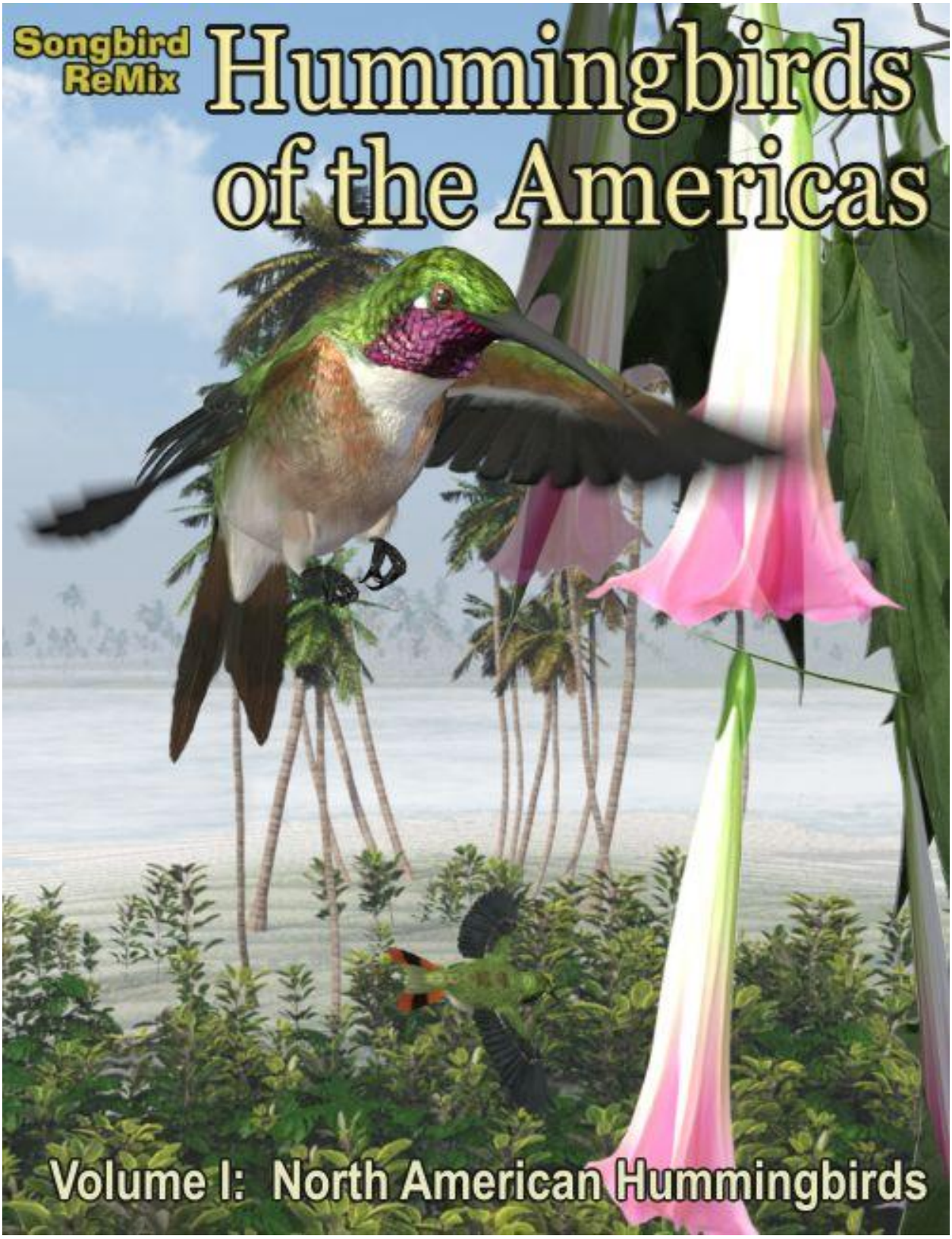

Avian Models for 3D Applications

by Ken Gilliland

Songbird ReMix

HUMMINGBIRDS OF THE AMERICAS VOLUME I

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HUMMINGBIRDS OF THE AMERICAS VOLUME I

Introduction

"Hummingbirds of the Americas" adds the smallest of songbirds to the Songbird ReMix series. While endemic to the Americas, they have been adopted worldwide as one of the most popular and beloved songbirds. Hummingbirds have been a staple in both ancient and modern cultures as a sign of vigor, energy, and skill.

This collection includes hummingbirds found throughout North America from the feeders of the Western and Eastern US suburbs to tropical islands in the Caribbean.

Included is the Zunzuncito (or Bee hummingbird) of Cuba, the smallest bird on the planet which measures only 2 inches in length and one of the largest hummingbirds, the Red-billed Streamertail from Jamaica, which measures over 10 inches with the tail.

Whether you choose to create art with a message or you are simply looking for realistic and attractive birds for your imagery, this package will easily fulfill those needs.

Overview and Use

Select **Figures** in the Runtime folder then go to the folder that contains the **Songbird ReMix**. Here you'll find an assortment of files that are easily broken into 2 groups: **Conforming Parts** and **Bird Base models**. Let's look at what they are and how you use them

- **Bird Base Models included in this volume:**
  - **Songbird ReMix3 Hummingbird Base** - All bird species included in this volume use this model.
- **Conforming Parts-** No conforming parts are required for this volume. It is always possible that future add-ons or free bird characters for this package may require conforming parts**.** All Conforming Crests have alpha-numeric icons in the lower right corners such as "C02", "C06" or "T4". This corresponds with characters in the Pose folders. All MAT/MOR files with the same icon use that particular Conforming Part. ***Be sure to read this:*** Most conforming parts are Crests which covers the head part. When posing the Base Model, the Conforming Part will follow any Bend, Twist or Rotate Commands. It will not obey any **SCALE** or **MORPH** commands you give the Base Model. You must manually

scale the Conforming Part and with morphs such as “Stretch” you must also set its counterpart in the head part of the Conforming Crest; “MatchStretch”.

Quick Reference Guide

When using Poser or when going the route of using DAZ Studio’s “Create Your Own” Base Models, here’s a chart to help you figure out what model goes with what character. Load the appropriate base model and apply the character settings.

