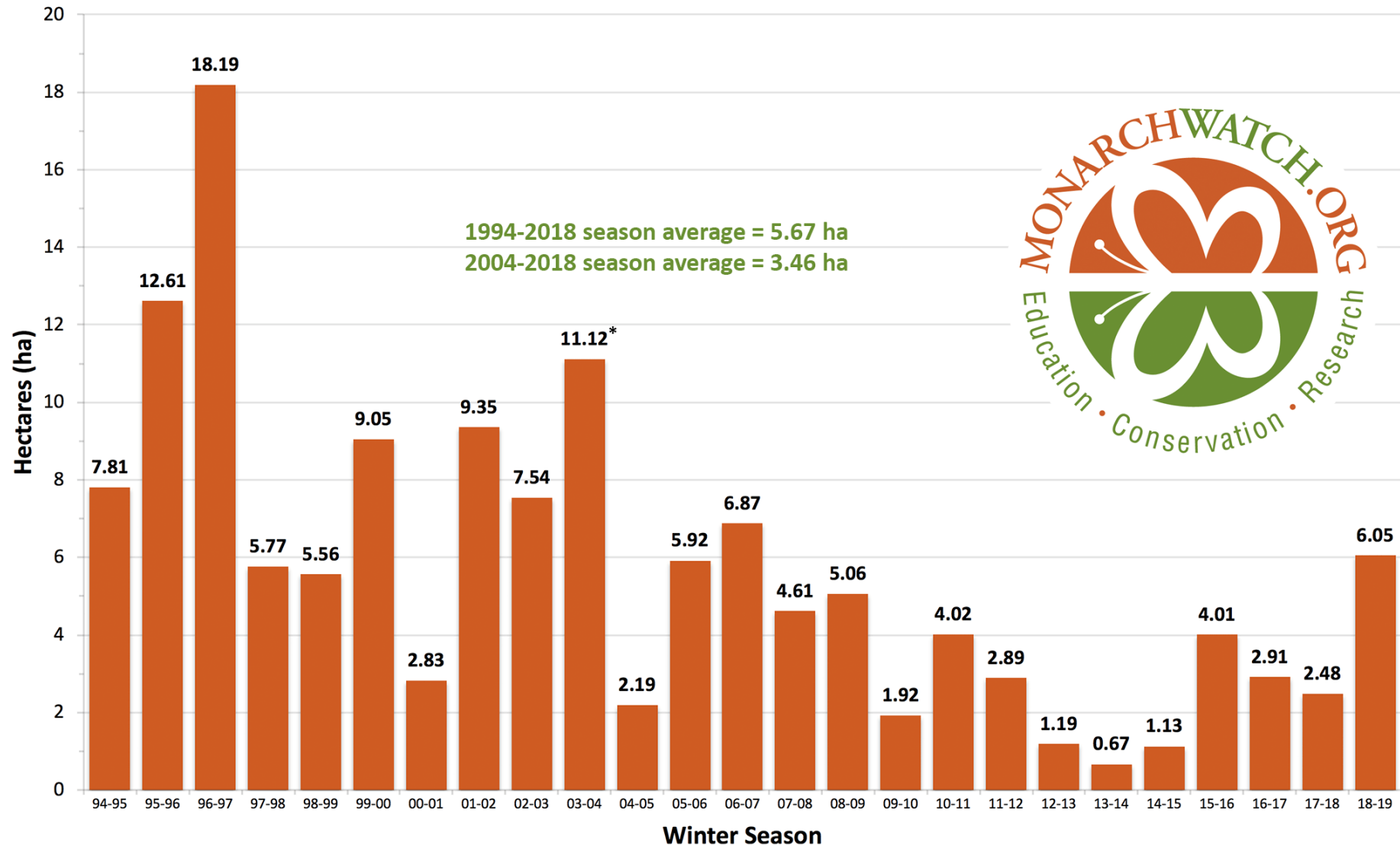


- Over 50% decline in managed honey bee hives since 1950
- Over 50% of native NA bee species are decreasing
- Meanwhile crop pollination demand is rising





## 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 2004-2018 collected by World Wildlife Fund Mexico in coordination with the Directorate of the MBBR.

