Butterfly Gardening

Butterflies epitomize the essence of natural beauty with their colors, patterns and graceful movements. For centuries, humankind has been enchanted by the exotic nature of butterflies. Their delicate form has been imitated in crafts, jewelry making, depicted in art and used in ceremonial dress. Their astonishing metamorphosis ("change of form") from earthbound caterpillars to beautiful, winged adults has become incorporated into the ritual and folklore of many countries. In Christian art, the metamorphosis of the butterfly symbolizes the Resurrection.

While our fascination with butterflies has transcended recorded history, our understanding of their evolution is limited at best. This is due largely to the fact that butterflies are such fragile creatures, they tend to disintegrate after death rather than be preserved as fossils. The most revealing specimens have been those found encased in amber dating back to the Cretaceous era, between 100-140 million years ago. While the fossil record indicates that butterflies first appeared in the Cretaceous era; there is a growing body of evidence that indicates a much earlier ancestry.

Butterflies are classified as insects because they possess a hard external skeleton, three body parts (head, thorax and abdomen) and three jointed pairs of legs. Closely related to skippers and moths, butterflies are members of the insect order Lepidoptera from the Greek *lepis*, for scale, and *pteron*, for wing. Butterflies can be distinguished from skippers and moths by their antennae—butterflies have clubbed antenna, skippers have clubbed antenna with a distinctive hook at the tip, and moths have feathery antennae.

Butterfly wings are covered by layers of microscopic scales which give them their beautiful coloration. The brilliant wing colors originate from pigments in the scales or in the structure of their surface. Scales serve several other functions in addition to creating color patterns—they absorb or reflect sunlight during basking, their easy detachment helps butterflies escape predators, and some male butterflies have specialized scales that produce scent during courtship.

Butterflies undergo four distinct life stages resulting in complete metamorphosis. Each butterfly begins life as an egg that has been laid on the underside of the leaves or twigs of the larval host plant. Although there are variations among species, generally the egg will hatch into a tiny caterpillar (larva) in approximately four to ten days. The young caterpillar emerges and begins to feed on the host plant. The larvae spend their days alternating between eating and resting. This is the active growth stage of the butterfly life cycle and most larvae will need to molt (shed its skin) four to six times to accommodate the new growth. When the caterpillar has finished growing, the larva will attach itself to an object or plant to form a pupal case. It is inside the pupal case that the caterpillar is transformed into an adult.

A complete life cycle of a butterfly is called a brood. Some species have only one brood a year while others may have as many as four or five broods. Each species of butterfly overwinters in a fixed life stage. Most butterflies winter in the same areas that they summer. However, some butterflies that overwinter as adults

migrate south to avoid the cold. The most notable being the Monarchs who sometimes travel in excess of 2,000 miles to their overwintering grounds in Mexico and parts of the Southern United States.

Unfortunately, butterfly populations have been on the decline in recent decades. Some believe the loss of native vegetation to development is largely to blame. When land is developed, native plants are destroyed in the construction process and replaced with commercially popular non-native species. Native butterflies cannot complete their life cycle on the new plants and are forced to travel further and further away in search of the native plants they need to survive.

Gardeners can help increase butterfly populations in their area by planting nectar plants for adults and host plants for their larvae. Not only does planting a garden with plants to attract butterflies aid in butterfly conservation; the gardener is richly rewarded "in kind" with opportunities to observe butterflies up close as they reveal such secrets of nature as metamorphosis, mimicry, predator-prey relationships and the cycles of life.

The Butterfly Garden

The first step in designing a butterfly garden is to take a survey of the butterflies in your area. The greatest concentration of butterflies will be in open, sunny areas of your neighborhood. Parks, vacant lots, unmowed roadsides, flower gardens, meadows or other sites with an abundance of nectar plants are good places to start. With the help of a good guide book, you may select to identify butterflies "on the wing" or you may choose to capture and immediately release them upon identification. Be certain to bring a wildflower field guide to assist in identifying the nectar plants that butterflies visit. After determining which butterflies visit your area and the plants that they use, record other observations of the local environment such as areas of sunlight, puddles, shelter and rocky areas. These observations will provide important information for the design of your garden.

