

NATURE'S LABORATORY

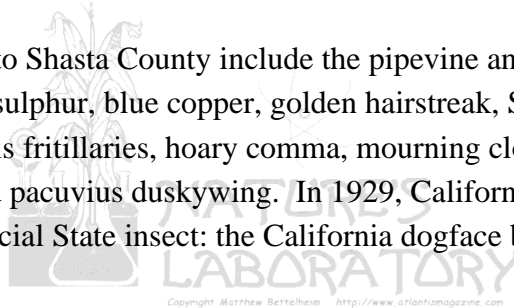
" The butterfly counts not months but moments, and has time enough."

-- Rabindranath Tagore

On the coattails of another crisp winter, spring is around the corner. While the sun struggles to remind us of the warm months to come, the harbingers of spring awaken from their deep winter sleep. Leaves unfurl, flowers unfold, and butterflies take to the skies.

There are upwards of 900 thousand different species of living insects on our planet, 17,500 of which are butterflies. In the United States alone there are approximately 750 species of butterfly. The five butterfly families found in the U.S. are the skippers (*Hesperiidae*), blues, coppers and hairstreaks (*Lycaenidae*), brush-footed (*Nymphalidae*), swallowtails (*Papilionidae*), whites, sulphurs and yellows (*Pieridae*), and metalmarks (*Riodinidae*).

Some butterflies native to Shasta County include the pipevine and anise swallowtails, Becker's white, orange sulphur, blue copper, golden hairstreak, Sonoran blue, spring azure, callipe and coronis fritillaries, hoary comma, mourning cloak, red admiral, painted lady, eufala skipper, and pacuvius duskywing. In 1929, California was the first state in the U.S. to select an official State insect: the California dogface butterfly (*Zerene eurydice*).



Perhaps the most familiar butterfly is the monarch (*Danaus plexippus*), which declares itself with bold orange wings veined in black. These butterflies are legendary for their migrations in which they overwinter in the warmer climes of Mexico and California. In Mexico's Sierra Madre Mountains, monarchs have been observed at an estimated 4 million butterflies per acre.

Butterflies aren't born butterflies – they originally come from caterpillars. When caterpillars are ready for adulthood, they undergo a complete metamorphosis, or change. After feasting on their favorite plants, caterpillars weave chrysalids of silk around themselves (moths make cocoons) which often connect to a neighboring leaf or branch by a silken anchor known as a cremaster.

Within the chrysalids larval caterpillars actually rearrange their body. As the larval tissues are broken down, cells that were once asleep in the caterpillar awaken, divide, and differentiate into their new adult body shape. When they've finished, the once-

caterpillars emerge from their chrysalids and unfold their wings for the first time. A butterfly is born!

Later in life butterflies will find a mate and lay their eggs on a host plant that will support next season's caterpillars. When the next generation of caterpillars are born, they'll be ready to eat and grow until they too are ready to build a chrysalis.

Every generation of adults is referred to as a "flight." Some butterflies have more than one flight each year, but the life span of each butterfly depends on their species and when the eggs from which each flight emerged from were laid. On average, however, adult butterflies probably live no longer than a week or two, and females tend to live a few days longer than males.

Make sure not to confuse butterflies with moths. Both groups of insects are able to coil their proboscis, a feeding tube, and both have wings covered with "scales" (which rub off when you touch them). What differentiates the two is that moths usually have feathery or threadlike antennae, while butterflies have club-tipped antennae. Generally, moths also tend to be nocturnal, while butterflies prefer the daytime.

Hands On: To attract butterflies to your garden, try planting a butterfly garden. Since many butterflies need particular host plants to sustain them throughout their life-cycle from caterpillar to butterfly, certain butterflies are only attracted to certain plants.

To ensure they make themselves at home in your garden, use these guidelines to attract your favorite butterflies: monarchs and queens require plants like common and swamp milkweed to thrive; viceroys and mourning cloaks require black, coyote, and weeping willow; cloudless sulphurs and sleepy oranges require partridge pea or sennas; buckeyes require false foxglove, toadflax, plaintain or indian paintbrush; great spangled and aphrodite fritillaries require wooley blue and lance-leafed violets; red admirals require common nettles or pellitory; and American painted ladies require cudweed or sweet everlasting.

Adult butterflies on the wing will stop to dine on flowers that provide nectar. To ensure your garden is suitable to passersby, try planting some of these flowering nectar plants. *White flowers:* bonset, button bush, white meadowsweet, and yarrow. *Orange flowers:* blanket flower, butterfly weed, and firebush. *Blue flowers:* bellflower, blue mist shrub, blue vervain, and golden dewdrop. *Yellow flowers:* black-eyed susan, chinese groundsel, goldenrod, coreopsis, and sunflower. *Pink, purple and red flowers:* anise, garden flox, New England aster, pineapple sage, verbena, weeping lantana, and wild bergamot.

To hone your skills at identifying butterflies, visit Turtle Bay's butterfly house in Redding. There you can experience a butterfly garden in action and watch butterflies undergo their metamorphosis from caterpillar to chrysalis to butterfly! You can also get a firsthand look at an array of native host and nectar plants.

At present, 27 states in the U.S. have officially designated State insects like the butterfly, the ladybug, or the praying mantis. Try looking up other State insects to learn about their roles in nature. You might be surprised how many states have chosen the honey bee as their insect of choice.

Matthew Bettelheim graduated from the University of California, San Diego, with a Bachelor's in Science, and is at present a practicing freelance science writer.