Load Model(s)	To Create… (apply MAT/MOR files)
	• Allen's Hummingbird • Anna’s Hummingbird • Bahama Woodstar • Bee Hummingbird • Black-chinned Hummingbird • Broad-billed Hummingbird • Calliope Hummingbird • Costa's Hummingbird • Cuban Emerald • Magnificent Hummingbird • Mexican Woodnymph • Red-billed Streamertail • Ruby-throated Hummingbird • Rufous Hummingbird

Scaling alters Bump & Displacement Settings

All the hummingbirds in this set are scaled to Poser/DAZ Studio Human figure scale. This makes them very, very small so often there’s a desire to scale-up the hummingbird went a human figure isn’t used in the scene. **Displacement and bump settings will not scale with the model.** In some case, the displacement and sometimes bump settings may need to be increased or decrease with scaling. If you scale-up the hummingbird you, will need to tweak the bump and displacement settings in Plumage, RumpTopFeathers, Gorget and possibly other material settings.

Creating a Songbird ReMix Bird

Here's a step by step to create a bird:

1. Choose what you want to load. For this example, we'll create a "Hummingbird".
2. Load Poser and select **FIGURES** and the Songbird ReMix folder. Because the "Hummingbird" uses the "Hummingbird" base model we'll load that.
3. Go to the **POSES** folder and select the appropriate Songbird Remix library. In this case, we'll select one of the "Hummingbird" species poses and apply it to our loaded Songbird ReMix base model. This pose contains morph and texture settings to turn the generic model into an "Hummingbird". As explained earlier in the Character Base Section, the Alphabet letter appearing on the base of a bird's Icon refers to what model it expects to adhere to. Thus the "Parrot" character is going to want the **<P>** Parrot Base Songbird ReMix Model. Birds with no icon usually want the Songbird Base.

Displacement in Poser 5+

In Poser, several settings will help to bring out the best in this bird set.

Under "Render Settings" (CTRL+Y) make sure you check "**Use Displacement Maps**" and (in some rare cases) the "**Remove Backfacing Polys**" boxes. In some poses, the wing morphs will expose backfacing polygons which tend to render black. Clicking the "Remove Backfacing Polys" fixes this.

Scaling and Square Shadows in Poser

All the birds in this package have to scaled proportionally to DAZ 3D's Victoria and Michael models. The smallest of the included birds (such as the Robins) **MAY** render with a Square shadow or improper lighting. This is a bug in Poser. Poser can't figure out how to render a shadow for something really small, so it creates a square shadow. The solution is to put a larger item that casts a normal Poser shadow in the scene (even if it is off camera) and the square shadows will be fixed or BODY scale the bird to a larger size.

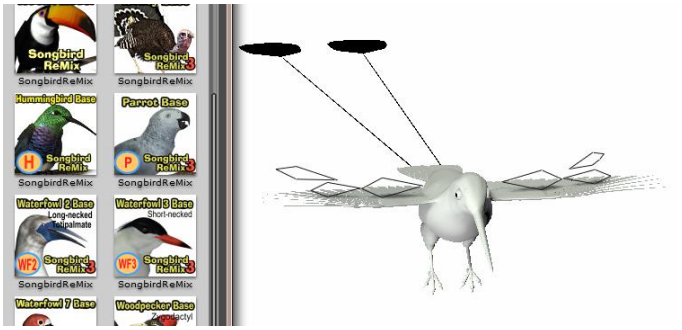
without prop off screen

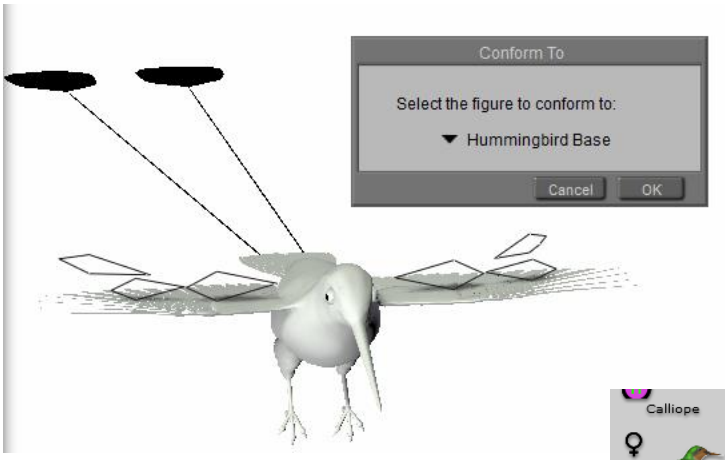
with prop off screen, lights/shadows will properly render

How to build a Songbird ReMix Character with a Conforming Part in Poser

1. In the Figures folder load a Bird base Model. Then load the appropriate conforming part for the bird you're trying to create.

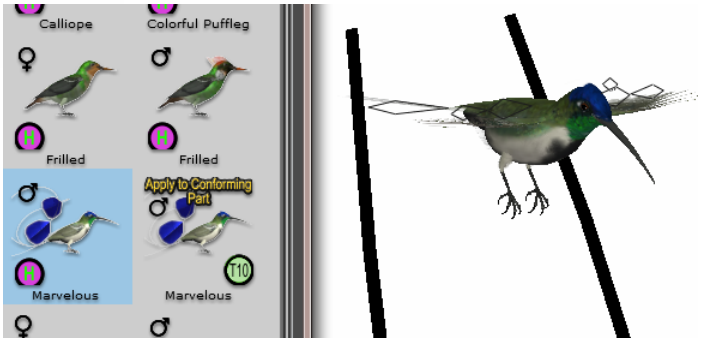
2. **Conform it** to the bird base model.



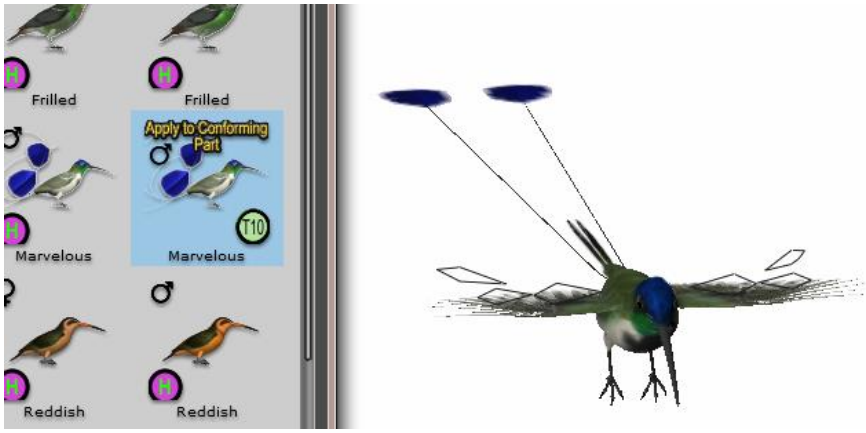


3. **Select the Base Model** and go to the **POSES folder.** Select and apply the appropriate Character/Material pose setting for the bird you're creating.

