



Photo: Pxhere

Create a Paradise for Pollinators in your Home Landscape and Gardens

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Dutchess County**

This program is aimed at inspiring home gardeners to:



**Understand pollinators -
their habits and needs... and their value**



**Explore ways to adapt your home
landscape to attract and sustain
pollinators**



**Foster wider plant diversity by
discovering more flowering plants for
your home gardens**

Look Beyond a Garden of Delights



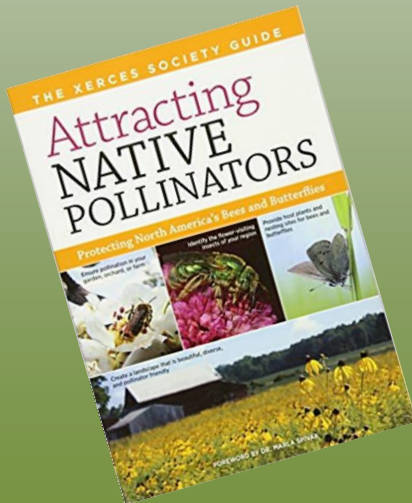
Pollination = Conservation



Garden as if Life Depended on it

According to the National Academy of Sciences, close to 75 per cent of the flowering plants on the earth rely to some degree on pollinators in order to set seed or fruit.

From these plants comes one-third of humankind's food and even greater proportions of the food for much of our wildlife.



From the Xerces Society Guide
Attracting Native Pollinators



Garden as if Life Depended on it

***Every time a species is lost
from an ecosystem, that ecosystem
is less able to support us.***

**Because nearly 85% of the U.S. is privately owned, our properties
are an opportunity for long-term conservation**

... if we design them to meet the needs of the life around us.

We need to redesign residential landscapes to

- 1) support diverse pollinator populations/complex food webs,**
- 2) store carbon, and**
- 3) manage our watersheds.**



**Professor Doug Tallamy
University of Delaware
“Bringing Nature Home”**

One example:

Bumblebees make up 40% of the 3,000 bee species

- **The Rusty Patched Bumblebee (*Bombus affinis*) has declined 87 per cent in the last 20 years**
- **7 species of bumblebees now listed as endangered**
- **Actions to help Bumblebees will help all pollinators**



Sources: U. S. Fish & Wildlife Service and National Geographic

Reasons for Pollinator Decline:

- **Habitat loss**
- **Improper pesticide use**
- **Disease**
- **Climate change**

We know we can help!



Good intentions

But . . .
when presented with
images representing
those choices . . .