Most butterflies, as well as the plants that attract them, need open, sunny areas in order to thrive. Plants will benefit by blooming longer and butterflies will have longer to mate and feed. Butterflies need sunlight to assist them in drying their wings after they emerge from the cocoon. In addition, butterflies are cold-blooded and depend on the warmth of the sun for energy. That is why you see butterflies active on sunny days and inactive on cloudy days. Placing light-colored, flat stones perpendicular to the sun for basking will help butterflies warm their wings to 85–100°F, the temperature necessary to provide strength for flight. Butterflies bask with their wings open and their bodies perpendicular to the sun to absorb heat quickly. Basking also provides the gardener with opportunities for close-up viewing and photography.

It is best to locate your butterfly garden out of the wind to help butterflies conserve their energy and ease their flight. A moderate amount of protection will attract more butterflies. Gardens completely surrounded by windbreaks are not recommended. Consider planting a windscreen of nectar producing shrubs such as lilacs, mock orange, butterfly bush or viburnums. A terraced approach, ranging from an open sunlit space in the front to successively taller plants in the back works best. Planting flowers with large, broad petals will also help butterflies conserve energy by providing "landing pads" on which to rest and sip nectar.

While streams and ponds are an asset in the butterfly garden, providing water can be as simple as creating a small puddle. Butterflies will "puddle" to obtain minerals and nutrients like salt, from the water. Creating a puddle will also attract young patrolling males searching for receptive mates. This behavior can often be observed during the warmest part of the day.

Finally, while butterfly larvae pose little threat to most vegetables and ornamentals, it is a good idea to locate larval plants in an out of the way area of your landscape. Many native larval plants such as ironweed and Joe-pye weed attain great heights and may be more suited to a naturalized area of your garden. Also,

some larval host plants have weedy characteristics that are best located in a contained area of the garden or in a container.

Plants for the Butterfly Garden

Strive to create a garden that is as appealing to you as it is to the butterflies you want to attract. Begin with an inventory of all of the plants that you recorded in your list of local observations. It is most likely that you will need to supplement your original list with additional food plants for adults and larvae. Some important things to consider when choosing plants for any garden, such as hardiness zone, height, color, bloom time and availability, apply to planning the butterfly garden as well. Researching gardening books, butterfly books, visiting nurseries, botanical gardens and nature centers should supply you with the information you need to round out your design.

When choosing food plants for butterflies be certain to choose species and cultivars that provide for successive seasons of bloom. Early and late season food sources are particularly valuable, as these are often in short supply. A mix of annuals and perennials works best. Annuals prolong the season of bloom, while perennials faithfully reappear year after year. Don't forget to plant successive plantings of larval host plants as well. This is especially important for those butterfly species, such as monarchs, who produce more than one or two broods each year.

Planting clusters of the same species of colorful nectar-producing plants will be the most attractive to butterflies and gardeners alike. In general, the best nectar plants for butterflies provide a constant source of nectar and have flowering heads with small, multiple florets (such as lantana and butterfly weed). When choosing nectar plants, it is best to stick with native species whenever possible. Many hybridized varieties have been bred to be showy, often at the expense of nectar production.

The top ten butterfly attracting nectar plants include perennials such as black-eyed Susan (*Rudbeckia* spp.), Liatris (*Liatris* spp.), coreopsis (*Coreopsis* spp.), purple coneflower (*Echinacea purpurea*), Joe-pye weed (*Eupatorium* spp.), aster (*Aster* spp.), butterfly weed (*Asclepias tuberosa*) and butterfly bush (*Buddleja* spp.). Annuals such as Egyptian star-cluster (*Pentas lanceolata*), lantana (*Lantana camara*) and annual black-eyed Susans (*Rudbeckia* spp.) round out the list. Other good choices are members of the milkweed family (*Asclepias* spp.), ironweed (*Vernonia* spp.), pincushion flower (*Scabiosa* spp.) and rose verbena (*Verbena canadensis*).

Other Butterfly Attractants

Some butterfly species such as the Red-spotted Purples, Mourning Cloaks, Commas and Viceroys prefer rotting fruit and tree sap as nectar sources. To attract these species, you can put out pieces of rotting fruit on trays as long as you are aware that other insects and animals may be attracted as well. Your family pet can provide the resources for butterflies that use dung and urine for obtaining their nutrients.

Butterfly feeders can be homemade from test tubes decorated to look like flowers or hummingbird feeders. Fill the feeder with a 10:1 part sugar-water solution and plug the tube with cotton which will act as a wick and also help keep the solution from evaporating. Butterfly feeders that use a sugar-water solution are also commercially available.

