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For the Birds, Butterflies & Hummingbirds:

Creating Inviting Habitats

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Reviewed by Dave Close, Consumer Horticulture Specialist, Virginia Tech, Blacksburg, VA

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Introduction

Are birds and butterflies attracted to your yard or garden? Like people, birds and butterflies require food, water and shelter. Like people, they prefer that their food and water be close to where they live. And like people, they favor certain types of homes and certain types of food. If you plant to meet their needs, then they will flock or flutter to your garden. This publication examines the habitat requirements for birds, hummingbirds and butterflies, and then gives an overview of planning your garden space to accommodate them.

Birds

Of the over 900 bird species found in North America, the Commonwealth of Virginia is home (either permanent or transitory) to about 400 of them. However, the loss or fragmentation of wildlife habitat due to human incursion (residential, agricultural and industrial development), invasive or non-native species and changes in climate pose challenges to the survival of many species. Virginia's Wildlife Action Plan identifies 96 bird species with low or declining populations as our "greatest conservation need" (Virginia Department of Game and Inland Fisheries, 2005). Maintaining or creating "natural" habitats in your landscape will not only aid overall conservation efforts, but will also enhance the value of your property and your own enjoyment of nature.

Food: Grow plants that birds feed on normally. Consider fruit or seed-producing canopy trees like oak and red maple; conifers like Eastern redcedar and pine; understory trees or shrubs like serviceberry, redbud and dogwood; and ground plants like sunflowers, coneflowers and asters. Select varieties that have staggered fruit and seed production to allow for a continuous food supply when possible. To extend the availability of food, postpone removing flower seed heads until early spring or grow a meadow garden that can be left relatively undisturbed for a season or more.



Figures 1A & 1B. When native *Cercis canadensis* (eastern redbud) fruit pods ripen and turn dark brown in fall, bobwhites and other birds eat the seeds. Photographs © Mary Free

Besides fruit and seed, many birds, especially young ones, eat insects, spiders or worms for protein. Therefore, your habitat should include plants that attract these food sources too. Even standing dead trees (snags) are often home to numerous insects, which in turn are a great food source for birds like woodpeckers (and also provide potential cavities for sheltering or nesting), so if they are not hazardous and do not violate local ordinances, then leave them alone. Logs and brush piles serve similar purposes. If you do not have space for trees or for a meadow garden, then you can select some native perennials like *Asclepias* spp. (milkweed), *Aster* spp. or *Solidago* spp. (goldenrod) that are especially inviting to a large variety of insects (butterflies, moths, bees, wasps, beetles, flies, true bugs, grasshoppers and/or walking sticks).

If you want to supplement natural food sources (especially in winter) with commercial bird food, keep bird feeders clean and food fresh to prevent spreading disease. Birds such as cardinals, finches, chickadees, titmice and sparrows prefer black-oil sunflower seeds (hulled seeds cause less mess) in hanging feeders. The Virginia Cooperative Extension publication *Feeding Wild Birds* (Bromley & Geis, 2009) gives a detailed breakdown of which species prefer which food sources.



Figure 2. American goldfinches feed on black-oil sunflower seeds at a “squirrel-proof” feeder. Photograph © Mary Free

Be careful when choosing the location for your feeders. They should be at least 6 feet above the ground and close enough (about 15 feet) to shrubs and evergreens so that birds can escape predators but not close enough for predators, such as cats, to hide and pounce. A recently published study estimates “that cats in the contiguous United States annually kill between 1.4 and 3.7 billion birds, with ~69% of this mortality caused by un-owned cats” (Loss et. al., 2012). Free-ranging domestic cats now appear to be the single greatest source of human related bird mortality.

Feeders should also be far enough away from windows to prevent collisions. According to Sibley (2010), 100 million to 1 billion birds die annually by flying into windows. Figure 3 shows a dazed cedar waxwing that dropped to the ground possibly from a window collision. There also is the possibility that it was intoxicated. Unlike other birds, cedar waxwings diet mostly on fruit, especially in the winter. They tend to overeat and have been known to get alcohol poisoning, and even die, by devouring fermented fruit. Fortunately, this cedar waxwing recovered and flew away. To help prevent window strikes, reduce window reflection with: outside screens (most effective); window dividers/muntins/grids; stained glass windows; or ribbons, string, tape, feathers or the like that hang in a row on the outside of a window (Sibley, 2010). For more information on feeders and steps to ward off unwanted wildlife, visit: www.ianrpubs.unl.edu/epublic/live/ec1783/build/ec1783.pdf (Pennisi and Vantassel, 2012).



