

Butterfly migration

As spring arrives in Arkansas, the flowers bloom and the butterflies return to flutter around in the warm weather. Each year I take time to appreciate the butterflies, which are both a pleasure to look at and a benefit to the environment. But where have they been these past months? In this article we will discuss where these delightful insects go in the winter, and how you might attract them to your own garden this April.

Butterflies require heat to flap their wings and to move. In the winter when temperatures drop, most North American butterflies go into diapause, a period of suspended development and activity. They thicken their blood with anti-freezing agents, allowing them to survive low temperatures. Some will overwinter in pupal form, others will overwinter in chrysalis or butterfly form, using light and temperature cues to determine when to go into and come out of diapause.

There is one notable exception to this overwintering technique: The monarch butterfly. Rather than go into diapause to weather out cold temperatures, the monarch makes a multigenerational migration southward toward tropical areas. Massive kaleidoscopes of monarch butterflies travel south in the fall. Despite each monarch weighing less than a gram, when they all land to roost together these huge groups are sometimes heavy enough to break large branches! Arkansas is in the monarch's fall flyway as well as their spring flyway as they come back north starting in March. Many monarchs will end their journey in Arkansas and lay eggs on milkweed plants here. This generation of monarchs will remain in the southern United States for the remainder of their lifespan, but the following generation will continue north to the group's original sites. Summer monarchs' lifespans are shorter than winter generations, ranging from three to five weeks rather than the winter generations lifespan of eight to nine months.

So, whether they're coming out of diapause or returning from the south, the beautiful monarchs, diana fritillaries, zebra and black swallowtails, painted ladies, and so many other common Arkansas species are out doing their part for the ecosystem as pollinators. You can help provide habitat for butterflies and other pollinators in your own backyard. To make your garden more attractive to native butterflies, you will need to provide adequate habitat and food. Butterflies have a liquid diet, and though occasionally they will seek nutrients from other sources, they get most of their diet from nectar in flowers. Hairstreak butterflies feed from goldenrod and mountain mints. While adult butterflies will feed on nectar from a wide variety of flowers, caterpillars typically have very specialized diets. For example, swallowtail caterpillars feed on plants from the parsley family, like fennel and dill, though as adults they feed from a variety of plants. Phlox, tickseed, butterfly bush, butterfly weed, and buttonbush are a few attractants for some common Arkansas butterflies.

Butterflies also need a place to rest and regain their energy. Butterflies don't sleep like people do, but many species do take a rest in groups, a behavior called "roosting." They roost in

various places, including in leaves, on bark of trees, rocky areas, and so on. Some gather around pools of water or on the ground in an activity called mud-puddling. They will often prefer areas that provide good cover, which serves to both protect them from predators and moderate their temperature. Butterflies are likely to stick around if they are provided with a place to reproduce. Many butterflies will only lay their eggs on specific plants called host plants, which will support their babies from the start of their larval stage to the point where they are a butterfly. Monarchs will only lay eggs on milkweed plants. Diana Fritillaries will lay eggs around the stems of violets. Often, the plant the butterfly lays eggs on is the same one the caterpillar will want to eat.

You don't necessarily have to have a big garden and a butterfly feeder to attract butterflies to your area. If you simply have an area with the kind of plants and habitat native butterflies need, it's likely you will see some butterflies. I wish you all luck in seeing the many beautiful species we have here in Arkansas this spring as we welcome the butterflies back and make a home for them in our hearts and our gardens.

Butterfly wings

From the vibrant stripes of a tiger swallowtail to the soft browns of a wood nymph, butterflies are known for the variety of colors and patterns across their wings. Though we enjoy watching butterflies, these wings are not just meant to look pretty. The structure and color of a butterfly's wings aid in its survival. In this article, we will discuss the various uses of a butterfly's wings, including warmth, flight, identification, and even protection from harm.

The first function that likely comes to mind for a butterfly's wings is flight. The motion of a butterfly's body propels it through pushing air under its wings. Butterflies have a unique wing structure, with an unusually broad wing shape for a flying animal, and a flexible forewing and hindwing that overlap. Their flight pattern is thought to be the reason for this. Butterflies fly in a 'figure eight' pattern, where the wings make a cup shape and perform a clapping motion which pushes a pocket of air backward. The butterfly then brings its wings down to push air underneath the body so the butterfly can move easily through the air. This method gives them their signature 'fluttering' look as they move. Some butterflies are capable of long journeys—monarchs will travel up to 3,000 miles on their small wings when migrating for winter. This is in part because they minimize energy usage by gliding on top of thermals and air currents.

A butterfly's wings can also be used for warmth and insulation. Butterflies need warmth to function, as they have a flight threshold, a temperature at which their muscles are warmed up enough to move so they can fly. Butterflies are *poikilothermic*, or cold blooded, meaning their body temperatures are not regulated internally like ours but instead vary with the temperatures outside. Thus, they require an outside heat source. When you see a butterfly basking on a rock or branch, it is absorbing heat from the sun through tiny scales on its wings like tiny solar panels.

The scales on a butterfly's wings are a fascinating structure, and they contribute another aspect to the wing: the color. Why do butterflies come in such a broad variety of colors and patterns? For one, the colors and patterns on butterfly wings help butterflies identify one another. Because butterflies can see ultraviolet light, when butterflies see each other, they can recognize certain markings that appear brighter than they do to the human eye. Some butterflies are thought to use this ability for recognizing which of them is a male or female, which is important for mating and potentially for territorial reasons, though there is debate surrounding the subject.

Wing colors can be a warning sign letting other animals know not to attack. For example, the monarch butterfly is poisonous to birds and will make a bird sick. If a bird eats a monarch and grows ill, it will recognize the monarch's orange and black coloration pattern and is less

likely to attack similar looking butterflies in the future. Another butterfly, the viceroy, has a similar orange and black coloration. Though the viceroy is not actually poisonous to birds, if a bird sees a viceroy, it is unlikely to eat it, as the viceroy looks like a monarch. This is a technique called mimicry, wherein one organism mimics a more dangerous organism to gain the advantage of association.

Butterflies can also use their wing colors for something quite the opposite of recognition or warning—camouflage. Some butterflies have dull colors to avoid notice, coloration that mimics the backgrounds they are commonly found in like leaves or rocks. Some have patterning that breaks up their outline, known as disruptive coloration. Another way butterfly's wings can protect them is through their shape. The sail swallowtail has extensions off the back edge of it's wings, like tails, that when attacked by a bird or other predator keeps the predator from hitting the more vital parts of its wings. The previously mentioned scales on the wings can also be used to escape spider webs and other dangers, as the scales are attached individually and can come off, allowing the butterfly to slip away when caught in sticky material.

The butterfly's tiny, delicate wing may not look like much, but a butterfly uses its wings in many ways, some of which we humans may not even know yet. Seeing that such a seemingly small piece has so many functions is one thing that is remarkable about nature—even the smallest part has its purpose, and every last organism is living in its own unique way. So this spring, when you see the familiar flapping wings of our native Arkansas butterflies, appreciate the many ways they help the butterfly survive.