A recent addition to the butterfly garden is the butterfly hibernation box. Hibernation boxes look like elongated versions of nest boxes. They attract butterflies to your yard by providing a protected space for species that overwinter as adults. Hibernation boxes are commercially available or you may opt to make your own. You can build a butterfly hibernation box from a wooden container three feet high, six inches

wide, and six inches deep. Cut two long 3/4-inch-wide slits in the front. Mount the box vertically on a tree or a post in a shady spot in your yard.

Butterfly Conservation

Butterflies are insects, so pesticides that kill insect pests will also kill butterflies. Butterfly larvae are particularly susceptible to BT, *Bacillus thuringiensis*, a bacterial insecticide that is commonly used in the vegetable garden. Fortunately, many of plants that are attractive food sources for butterflies are native to Missouri. Planting your butterfly garden with a rich diversity of these native species will greatly help reduce insect and disease problems. If insects do become a problem, try using more environmentally friendly methods of pest control such as hand picking or hosing off insect pests. Better still; learn to develop tolerance for a chewed leaf or two.

Until recently, a common pastime for many butterfly enthusiasts has been collecting butterflies, killing and mounting them in boxes. While collections are important and valuable to scientific studies, for the most of us, it is far better to enjoy butterflies in their living state. This is particularly true as butterfly life cycles and behaviors such as basking, puddling and courting are so fascinating to observe. You may wish to purchase binoculars for close up viewing or for viewing the behaviors of shier butterflies from a distance.

Butterfly gardening can be a lifelong fascination that becomes more exciting as your knowledge grows. To learn more about butterflies, butterfly habitat and conservation, consider joining a local garden club and/or nature study organization, especially those organizations whose focus is on the study of insects (entomology) or native plants. You might also consider assisting in the annual Fourth of July Butterfly Count sponsored by the Xerces Society. Butterfly counts help to determine which butterfly populations are scarce or declining in your area. By determining which species are in decline, gardeners can educate, preserve or help to create the precious habitat that these delicate creatures need for survival.

Nectar Plants for the Butterfly Garden

Annuals

Botanical Name	Common Name	Bloom Time	Light	Height (in ft.)	Bloom Color
Coreopsis tinctoria	Calliopsis	Su-F	full sun	2-3	yellow/orange
Cosmos bipinnatus	Cosmos	Su-F	full sun	1.5 - 3	pinks, reds, white
Cosmos sulfureus	Cosmos	Su-F	full sun	1	orange/yellow
Dianthus chinensis	Pinks	Sp-F	full sun	0.5 - 1	pinks, reds, white
Gaillardia pulchella	Blanketflower	Summer	full sun	1.5 - 3	yellow/red
Helianthus annuus	Sunflower	Su-F	full sun	1-12	orange, yellow, bronze
Heliotropium arborescens	Heliotrope	Summer	full sun	1-2	purple, white
Impatiens wallerana	Impatiens	Su-F	part shade	0.5 - 1.5	many colors
Lantana spp.	Lantana	Su-F	full sun	0.5 - 2.0	many colors
Lobularia maritima	Sweet Alyssum	Sp-Su	full sun	0.5 - 1	white, lavender
Pentas lanceolata	Pentas	Summer	full sun	1-3	pink, red, lavender
Petunia x hybrida	Petunia	Summer	full sun	0.5 - 1.5	many colors
Salvia coccinea	Scarlet Sage	Summer	full sun	2-3	red, salmon, white
Salvia elegans	Salvia	Su-F	full sun	2-3	many colors
Tagetes erecta	Marigold	Su-F	full sun	1-3	yellow, orange
Tagetes patula	French Marigold	Sp-Su-F	full sun	0.5 - 1.5	red, yellow, orange
Tithonia rotundifolia	Mexican Sunflower	Su-F	full sun	4-6	orange, yellow
Verbena bonariensis	Brazillian Verbena	Su-F	full sun	4-5	lilac
Zinnia elegans	Zinnia	Su-F	full sun	1-3	many colors

Perennials
*denotes Missouri native plant **denotes genus with many native species