Figure 3. Cedar waxwings get their common name from their fondness for cedar fruit. Photograph © Bruce Roberts

Shelter: Encourage birds to live on your property as well as feed there. Birds prefer a layered habitat—vegetation of varying heights and density. Some of the same evergreen or deciduous shrubs and trees that produce fruit and seed also provide ideal cover from predators and harsh weather as well as potential nesting sites. Remember that deciduous trees do not provide the same cover in the winter as they do in the summer. Do not prune trees while birds are nesting.

Offer additional incentive by substituting a platform or a nest box. Discourage undesirable species from competing with or displacing native birds by ensuring the nest box is made specifically for the species you want to attract. Nest boxes should provide adequate ventilation, drainage, accessibility and protection. Figures 4A and 4B show house wrens living in a nesting box. These small birds are not shy. In fact, they can be aggressive in finding and claiming nesting sites, often displacing other birds. Note that the box in Figure 4B has a perch below the entrance hole. Perches invite predators and undesirable bird species, so make sure that your nest boxes do not have them.



Figure 4A & 4B. House wrens are ideal candidates for close-to-house nest boxes. Photographs © Mary Free

Chart 1. Nest Box Dimensions for Bird Species Commonly Found in Virginia.

SPECIES	NEST BOX ¹ DIMENSIONS				
	Box Floor (Inches)	Box Height (Inches)	Entrance Height (Inches)	Entrance Diameter (Inches)	Placement Height (Feet)
American Robins*	7x8	8	--	--	6-15
Eastern Bluebird**	5x5	8-12	6-10	1-1/2	4-6
Chickadees**	4x4	8-10	6-8	1-1/8	4-15
Titmice	4x4	10-12	6-10	1-1/4	5-15
Purple Martin	6x6	6	1-2	2-1/4	6-20
Tree Swallow**	5x5	6-8	4-6	1-1/2	5-15
Downy Woodpecker	4x4	8-10	6-8	1-1/4	5-15
Northern Flicker	7x7	16-18	14-16	2-1/2	6-20
Bewick's Wrens; House Wrens	4x4	6-8	4-6	1-1/4	5-10
Carolina Wrens	4x4	6-8	4-6	1-1/2	5-10
Ospreys	48 x 48 platform				

¹Adapted from USFWS, *Homes for Birds*, (updated 2012), <http://www.fws.gov/migratorybirds/NewReportsPublications/pamphlet/house/html>
 *Use nesting shelf, platform with three sides and an open front.
 **Locate boxes away from buildings/shrubs to reduce interference by house wrens.

Creating Inviting Habitats

Chart 2. Timing and Beneficiaries of Seed/Fruit Produced by Selected Native Plant Species

Native Species	Common Name	Fruit (F), Seed (S) Available ¹	Birds ² and Other Wildlife ³ Benefited	Notes ³
<i>Stellaris media</i>	chickweed (S)	Jan-May	S, G	leaves edible & used in salads
<i>Ulmus</i> spp.	elm (S)	Mar-Apr	G  	<i>U. Americana</i> MA & ND state tree and favorite nesting site for Baltimore orioles
<i>Acer rubrum</i>	red maple (S)	Mar-Jun	G, N, C, S 	earliest spring bloomer; adaptable
<i>Amelanchier arborea</i>	serviceberry (F)	May-Jun	R, G, M, W, P  	used by 58 wildlife & 35 bird species; early summer food; berries edible & used for jams
<i>Carex</i> spp.	sedge (S)	May-Jul	S, G   	some attract waterfowl
<i>Rubus</i> spp.	blackberry (F)	Jun-Jul	R, M, G, T, W, O, C, P, S   	juicy edible fruit
<i>Sassafras albidum</i>	sassafras (F)	Jun-Jul	M, R, T  	edible & medicinal uses; spring & fall color
<i>Prunus serotina</i>	black cherry (F)	Jul-Aug	R, G, M, W, P, T, O 	preferred host plant for tent caterpillars (pests)
<i>Sambucus canadensis</i>	elderberry (F)	Jul-Sep	R, M, G, S, T, O, P 	berries eaten by 48 bird species; purple or blue berries edible & used for wine, jams & pie
<i>Helianthus</i> spp.	sunflower (S)	Jul-Oct	S, G, C   	hummingbird attracted to <i>H. helianthoides</i>
<i>Lindera benzoin</i>	spicebush (F)	Aug-Sep	R, T  	aromatic & edible (as tea & spice); host plant for spicebush swallowtail
<i>Cornus florida</i>	dogwood (F)	Aug-Oct	R, M, G, W, P, T   	VA & MO state tree; VA & NC state flower
<i>Rudbeckia fulgida</i>	orange coneflower (S)	Aug-Nov	G, S  	cultivars have nice foliage
<i>Pinus</i> spp.	pine (S)	Aug-Nov	G, C, N, W 	provides winter cover
<i>Viburnum</i> spp.	viburnum (F)	Aug-Dec	M, W  	<i>V. prunifolium</i> 's edible fruit used for preserves
<i>Aster</i> spp.	aster (S)	Aug-Feb	G, S, C, N  	
<i>Liriodendron tulipifera</i>	tuliptree (S)	Sep-Oct	G 	host plant for eastern tiger swallowtails
<i>Echinacea purpurea</i>	purple coneflower (S)	Sep-Oct	G, S   	hummingbirds attracted to the insects; American goldfinch favors seeds
<i>Quercus</i> spp.	oak (S)	Sep-Dec	P, N, C, M  	MD state tree (<i>Q. alba</i>); acorns for wildlife
<i>Ilex opaca</i>	American holly (F)	Sep-Feb	R, M, W, P	DE state tree
<i>Juniperus virginiana</i>	eastern redcedar (F)	Sep-Feb	W, G, R, M  	berries consumed by over 50 bird species
<i>Coreopsis</i> spp.	tickseed (S)	Sep-Mar	G, S  	
<i>Solidago</i> spp.	goldenrod (S)	Oct-Mar	G, S   	pollen does not cause seasonal allergies