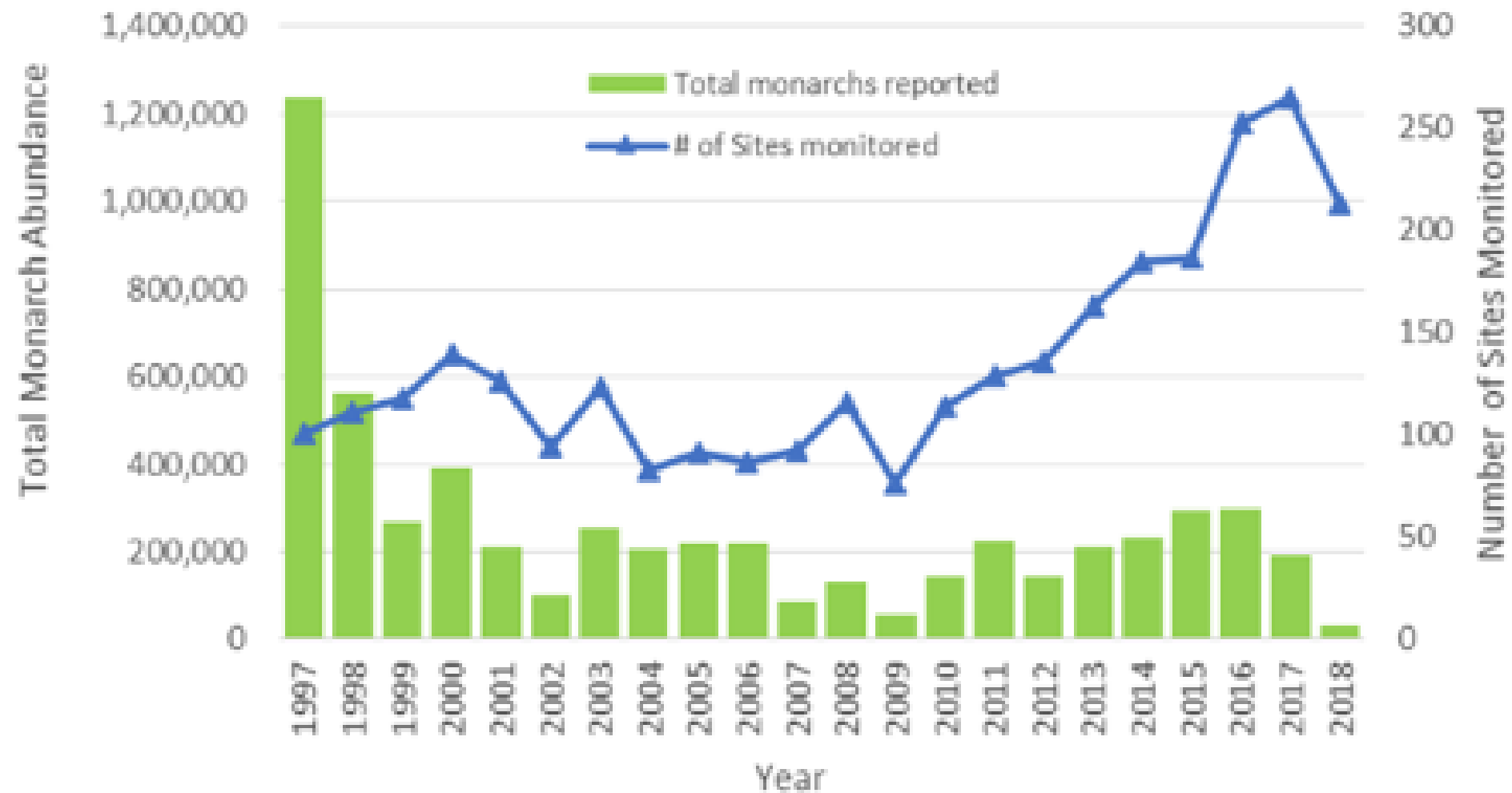
\* Represents colony sizes measured in November of 2003 before the colonies consolidated. Measures obtained in January 2004 indicated the population was much smaller, possibly 8-9 hectares. CT



# The Xerces Society Western Monarch Thanksgiving Count

Total Abundance Estimates w/Number of Sites Monitored from 1997-2018

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# WESTERN MONARCHS IN CRISIS

Western monarchs have declined by 99.4% since the 1980s. For every 160 monarchs there were then, there is only one left today.