Photo Easton Landscapes

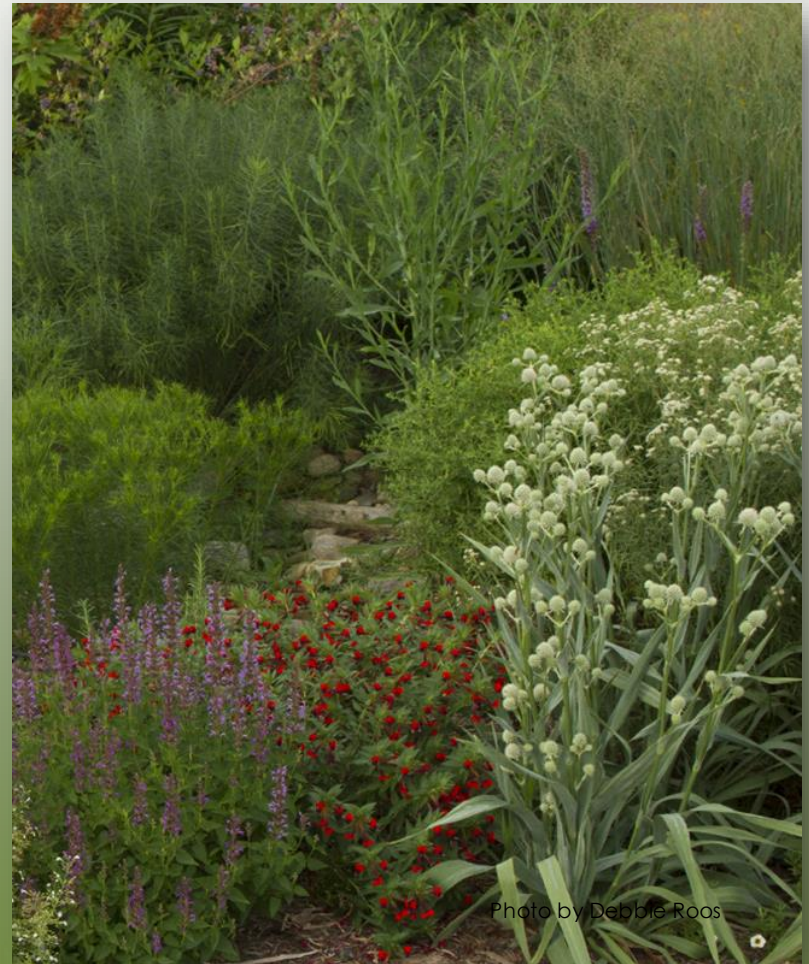


Photo by Debbie Roos

What will the neighbors think . . .

We've borrowed our landscape ideals from a European garden aesthetic.

- **Fall into the familiar**
- **Not especially adapted to our environment**
- **Probably require continuous inputs**
- **Does not support beneficial organisms**



Creating a Pollinator Paradise

Landscapes with trees, shrubs, perennials and annuals planted close together harbor a wider variety and larger number of pollinators and other beneficial insects.



**Why? Let's ask
the pollinators...**

Meet the Pollinators

The Top Three:

1. Bees
2. Butterflies
3. Hummingbirds



More Pollinators

**4. The Night Shift:
Moths and Bats**

**5. Other insects:
Flies, Spiders, Beetles**

**6. Other species:
Geckos, Lemurs,
Australian Honey
Possum**



Top 3 Pollinators

Bees

Seek nectar for energy, and females also bring pollen back to nest



Favorite Flowers:

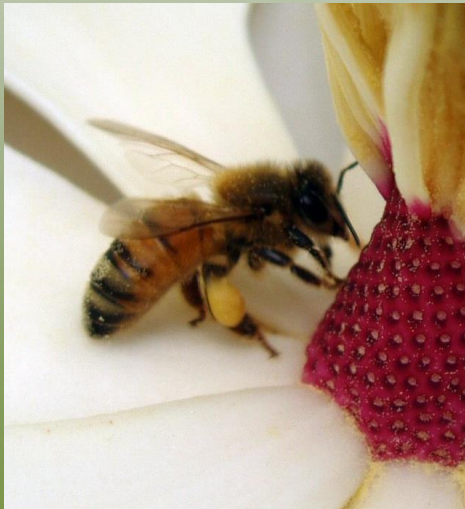
- **Bright yellow and blue flowers**
- **Bees cannot see red**

How they pick up pollen:

Tiny hairs on their bodies pick up pollen as bees drink nectar

Solitary Bees: 90% of Bees in North America

- **Females construct and provision their own nests**
- **Most not aggressive, many stingless**
- **30% are tunneling nesters:**
live in snags, hollowed out twigs and stems
- **70% are ground nesters:**
live in sparsely vegetated, well-drained soil



Horn Faced Bee with saddlebags



Mason Bee nesting in bamboo



Polyester Bee in ground nest

Social Bees Live in Colonies

- **European Honey Bees (*Apis mellifera*)** most used species for managed pollination in agriculture
- **Bumblebees (*Bombus*)** best known US Native