Botanical Name	Common Name	Bloom Time	Light	Height (in ft.)	Bloom Color
***Achillea spp.*	Yarrow	Sp-F	full sun	0.5 - 4	many colors
**Agastache nepetoides*	Anise Hyssop	Su-F	full sun	3	blue, violet, pink
**Anaphalis margaritacea*	Pearly Everlasting	Summer	full sun	3	white
**Asclepias tuberosa*	Butterfly Weed	Summer	full sun	2-3	orange, red
**Asclepias incarnata*	Swamp Milkweed	Summer	full sun	2-4	pink, white
**Asclepias syriaca*	Common Milkweed	Summer	full sun	6-8	pink
**Aster novae-angliae*	New England Aster	Su-F	full sun	4-6	rose, pink, blue, violet
**Astilbe cvs.*	False Spirea	Sp-Su	part shade	0.5 - 3.5	red, white, pink, lavendar
**Baptisia australis*	Blue Indigo	Sp-Su	full sun	2-3	blue
**Blephilia hirsuta*	Wood Mint	Sp-Su-F	full sun/ part shade	1 - 2.5	blue, purple
**Boltonia asteroides*	Boltonia	Su-F	full sun	4	purple, white
Centranthus ruber	Red Valerian	Summer	full sun	3	pink, red, white
Ceratostigma plumbaginoides	False Plumbago	Su-F	full sun	0.5 - 1	blue
**Chelone glabra*	Turtlehead Plant	Su	full sun/ part shade	2-3	white, pink
***Coreopsis spp.*	Coreopsis	Sp-F	full sun	1.5 - 3	yellow
**Dalea purpurea*	Purple Prairie Clover	Su-F	full sun	1-3	purple
**Echinacea purpurea*	Purple Coneflower	Summer	full sun	3	pink
Echinops ritro	Globethistle	Su-F	full sun	3-4	steel blue
**Eupatorium perfoliatum*	Boneset	Su-F	full sun	3	white
**Eupatorium coelestinum*	Purple Ageratum	Su-F	full sun	2-3	purple
**Eupatorium purpureum*	Joe-Pye-Weed	Su-F	full sun	5-7	mauve pink
**Heliopsis helianthoides var. occidentalis*	False Sunflower	Su-F	full sun	4-6	yellow
Hemerocallis spp.	Daylily	Su-F	full sun	1-4	many colors
**Hibiscus lasiocarpus*	Rose Mallow	Su-F	full sun	3-7	white, rose
Hylotelephium spectabile	Sedum	Su-F	full sun	1-2	rose
**Geranium maculatum*	Wild Geranium	Sp-Su	part shade	1-2	pink, blue
Iberis sempervirens	Candytuft	Sp-Su	full sun	0.5 - 1	white
Lavandula spp.	Lavender	Su-F	full sun	1-2	lavender, purple
**Leucanthemum vulgare*	Ox-eye Daisy	Su-F	full sun	3	white
***Liatris spp.*	Blazing Star	Su-F	full sun	1.5 - 5	white, rose, lavender
**Lobelia cardinalis*	Cardinal Flower	Su-F	full sun/ part shade	3-4	red
***Monarda spp.*	Bergamont	Su-F	full sun	2-4	many colors
***Rudbeckia spp.*	Black-eyed Susan	Su-F	full sun	2-9	yellow
Scabiosa columbaria	Pincushion-flower	Su-F	full sun	1 - 1.5	pink, blue
**Solidago speciosa*	Showy Goldenrod	Su-F	full sun	2-3	yellow
**Verbena canadensis*	Rose verbena	Su-F	full sun	1-2	rose

***Veronia spp.*	Ironweed	Su-F	full sun	3-5	purple
***Viola spp.*	Violet	Sp-Su	full sun/ part shade	0.5 - 1	white, blue, purple

Shrubs and Vines
*denotes Missouri native plant **denotes genus with many native species