4. The Conforming part will look wrong. That's okay—we're going to fix that now. **Select the Conforming Part** and apply appropriate Character/Material pose for the part.



5. Voila! Your bird is done. Just remember to select the bird base when posing and often there are additional morphs in the conforming part you can use.



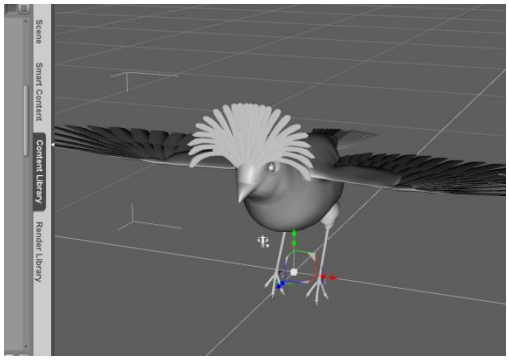
Updates and Freebies

The Songbird ReMix series is constantly growing and improving. New morphs and additions to upcoming and future products often end up benefiting existing sets with new geometry, morphs and textures.

Songbirdremix.com always has the latest updates and additions to existing Songbird ReMix products (often months before they are updated at DAZ), plus the latest digital and real bird news, tutorials, videos, all the Field Guides, free bird characters, props and much more…

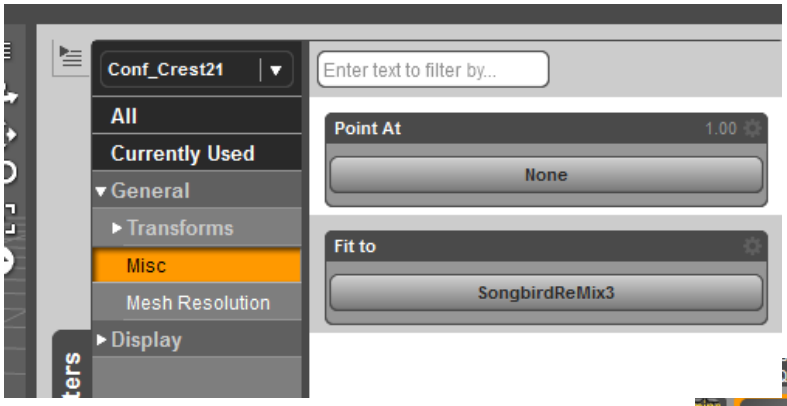
Songbird ReMix.com

How to build a Songbird ReMix Character with a Conforming Crest in DAZ Studio

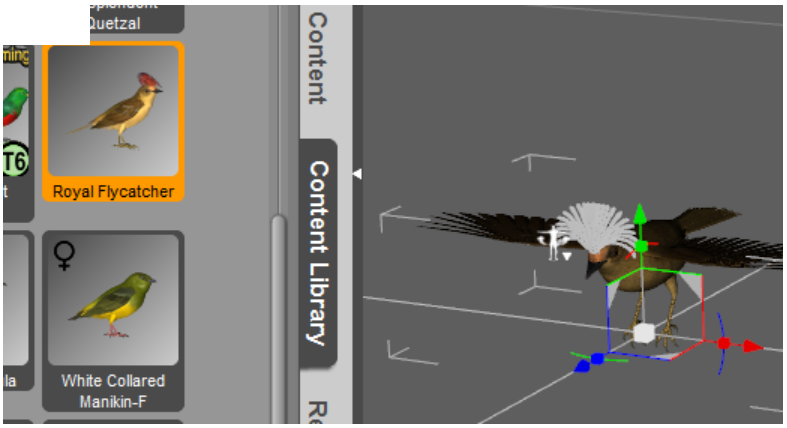


In the **Runtime** folder, select **Figures** and load the Songbird ReMix Model and the appropriate Conforming Crest in Studio. Select the Conforming Crest by selecting on the screen or in the **Scene** Tab.

Now, using the “FIT TO” command in the Parameters Tab, Select the Songbird ReMix Model. Go back to the **Scene** Tab and select the Songbird ReMix Model.



Select the Studio **Content** Folder and go to the **Animals : SBRM : !CreateYour Own : Characters** folder and select the appropriate Songbird Remix library. Apply the Character setting to the bird base. It will probably reduce the size significantly and change the shape of the bird.



Now that the bird is sized, select the conforming part and apply the conforming part character settings.

Voila! Your bird is done. Just remember to select the bird base when posing and often there are additional morphs in the conforming part you can use.

Field Guide

North American Hummingbirds

Allen's Hummingbird

Anna's Hummingbird

Bahama Woodstar

Bee Hummingbird (aka Zunzuncito)

Black-chinned Hummingbird

Broad-billed Hummingbird

Calliope Hummingbird

Costa's Hummingbird

Cuban Emerald (aka Zun-zun)

Magnificent Hummingbird

Mexican Woodnymph

Red-billed Streamertail (aka the Doctor-bird)

Ruby-throated Hummingbird

Rufous Hummingbird

Hummingbird Facts

Hummingbirds comprise the *Phaethornithinae* and *Trochilinae* families. There are 356 species of hummingbird with 51 species currently having an “endangered status”. They are among the smallest of birds, most species measuring in the 3–5 inches (7.5–13 cm) range. The smallest living bird species is the Bee Hummingbird (2 inches (5 cm)).

They can hover in mid-air by rapidly flapping their wings 12–90 times per second (depending on the species and can fly at speeds exceeding 34 mph (54 km/h). Hummingbirds are the only birds in the world that can fly backwards, but most are incapable of walking or hopping.

