

Lesson: Why a Butterfly Garden? Seeking Pollinator Certification

Introduction:

Butterflies are creatures of beauty that have fascinated us for centuries. Depictions of butterflies go back to the time of the Aztecs or before. Their colorful presence, their association with flowers, their graceful movements, their fragile beauty, and their dancing movements with the wind have fostered a special appreciation for these insects.

Aside from adding beauty to our lives, they play a significance role in nature as well. They are very important pollinators, resulting in the pollination of food for us (apples, watermelon, squash, cucumbers, etc). Butterflies have long tongues to reach deep into a flower blossom to pollinate flowers and they travel over large areas effecting pollination in different locations. This helps to improve the gene mix of genes in the plant world. (Bees are important pollinators, but usually stay in one area.) The presence of butterflies is also an important indicator of general good environmental health as butterflies and moths make up one of the major insects groups in the world. This is important because insects along with plants make up the supporting basis for life on the trophic scale.

The Endangered Species Act (ESA) was signed into law in 1973 and contained no insect pollinators at that time. The first butterfly to receive protection under the Endangered Species Act was the Schaus swallowtail. The Schaus swallowtail is found in the area of South Miami to the Florida Keys. It was originally listed as threatened and later reclassified as endangered because of a dramatic decline in population. The destruction of its tropical hardwood habitat, and mosquito spraying caused the population to be declared endangered. In August 31, 1984, the butterfly made the federal list of endangered species. The Miami blue butterfly is another butterfly that has been threatened by Florida's chemical war on mosquitoes. This species of butterfly was believed to be possibly extinct due to mosquito spraying and hurricane Andrew until it was sighted again in 1999 in the Florida Keys.

Other butterflies have been added to the endangered list since the first butterfly was listed. In 2000, the Fender blue butterfly in Oregon made the federal endangered list. The main cause was habitat destruction and loss of it host plant, lupine. The Fender blue butterfly is dependent on the lupine plant to lay its eggs on the plant's leaves. The caterpillars that emerge feed on the leaves and then go into dormancy at the base of the plant until ready to emerge.

The monarch butterfly, which is seen in many states in the United States, including Georgia, has also suffered a decline in population. Monarch butterflies are dependent on one host plant, the milkweed plant to lay their eggs and feed their young caterpillars. The milkweed plant population has declined in the United States due to pesticides, agriculture, and land development. Millions of Monarch butterflies migrate every fall from Canada and the United States to Mexico to spend their winters in Mexico at specific sites in the mountains of Central Mexico that are protected preservation sites by the Mexican

government. The monarch butterfly migration is considered one of the greatest migrations in nature. Illegal logging in central Mexico has destroyed parts of their winter habitat, however, reducing the Monarch butterfly population.

1. What is the primary threat to most endangered species?

Answer: Habitat loss (from land development and agriculture).

2. Why is our butterfly and pollinator population declining?

- a. Loss of habitat. Housing developments and malls have taken the place of fields that support and are the breeding ground of butterflies.
- b. Pesticides used for crops and backyard weed control have left butterflies without a place to live and multiply. Pesticides used to control insects in gardens also harm butterflies.
- c. Invasive plants or non-native plants (such as kudzu) that take over in lieu of native plants have also resulted in a decline in population.

When researchers look at the reason why butterflies are endangered the correlation is clear. The source of native plants to supply nectar for the butterflies is low due to land development and habitat loss. In order to reestablish a species, native plants have to be reestablished in an area to support the species. This effort to reestablish a species is called habitat restoration. One method to do this is called solarization. Large sheets of plastic are laid over an area in the hot summer months. The heat bakes and kills the nonnative plants and their seeds. Native seeds are then planted in the fall, hopefully with less competition from the invasive or nonnative plants.

3. Why create a butterfly garden?

- a. To increase our butterfly population. Butterflies are becoming increasingly rare. By growing plants that butterflies need, you will help to preserve butterflies by providing them with the plants they need for food and to raise their young.
- b. You will be helping other pollinators as well with a butterfly garden. (Butterflies and insects are an important part of a healthy ecosystem.)
- c. Butterfly gardens need little care.

