

Hummingbirds



Marvels of the Bird World

Written and Photographed by

STAN TEKIELA

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Dedication

Dedicated to my father, a man of strength who loved little tiny birds

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Amazing hummingbirds

As far back as I can remember, I have loved all birds. However, if I had to come up with a list of my favorites—the fantastic birds that have found their way deep into my heart—hummingbirds would occupy a prominent spot at the top. Their tiny size, giant personalities, amazing colors and mind-boggling ability of flight are just a few characteristics that draw me to hummers as a naturalist and photographer. After more than 30 years of photographing and studying these miniature marvels, here is their incredible story.

Enjoy the Hummingbirds!

Stan Tekiela





Broad-tailed Hummingbird



female Ruby-throated Hummingbird

The hummingbird family

Biologists who study birds, called ornithologists, group similar birds into families. The hummingbird family, known as Trochilidae, includes more than 350 species. Compared with the other bird families, this one is huge! It is the second largest in size after the flycatcher family, which has around 400 species.

Hummingbirds are New World birds found only in North, Central and South America. These tiny flying jewels were unknown to European science until settlement, and the wide variety of hummers must have mystified the early ornithologists. Even today, it's not clear why there are so many different species of hummingbirds.

The Trochilidae family is divided into six subfamilies. Hermit hummingbirds belong to the Phaethornithinae subfamily. They live in the tropical lowlands of southern Mexico and range down into South America. Hermit hummers have large down-curved bills and tend to be relatively drab in color.

Tropical hummingbirds are members of the Trochilinae subfamily. The majority of all hummingbirds, including all species in the United States and Canada, belong to this subfamily. With their wide variety of sizes and colors, long or short bills and conspicuous, colorful males, they appear more like what we consider to be typical hummingbirds.

None so fair

North American hummingbirds are some of the most easily recognized birds and are characterized by many unique features. These petite treasures are well known for their specialized, brightly colored, sparkly feathers, which refract sunlight almost like a prism. Unlike most other birds, hummers enjoy a distinctive diet of nectar liberally seasoned with minute insects. For sipping their sweet drinks, they sport a long, narrow bill that slips easily into flowers and nectar feeders.

They are very fast, agile flyers and the only birds that truly hover in flight. Many birds can remain stationary, or hover, for a few wing beats if they have a good headwind, but they cannot sustain their hover like a hummingbird. Incredibly, hummers can also fly backward! They are the only birds that can also fly straight up and down, side to side and even flip around in an aerial somersault. The key to all of this fantastic flight is their size and weight.





female Black-chinned Hummingbird



female Ruby-throated Hummingbird

A good name

Some birds have misleading names. Red-bellied Woodpeckers, for example, don't have a noticeable red belly. They have just a slight red blush that is easily missed unless you are nearby and viewing the bird from underneath.

Few birds are as well named as the hummingbird. Just listen for the humming sound you'll hear as they fly by and you will understand the reason for the distinctive name. The sound, however, is not made with the vocal chords. It's actually created by the wings, which flap incredibly fast. Hummer wings move so much air so quickly that audible reverberation is produced.

A Ruby-throated Hummingbird flaps its wings 70-80 times per second during regular flight. The extraordinary speed of the wing beats makes it difficult to photograph a hummer in flight, freezing it in time. This image shows flight movement captured in less than a hundred-thousandth of a second. During specialized courtship flights, a Ruby-throat will flap up to a tremendous 200 times per second! Try doing anything 200 times in less than 60 seconds and you'll agree that these birds are beyond amazing.



Origins of the species

The scientific view of the origin of hummingbirds is murky at best. Because only a few fossils are preserved of these very slight birds, scientists have offered theories. Some think that the ancestors of hummers were insect-eating (insectivorous) tropical birds. As the ancient birds gleaned insects from plant leaves and flowers, some individuals would have discovered nectar deep within the blossoms. Over thousands of years and countless generations, the insect-eating birds came to feed regularly on quick-energy nectar and continued to eat the insects for protein.