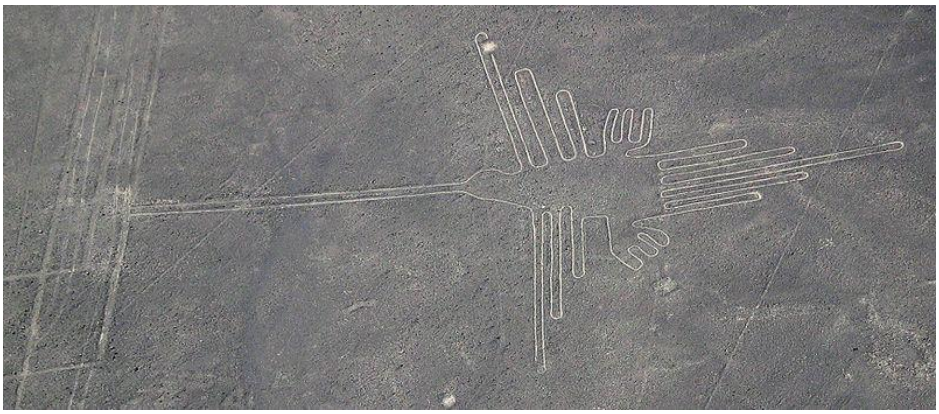
At rest, their heart beats an average of 480 beats per minute. On cold nights they go into torpor, and the heart rate drops to 45–180 beats per minute. Breathing rate when resting is 245 breaths per minute at 91 degrees Fahrenheit; this rises to 420 breaths per minute when the temperature drops to 55 degrees Fahrenheit. Torpid hummingbirds breathe sporadically.

With most hummingbirds, females average larger than males, and young birds average larger than their parents.

Hummingbirds consume about 1.6 to 1.7 times their body weight in nectar each day. Because hummingbirds sip from so many different flowers on any given day, they are integral to the process of pollination.

Their English name derives from the characteristic humming sound made by their rapid wing beats.

A group of hummingbirds has many collective nouns, including a “bouquet", "glittering", "hover", "shimmer", and "tune” of hummingbirds.



Hummingbirds play a strong role in Mesoamerican cultures. In Peru, one of the Nazca Lines depicts a hummingbird. The Nazca "drew" several hundred simple but huge curvilinear animal and human figures by this technique. In total, the earthwork project is huge and complex: the area encompassing the lines is nearly 500 square kilometers (190 sq. mi), and the largest figures can span nearly 270 meters (890 ft.). The lines were made by removing the reddish-brown iron oxide-coated pebbles that cover the surface of the Nazca desert. When the gravel is removed, it leaves a shallow trough

ranging from 10 centimeters (3.9 in) to 15 centimeters (5.9 in) deep and the light-colored earth beneath shows in lines of sharply contrasting color and tone. This sub-layer contains high amounts of lime which with the morning mist hardens forming a protective layer that shields the lines from winds therefore preventing erosion. The extremely dry, windless, and constant climate of the Nazca region has preserved the lines well.

Aztecs wore hummingbird talismans, the talismans being representations as well as actual hummingbird fetishes formed from parts of real hummingbirds: emblematic for their vigor, energy, and propensity to do work along with their sharp beaks that mimic instruments of weaponry, bloodletting, penetration, and intimacy.

The Aztec god Huitzilopochtli is often depicted as a hummingbird. The Nahuatl word huitzil (hummingbird) is an onomatopoeic word derived from the sounds of the hummingbird's wing-beats and zooming flight.

Hummingbirds captured the imagination of European settlers as well and by the middle of the nineteenth century there was a large market for hummingbird skins in Europe. Sadly, hundreds of thousands of hummingbirds were killed in South America and shipped to markets in London and other cities throughout Europe, where they were purchased for collections, to make artificial flowers, and other ornamental uses.

American bird artist, John James Audubon, referred to hummingbirds as "glittering garments of the rainbow." Emily Dickinson, after seeing a Ruby-Throated Hummingbird in her garden, she wrote:

He never stops, but slackens
Above the Ripest Rose --
Partakes without alighting
And praises as he goes,
Till every spice is tasted.

What's a Gorget?

A gorget is a patch of colored feathers found on the throat or upper breast of male hummingbirds. Gorgets are typically iridescent. The term is derived from the "gorget" used in military armor to protect the throat.

Feather wear and exposure to the sun can produce changes in the apparent color of iridescent gorget feathers. For example, fresh gorget feathers on the Anna's Hummingbird are rose red; these fade to a coppery bronzy color with age. A number of social functions have been suggested for the gorget. It may aid in mate attraction or in resource defense. It may signal social status or allow species to identify conspecifics. While gorgets are typically found only on male hummingbirds, in rare instances, females may have them; they appear to serve primarily for signaling threats.

Common Name: Allen's Hummingbird
Scientific Name: *Selasphorus sasin*

Size: 3.5 inches (9 cm)

Habitat: North America; found on the coastal strip of the Pacific ocean from Southern Oregon to Mexico. Breeds in moist coastal areas, scrub, chaparral, and forests. Winters in forest edge and scrub clearings with flowers.

Status: Least Concern **Global Population:** 500,000 mature individuals. Populations may be declining (Cornell Lab of Ornithology/IUCN).

Diet: Flower nectar, small insects, and tree sap. Comes to hummingbird feeders.

Breeding: Males have iridescent magenta gorgets. Females have white throats. Both sexes have greenish copper upper parts. Immatures resemble adult females.

Breeding male and female Allen's Hummingbirds have different habitat preferences. The male sets up a territory overseeing open areas of coastal scrub vegetation or riparian shrubs, where he often perches conspicuously on exposed leafless branches. The female selects nest sites in more densely vegetated areas and forests. The courtship flight of the male Allen's Hummingbird is a frantic back and forth flight arc of about 25 feet (10 m) similar to the motion of a swinging pendulum, followed by a high-speed dive from about 100 feet (30 m). The male is also highly aggressive and territorial.

The Allen's Hummingbird constructs its nest out of plant fibers, down, and weed stems, coating the nest with lichens to give it structure. The nest is placed above ground on a tree branch or the stalk or stem of a plant. The female lays two white eggs, which she will incubate for 15 to 17 days. The young will leave the nest about three weeks after hatching. The mother will continue to feed the fledglings for several more weeks, then the young are left to fend for themselves.