European Honey Bee forager returns to hive with pollen



Bumblebee on Echinacea

Wasps aren't Bees, but Close Relatives

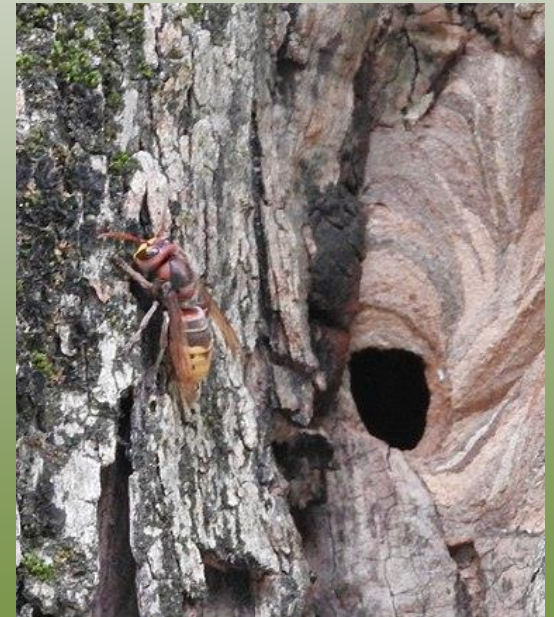
- Carnivores during larval stage
- Short tongues, so drink nectar from shallow flowers and nonfloral sugar sources
- Smooth bodied, so only incidental pollinators
- Can defend nests aggressively



Paper Wasp



Yellowjackets



Hornet

Top 3 Pollinators

Butterflies

Lepidoptera is the second largest order of insects with 160,000 species worldwide



Favorite Flowers:

- Bright colors
- Flat landing places
- Because Moths mostly nocturnal, attracted by white flowers and strong fragrance

How they pick up pollen:

Same as bees, pollen gets stuck on their body as they drink nectar. But thinner bodies don't carry as much pollen.

5 Butterfly Families

Skippers

Family Hesperiidae



Swallowtails

Family Papilionidae



5 Butterfly Families, continued

**Whites,
Marbles and
Sulphurs**
Family Pieridae



**Gossamer-
Winged
Butterflies**
Family Lycaenidae



5 Butterfly Families, continued

Brush-Footed Butterflies

*Family
Nymphalidae*



Top 3 Pollinators

Hummingbirds

Insects use scent, but birds use sight, so hummingbird flowers may have little or no fragrance



Ruby Throated Hummingbird

Favorite Flowers:

- Red, orange or white
- Tube-shaped flowers strong enough to support a hummingbird's weight

How they pick up pollen:

They reach their long beaks into flowers to access nectar, dusting their faces and beaks with pollen

What is this pollinator?

Hummingbird or Sphinx Moth



Favorite Flowers:

- Tubular
- Red

How they pick up pollen:

When they feed, their forehead rubs against the stamens and pistils collecting pollen

Creating your Pollinator Paradise

- 1. Give them Shelter**
- 2. Provide Nesting Sites and Materials**
- 3. Dish up Variety of Foods**
- 4. Use Pesticides with Care**



Woody shrubs, ornamental grasses and close-planted perennials create varied structure

Photo: Debbie Roos, NC Extension

1. Shelter

Provide places to hide:

- **Brush Pile**
- **Untreated Wooden Structures**
- **Ornamental Grasses**



Wooden Structures like this also offer building materials for some bees

Photo, Debbie Roos, NC Extension

1. Shelter

Brush Pile not your style?

- **Wattle fence**
- **Split Rail Fence**
- **Bare Cedar Fence**
- **Rustic Arbor**

Use Untreated Wood



Shelter from Wind also important

- **Air movement affects light little pollinator bodies, and global warming will increase winds**
- **British 2020 study showed 35% reduction in number of flowers bees drank from in wind conditions**
- **Build in windbreaks to your landscape**



2. Nesting Sites & Materials

Sites for bees:

- Bare Earth
- Twigs
- Branches



Bumble bees like the base of brush piles



Cavity nesters



Nesting carpenter bees in “brood chambers”

2. Nesting Sites & Materials

Materials:

- **Mud**
- **Wood**
- **Grasses**
- **Sandy Soil**



**Carpenter bee
carrying mud**



**Chrysalis on
grass blade**

2. Nesting Sites & Materials

Host sites for Butterflies:

Plants that produce food and shelter for *caterpillars* that emerge from eggs laid by butterflies



Xerces.org

Two thirds of host plants are shrubs and trees

Pollinators can be Specialists or Generalists

Specialists:

- **Have evolved specific relationship with plant species**
- **Some bees forage for pollen from only one plant species, emerge from nest when host plant begins to flower**
- **Host flower sometimes depends on specific bee to pollinate, too**

Generalists:

Visit wide range of flower types and species when seeking pollen



Male squash bees prepare pollen for a female

Source: USDA

Butterflies and Moths can be Specialists too:

- **Monarchs only lay eggs on Milkweeds (Asclepias)**
- **Eastern Black Swallowtails lay eggs on any plant in Carrot family (Apiaceae)**



2. Nesting Sites & Materials

Do Butterfly Boxes work?

