

Pollinator Garden Basics

“Chances are you never thought of your garden--indeed, all of your property--as a wildlife preserve that presents the last chance we have for sustaining plants and animals that were once common throughout the U.S. But that is exactly the role our suburban landscapes are playing.” Douglas Tallamy, Professor of Entomology and author of The Living Landscape: Designing for Beauty and Biodiversity in the Home Garden and Nature's Best Hope: A New Approach to Conservation that Starts in Your Yard

Guiding Question

How can I create a pollinator garden for native bees and butterflies that will provide the essential elements for a thriving, sustainable pollinator community?

TEACHER Background Information

Pollinators

Many animals are pollinators. Our garden project will focus on the invertebrates, more specifically the native bees and butterflies. Once your garden has been created, you will be able to observe more than just many different native bees and butterflies but also hummingbirds, beetles, and wasps pollinating the native flowers.

Nectar plants and Host plants for Pollinators

Host Plants

The butterflies' larval form, caterpillars, are picky eaters. They will only eat a specific type or types of plants. These plants play host to the butterflies' eggs and then caterpillars.

Nectar Plants

Butterflies prefer flowers with multiple flowers clustered together. Examples of this are milkweeds from the genus *Asclepias*, and bee balm from the genus *Monarda*. This cluster allows the butterfly to save energy by simply walking to the next flower for nectar.

A bee's source of nectar is often determined by the length of its tongue. Bumble bees and butterflies both have long tongues. The small, metallic green sweat bee has a very short tongue. Flowers of various sizes will, therefore, attract a greater variety of native bees. Providing blooming flowers from April to October will provide food throughout the season. Providing a variety of nectar plants (8-20 varieties) will attract more pollinators.

Groupings of the same host or nectar plant will allow specialists to save energy when seeking food or a place to lay eggs.

The Winter Garden

Even though the winter garden appears lifeless, many of the pollinators will be tucked into a variety of shelters in the garden. Some will overwinter as an adult, others in the larva or pupa form. Some may even overwinter as eggs. When you maintain your



garden be aware of the various life stages that may have settled into the leaf litter, dead branches and underground.

Sustainability

Prairie Plants

Oklahoma's native prairie plants have evolved to survive the rough conditions of what was once called The Great American Desert. Fires routinely cross the prairie and harsh, dry summers can be followed by ice storms and blizzards. Herds of grazing animals roam these prairies. To survive, prairie plants have developed many unique features. Most prairie plants have narrow leaves that lose less water and root systems that are longer than the plant is tall. The growth node from which the above-ground portion of the plant sprouts is below ground protecting the plant from fires and grazing animals and allowing them to grow back quickly when the plant is burned or eaten away.

http://www.museum.state.il.us/muslink/prairie/htmls/eco_adapt.html

Carbon Sequestration

The adaptations of our prairie plants make them an excellent storage place for carbon. The root system of these plants can be as long as 15 feet. The familiar Purple Coneflower grows 3 to 4 ft. tall while its roots go down 5 ft. The shorter Lead Plant that grows 3 ft. tall, has a root system that goes down 15 feet. These extensive root systems store large amounts of carbon below ground. Placing the growth node of these plants below ground allows the plant to grow back quickly when plant is destroyed above ground. Even if the plant is killed, the roots can remain underground for 100's of years holding that carbon in storage.

It has been estimated that carbon storage rates of prairie plants ranges from 0.3 to 1.7 metric tons per acre per year.

Satellite images from NASA show that there are approximately 40 million acres of lawn in the continental USA. If only 2 million acres were converted to prairie, the prairie plants would sequester 2,000,000 metric tons per year, cumulative.

<https://tallgrassontario.org/wp-site/carbon-sequestration/>

<https://www.qualicocommunitieswinnipeg.com/our-commitment/native-plants-grasses>

Water Conservation & Quality

The deep root system of native plants allows them to both increase stormwater infiltration into the soil and improve the water quality acting as a natural filtration system. Their adaptations allow them to need little to no additional water once they are established, unlike turf grass lawns.

<https://www.deq.ok.gov/wp-content/uploads/water-division/Rain-Gardens-8-2018.pdf#:~:text=Some%20examples%20of%20native%20Oklahoma,Passion%20Flow%2C%20PawPaw%2C%20Sassafras%2C>

https://www.watershedcouncil.org/uploads/7/2/5/1/7251350/rain_garden_brochure-v7final_20.pdf



Soil Conservation and Erosion Control

Although the Dust Bowl of the 1930s was caused by a number of environmental factors that could not have been controlled, the farms may have survived if they had left some native plants, rotated crops, and not left barren fields over the winter months.

http://harkeycm.weebly.com/uploads/4/0/8/7/40877465/what_caused_the_dust_bowl_.pdf

<https://www.history.com/topics/great-depression/dust-bowl>

Native Pollinators

“Did you know that you can thank pollinators for one out of every three bites of food you eat?...”

“So hear this: Pollinators may be our planet's most ecologically and economically important group of animals. They provide stability for every terrestrial ecosystem in the world, because wild flowering plants depend on these native bees, flies, butterflies, beetles, moths, bats, birds and other animals to reproduce. “

https://www.biologicaldiversity.org/campaigns/native_pollinators/index.html

Tips for the Project

- Have students use the scientific name, Genus species, when researching a plant or animal. Common names are unreliable. They can be used for more than one species and can vary from region to region. Also, some native plants have been bred to create fancy new colors and may no longer have the nectar that the pollinators need.
- Internet resources that are created by educational entities are often very reliable.
- Encourage students to keep track of their internet resources by copying and pasting a webpage's address into a document. A quick note about what was found on the site will help, too.
- Check your state and local nonprofit groups. There are many groups with interests in pollinators, butterflies, bees, native plants, etc. Some of these local groups may also have experts that can help.
- If you are buying your own plants, be sure to get them from a plant store that has been selling these plants specifically for pollinators. Springtime garden shows often feature local vendors that specialize in these plants for pollinators. Many plant stores now sell plants that have been treated with insecticides so that their plants will remain “perfect” and not eaten by insects. You want plants that are going to be safe for insects to eat. Be aware that if you get a plant with holes in the leaves or chewed-on leaves, you may be getting a free caterpillar with your plant!

Possible Resources

Butterflies and bees native to Oklahoma (similar sites will be found in each state)

<https://dengarden.com/gardening/Butterflies-of-Oklahoma-15-Beautiful-Specimens-And-How-To-Attract-Them>

<https://xerces.org/blog/oklahoma-butterflies>



<http://w3.biosci.utexas.edu/jha/about-native-bees>

link to NSTA recommended picture books about pollinators

<https://www.google.com/search?source=univ&tbm=isch&q=NSTA+recommended+pictures+books+about+pollinators&sa=X&ved=2ahUKEwjMxNjmjPPpAhVrmK0KHQhZCEQQsAR6BAgHEAE>

[Bees: An Identification and Native Plant Forage Guide](#), by Heather Holm

[The Life Cycle of Butterflies](#), by Judy Burris & Wayne Richards

[Pollinators of Native Plants](#), by Heather Holm

