



Ruby-throated Hummingbird

The ruby-throated hummingbird, *Archilochus colubris*, is the only breeding hummingbird species east of the Great Plains. The hummingbirds (Family Trochilidae) occur only in the Western Hemisphere, with most of the 325-plus species inhabiting the tropics. Hummingbirds hover at flowers and feed on nectar. Many also consume insects and other arthropods. Although small and dainty looking, hummingbirds defend their territories very aggressively, and some species—including the ruby-throated—undertake long and strenuous migrations.

Biology: the ruby-throated hummingbird breeds from central Canada south to the Gulf Coast. Adults are about 3 inches long and weigh a tenth of an ounce, which is less than a penny. Both males and females have glistening green-bronze backs and pale bellies. The male sports a bright metallic-red gorgette, or throat patch; on the female this area is grayish white. The bill is long and thin. The legs are short, and the feet are small, designed for perching rather than for walking or hopping.

The flight muscles of hummingbirds make up a higher percentage of their overall body weight as compared to other birds. They are unique in their ability to hover in place for extended periods, and to suddenly fly backwards, sideways, or up and down. In flight, a ruby-throated hummingbird beats its wings about 53 times per second, and as rapidly as 80 times per second when moving forward. Hummingbirds have flexible shoulder joints that let their wings move in a pattern like a figure eight laid on its side, with both forward and backward strokes generating lift. Minute changes in the angle of the wings let the bird control its speed and course. Scientists have calculated that hovering requires 204 calories per gram of body weight per hour, compared to 20.6 calories needed by the bird at rest. A hummingbird's heart beats more than 10 times per second during activity. The bird must eat almost constantly to fuel its high-speed metabolism.

Ruby-throats insert their bills into flowers, feed on nectar, and in the process act as pollinators for many plants. They



are especially attracted to bright red and orange blossoms. Scientists believe that some plants, including a woodland vine known as the trumpet creeper, evolved red tubular-shaped flowers to attract hummingbirds. Ruby-throats take nectar from more than 30 species of flowers, including trumpet creeper, wild bergamot, beebalm, spotted jewelweed, honeysuckle, columbine, and cardinal flower. They also enjoy many garden flowers such as petunia, salvia, and scarlet runner beans. When the structure of a plant permits it, the bird may perch while feeding; otherwise, it hovers. A hummingbird does not suck in nectar but rather the hummingbird's tongue acts as a liquid-trapping device that allows the hummingbird to feed on nectar very efficiently. Hummingbirds will also take sap from trees, visiting the rows of small holes, or sap wells, that yellow-bellied sapsuckers excavate in birches and maples. Up to 60 percent of an individual's diet may be insects, including mosquitoes, gnats, fruit flies, and small bees. Ruby-throats pluck spiders and their prey out of their webs, and glean aphids, small caterpillars, and insect eggs from the leaves and bark of trees.

When sleeping, a hummingbird retracts its neck, points its bill slightly upward, and keeps its body feathers fluffed to reduce heat loss. At times it may enter a torpid state: its temperature drops, and its metabolism slows, letting the bird get through the night, or through a cold snap, without starving.

Ruby-throats arrive in Pennsylvania in late April and May, with males preceding females by a week or two. The timing of arrival seems to coincide with the blooming of wild columbine, but the availability of flying insects and flowing

sap are probably important also. Males stake out individual territories of about a quarter of an acre and defend them vigorously against other hummingbirds, both male and female. If food sources are abundant, only 50 feet may separate two males. Male ruby-throats give a string of chipping calls from a perch in the center of their territory. Hummingbirds are solitary, and males and females get together only for courtship and mating. When confronted by a female, the male does a series of U-shaped looping dives with an arc length of feet or more (these maneuvers may be part of the male's territorial defense). Once the female perches, the male's courtship display shifts to a series of side-to-side arcs in which he shows off his colorful throat patch. Most breeding occurs in late May and June, but second broods may occur into July. Individual males may mate with several females.