- Meant as wintering shelter
- But most butterflies and moths do NOT overwinter in north
- Species that do overwinter are not apt to choose spot in open sunny garden



Mourning Cloak
Photo: Wikipedia



3. Variety of Foods

Pollinators need sources of

- ***Nectar***
- ***Pollen***
- ***Water?***



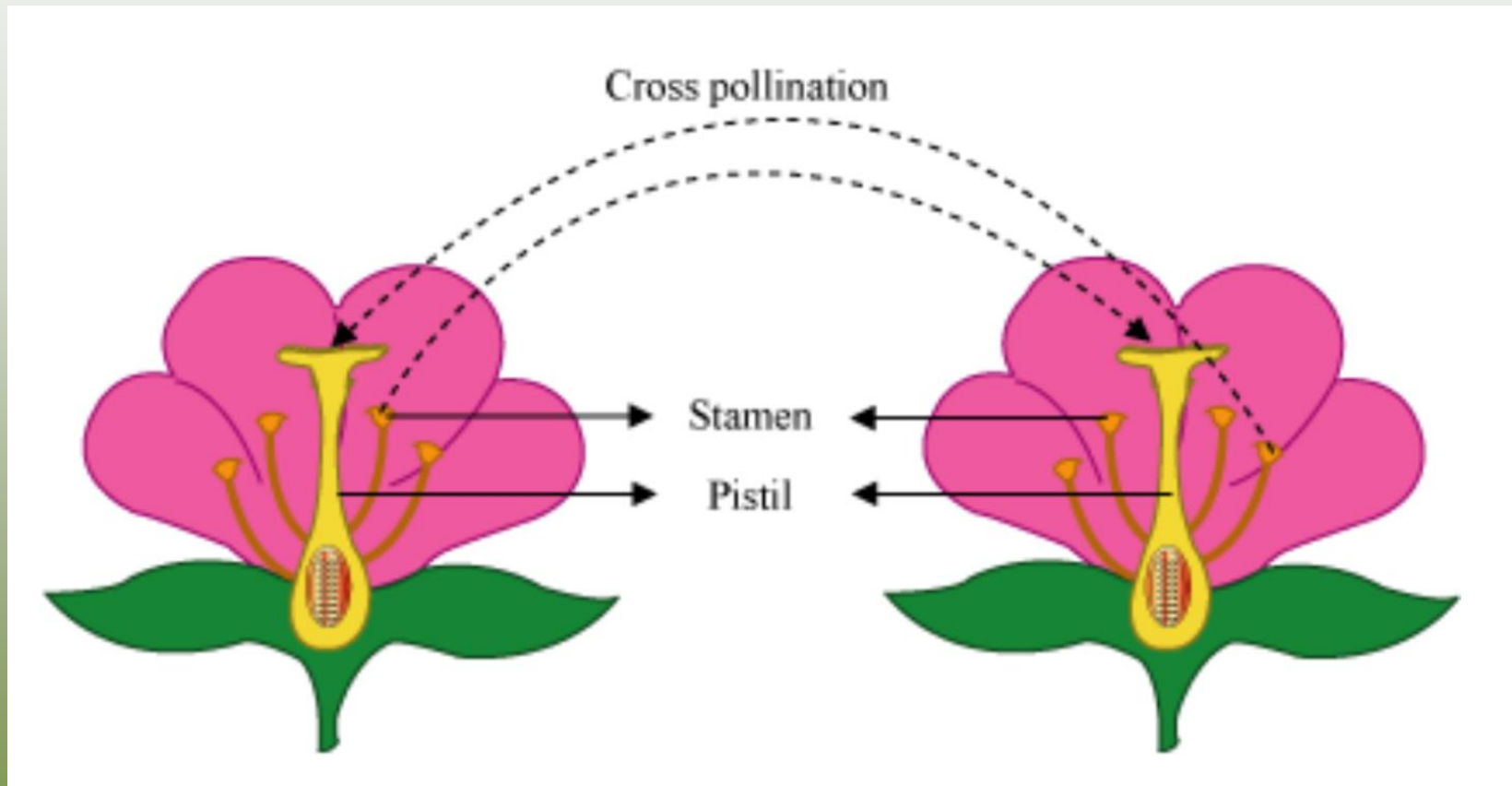
3. Variety of Foods

Butterflies get water from nectar...

It's minerals they seek from "puddling"



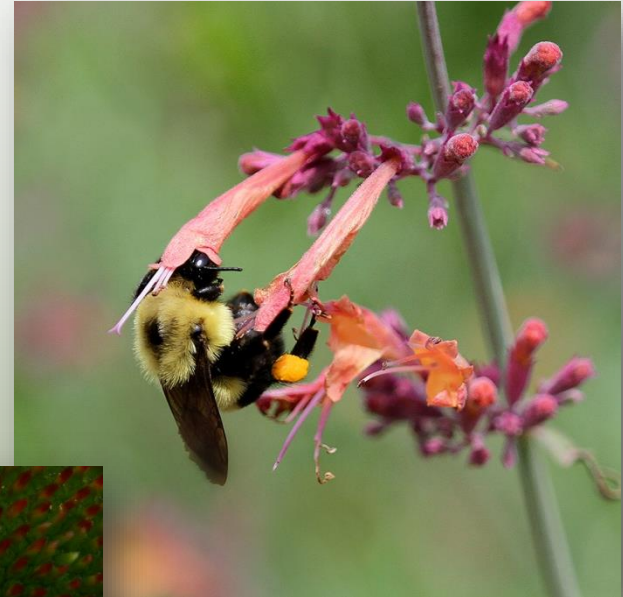
Sources of Nectar and Pollen



Food Variety to serve Pollinator Diversity

Celebrate their Differences!

- **Different mouthparts**
- **Different body sizes**
- **Different times of year**



Small sweat bees (left) feed from open-faced or small flowers.

Bumblebees (above) can reach into tubular flowers

Photos: Debbie Roos

Plant to Provide Diversity

Proposal:

Balance Non-native (introduced) plants with Native plants

- **Native: good for specialist bees**
- **Non-native: good for generalist bees**



*Swamp Sunflower (Helianthus) and
Oak-Leaf Hydrangea (H. Quercifolia)
Photo Debbie Roos*

Plant to Provide Diversity

Also consider:

- **Sequence of bloom**
- **Variety of colors and shapes**
- **Importance of other beneficial insects**



*Swamp Sunflower (Helianthus) and
Oak-Leaf Hydrangea (H. Quercifolia)*
Photo Debbie Roos

Sources of Pollen & Nectar

- **Shrubs & Trees**
- **Perennials**
- **Annuals**
- **Ground Covers
vs. Lawns**



Plant to Provide Diversity

Do we have to replace our lawns with wildflower meadows?