— 1980s —



— 2018 —



[xerces.org/save-western-monarchs](https://xerces.org/save-western-monarchs)

 **XERCES  
SOCIETY**  
for Invertebrate Conservation



# Pollinators at risk



rusty-patched bumble bee  
federally endangered



monarch butterfly  
under petition to be listed as federally  
endangered



yellow-banded bumble bee  
federal & state special concern



# Reasons for the Serious Decline of Pollinators:

- Habitat loss
- Disease
- Climate change
- Chemical exposure



By John Anderson, Hedgerow farms INC.



# Habitat loss

Monocultures



Invasive species



Development





# Disease

## Varroa mite

- Feeds on blood



## Pathogens

- Deformed wing virus
- Israeli acute paralysis virus

# Climate change

## Extreme weather events

- Harsh seasons
- Extreme temperature fluctuations
- Droughts





# Chemical exposure

## Pesticides

- Insecticides
- Fungicides
- Herbicides



## *Effects of neonicotinoids on bees:*

- *Reduction of navigation skills, sense of smell, longer maturation periods*

➡ *Lower survival rates*

Neonicotinoid	Garden and ornamental uses	Garden product trademark names
Imidacloprid	Foliar spray for turf and ornamental flowers, trees, and shrubs; soil drench for garden fruits and vegetables, and ornamental flowers, trees, and shrubs; trunk injection for trees; granules for turf and ornamental flowers, shrubs or trees.	Bayer Advanced 3-in-1 Insect, Disease, & Mite Control Bayer Advanced 12 Month Tree & Shrub Insect Control Bayer Advanced 12 Month Tree & Shrub Protect & Feed Bayer Advanced Fruit, Citrus & Vegetable Insect Control Bayer Advanced All-in-One Rose & Flower Care concentrate DIY Tree Care Products Multi-Insect Killer Ferti-lome 2-N-1 Systemic Hi-Yield Systemic Insect Spray Knockout Ready-To-Use Grub Killer Monterey Once a Year Insect Control II Ortho Bug B Gon Year-Long Tree & Shrub Insect Control Ortho MAX Tree & Shrub Insect Control Surrender Brand GrubZ Out
Clothianidin	Granules for turf, and ornamental flowers, shrubs or trees.	Bayer Advanced All-in-One Rose & Flower Care granules Green Light Grub Control with Arena
Thiamethoxam	Foliar spray for turf and ornamental flowers, trees, and shrubs; granules for turf and ornamental flowers, trees, and shrubs.	Amdro Quick Kill Lawn & Landscape Insect Killer granules Amdro Rose & Flower Care Maxide Dual Action Insect Killer
Acetamiprid	Foliar spray for garden fruits and vegetables, and ornamental flowers, trees, and shrubs.	Ortho Bug B Gon Garden Insect Killer Ortho Bug B Gon for Lawns Ortho Flower, Fruit and Vegetable Insect Killer Ortho Rose and Flower Insect Killer Ortho RosePride Insect Killer
Dinotefuran	Granules for turf and ornamental flowers, shrubs or trees; soil drench for ornamental flowers, trees, and shrubs.	Green Light Tree & Shrub Insect Control with Safari 2 G Ortho Tree & Shrub Insect Control Plus Miracle Gro Plant Food



# “Bee” the Change



## If you have to use pesticides.....

- Don't overreact!
  - many plants can tolerate insect damage
- Know the difference between systemic and non-systemic.
  - goes into nectar and pollen
  - persists for weeks to months
- Time your spraying
  - not when windy
  - not when pollinators are active
  - not when plants are in bloom



The new bee icon helps signal the pesticide's potential hazard to bees.