4. Why are pollinators important? What kind of crops do they affect?

Crops are grown for food, medicine, spices, beverages, and fibers. An estimated 75% of these crops are dependent on pollinators. The plants that many wild creatures rely on for food or shelter would also disappear without pollinators, causing a collapse of our ecosystem. Without pollination most plants could not produce fruit or seeds and many of the foods we eat would not be available for us. (source for statistic: Wildlife Habitat Council)

5. What do butterflies need:

- a. A sunny location. Butterflies love the sun and cannot fly unless the temperature is warm enough (above 55 degrees). They will bask in the sun to warm up their bodies.

- b. Flowers of different colors to attract the butterflies. Their favorite colors are usually pink, purple, yellow and white. Butterflies need nectar from the plants for food. Because butterflies need the sun, most of the nectar plants they need are also plants that are sun lovers.
- c. Host plants (plants that the butterflies depend on to lay their eggs).
- d. Plants and flowers that are left intact after the growing season has ended. Cutting back plants can destroy butterfly eggs or pupae.
- e. A garden without pesticides. Pesticides kill insects and butterflies are insects.
- f. A water source

6. How do plants support pollinators?

They provide food. Butterflies, moths, and bees get most of their food from flowers. They feast on the nectar inside the flowers that has the sugary liquid they need for nourishment. Bees will drink the nectar as their food source and also carry some of it back to the hive for the baby bees and for storage in the hive. The nectar in flowers is there solely to tempt pollinators to come and transport their pollen to another flower. It has no other function.

7. How do plants support birds?

- 1. As a food source. Some birds will also need the nectar of flowers for food. Birds such as hummingbirds will drink the nectar from the flowers. It is high-energy food for them. Hummingbirds need to consume a lot of nectar every day. They will consume twice their weight in nectar every day. The seeds from flowers, such as sunflowers, will also provide food for the birds.
- 2. Plants also attract insects which the birds will eat.
- 3. Plants also provide shelter or cover for the birds. Birds like to feel secure from larger birds or animals.
- 4. Plants, especially bushes and trees, provide nesting sites for birds.

8. Insects are our most important pollinators. What are our top three pollinators?

- a. Bees
- b. Butterflies
- c. Moths
- d. Other pollinators include: Birds, Bats, Flies, Beetles, Ants, Spiders, Mice and other small mammals

9. What is a host plant?

A host plant is one that a species is dependent on for survival. The plant provides nourishment and shelter and is important for the development of the species.

10. Why is a host plant important to a pollinator?

A number of pollinators such as butterflies depend on host plants for survival. The loss of host plants due to development and logging has resulted in the decline of our

pollinator population. The monarch butterfly population, for example, has decreased due to the decline of milkweed plants that these butterflies depend on to lay their eggs. Once their eggs hatch into caterpillars, the monarch caterpillars will only eat milkweed leaves.

11. The female part of the flower is called a **pistil**.

12. The male part of a flower is called a **stamen** and has multiple grains of **pollen**.

13. How do pollinators spread pollen?

The petals of a flower surround the center of a flower where we find **the pistil** (female organ of the flower in the center with a sticky knob on top) and stamen (male organs of the flower that have a stalk and a filament on top of their stalk). **The pollen from the male stamen** has to be transferred to the female pistil for the eggs to be fertilized and develop into seeds. For the transfer of pollen to take place, the flowers need help. Most flowers cannot do this on their own. They need a pollinator such as a bee or butterfly to pick up and transfer the pollen from the anthers of one flower to the pistil of another flower.

True or False:

14. ____ Flowers are designed in such a way that insects can not avoid getting pollen on them and carrying it away. (True, Flowers have sticky stigma so pollinators pick up pollen when visiting the flowers for nectar.)