Cool Facts: Two subspecies of Allen's Hummingbirds are recognized. The nominate race of Allen's Hummingbird *S.s. sasin* is migratory, and winters along the Pacific coast of central Mexico. A second race *S.s. sedentarius* is a permanent resident on the Channel Islands off southern California. This population colonized the Palos Verdes Peninsula of Los Angeles County in the 1960s and has since spread over much of Los Angeles and Orange Counties.

Allen’s Hummingbirds closely resemble the smaller Rufus Hummingbirds and 10% of each species has the exact field markings of its counterpart, but for the most part, Rufus Hummingbirds have coppery backs and Allen’s have greenish backs. Both the birds are distinctive by their metallic sounding wingbeat.

The Allen's Hummingbird is a remarkably early migrant compared with most North American birds. Northbound birds may depart on spring migration as early as December and arrive on the summer breeding grounds as early as January. Adult males may begin their southward fall migration in mid-May and arrive on winter grounds as early as August.

The common name commemorates Charles Andrew Allen (1841-1930), American collector and taxidermist.

Common Name: Anna's Hummingbird
Scientific Name: *Calypte anna*

Size: 4 inches (10 cm)

Habitat: North America; West coast from Canada to Mexico, but primarily California. They live in chaparral near open woodland, and urban and suburban areas.

Status: Least Concern. **Global Population:** 1,500,000 mature individuals. Range is expanding and numbers increasing due to exotic, non-native plants being introduced.

Diet: Pollen and small insects. At times hummingbirds will fly-catch by diving into clouds of gnats.

Breeding: Males have iridescent magenta crowns and gorgets. Females have white throats and under parts, sometimes with some violet feathers. Both sexes have green upper parts. Immatures resemble adult females, with gray-buff edging on feathers of

upper parts.

Females construct tiny nests out of leafy material and feathers that are bound together with spider webs. The nests are placed on crotches of branches. Once the nest is completed, the female begins courtship with a male. Unlike most hummingbirds, the Anna's sings during courtship. After courtship, the male leaves and the female incubates two eggs. She cares for the hatchlings by herself. Young hummingbirds are born naked and blind and fledge after about three weeks.

Cool Facts: The Anna's Hummingbird was named after the 19th century Italian duchess Anna De Belle Massena. Naturalist, Rene Primevere Lesson, discovered the first specimen and named it after his patron's name. It is also the largest of the hummingbirds of North America.

The Anna's hummingbird is the only hummingbird that stays put. Though some winter in Mexico and some travel as far as Canada, most Anna's Hummingbirds stay year round in California.

Mishaps can occur trying to get lunch… bees and wasps may become impaled on the bill, causing the bird to starve to death**.** The male Anna's hummingbird is extremely territorial.

Common Name: Bahama Woodstar
Scientific Name: *Calliphlox evelyna*

Size: 3-5 inches (8-12 cm)

Habitat: North America; endemic to the Bahamas. It is found in many different habitats on all the islands in the Bahamas. There are 2 subspecies; *Calliphox evelyna lyrura* (Males; purplish gorget), inhabits Inagua Island and *Calliphox evelyna evelynae* (Males; magenta gorget), is found on all remaining islands.

Status: Least Concern.
Global Population: Unknown amount of mature individuals. Although the Bahama Woodstar is not listed on the IUCN Red List of Threatened Species, it is protected by Bahamian law under the Wild Birds Protection Act. The Convention for International Trade of Endangered Species (CITES) lists the Bahama Woodstarin Appendix II which limits the exportation of the species as it can cause the species to become endangered.

Diet: Flower nectar, small insects, and tree sap.

Breeding: Males show a reddish-pink throat which is lined by a white collar during breeding season. After breeding season is over, he loses the colorful throat which turns

to a pale gray color of eclipse plumage. Females are much more drab in color. Tails on male birds are forked, females are much more rounded.

Nesting is done in a small cup made of plant down, bark and cobwebs. The female lays 2 elliptical white eggs, which will incubate for 15-18 days. This hummingbird nests all year round.

Cool Facts: A distinct local race, or sub-species, of the Bahama Woodstar is found on Inagua, males of which have violet feathers on the forehead as well as on the throat. The Bahama Woodstar will nest all year round and does not migrate.

While most hummingbirds are aggressive to any bird, with the exception of their mates, the Bahama Woodstars may gather where flowers are abundant. However they are not truly sociable birds. There are times that they will chase an intruding neighbour away as well as birds of other species.

Common Name: Bee Hummingbird or Zunzuncito
Scientific Name: *Mellisuga helenae*

Size: 2 inches (5 cm)

Habitat: Central America; endemic to Cuba and Isla de la Juventud. This species is uncommon and restricted to the eastern slopes of the río Utcubamba valley (an affluent on the right bank of the río Marañón) in the Cordillera del Colán, Amazonas, and one locality further east in San Martín, north Peru.

It occurs in forest edges, second growth, montane scrub and, in particular, thorny, impenetrable Rubus thickets admixed with Alnus trees, at 2,100-2,900 m (occasionally 1,700-3,700 m).

Status: Near Threatened. **Global Population:** Unknown amount of mature individuals; the species is suspected to be declining at a slow to moderate rate. The historic decline is principally the result of habitat modification and destruction. Much of Cuba's natural vegetation has been converted to cultivation and pasture for cattle, with only 15-20% of land remaining in its natural state, and the recent expansion of cacao, coffee and tobacco production poses a further serious threat.

Diet: Flower nectar; its preferred food-plant is the red-flowered lily *Alstroemeria or Bomarea formosissima*, but it has been observed feeding on at least five species of flowering plant.

Breeding: The male bee hummingbird exhibits extravagant breeding plumage, with iridescent, fiery red-pink feathers on the head and throat, which are elongated around the neck. The rest of the upperparts are bluish-green, and the underside is white-grey, with blue spots on the wing tips and black-tipped tail feathers. The brightly colored

feathers are only apparent before and during the breeding season, and are shed shortly after, when they are replaced by more drab plumage. The female bee hummingbird is slightly larger than the male, with green upper-parts, white tips to the tail feathers, and without the iridescent plumage.