## Is mosquito spraying really necessary?

- Insecticides used are effecting EVERY insect!
- Explore alternative mosquito repellent or eradication methods other than spraying insecticides
- Weigh your options



# Create buffer strips of wild flowers and native grasses

- Create habitat for pollinators and beneficial insects
- Increase biodiversity
- Improve nutrient composition





## Buffer strips are applicable in:

- Farmland
- Golf Course out-of-play areas
- Storm water runoff ponds
- Rain gardens





## How a rain garden functions



### Gutters & Down Spouts

Assist with directing rain water from your roof to your rain garden.



### Native Plants

Native plants are adapted to local conditions and are easy to maintain once established. Plus they attract birds, butterflies and other pollinators.

### Berm

A berm holds water in the garden during heavy rains.



## Create pollinator plantings wherever possible:

- Parks
- Roadside restoration
- Restoration after invasive plant species removal
- Solar fields
- Recreational trails
- Private & public green spaces



## What is a *Bee Lawn*?


- mixture of grasses and very low growing flowers
- Provides much more nectar sources than turf grass
- Resilient to mowing
- Less maintenance than turf grass
- Neat looking





## COMPARING FLOWERING BEE LAWNS WITH OTHER TYPES OF VEGETATION

Flowering bee lawns combine features of traditional turfgrass lawns and other types of vegetation supporting bees and preserving the open sightlines and many recreational uses associated with lawns.