July 20, 2020

Plant to Provide Diversity



Plant to Provide Diversity

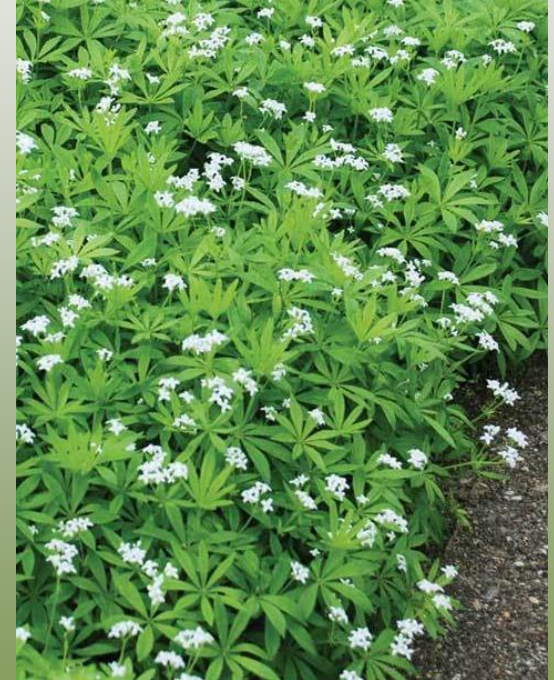
Consider flowering ground covers to replace turf



Ajuga
(Bugleweed)



Vinca minor
(Periwinkle,
Creeping Myrtle)



Galium odoratum
(Sweet Woodruff)

Go Big for Pollinators!



21

Liriodendron tulipifera
(Tulip Tree) 120 feet +



285

Acer rubrum (Red Maple)
50-90 feet



413

Betula (Birch)
50-90 feet

And: *Carya ovata* (Shagbark Hickory), *Tilia Americana* (American Linden), *Pinus* (Pine), *Quercus* (Oak)

Small Trees



Cercis canadensis
(Redbud) 6-9 feet



Malus (Crabapple)
13-35 feet



Amelanchier (Serviceberry or
Shadblow) 6-8 feet

Shrubs



Aesculus parviflora
(Bottlebrush Buckeye)



Lindera benzoin
(Spicebush)



Vaccinium corymbosum
(Highbush Blueberry)

Perennials for Spring Bloom



Baptisia alba
(False Indigo)



Tradescantia ohiensis
(Ohio Spiderwort)



Zizia aurea
(Golden Alexander)

Perennials for Summer Bloom



Asclepias syriaca
(Common Milkweed)

Asclepias incarnata
(Swamp Milkweed)



Liatris aspera
(Tall Blazing Star)



Chelone glabra
(White Turtlehead)

Perennials for Late Summer to Fall Bloom



Echinacea purpurea
(Purple Coneflower)



Helenium autumnale
(Common Sneezeweed)



Symphyotrichum novi-belgii
(New York Aster)

Make a special effort to provide Butterflies with a Fall Send-Off



- Late-season nectar fuels migration
- Plant in groups for more efficient foraging

Classic Fall Butterfly Fodder



Solidago 'Fireworks' (Goldenrod)



Chrysanthemum

4. Pesticide Care

Pesticides that can be poisonous to pollinators include

- ***Insecticides and***
- ***Fungicides and***
- ***Herbicides***

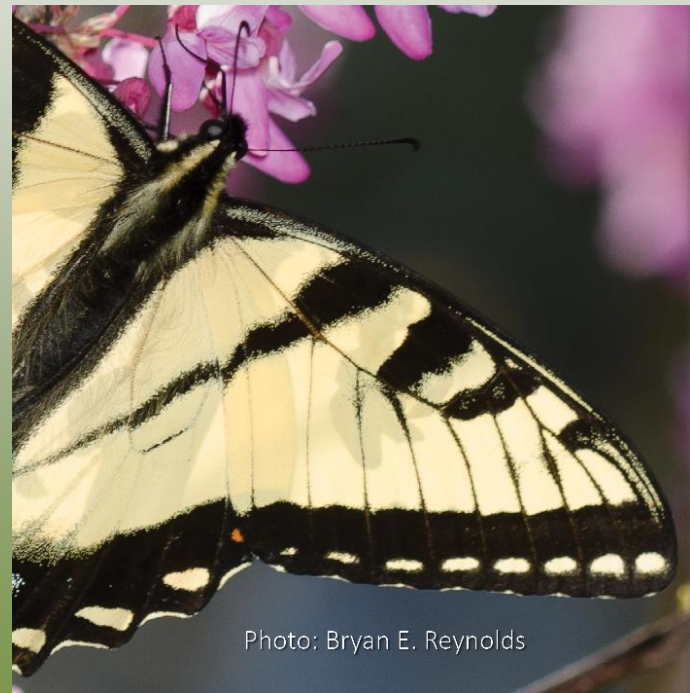


Photo: Bryan E. Reynolds

4. Pesticide Care

Current Model of Action:

- **People seek advice from family and friends**
- **Or just pick something up off the shelf**
- **Don't have time to research other options, or read labels**
- **Use “Fire-hose” approach after trouble has erupted**



4. Pesticide Care

Integrated Pest Management may differ from what is familiar

IPM requires you to:

- **Scout, observe, repeat**
- **Learn: plant, pest, options**
- **Decide how much damage you can live with**
- **Devise a control strategy that you can feel good about**
- **Make it public: Share knowledge with family & friends**



Leafcutter Bee damage on seedling

4. Pesticide Care

If you must use a pesticide . . .

- **Don't spray plants in flower**
- **Don't spray during the day**
- **Learn the pest's lifecycle**
- **Choose the least toxic, lowest residual pesticide**
- **Be conscientious with systemic or long-residual pesticides**



But **Bee** Brave!

The Challenge:

**Aim for a *different aesthetic*
that includes *cues from the past*
to make your**

landscape

beautiful

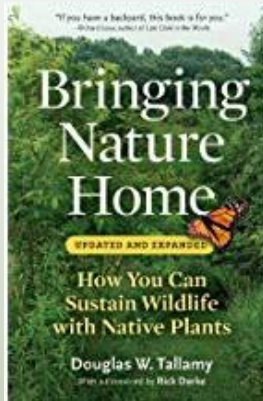
and

**pollinator-
friendly!**



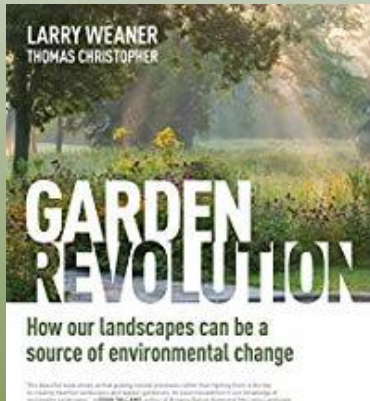
Photo by Debbie Roos,

References & Resources



Bringing Nature Home: How You Can Sustain Wildlife with Native Plants

Douglas W. Tallamy

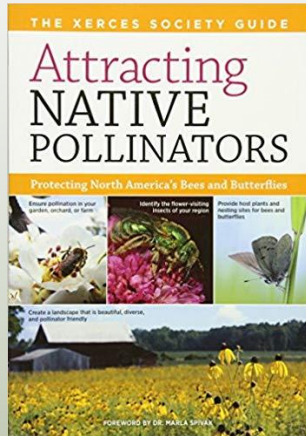


Garden Revolution:

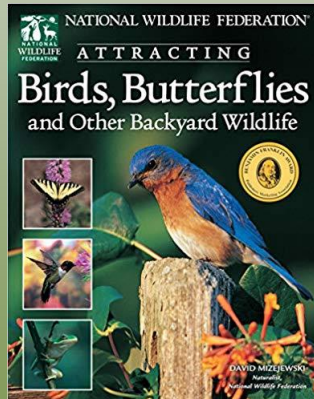
How our landscapes can be a source
of environmental change

Larry Weaner & Thomas Christopher

References & Resources, continued



**Attracting Native Pollinators:
Protecting North America's Bees
and Butterflies**
The Xerces Society



**Attracting Birds, Butterflies &
Other Backyard Wildlife**
National Wildlife Federation

More Resources



The Xerxes Society

For invertebrate conservation.

www.xerxes.org



New England Wildflower Society

Conserving and promoting the region's native plants to ensure healthy, biologically diverse landscapes

www.newenglandwild.org/



The Pollinator Partnership

Protect their lives. Preserve ours.

www.pollinator.org



**And thank you to Jennifer Lerner and
Cornell Cooperative Extension of Putnam County
putnam.cce.cornell.edu/gardening/create-a-pollinator-paradise**

Get out there and Garden as if life depended on it!



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