Using bits of cobwebs, bark, and lichen, the female bee hummingbird builds a cup-shaped nest that is only about 1 inch (2.5 cm) in diameter. Nests have been built on single clothespins. She lines the nest with soft plant fibers. In this nest she lays her eggs, which are no bigger than peas. She alone incubates the eggs and raises the young. Nesting takes place between April and June.

Cool Facts: The diminutive bee hummingbird has the incredible distinction of being the smallest living bird in the world. The bee hummingbird beats its wings an estimated 80 times per second — so fast that the wings look like a blur to human eyes.

Zunzun and Zunzuncito. The Cuban Emerald and Bee Hummingbirds forage.

Common Name: Black-chinned Hummingbird
Scientific Name: *Archilochus alexandri*

Size: 3.25 inches (8.25 cm)

Habitat: North America; **Summer:** Breeding habitat includes open semi-arid areas near water in the western United States, northern Mexico and southern British Columbia. **Winter:** Mexico.

The Black-chinned Hummingbird is a habitat generalist, found in lowland deserts and mountainous forests, in “natural” habitats and very urbanized areas as long as there are tall trees and flowering shrubs and vines.

Status: Least Concern. **Global Population:** 2,000,000 mature individuals. This species has undergone a large and statistically significant increase over the last 40 years in North America (72.6% increase over 40 years, equating to a 14.6% increase per decade; data from Breeding Bird Survey and/or Christmas Bird Count.

Diet: Flower nectar, small insects, and tree sap. Hovers at flowers and feeders, darts erratically to take tiny swarming insects, perches atop high snags to survey its territory, watching for competitors to chase off and for flying insects to eat.

Breeding: Adults are metallic green above and white below with green flanks. Their bill is long, straight and very slender. The adult male has a black face and chin, a glossy purple throat band and a dark forked tail. The female has a dark rounded tail with white

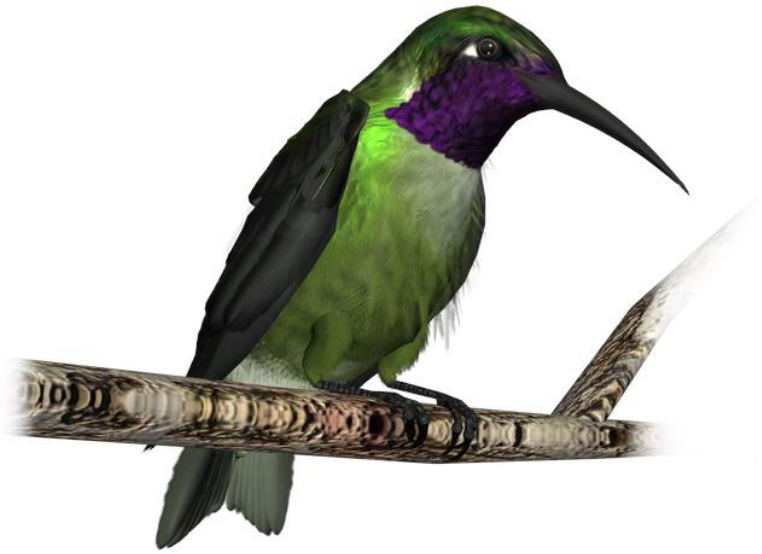
tips and no throat patch; they are similar to female Ruby-throated Hummingbirds. During courtship and territorial defense, males display by diving 66-100 feet.

Females build a well-camouflaged nest in a protected location in a shrub or tree using plant fiber, spider webs and lichens. A Black-chinned Hummingbird's eggs are about the size of a coffee bean. The nest, made of plant down and spider and insect silk, expands as the babies grow.

Cool Facts: A hybrid between this species and Anna's Hummingbird was called *Trochilus violajugulum*. It is also known to hybridize with Costa's Hummingbird.

The Black-chinned Hummingbird's tongue has two grooves; nectar moves through these via capillary action, and then the bird retracts the tongue and squeezes the nectar into the mouth. It extends the tongue through the nearly closed bill at a rate of about 13–17 licks per second, and consumes an average of 0.61 milliliters (about a fifth of a fluid ounce) in a single meal. In cold weather, may eat three times its body weight in nectar in one day. They can survive without nectar when insects are plentiful. They aren't so much drawn to the red coloring as they are to the colors of recent nectar sources.

The oldest known Black-chinned Hummingbird lived to be 10 years, 1 month old.



Common Name: Broad-billed Hummingbird
Scientific Name: *Cynanthus latirostris*

Size: 3.25-3.5 inches (9-10 cm)

Habitat: North America; Mexico to southeastern Arizona. Broad-billed Hummingbirds that nest in Arizona are migratory; populations in Mexico are resident year-round in their breeding range.

Found in arid scrub, open deciduous forest, semi-desert and other open situations in arid habitats.

Status: Least Concern.
Global Population: 2,000,000 mature individuals. The population trend is increasing in North America (based on BBS/CBC data: Butcher and Niven 2007).

Diet: Flower nectar, small insects, and tree sap.

Breeding: Adults are colored predominantly a metallic green on their upper parts and breast. The under tail coverts are predominately white. The tail is darkly colored and slightly forked. The bill of the male is straight. It is orange-red in coloration, and shows a black tip. His throat is a deep blue. The female is less colorful than the male. She usually shows a white eye stripe. The male Broad-billed Hummingbird performs a courtship display, starting by hovering about a foot from the female and then flying in repeated arcs, like a pendulum.

The female builds a nest in a protected location in a shrub or tree. Females lay two white eggs.

Cool Facts: One of the smallest and most colorful hummingbirds in North America. Broad-bills weigh approximately three to four grams.

Common Name: Calliope Hummingbird
Scientific Name: *Stellula calliope*

Size: 3.5 inches (9 cm)

Habitat: North America; **Summers:** The Pacific Northwest from Northern California to British Columbia. **Winters:** Southern Mexico to Central America.

Found in open montane forest, mountain meadows, willow and alder thickets while in migration and, in winter, they are also found in chaparral, lowland brushy areas, deserts and semi-desert regions.

Status: Least Concern. **Global Population:** 1,000,000 mature individuals. This species has had stable population trends over the last 40 years in North America (data from Breeding Bird Survey and/or Christmas Bird Count: Butcher and Niven 2007).