Bird Key²:

C chickadees, titmice	P woodpeckers
G grosbeaks, buntings, cardinals, finches	R robins, thrushes
M mockingbirds, catbirds, thrashers	S sparrows, towhees
N nuthatches	T tanagers, vireos
O orioles	W waxwings

Other Wildlife Key³:

 Waterfowl (shorebirds, wading birds, ducks and/or geese)
 Mammal (small animals like squirrels, raccoons, opossums, foxes)
 Butterfly (adults or larval stage)
 Beneficial insect (pollinators like bees and/or predators like lady bugs)
 Hummingbird (attracted because of food or insects)

¹Modified from Radford, et al. (1968). Dates represent timing of fruit or seed presence on the plant; fruits and seeds of many plant species persist through the winter.

²According to Martin, Zim, and Nelson (1961).

³Adapted from U.S. Fish & Wildlife Service, Native Plants for Wildlife Habitat and Conservation Landscaping. Desirable species likely to use plants for food. Chart modified from *Managing Backyards & Other Urban Habitats for Birds* (Moorman, 2002).



Figure 5. *Juniperus virginiana* (Eastern redcedar) is a favorite food source and nesting site for robins. Photograph © Mary Free



Figure 7. A robin fledgling. Photograph © Amy Free

Figure 8, this birdbath sits under a 40-foot *Tsuga canadensis* (Eastern hemlock) that provides dappled shade and food (including insects), cover and nesting sites for birds like warblers, wrens, thrushes, chickadees, nuthatches and finches. A potential problem: the hostas could provide a hiding place for predators like cats. Keep the birdbath and its water clean so bacteria, other pathogens, and mosquitoes do not breed. If applying fertilizer or any pesticides, be sure not to contaminate birdbath water. If in question, be sure to dispose of the old water, rinse, and replace with fresh water.

Despite efforts to provide safe nesting sites, birds still fall victim to natural predators. For example, the mortality rate for young robins is as high as 80% each year. Squirrels eat the eggs and nestlings and owls attack the roosts. Figures 6A and 6B show the difficulty robins can have with a natural predator. The squirrel found and destroyed the exposed nest while the robins were foraging for twigs, grass and mud. The next year the robins constructed their nest in a more protected crotch in the same Eastern redcedar and bred successfully.



Figure 6A & 6B. An exposed robin nest is susceptible to natural predators. Photographs © Mary Free

Water: If you don't have a natural water source, use raised birdbaths and ground containers (or create an artificial pond). Choose shallow, sloping birdbaths/containers with the deepest point no more than 3 inches (1½ inches for hummingbirds) and with rough surface/edges and a rim so that birds (and insects) can get a solid footing and do not drown. Small stones arranged in the middle of the basin/container also help.

Place birdbaths in a shady, open space near shrubs or low trees so that birds feel safe and can easily escape predators. As seen in



Figure 8. This urban townhouse birdbath sits amidst native ferns, hostas, purple coneflower, and Japanese pachysandra. Photograph © Mary Free



Figure 9. House sparrows often follow a water bath with a dust bath where they wallow in shallow holes they create in loose soil. Photograph by Abubiju (public domain)

You can also create a dust birdbath made of loose soil, sand and peat moss. Besides a water bath, a number of birds dust their feathers to keep clean and perhaps free of parasites (Ehrlich et. al., 1988). Dust baths are common in arid areas where water is scarce but some birds, such as wrens, often “dust” their feathers after a water bath.