Over the same amount of time, the plants would have evolved flowers with long tubular shapes specifically to favor the bills of hummingbirds and exclude other birds with short bills. As a result, cross-pollination occurred when the hummers sampled nectar and unwittingly transported pollen from one flower to another. Over the ensuing thousands of years, hummingbird bills became longer and narrower, affording the birds better access to flower nectar. These events bring us into the present, when hummingbirds with long, narrow bills not only feed on nectar from long tubular flowers, but also eat insects.



Broad-billed Hummingbird



Calliope Hummingbird

The world's smallest bird

All hummer species are extremely small. In fact, the smallest bird in the world is a hummingbird. The mini Bee Hummingbird, which occurs in Cuba, is only 2 inches long and weighs 1.8 grams—about $\frac{6}{100}$ ounce. The smallest hummer in the United States is the Calliope Hummingbird. It weighs just 2.5 grams, which is still miniscule at under $\frac{1}{10}$ ounce. The Calliope is noticeably smaller than the other hummingbirds and also has a very short bill. The weight range of a Ruby-throated Hummingbird is slightly more at 2.7–3 grams, making it about the weight of a U.S. penny!

On average, a hummingbird weighs a full gram less than a single Bald Eagle primary flight feather, which weighs about 4 grams. In most species, female hummers are just a bit larger than the males.



Hummingbirds have a highly modified body that reduces their weight to almost nothing. For example, they have teeny legs and feet that add little weight and function mainly as a grip for holding onto branches and other perches instead of walking. Wing bones are also reduced and don't bend at the wrist like they do in other birds. Hummers have a rigid wing instead, which is long, narrow and pointed.

A flat sternum, or long bone in the chest (like the breastbone in people and other mammals), is too heavy for avian flight. Instead, birds have a thin, lightweight chest bone called a keel. The keel has a large surface area where powerful flight muscles attach. The lack of teeth cuts more weight, and a slim, lightweight bill and hollow bones help to trim the overall weight.



Broad-tailed Hummingbird



Ruby-throated Hummingbird



Blue-throated Hummingbird

Life span

In most birds, the larger the bird, the longer the life span. Reversing this—the smaller the bird, the shorter the life span—you'd be correct to assume that hummingbirds don't live a long time. A Broad-tailed Hummingbird remains one of the oldest recorded hummers. It had a 12-year life span, which is an extremely long life for such a small bird. The longest-living Ruby-throated Hummingbird is on record at just over 9 years, but this is also an exception. Most hummers live a short 4-6 years. Others live only 2-3 years.

Hummingbirds not only fly fast, they also live fast. Only about 50 percent of all hummers that hatch survive their first year and live to adulthood. Hummers have a maximum of two chicks per year. Thus, adults need to live at least two breeding seasons to replace themselves and three breeding seasons to add to the population.

What is most remarkable is that such teensy birds are able to survive at all. Many things can cause the demise of these pretty little jewels. Early and late frosts and freezes take a toll on all hummer species. Their high-energy requirements don't allow for long periods of cold and going without food. Hail storms also kill a surprising number of hummingbirds. In my own experience, after a strong, hail-producing afternoon storm, five hummers disappeared from the population of six that had been visiting my feeders. That population never recovered, even many years later. In addition, migration is exceptionally rigorous for hummingbirds. Obstacles, predators, bad weather and more contribute to their mortality during this time.

Staying alive

Hummingbirds have a surprising variety of predators. They range from the usual suspects, such as hawks, to the particularly unusual, such as the praying mantis. The mantis, a relatively large, well-camouflaged insect, often hangs from a twig or stem of a flower close to where hummers visit. When an unsuspecting hummer flies within reach, the mantis snatches the bird from midair. Mantids are not the only insect predator. Hummers are reported to have been caught in spider webs. While the dainty bird struggles to break free of the web, the resident spider subdues its prey with a bite.