Diet: Flower nectar and small insects.

Breeding: These birds have glossy green on the back and crown with white underparts. Their bill and tail are relatively short. The adult male has wine-red streaks on the throat, green flanks and a dark tail. Females and immatures have a pinkish wash on the flanks, dark streaks on the throat and a dark tail with white tips.

The female builds an open cup nest in a conifer under an overhanging branch.

Cool Facts: It is the only member of the Stellula genus. The genus name means "little star". This bird was named after the Greek muse Calliope.

Common Name: Costa's Hummingbird
Scientific Name: *Calypte costae*

Size: 3.5 inches (9 cm)

Habitat: North America; Northwest Mexico, Baja California, Southern California, western Arizona and southern Nevada.

Desert and semi-desert, arid brushy foothills and chaparral while in migration and in winter they are also found in adjacent mountains, in open meadows and gardens.

Status: Least Concern. **Global Population:** 4,000,000 mature individuals. Loss of habitat, especially coastal scrub and Sonoran desert scrub, pose the most serious threat to the species. Availability of feeders may have a compensating effect, to an undetermined degree.

Diet: Flower nectar and small insects.

Breeding: Males have iridescent violet crowns and gorgets. The Gorget ends extend out sides of throat. Females have white throats and under parts, sometimes with some violet feathers. Both sexes have green upper parts. Immatures resemble adult females, with gray-buff edging on feathers of upper parts, and a doubly-rounded tail instead of singly-rounded.

The male Costa's Hummingbird's courtship display is a spirited series of swoops and arcing dives, carefully utilizing a proper angle to the sun to show off his violet plumage to impress prospective mates. Each high-speed dive will be accented by a high-pitched sound (caused by the air flow over the tail feathers) as the male passes within inches of the female, who is perched on a nearby branch.

The Costa's Hummingbird constructs a small cup-shaped nest out of plant fibers and down, coated with lichen to hold it together. The nest will be situated above ground on a yucca stalk or tree limb. The female lays just two eggs, which are white in color, which she will incubate for 15 to 18 days before the young hatch. The young Costa's Hummingbirds leave the nest after 20 to 23 days.

Cool Facts: Researchers have found that the Costa's Hummingbird can enter a torpid state, with slowed heart rates and reduced body temperatures, under low ambient nighttime temperatures. The hearts of torpid Costa's Hummingbirds beat about 50 times per minute, while those of non-torpid resting Costa's Hummingbirds beat 500 to 900 times per minute.

Common Name: Cuban Emerald or Zun-zun
Scientific Name: *Chlorostilbon ricordii*

Size: 3.5 - 4 inches (9-10.5 cm)

Habitat: North America; endemic to Cuba and the Bahamas.

It is found in a wide range of semi-open habitats; forests, coastal vegetation, and gardens.

Status: Least Concern. **Global Population:** Unknown amount of mature individuals. The global population size has not been quantified, but this species is described as 'common'.

Diet: Flower nectar and small insects. The Cuban emerald is bigger than its cousin, the bee hummingbird, and as a result feeds on a much larger array of blossoms. Because of this size difference, the two species have avoided competing with each other for food.

Breeding: The male has a short bill with a black upper mandible and a red lower mandible with a black tip. Upper parts are dark green while under parts are shiny green with a hint of metallic blue. The under-tail coverts are white and the tail is deeply forked. The female is similar but the under parts are brownish-grey with green flanks and the tail is slightly less forked. Both sexes have a whitish spot behind the eye.

The female builds a nest in a protected location in a shrub or tree. Females lay two white eggs.

Cool Facts: The Zun-zun is the national bird of Cuba.

Common Name: Magnificent Hummingbird
Scientific Name: *Eugenes fulgens*

Size: 4.3-5.5 inches (11-14 cm)

Habitat: North America; from Southern Arizona to western Panama.

Humid montane forest (primarily in edge and clearings), pastures, open woodland, pine-oak association and scrubby areas.

Status: Least Concern. **Global Population:** 2,000,000 mature individuals. Habitat destruction may be a problem in Mexico and Central America, but specific effects have not been documented.

Diet: Flower nectar and small insects.

Breeding: The adult male is green-bronze dorsally, becoming more bronzed on the black-tipped tail. The crown is violet, the throat gorget bright blue-green, and the rest of the head black apart from a white spot behind the eye. The chest is green-bronze and the belly greyish. The female Magnificent Hummingbird is bronze-green dorsally and a dull grey ventral coloring. There is a white stripe behind her eye. Immature birds are like the female, but darker and browner. Magnificent Hummingbird males perch conspicuously and defend their feeding territories aggressively.

The female is entirely responsible for nest building and incubation. She lays two white eggs in her bulky cup nest about 3 meters up near the tip of a descending branch stem. Incubation takes 15–19 days, and fledging another 20–26.

Cool Facts: The Magnificent Hummingbird is the second-largest hummingbird north of Mexico. Only the Blue-throated Hummingbird is larger.

Common Name: Mexican Woodnymph
Scientific Name: *Thalurania ridgwayi*

Size: 3.75 inches (10 cm)

Habitat: North America; Mexico. It is patchily distributed in south Nayarit, Jalisco and Colima states, west Mexico, where it is uncommon to locally common.

It occurs in humid, semi-deciduous woodland and shade coffee plantations at elevations of 250-1,200 m. Its ecology is poorly known, but it is often found along streams and generally avoids edge habitat.

Status: Vulnerable. **Global Population:** 10,000-19,999 mature individuals and decreasing. The reasons for its patchy distribution and its precise ecological requirements are poorly understood. The avoidance of edge habitats indicates that it is probably threatened by habitat destruction, particularly for the cultivation of sun coffee.

Diet: Flower nectar, also some insects.

Breeding: Medium-sized, mainly green hummingbird with black wings. Male has iridescent blue forehead and bluish-green hindcrown, iridescent emerald throat and slightly forked, bluish-black tail. Female green above with small, white postocular spot, greyish below with green discs on flanks. Bluish-black tail with white tips to outer rectrices and green central rectrices. Straight black bill.

Cool Facts: It has been considered conspecific with the Violet-crowned Woodnymph of Central and northern South America.