One additional consideration to take into account when choosing a birdbath is

construction material. For example, the concrete-composite birdbath shown in Figure 10 is very durable, but it is heavy and its flower-shaped basin is not detachable, which makes it more difficult to care for. Similarly, some lightweight plastic birdbaths or ceramic birdbaths like the one in Figure 11 can be subject to cracking when water freezes in them during the winter months.

Did You Know?

Although house sparrows may be fun to watch as they tend to feed and bathe in flocks, they are considered to be pests. Noted ornithologist William Dawson attributed in part “the wholesale reduction of our smaller birds... to the invasion of that wretched foreigner” whose introduction here he thought was “without question the most deplorable event in the history of American ornithology”(Dawson 1903).



Figure 10. This durable, concrete-composite birdbath attracts large and small birds alike. Photograph © Mary Free



Figure 11. Located under a dogwood tree, this hand-painted, ceramic stoneware birdbath seems to appeal to house sparrows. Photograph © Mary Free

Hummingbirds

Hummingbirds require a diverse habitat with flowers and insects for food as well as trees and shrubs of varying heights for nesting, resting and sheltering. The only hummingbird species that breeds in eastern North America—ruby-throated hummingbirds—have emerald green backs and white breasts. Only males sport throat feathers that appear iridescent ruby red (or black depending on the light’s angle).

Besides these regular warm-weather residents, Virginia sometimes welcomes accidental migrants. Rufous hummingbirds, a common Western species, have been sighted in Virginia from the Blue Ridge Mountains to Hampton Roads in late fall and winter. Thirty rufous sightings at Green Spring Gardens in Fairfax were reported on the www.eBird.org website over a two-month period from October to December 2012. On much rarer occasions, Western species such as Allen’s, black-chinned and Calliope hummingbirds also have been recorded in the state. And, according to eBird (2012), “one of the more remarkable Eastern records of stray hummingbirds”—that of a violet-crowned hummingbird—occurred near Roanoke in 2009.

Food: Though they weigh not much more than a copper penny, ruby-throats have very high metabolisms that drive them to feed between 1 to 12 times an hour, all day long (dawn to dusk). They may consume the nectar of hundreds of flowers. A female ruby-throat might capture up to 2000 insects per day (Barnes, 2000). Her chicks need insect protein to develop and within three weeks they fend for themselves. Hummingbirds, unlike many pollinators that are attracted to flower fragrance, are attracted to flower color (especially red, orange, pink and yellow) and shape (nodding flowers and those with long corolla tubes). Many flowers that appeal to hummingbirds also appeal to butterflies.

When they arrive in spring, entice hummingbirds to your yard with early blooming flowers. Grow similar flowers together in a large group rather than smaller interspersed plantings so that hummers can spot them more easily while flying and use less energy to gather their nectar. They also will save energy if you supply artificial feeders to supplement flower nectar. A simple recipe for artificial feeders is to add 1 part table sugar to 4 parts boiling tap water and boil for 2 minutes. Do not use honey, artificial sweeteners or red food dye. Fill feeders with cooled mixture and change it about every 3 days.

Did You Know?

Ruby-throated hummingbirds migrate from Mexico and Central America in early spring and return in late summer. Females produce one or two clutches a season. According to the Smithsonian Migratory Bird Center (2012), two eggs, each the size of a pea, are laid in a walnut-size nest made of soft plant parts and spider silk. Nests may be found in trees like beech, birch, hemlock, hornbeam, maple, oak, pine, poplar or spruce.

To keep hummingbirds interested all season, make sure your garden has continuous blooms—those that hummingbirds use for nectar, those (like Echinacea) that attract a variety of insects and those (like cup plant) whose leaves can hold water in which hummers can bathe.

Male hummingbirds in particular do not share their feeding ground and will defend their territory. So to attract more hummers, hang several feeders in shady spots spaced 10-15 feet apart. If feeders are exposed to too much sun, their contents may spoil quickly. Also, hanging the feeders so that they are not in direct line of sight of one another will help to cut down on the territorial nature of the male hummingbirds. If you decide to leave a feeder up into winter for a stray rufous hummingbird,

try to keep the feeder sheltered and take it in each night to prevent the contents from freezing.