Another unusual predator of hummingbirds is the bullfrog. This huge aquatic frog sits motionless and camouflaged at pond edges, where hummers come to drink and bathe. An unwary bird busy at the water can quickly disappear down the throat of this amphibian with a flick of its sticky tongue.

Sharp-shinned Hawks and larger birds that feed exclusively on other bird species will also catch and eat hummingbirds on occasion. Another large, atypical predator is the very smart Greater Roadrunner, which has been spotted below hummingbird feeders, waiting for a victim. When the opportunity arises, it jumps straight up, snatches a hummer from midair and runs off to eat in private. In the American Southwest, large lizards are also known to take hummers.







Ruby-throated Hummingbird

Hummers from coast to coast

Hummers range from Alaska in the northwest to Labrador in the northeast to Tierra del Fuego in the tip of South America. In the United States and Canada, 16 hummingbird species can be found with regularity. Another 2-4 species show up every now and then. These represent only about 6 percent of the total hummingbird species in the world.

Even with such a small percentage of the total species, we have a modest variety of hummers. In the eastern half of the country and most of southern Canada, only one species is seen—the beautiful Ruby-throated Hummingbird. The Ruby-throat has the largest range of any U.S. hummer, extending from Texas to northern Florida, northward up the East Coast to Labrador, across southern Canada to the middle of Canada, and southward to Texas. This species winters in southern Mexico, which requires an astounding non-stop flight of 500-600 miles from the U.S. Gulf Coast to reach the wintering destination across the Gulf to Mexico. Of course, the birds have to repeat this long trip in reverse come spring.

The other 15 hummingbird species occur in the western halves of the United States and Canada. Most have limited ranges. Allen's Hummingbirds occur along the Pacific Coast, stretching from Oregon to southern California, while Buff-bellied Hummingbirds are found in southeastern Texas and Mexico only. Tiny Calliope Hummingbirds live in western mountainous states such as Idaho, Washington and Colorado, and southwestern Canada. Large Blue-throated Hummingbirds, as well as Lucifer, Rivoli's and Violet-crowned Hummingbirds, are seen in several mountainous areas of southeastern Arizona and parts of Texas. Broad-billed, Berylline and White-eared Hummingbirds also share that same region, but are much less common. To see the widest variety of hummers in the United States, southeastern Arizona is the best place to be. Most of the species already live there and during spring and fall migration, you will see even more of these exquisite birds.

Allen's Hummingbird



Buff-bellied Hummingbird



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Calliope Hummingbird



White-eared Hummingbird





Habitats

Hummingbirds occupy a wide variety of habitats. They can be seen just about anywhere across the country, from the Atlantic seaboard to the Gulf Coast, along the coastline of the Pacific and everywhere in between. Hummingbirds thrive in the thick deciduous forests in the east to the boreal forests of Canada, across high Rocky Mountain slopes into the lowest deserts. Some species, such as the Black-chinned Hummingbird, live high up, where cold weather and snow showers are not uncommon, even in summer. Others, such as the Broad-billed Hummingbird, prefer the dry desert.

Attributes of good hummingbird habitat are nectar-producing flowers and a supply of miniscule insects. Environments that have a wide diversity of plants and even just a small amount of water without insecticides or pesticides will provide a good home for hummers. Consider these key features to attract hummingbirds to your own backyard.



male Broad-billed Hummingbird





female Ruby-throated Hummingbird

Regional variations

For many species of birds, regional variations are apparent in the size of the bill, the plumage color of the male or other features. In hummingbirds, regional variation is uncommon. For example, Ruby-throated Hummingbirds look the same in Mississippi as they do in Michigan. The same is true for all other hummer species in the United States.

Regional differences are apparent only in the kinds of flowers the birds visit or by the number of visits they make to nectar feeders. For example, in regions where wildflowers are plentiful, hummers won't visit feeders as much as they will in regions that lack wildflowers. In all regions, however, the preference is for flowers over feeders.