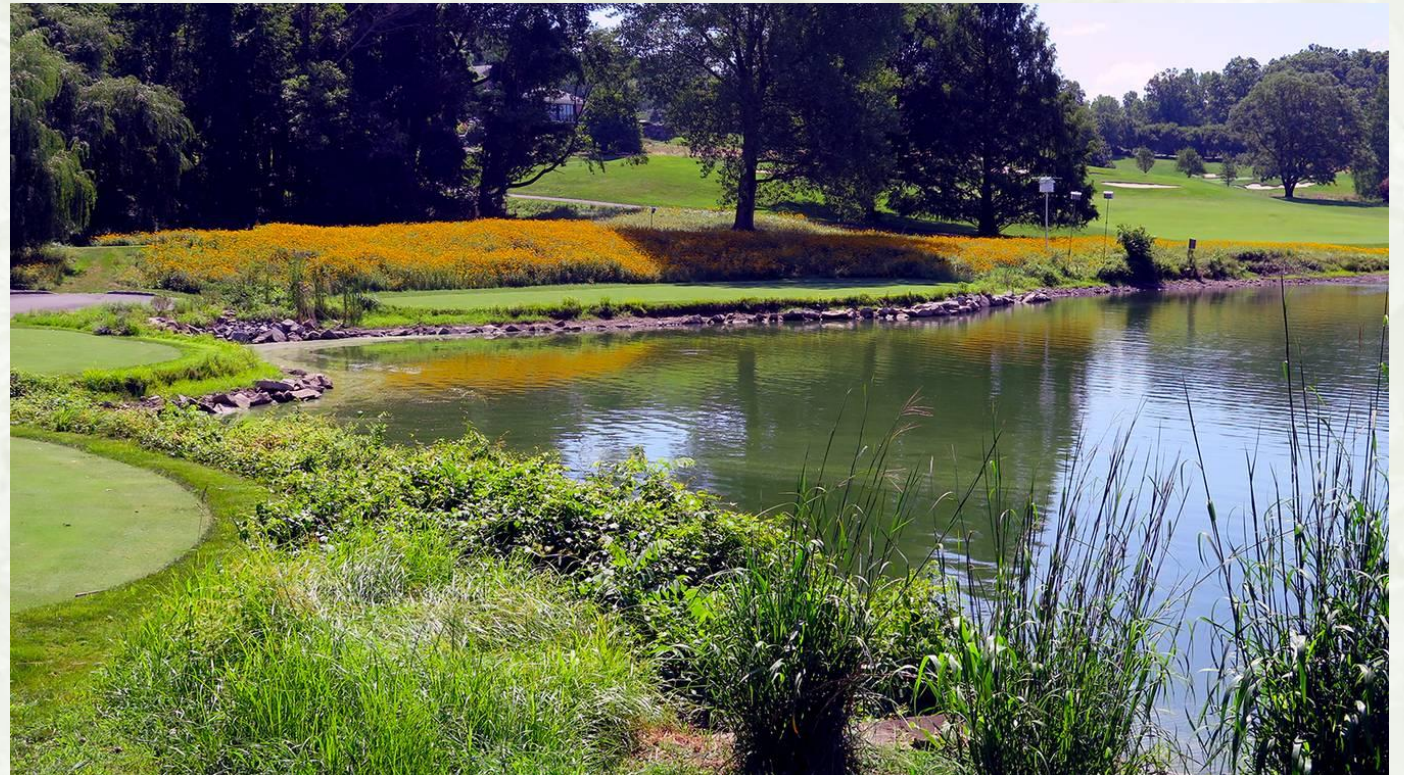
					
	Traditional turf	Bee Lawn	Urban meadow	Native prairie	Pollinator garden
Description	Area dominated by & managed for turfgrasses. Turf that has not been treated with herbicides may have unintentional forbs. <sup>1</sup>	A mix of low-input turfgrasses & low-growing forbs selected to provide bee forage. Mowed regularly to maintain recreational uses similar to lawns. <sup>4</sup>	"Naturalistic, unmown grassland with or without flowering forbs." <sup>5</sup>	Area dominated by grasses & grass-like species, often with a diverse assemblage of forbs & other plant species. <sup>9</sup>	Garden bed planted with species selected to provide high-quality pollinator forage.
Key criteria for selecting species	Appearance (e.g. color, texture); Maintenance requirements	Provision of pollinator forage (& other ecological benefits); Ability to grow in lawn conditions	Biodiversity (& other ecological benefits); Appearance/color diversity	Native species (& other ecological benefits)	Provision of pollinator forage (& other ecological benefits)
Vegetation height	Short (2-4.5 inches) <sup>3</sup>	Short (2-4.5 inches) <sup>3</sup>	Short (2 inches) to Tall (40 inches) <sup>5</sup>	Short (6 inches) to Tall (120 inches) <sup>9,11</sup>	Varies
Suitability for foot traffic	Excellent	Good	Poor to None	None	None
Mowing frequency	1-6/month <sup>2,3</sup>	1-3/month <sup>4</sup>	1/month to 1/season <sup>5</sup>	0-2/season <sup>10</sup>	N/A
Other maintenance considerations	Staff are usually already familiar with & skilled at maintaining.	Can mow less frequently than traditional turf. No new equipment is necessary. Herbicide use should be avoided.	Mowing is substantially reduced. Removal of plant residues may require additional equipment/effort.	May be maintained by prescribed burns. Requires specialized training and equipment.	Requires intensive management, such as hand weeding & mulching.

Illustration by Joseph Nowak III. References: <sup>1</sup>Ignatieva, Eriksson, Eriksson, Berg, & Hedblom, 2017; <sup>2</sup>Yue et al., 2017; <sup>3</sup>Cornell University, 2018; <sup>4</sup>Lane, 2016; <sup>5</sup>Southon et al., 2017 (p.106); <sup>6</sup>Hoyle et al., 2018; <sup>7</sup>Smith & Fellowes, 2015; <sup>8</sup>Smith & Fellowes, 2014; <sup>9</sup>Blair, Nippert, & Briggs, 2014; <sup>10</sup>Minnesota Dept of Natural Resources, 2004; <sup>11</sup>Oregon State University, 2018.

## Bee Lawns are applicable in:

- Private and public yards
- Golf courses
- Parks
- Cemeteries
- Recreational Trails





# “Bee the Change”

- Natural “messy” garden:  
Leaf litter, longer grass, mulch and dead stalks provide habitat
- Work with beneficial insects and think twice whether pesticide use is needed
- Bee lawn
- Create buffer strips on farms and greenspace
- Have native wildflowers on your balcony
- Seek conversation with others





Thank you for being a champion

See [www.oclw.org](http://www.oclw.org) for resources