Botanical Name	Common Name	Bloom Time	Light	Height	Bloom Color
Abelia x grandiflora	Glossy Abelia	Su-F	full sun	3-6	white, pink
**Amorpha canescens*	Leadplant	Summer	full sun	2-4	purple
Buddleja davidii cvs.	Butterfly Bush	Su-F	full sun	2-8	many colors
**Ceanothus americanus*	New Jersey Tea	Summer	full sun/ part shade	3-4	white
**Cephalanthus occidentalis*	Button Bush	Su-F	full sun/ part shade	3-9	creamy white
Clethra alnifolia	Sweet Pepperbush	Summer	full sun/ part shade	3-8	white, pink
Ligustrum spp.	Privet	Summer	full sun/ part shade	4-15	white
**Lonicera sempervirens*	Trumpet Honeysuckle	Sp-F	full sun/ part shade	10-20	scarlet/orange
**Passiflora incarnata*	Passion Flower Vine	Su-F	full sun	6-8	white/purple
Philadelphus x lemoinei	Mock Orange	Summer	full sun/ part shade	5-6	white
Rhododendron spp. & cvs.	Rhododendron, Azaleas	Sp-Su	full sun/ part shade	2-10	many colors
***Rhus spp. & cvs.*	Sumac	F	full sun	1.5 - 25	greenish-yellow
Spiarea japonica cvs.	Japanese Spirea	Summer	full sun	1-3	white, pink
**Syringa vulgaris*	Lilac	Spring	full sun	3-15	white, pink, blue, purple
Vaccinium corymbosum	Blueberries	Summer	full sun	6-8	white
Vitex negundo	Chaste Tree	Summer	full sun	8-10	violet/blue

Larval Plants for Butterflies
*denotes Missouri native plant ** denotes genus with many native species

Butterfly Species	Botanical Name	Common Name	Light	Height
Eastern Black Swallowtail	**Daucus carota*	Wild Carrot	full sun	2-4
	Petroselinum crispum	Parsley	full sun	1.5 - 2
	Anethum graveolens	Dill	full sun	2-5
	**Pastinaca sativa*	Parsnip	full sun	0.5 - 1.0
Giant Swallowtail	**Ptelea trifoliata*	Wafer Ash	part shade/ full shade	15 - 20
Pipevine Swallowtail	**Aristolochia tomentosa*	Dutchman's Pipe	full sun/ part shade	15 - 30

	**Aristolochia serpentaria*	Virginia Snakeroot	part shade/ full shade	1.5 - 2.0
Spicebush Swallowtail	**Lindera benzoin*	Spicebush	full sun/ part shade	6-12
	**Sassafrass albidum*	Sassafrass	full sun/ part shade	30 - 60
Tiger Swallowtail	**Ptelea trifoliata*	Wafer Ash	part shade/ full shade	15 - 20
	**Prunus serotina*	Wild Black Cherry	full sun	30 - 60
	**Liriodendron tulipifera*	Tuliptree	full sun	70 - 90
Zebra Swallowtail	**Asimina triloba*	Pawpaw	full sun/ part shade	15 - 30
Great Spangled Fritillary	***Viola spp.*	Violets	full sun/ part shade	2.5 - 1.0
Buckeye Butterfly	**Agalinus tenuifolia*	Gerardia	full sun	1.5 - 2
	Linaria spp.	Toadflax	full sun	1.0 - 3.5
	Antirrhinum spp.	Snapdragons	full sun	0.5 - 4.0
	**Ludwigia alternifolia*	False Loosestrife	full sun	2.0 - 2.5
Painted Lady	**Centaurea cyanus*	Bachelor Button	full sun	1.0 -2.0
Red-spotted Purple	***Salix spp.*	Willows	full sun	15 - 75
	***Populus spp.*	Poplars	full sun	50 - 60
	**Prunus serotina*	Wild Black Cherry	full sun	30 - 60
	**Crataegus mollis*	Downy Hawthorn	full sun	30 - 36
Viceroy Butterfly	**Salix nigra*	Black Willow	part shade/ full sun	10-20
	**Salix discolor*	Pussy Willow	part shade/ full sun	15 - 25
	***Populus spp.*	Poplars	full sun	40 - 80
	**Prunus americana*	Wild Plum	full sun	15 - 25
	**Prunus serotina*	Wild Cherry	full sun	30 - 60
Hackberry Butterfly	**Celtis occidentalis*	Hackberry	full sun	40 - 60
	**Celtis laevigata*	Sugarberry	full sun	60 - 80
Cloudless Sulphur	**Cassia marylandica*	Wild Senna	full sun	3-8
	**Cassia fasiculata*	Partridge Pea	full sun	1.5 - 2.5
Dogface Butterfly	**Amorpha fruticosa*	False Indigo	full sun	6-15
	**Amorpha canescens*	Lead Plant	full sun	2-3
	**Petalostemon candidum*	White Prairie Clover	full sun	1.5 - 2.0
Common Snout Butterfly	**Celtis occidentalis*	Hackberry	full sun	40 - 60
Monarch	***Asclepias spp.*	Milkweeds	full sun	1-5