Differences of the sexes

There isn't a better example of sexual dimorphism (differences between the sexes) than that found in hummingbirds.

Male and female hummers share similar colors on their heads, wings and bellies, but the male's colors are brighter and more intense. All male hummingbirds in the United States and Canada also have a specialized reflective throat patch, called a gorget (pronounced "gor-JET"), on or near the throat. In some species, the males also have reflective feathers on top of their heads. The reflective feathers from these areas glisten when viewed from the front in full light.



male Ruby-throated Hummingbird



female Ruby-throated Hummingbird





Feather lights

Hummingbirds have many specialized feathers that cover over half of their body. These feathers reflect green light, making the bird appear green. When the sun is shining, hummers light up like a neon sign. In low-light conditions, such as early or late in the day, hummingbirds look gray. The color change from green to gray also occurs on rainy or very cloudy days.

Feathers are composed of tiny barbules, or thin strands of feather. Within each barbule are cells with air spaces that act like prisms. These break up sunlight into the component bands of light—red, orange, yellow, green, blue, indigo and violet. At the base of each cell is a layer that absorbs most wavelengths of light and reflects the remaining light back to our eyes. In the throat patch (gorget) of male Ruby-throated Hummingbirds, the colors reflected are red, orange, and yellow. These create the gorget's ruby color. The remaining green, blue, indigo and violet components of light are absorbed.



male Anna's Hummingbird feathers reflecting



male Anna's Hummingbird feathers not reflecting

Reflective feathers

Both male and female hummers usually have some green reflective feathers at the back of their heads, on their backs and over the upper surface of their wings. The amount of green you'll see is generally dependent on the amount of sunlight and the angle at which you are viewing the bird. A hummingbird flying past you at dusk frequently appears gray because daylight is diminished. View the same bird at midday with its back toward you, and you'll see a glinting, iridescent green hummer. Male hummers have especially shiny, metallic-looking feathers. Their feathers are faceted in a flat plane, which reflects the maximum amount of light.

The distribution of reflective gorget feathers in males differs among species. Blue-throated Hummingbird males, for example, have just a small reflective patch on the throat. Male Ruby-throated Hummingbirds have a medium throat patch that shines brightly when reflecting and turns black when not reflecting. Anna's Hummingbird males have both a large gorget and reflective head feathers. A very slight change in position will turn the sparkling feather reflection on and off.



Purple-crowned Fairy Hummingbird



Rivoli's Hummingbird

The male Ruby-throat uses his gorget to full reflective advantage when trying to impress a mate. He will perform a flight display directly in front of the female to dazzle her with his beauty. Each time he passes, he turns his body and aligns his gorget to be perpendicular to her for maximum light reflection. The glimmering sheen from his gorget shows her that he is a healthy male.

Rivoli's Hummingbird males are different from many other hummers because they are covered with reflective feathers. With their velvety black bodies, bright green throats and glossy purple crowns, they have arguably the most striking coloration of the hummingbirds.

Adding color

Feather color occurs in different ways. Pigments in feathers produce black, gray, brown, red, yellow and orange colors. Northern Cardinals are red because of pigments. Feathers of other birds reflect color through a structural process. The specialized cells in feathers that split sunlight apart into a color spectrum also absorb most wavelengths of light and reflect the remaining colors back to our eyes. These colors tend to be green and blue. Eastern Bluebirds and Blue Jays appear blue due to the process of light absorption and refraction. Feathers that lack pigment or the cell structure for the mechanical process will be white.

Hummingbirds have a combination of all three processes. The wings of most hummers are gray, brown or black from pigments. Chests and bellies are normally white. Their backs and the upper surface of their wings are green from light reflection. The lustrous colored crowns and throat patches of the males are also classic examples of light trickery.