Illustration 1. A male ruby-throated hummingbird. Illustrated by Catie Brown



Figure 12. A rufous hummingbird pauses from flight. Photograph by Dave Menke

Creating Inviting Habitats

Chart 3. FLOWERS THAT ATTRACT HUMMINGBIRDS ¹			
Spring	Spring into/through Summer	Summer	Late Summer and into Fall
 <p><i>Ajuga reptans</i> (ajuga): S, PS; good ground-cover</p>	 <p><i>Althea rosea</i> (hollyhock): S; flowers to fall, well-drained soil</p>	 <p>*<i>Helianthus annuus</i> (sunflower): S; annual; drought tolerant</p>	 <p><i>Aster</i> spp. (aster): S; flowers well into fall</p>
 <p>*<i>Aquilegia canadensis</i> (wild columbine): PS; moist soil</p>	 <p><i>Asclepias tuberosa</i> (butterfly weed): S; attracts ~450 different types of insects</p>	 <p><i>Hibiscus</i> spp. (hibiscus): S to PS; red, white, pink flowers into fall</p>	 <p><i>Canna generalis</i> (canna): S; well-drained soil; red, pink orange flowers</p>
 <p><i>Consolida</i> spp. (annual) <i>Delphinium</i> spp. (larkspur): S, PS</p>	 <p><i>Buddleia</i> (butterfly bush): S; invasive in some areas; flowers into fall if deadheaded</p>	 <p><i>Hosta</i> spp. (hosta): PS; well-drained, fertile soil</p>	 <p><i>Chelone lyonii</i> (turtlehead): S, PS; rich, moist soil</p>
 <p><i>Dicentra spectabilis</i> (bleeding heart): PS; moist, well-drained soil</p>	 <p>*<i>Campsis radicans</i> (trumpet creeper): S, PS; aggressive</p>	 <p>*<i>Impatiens</i> spp. (jewel-weed): Sh; flowers into fall; moist soil; annual <i>Impatiens</i> non-native</p>	 <p><i>Dahlia</i> spp. (dahlia): S; semi-hardy in zones 6 and 7</p>
 <p><i>Digitalis</i> spp. (foxglove): PS; biennial</p>	 <p><i>Echinacea purpurea</i> (purple coneflower): S, PS; attracts a variety of insects</p>	 <p><i>Lantana camara</i> (lantana): S; flowers into fall; well-drained soil; some cold-hardy to Zone 7</p>	 <p><i>Liatris</i> spp. (liatris): S; well-drained soil</p>
 <p><i>Iris cristata</i> (crested iris): PS; moist, well-drained soil</p>	 <p><i>Heuchera sanguinea</i> (coral-bells): PS; well-drained, fertile soil</p>	 <p>*<i>Monarda didyma</i> (bee balm): S, PS; moist soil</p>	 <p>*<i>Lobelia cardinalis</i> (cardinal flower): PS; moist, fertile soil</p>
 <p><i>Mertensia virginica</i> (Virginia bluebells): PS; rich, moist soil</p>	 <p>*<i>Lonicera sempervirens</i> (trumpet honeysuckle): S, PS; flowers mostly in spring and fall</p>	 <p><i>Salvia</i> spp. (sage): S, PS; perennials & annuals; some non-native; flowers into fall</p>	 <p><i>Phlox</i> spp. (phlox): S, PS</p>
 <p><i>Phlox stolonifera</i>/<i>P. subulata</i> (creeping/moss phlox): S, PS</p>	 <p>*<i>Silene virginica</i> (fire/Indian pink): S, PS; well-drained soil</p>	 <p><i>Silphium perfoliatum</i> (cup plant): S, PS; leaves hold water in which hummers bathe</p>	 <p><i>Physostegia virginiana</i> (obedient plant): S, PS; flowers to fall; moist, well-drained soil</p>
 <p><i>Pulmonaria</i> spp. (lungwort): PS, Sh; moist, fertile soil</p>	 <p><i>Verbena x hybrida</i> (verbena): S, PS; self seeding annual</p>	<p>¹Adapted from Evans, Attracting Hummingbirds: Flowers http://www.ces.ncsu.edu/depts/hort/consumer/factsheets/birds/text/hbird_flowers.html Notes: Bold type indicates native plants. All plants are perennials unless otherwise noted. S=Sun, PS=Part Sun/Part Shade, Sh=Shade. *Flowers particularly attractive to or primarily pollinated by hummingbirds.</p>	

Photographs 13A through 13HH © Mary Free except for photographs J, M, Q, V, EE & FF. (See "photographs & illustrations" on reference page for photo credits.)

Butterflies

Many flowering plants that birds feed on attract butterflies and other pollinators as well. Butterflies also attract birds. “In fact, 96% of land birds in North America feed on arthropods, and no other group of insects supplies as much food as the Lepidoptera (the butterflies and moths) to other animals” (Abugattas, 2009).

Although butterflies prefer a sunny garden for nectar flowers, a shade garden is home to many of their host plants and sheltering shrubs. If you lack a sunny spot for your garden, you can also use a partially shaded area, in which many favorite nectar flowers also grow. Additionally, even when you have limited space, your butterfly garden can thrive if you choose the right plants.

Food: A butterfly life cycle requires basically two food types: leaves or other plant parts (host plants) for developing caterpillars and nectar for winged adults (nectar plants).