15. ____ Most flowers are self pollinating. (False, they need insects to transfer the pollen from the stamens on a flower to the pistils of another flower. Many plants have methods of preventing self-pollination. In most plants, the male and female organs develop at different time intervals to prevent self-pollination and having the same genetic makeup. Nature seeks genetic variations through cross-pollination.)

16. ____ Some plants are pollinated by the wind. (True, flowers from the hop plant, for example, are wind-pollinated. Flowers from the hop plants are used for making beer and they have green cone shaped flowers.)

17. ____ Insects are attracted to flowers based on their shape. (True – the shape of flowers attracts different pollinators. For example, butterflies tend to like flat petals for them to land and sit. Hummingbirds like tubular shaped flowers that fit their long beaks for gathering nectar. Hummingbirds do not need flat petals as they hover in the air while nectaring.)

18. _____ Flowers use their scent to attract insects. (True – this is how flower attract bees, butterflies and moths to visit them. The scent appeals to them – it tells them that they have food (the nectar) for the pollinators.)

19. _____ Insects see the same colors that we see. (False, the eyes and brains of many insects do not have the ability to see the reflection of wavelengths of light from some colors.)

20. _____ Flowers use their colors to attract insects. (True – The beautiful colors of the flowers attract pollinators and send messages to them.)

21. _____ Insects are especially attracted to red flowers. (False – bees and many insects cannot see red objects or pure red flowers. Thus, red is unappealing to insects in general.)

20. _____ Birds especially like red flowers. (True - Hummingbirds and birds like red flowers and they are sometimes exclusively pollinated by birds. Insects tend not to be attracted to red flowers).

21. _____ Nighttime creatures such as bats are attracted to white flowers. (True. Moths and bats are attracted to white or light color flowers because they can see them and find them at night.)

22. _____ Bees, butterflies, birds, and beetles look for pink, yellow, white, blue, and purple flowers. (True – these colors are easy to see during the day.)

23. Colors are nature's way of separating the plants for different pollinators. The colors of the flowers will determine which pollinators find them. True – the colors will often make a difference in attracting different pollinators. It is nature's way of ensuring that there are different plants for different pollinators. (The pollinators that like red flowers, for example, will not have to compete with the pollinators that prefer white flowers.)

24. _____ Flowers have nectar guides patterns on their petals to direct the pollinators to the nectar. (True, the petals have a pattern of spots or dotted lines on their petals to direct the pollinators to the nectar (called nectar guides). The flowers help the insects locate the nectar.)

25. _____ Humans can see the nectar guides on all flowers. (False, Some nectar guides are not visible to humans, only to insects. Humans cannot see the nectar guides on dandelions, for example. Dandelions simply look yellow to people, however, pollinators can see their dark centers, which guide them to the center of the flowers where the nectar and pollen is found. (Insects can see short wavelengths beyond the violet end of the color spectrum that we cannot see.)

26. _____ Any pollinator can extract nectar from a flower.

False - some flowers like water lilies do not produce nectar. Flowers that offer nectar have evolved shapes that protect their nectar so it goes to the right animals. The nectar is usually hidden deep inside a tube, bell shape, or funnel. The animals that reach their nectar must have a long tongue called a proboscis. Butterflies have this long tongue that is coiled up when not in use. Hummingbirds have long slender beaks with even longer tongues to get into the flower tubes to suck up the nectar. While getting the nectar, the pollen will get stuck to its feathered head or breast. Bees have tube shaped mouths with long tongues inside. Butterflies need a landing platform on the petals of the flowers to get the nectar. Moths do not. They hover in the air while drinking nectar. Thus, the shape of the petals will also determine which pollinators can extract nectar from a flower.

27. _____ A “moon garden” has predominately white flowers.

(True – A moon garden, otherwise known as an “evening garden” or a “white garden,” uses predominately white flowers and silvery foliage. The flowers tend to glow because of their bright white color which attracts night pollinators such as bats and moths. Some flowers, such as moonflowers, open only at night.