Rufous-tailed Hummingbird



leucistic Anna's Hummingbird

How to attract hummingbirds to your yard

When you spot a hummingbird in your yard or garden, it's always a delight. If you take some easy, cost-effective steps, you can make your yard more welcoming to hummingbirds and birds and wildlife generally. Here are some simple tips to get started.

Put up a hummingbird feeder, but don't use red dye

You can also welcome hummingbirds to your yard by putting up a sugar-water hummingbird feeder. These often-red bottles hold sugar-water, which is easy to make yourself (mix four parts water and one part sugar), which hummingbirds will visit often, once they discover the feeder. Be sure to buy a feeder with bee/wasp-proof nozzles, as they're attracted to the sugary stuff too. Wash out your feeders at least once a week.

Don't spray pesticides or herbicides in your yard

Hummingbirds eat a whole lot more than plant nectar. In fact, like many birds, they depend a great deal on insects and arthropods for food, and even for nesting materials. Unfortunately, many of the insecticides that homeowners commonly use in their yards are broad-spectrum, which means they don't just target one insect species. Mosquito foggers are an example: they kill far more than just mosquitoes, including bees, butterflies, and other insects and arthropods. (This includes spiders; spider silk is often a component of some hummingbird nests.) Pesticides and herbicides also harm birds directly as well, so if you can avoid using them, you'll make your yard more bird-friendly.

Native plant options for hummingbirds

Hummingbirds are well-adapted to the native plants in their geographic range. Generally speaking, these plants have similar characteristics (bright colors, tubular flowers), but the particular plants vary by region. Here are some suggestions for hummingbird-friendly plants for the major regions in the U.S.

Northeast

Common Milkweed
Dense Blazing Star
Trumpet Honeysuckle
Blue Wild Indigo
Common Buttonbush
Cardinal Flower
Foxglove Beardtongue
Great Blue Lobelia

Midwest

Anise Hyssop
Marsh Blazing Star
Trumpet Honeysuckle
Trumpet Creeper
Red Columbine
Foxglove Penstemon
Cardinal Flower

Southwest

Autumn Sage
Desert Honeysuckle
Hummingbird Trumpet
Pineapple Sage
Red Yucca
Cardinal Flower
Parry's Penstemon
Scarlet Betony
Wild Bergamot

Southeast/South

Black-eyed Susan
Indian Blanket
Lanceleaf Coreopsis
American Beautyberry
Florida Dogwood
Compass Plant

Northwest

Columbine
Honeysuckle
Indian Paintbrush
Canada Goldenrod
Checkermallow
Penstemon (all)



Cardinal Flower



About the author

Naturalist, wildlife photographer and writer Stan Tekiela is the originator of the popular Wildlife Appreciation series that includes *Cranes, Herons & Egrets*. Stan has authored more than 190 educational books, including field guides, quick guides, nature books, children's books and more, presenting many species of animals and plants.

With a Bachelor of Science degree in natural history from the University of Minnesota and as an active professional naturalist for more than 30 years, Stan studies and photographs wildlife throughout the United States and Canada. He has received national and regional awards for his books and photographs and is also a well-known columnist and radio personality. His syndicated column appears in more than 25 newspapers, and his wildlife programs are broadcast on a number of Midwest radio stations. You can follow Stan on Facebook, Instagram and Twitter, or contact him via his website, naturesmart.com.

Dainty, Elusive, Delightful . . . the Hummingbird

Their beauty captivates us. Their aerial acrobatics enchant us. Hummingbirds are beloved backyard visitors. A sighting is a remarkable event, worthy of remembering, cherishing and sharing with others. Feel that joy with every turn of the page in *Hummingbirds*. Award-winning author, naturalist and wildlife photographer Stan Tekiela presents stunning photographs and insightful descriptions of a hummingbird's life. The result is a book deserving of a place on any coffee table or shelf.

Give it a try. Open this book to any page, and prepare to be struck with wonder.



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