- **Host plants:** Butterflies lay their eggs on particular plants that feed their caterpillars. More butterflies will visit your garden for nectar when host plants for their caterpillars are nearby. If you are concerned that defoliated plants will detract from your garden, then place host plants in unobtrusive places where you do not need to remove dead foliage or flowers, which may harbor eggs or developing butterflies.

Did You Know?

Monarch butterflies east of the Rocky Mountains overwinter in Mexico but only those born around September or October make the trip. This last generation migrates to Mexico and then returns to the United States in early spring to mate and lay their eggs before they die. Unlike the first three to four generations hatched in spring and summer that live about one month each, this last generation lives 6-9 months and may travel up to 3,000 miles in their lifetime.

Butterfly Life Cycle

Butterflies go through four stages of growth called metamorphosis. 1. They lay their **eggs** under the leaves of host plants. 2. Eggs hatch into **larvae** (caterpillars) that eat the host plant leaves. 3. When the caterpillars are big enough, they find a twig (or leaf), hang upside down and enter an inactive **pupae** or chrysalis stage. 4. In time they split the chrysalides and emerge as **adult** butterflies.



Most butterflies use more than one plant species as host for their larvae, but monarch butterflies lay their eggs solely on milkweed leaves. Monarch caterpillars eat the toxic leaves of milkweeds like *Asclepias tuberosa* (Figure 14), and store the toxin in their bodies making them poisonous to predators. They advertise their toxicity with their bright aposematic colors. Although the adult monarch butterflies may use

milkweed species for shelter, they obtain nectar from a variety of flowers, like the *Lantana* spp. (Figure 16).

On the other hand, the black swallowtail caterpillar (Figure 17) feeds on non-toxic hosts like fennel, dill and parsley. The adult butterfly (Figure 19) feigns toxicity by mimicking the coloring of the poisonous pipevine swallowtail. Photographs © Mary Free



Chart 4. Host Plants for Some Common Virginia Butterflies.

Butterfly Species ¹	Host Plant ²
American Lady	pussytoe, ironweed
Azures	flowers of dogwood, New Jersey tea, cherry, meadowsweet, holly, viburnum
Black Swallowtail	dill, parsley, fennel, carrot
Buckeye	gerardia, plantain, snapdragon, foxglove, ruellia, monkey flower, verbena
Clouded Sulphur	clover (mainly white)
Eastern Comma	nettle, elm, hops
Eastern Tailed-Blue	clover, vetch, legumes
Fritillaries	violet, pansy, sedum, passionflower
Gray Hairstreak	legumes, cotton flowers, oaks
Monarch	milkweed species
Orange Sulphur	alfalfa, clover, wild indigo
Pearl Crescent	aster (probably not New York, flat-top or white wood asters)
Red Admiral	nettle, Pennsylvania pellitory
Red-Spotted Purple	cherry, serviceberry, cottonwood, aspen, willow, scrub & black oaks
Silver-Spotted Skipper	black & honey locusts, wisteria
Skippers (various)	native grasses & sedges
Spicebush Swallowtail	sassafras, spicebush
Tiger Swallowtail (Eastern)	tulip tree, wild black cherry, lilac, ash, basswood, willow

¹Adapted from Abugattas, *Butterfly Gardening in the Washington Metropolitan Area*.
²The list of host plants may not be complete.

Figures 20, 21, & 22. Native composites:



Symphotrichum oblongifolium 'Raydon's Favorite' with an American lady



Solidago rugosa 'Fireworks' with a common buckeye



Echinacea purpurea with a duskywing. Photographs © Mary Free

- **Nectar plants:** Choose plants with different bloom times so butterflies can find sustenance spring through fall. Plant enough of the same flowers to draw their attention with like colors together. Some butterflies also eat rotting fruit (dropped on the ground by plants or provided by you), but this may also lure unwanted pests. For nectar plants, follow these five rules:

1. **Plant natives.** They are favored by butterflies. Data show that they support more butterfly and moth species than introduced plants (Tallamy 2009).
2. **Choose plants with multiple florets.** Their forms make it easier to obtain a lot of nectar at one time, and include such plants as mums, coneflowers and zinnias, which have composite flowers.

3. **Plant the right colors.** Butterflies are drawn to:
 - **Bright colors** like *Asclepias* spp. and *Lantana* (non-native).
 - **Purple flowers** like *Buddleia* spp. (non-native), *Echinacea purpurea*, *Liatris* spp., *Symphotrichum novae-angliae*, *S. novi-belgii*, *Verbena* (non-native) and *Vernonia noveboracensis*.
 - **Blue flowers** like *Eupatorium coelestinum*, *Phlox divaricata*, *Scabiosa* (non-native), *Stokesia laevis* and *Symphotrichum oblongifolium*.
 - **Yellow flowers** like *Coreopsis* spp., *Heliopsis helianthoides*, *Rudbeckia* spp., *Silphium perfoliatum* and *Solidago* spp.
 - **White (& pink) flowers** like *Ceanothus americanus*, *Cephalanthus occidentalis*, *Erigeron* spp., *Phlox paniculata* and *Sedum spectabile* 'Autumn Joy' (non-native.)