The female picks a nest site, usually in a deciduous tree in a forested area, usually 10 to 40 feet above ground. Near the tip of a downward-sloping branch she constructs a platform of thistle and dandelion down, attached to the branch with spider silk. The nest often overhangs a stream, a trail, or an unimproved road. She uses more plant down for the nest's side walls, holding the material together with spider webbing or pine resin and cementing bud scales and lichens to the outside. The finished nest is a soft, flexible cup about 2 inches wide and 1.5 inches high. Some females simply refurbish old nests. The males do not participate in nest-building or provisioning either the female or the young.

The female lays two white, oval eggs (occasionally one and rarely three), each about a half inch long by a third of an inch wide and weighing 0.02 ounces. Typically, egg laying in Pennsylvania runs from May to July. The female incubates her clutch for 12 to 16 days. The altricial young are naked and dark gray in color. Their mother feeds nectar and insects by inserting her bill into that of a young bird and pumping the food into its gullet.

She broods the nestlings almost constantly, except when foraging. Young ruby-throats' eyes open after nine days, and the female ceases brooding and starts bringing them whole insects clasped in her bill. The young fledge after 18 to 22 days. The female may continue to feed them for four to seven days as they learn to forage. She may mate again and raise a second brood.

After breeding, ruby-throats start building up body fat for their long migration. An individual's weight can double before it migrates, adding up to 10 percent of its weight per day. Males may begin leaving the breeding range in early August; females and juveniles (whose plumage matches the females') may stay until late August or early September, with occasional stragglers into October or later. Ruby-throats join many other birds in migrating along ridge tops. They can be seen in good numbers when a strong cold front ushers in a north wind. Ruby-throats winter in southern Florida, Louisiana, Texas, Mexico, and Central America south to Panama. Although migratory routes are poorly documented, it is known that some ruby-throats follow the coast and that others fly nonstop across the Gulf of Mexico, a flight of nearly 600 miles over open water.

Predation probably does not account for much hummingbird mortality.

Hummingbirds are preyed on by free-roaming cats, small hawks and owls, and even frogs and bass; blue jays have been known to kill and eat nestlings. Some hummingbirds get caught in spider webs. But

probably more hummingbirds succumb to accidents: crashing into windows, cars, and telecommunications towers. People can help avoid hummingbird window collisions by not placing nectar feeders near windows which increases the risk of fatal window strikes. Females have been documented to live for nine years and males for five years. Higher energy demands for males defending territories on breeding grounds followed by an arduous migration may contribute to a higher mortality rate for male ruby-throats.

Habitat: Ruby-throats inhabit eastern deciduous and mixed deciduous coniferous forest. They are found in open woods, woods edges, gardens, parks, thickets, wet meadows, along streams, and orchards. They are less common in large urban areas, in dense forest tracts without streams, and in extensive agricultural areas. An abundance of flowering plants, especially beebalm and spotted jewelweed, found in floodplain forests and areas along streams offer good nesting and feeding habitat. People who enjoy hummingbirds can enhance their properties by planting native wildflowers, especially those with tubular flowers, as well as small shrubs and trees, and by developing water gardens. In the wintering range, ruby-throated hummingbirds live in a variety of forests, scrubby habitat, citrus tree groves, and gardens, but especially along forest edges and near water where they feed on nectar and insects.

Population: In Pennsylvania, the ruby-throated hummingbird breeds statewide. The population seems to be stable, but urbanization is robbing the hummingbirds of habitat in Pennsylvania and elsewhere. There are hints that hummingbirds are heading northward earlier than they did decades ago, so they are more vulnerable to bad weather events and food shortages that might occur in mid-spring when they arrive. Creating and maintaining islands of wooded habitat in the urban and suburban sprawl that are attractive to this and other popular backyard, thicket, and forest birds is important. Gardening birdwatchers should be advised of what native plant species they can provide hummingbirds on their own property. The western hummingbird species such as the rufous hummingbird (*Selasphorus rufus*) is an occasional visitor to Pennsylvania and other eastern states in migration and winter.