Figure 23. *Vernonia noveboracensis* with a male zabulon grass skipper.

Figure 24. *Scabiosa* (non-native) with an orange sulphur.

Figure 25. *Rudbeckia* spp. with a pearl crescent.

Figure 26. *Sedum spectabile* 'Autumn Joy' (non-native) with a white-m hairstreak. Photographs © Mary Free

4. *Steer clear of double flowers.* These plants look stunning but provide little nectar.
5. *Refrain from using pesticides whenever possible.* Pesticides applied improperly or at the incorrect time can kill butterflies.

Shelter: Butterflies need refuge from wind and rain. Shelter nectar flowers with fences, shrubs, vines or trees. Actually, your larger woody species can provide habitat for more insect species than herbaceous plants. For example, *Quercus* spp. (oaks) support 534 different butterflies and moths alone (Tallamy, 2009).

Butterflies also need an area in the sun to warm their wing muscles so they can fly. As long as they have a sunny place to bask nearby, they will visit nectar flowers that are shaded during part of the day. Make a basking area by placing a flat rock in a sunny spot.

Water: Butterflies, especially males, need soil minerals for reproduction. They extract these by sipping moisture from mud puddles. To make a puddling area, place a shallow dish at ground level, fill it with sand mixed with yard soil and keep it damp.



Figure 27. Sunny leaves also provide good basking spots for butterflies like this red-banded hairstreak. Photograph © Mary Free



Figure 28. Tiger swallowtails “puddling.” Photograph by Sharee Basinger (public domain)

Plan Before You Plant

Now that you have some background on birds and butterflies, decide the species you want to attract and research their requirements. Remember that their needs vary and may change with the seasons.

The first step is to start with your available area. Draw a map of your yard to assess whether it and the surrounding habitat (neighboring yards or land) have the necessary features. Then, make a list of plant material and habitat you already have. A plant inventory of your property will also make it easier to incorporate missing components. On this inventory, note each species' wildlife value, growth habits and requirements (e.g., size, amount of sun needed, soil type and moisture retention, etc.), when they flower or produce fruit/seed and if they provide shelter.

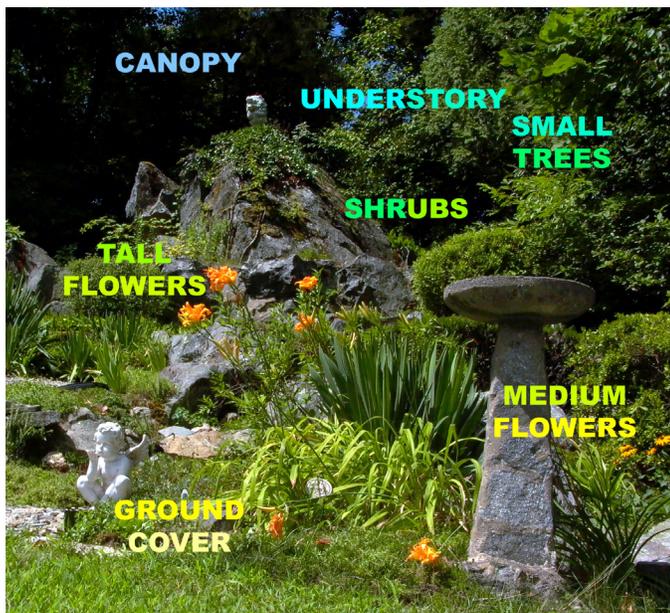


Figure 29. This garden of irises, yucca, rudbeckia, daylilies and moss meets the woodland's edge with transition evergreen shrubs and small trees. Photograph © Mary Free

In addition to this list, keep track of plants you want to add. Also be aware of the different plant characteristics during each season and the needs of the birds and butterflies you desire. While planning these plantings, try to create a natural and diverse habitat. The more diverse the vegetation in terms of species, shape, size (with horizontal and vertical layers) and seasonal interest, the more diverse the wildlife it will entice. For more help in planning and design, refer to *Backyard Wildlife Habitats* by visiting pubs.ext.vt.edu/426/426-070/426-070.html (Eaton, 2009).

When designing a new garden, you should consider native plants that are suited to local conditions. This may require removing and replacing invasive species or non-native plants. Native plants usually need less watering and maintenance (Tallamy, 2009). They are also naturally more pest and disease resistant, meaning that they require little to no use of pesticides that can harm water quality and wildlife. *Wildlife Habitat and Conservation Landscaping: Chesapeake Bay Watershed* (Slattery et al., 2003) by the U.S. Fish and Wildlife Service discusses these and other benefits of using native plants and gives a “high wildlife value” designation to those whose fruits, seeds and/or nectar attract a significant number of species. This user-friendly, illustrated publication is available online at <http://www.nps.gov/plants/pubs/chesapeake/>.

Although the very southern and southwestern parts of Virginia are not in the watershed, the native plants recommended for the coastal plain, Piedmont plateau or the mountain zone should still be applicable to these areas. Additionally, the Virginia Department of Conservation and Recreation has five different Native Plants for Conservation, Restoration and Landscaping brochures available at http://www.dcr.virginia.gov/natural_heritage/nativeplants.shtml.

Next, before making your final plant selections, look around to see which plants are well represented in your neighborhood. If an (over) abundance of a certain native species is nearby, consider providing some diversity by planting something different on your property. For example, *Cornus florida* (flowering dogwood), the state tree and flower of Virginia, has become very common in residential landscapes. This graceful tree attracts a variety of birds and small mammals and is a host plant for azure butterflies. However, adverse growing conditions or bark injury increase its susceptibility to borer insects and to the destructive fungal disease, *Discula anthracnose* (Hansen, 2009).



Figures 30 & 31. Dogwood's spring flowers, with white or pink bracts. These flowers are followed by green fruit (drupes) that ripen to red and red-purple fall foliage. Photographs © Mary Free

An alternative understory tree you could use is native *Amelanchier arborea* (downy serviceberry), which is used infrequently in home landscapes. Like dogwood, it prefers a partially shady, moist, well-drained and fertile site, but it tolerates more sun or shade and wet soil and is better suited to smaller spaces. Like dogwood, serviceberry has high wildlife value, providing food, cover and nesting places for small birds and serving as a host plant for a butterfly—the red-spotted purple. Unlike the fruit of the flowering dogwood, serviceberry fruit is edible and tasty for birds and people alike.



Figures 32 & 33. Serviceberry's spring flowers precede edible red-purple berries that ripen to black in summer. Fall foliage is yellow to red. Photographs © Mary Free

Lastly, if you plan to add native wildflowers, make sure they have been propagated in reputable nurseries and not harvested from the wild. Ask about a plant's origin before you buy it. Plants grown in a similar climatic region as your garden, and even better, those plants from local stock, tend to be better adapted and increase the likelihood of not only surviving transplanting, but also thriving in your garden. To check on native plants sales and nurseries that produce natives, a good source is the Virginia Native Plant Society at <http://www.vnps.org/>.

Identifying Birds and Butterflies

Now that you are planting to attract birds and butterflies, will you be able to identify them when they come? Can you distinguish a ... purple martin from a tree swallow? ... Hummingbird from hummingbird moth? ... Painted lady from American lady? To aid in identification, take pictures of the birds and insects that visit your garden, then consult field guides or online resources to learn more about these visitors. You also might want to record the plants that birds and butterflies frequent in your garden to help decide about future plantings. Above all though, enjoy yourself and your visitors!

Online Identification Resources

Birds:

www.allaboutbirds.org

Insects:

www.bugguide.net

Butterflies:

www.butterfliesandmoths.org



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- The following publication is from another state. While it contains very helpful information, its wildlife control recommendations may or may not be consistent with Virginia law. Please consult your local Cooperative Extension office for current Virginia statutes that may apply:*
- Pennisi, L. and S.M. Vantassel. *Selective Bird Feeding: Deterring Nuisance Wildlife from Bird Feeders*. EC1783. University of Nebraska-Lincoln Extension. <<http://www.ianrpubs.unl.edu/eublic/live/ec1783/build/ec1783.pdf>>

Additional Web Links:

The Cornell Lab of Ornithology, *All About Birds* <<http://www.allaboutbirds.org/>>

U.S. Fish and Wildlife Service, Migratory Bird Program, *Homes for Birds*, (updated 2012), <<http://www.fws.gov/migratorybirds/NewReportsPublications/pamphlet/house.html>>

U.S. Forest Service, Celebrating Wildflowers, *The Monarch Butterfly in North America* <<http://www.fs.fed.us/wildflowers/pollinators/monarchbutterfly/>>

Virginia Department of Conservation and Recreation, *Native Plants for Conservation, Restoration, and Landscaping* <http://www.dcr.virginia.gov/natural_heritage/nativeplants.shtml>

Washington Department of Fish & Wildlife, *Living with Wildlife: Robins* <<http://wdfw.wa.gov/living/robins.html>>

Washington Department of Fish & Wildlife, *Ponds and Birdbaths* <<http://wdfw.wa.gov/living/birdbaths/index.html>>

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