Common Name: Red-billed Streamertail or Doctor Bird
Scientific Name: *Trochilus polytmus*

Size: 3.25-3.5 inches (9-10 cm); Streamers (rectrices) on males add an additional 6-7 inches (13-19 cm)

Habitat: North America; endemic to Jamaica.

Occurs in all habitats from sea level to the highest mountains wherever there are flowering plants. Absent only from the most eastern end of the island. Most abundant in closed forest, but is a common garden bird and a popular garden-feeder species.

Status: Least Concern. **Global Population:** Unknown amount of mature individuals. The global population size has not been quantified, but this species is described as 'common'.

Diet: Flower nectar, also some insects.

Breeding: Males have a bright iridescent emerald green body, black head with lateral crown feathers elongated behind the nape to form conspicuous ear tufts, bill is bright red with black tip. Tail is black with the second to outermost tail feathers elongated to form ‘streamers’ which are often crossed. The streamers, scalloped and fluted on the inside, create a high whining humming sound in flight. Immature males and males in molt lack the streamers. Females are green upper back with white under parts, gray-brown head; bill is mostly dark, red at base. No streamers in the tail, but outer tail feathers are tipped white.

Nests are a small compact cup constructed of plant materials bound together by spider's web and often camouflaged with lichens. Streamertails do breed year-round, but mainly from October to March. Females lay two bean-sized white eggs, incubation period is 2-3 weeks. Baby hummingbirds are born without feathers, fed regurgitated insects and are ready to leave the nest after 3 weeks. Up to three broods may be raised in one season.

Cool Facts: Most commonly called the "Doctor Bird," the Red-billed Streamertail is well represented in Jamaican folklore, and killing these birds is considered to bring bad fortune on one's self in most parts of rural Jamaica. The long tail feathers resemble the old-fashioned coattails of a doctor; hence, the name "Doctor Bird."

Originally, the Red-billed and Black-billed Streamertails were considered two forms of one species. The Black-billed Streamertail occurs in eastern Jamaica while the Red-billed Streamertail occurs west of a line from Morant Bay following the Morant River, and via Ginger House and the middle Rio Grande to Port Antonio. Besides location, significant differences in courtship behavior, call, bill color and width and to a lesser degree body size define them as separate species. Where the two species meet between the Blue Mountain and John Crow Mountain ranges in eastern Jamaica they form a zone of hybrids.

Red-billed Streamertail is the national bird of Jamaica.

To see a Doctor Bird up close, there is no better place than Rockland's Bird Sanctuary and Feeding Station, located just south of Montego Bay in Anchovy. Here, since the early 1950's, hummingbirds nurtured by the late Lisa Salmon have been trained to feed out of your hand. The spectacular displays and intimate encounter provided by Rockland's hummingbirds has attracted many eminent visitors including European Royalty, global heads of state (such as Winston Churchill), and Vogue Magazine to name but a few.

Common Name: Ruby-throated Hummingbird
Scientific Name: *Archilochus colubris*

Size: 3-3.75 inches (7.5-9cm)

Habitat: North America; Eastern United States to Central America. Migration follows favorite pollen and insect sources.

Status: Least Concern. **Global Population:** 7,000,000 mature individuals. Populations are stable; however loss of key plant species could put this bird at risk.

Diet: Pollen and small insects. At times hummingbirds will fly-catch by diving into clouds of gnats.

Breeding: Males have iridescent magenta crowns and gorgets. Females have white throats and under parts, sometimes with some violet feathers. Both sexes have green upper parts. Immatures resemble adult females, with gray-buff edging on feathers of upper parts.

Ruby-throat's nesting is determined by the location of its key feeding plants. Females construct a tiny nest out of leafy material that is bound together with spider webs and tent caterpillar nests. They sometimes decorate their nests with lichens. The nests are placed on downward sloping limbs that are protected by other branches. Once the nest is completed, the female begins courtship with a male. After courtship, the male leaves and the female incubates two eggs. She cares for the hatchlings by herself. Young hummingbirds are born naked and blind and fledge after about three weeks.

Cool Facts: The northern migration of this hummingbird appears to be linked to the flowering of various plants in the spring. The red buckeye (*Aesculus pavia*), the Canadian columbine (*Aquilegia canadensi)* and the Clove currant (*Ribes odoratum*) are among its favorites. It is believed that up to 19 species of plant have evolved specifically to partner with the Ruby-throated Hummingbird, influenced by its pollination.

Ruby-throated Hummingbirds have one of the longest migration paths of any hummingbird. Wintering in Central America and migrating through Mexico and Texas in the Eastern US coast. It is believed that some Ruby-throated Hummingbirds do make the 500-mile shortcut across the Gulf of Mexico. During the spring migration, males travel ahead of females to set up forging territories. Males are very territorial.

The Ruby-throated Hummingbird beats its wings 53 times a second and due to its extremely short legs it can't walk or hop. It will shuffle along a perch. Nonetheless, it can scratch its head and neck by raising its foot up and over its wing. It also doesn't care about the traditional red feeder and dyed-sugar water. Instead, it prefers specific feeder locations.

Common Name: Rufous Hummingbird
Scientific Name: *Selasphorus rufus*

Size: 1.8-3.5 inches (7-9 cm)

Habitat: North America; Western North America (east of the Rockies) from Alaska to Central America. **Summers:** Alaska, British Columbia and Washington state. **Winters:** Southern Mexico and Central America.

Rufous Hummingbirds typically breed in open or shrubby areas, forest openings, yards, parks, and sometimes in forests, thickets, swamps, and meadows from sea level to about 6,000 feet. During their migration, Rufous Hummingbirds can be found in mountain meadows up to 12,600 feet elevation. In Mexico, wintering Rufous Hummingbirds live in oak, pine, and juniper woods (at 7,500 to 10,000 feet elevation), shrubby areas, and thorn forests.

Status: Least Concern. **Global Population:** 6,500,000 mature individuals. The annual Breeding Bird Survey indicated a slow decline in Rufous Hummingbird numbers in Washington, Oregon, and British Columbia (1-2 percent per year from 1980 to 2004)

Diet: Flower nectar (primarily from colorful, tubular flowers including columbine, scarlet gilia, penstemon, Indian paintbrush, mints, lilies, fireweeds, larkspurs, currants, and heaths), also feeds on insects.

Breeding: Males have iridescent magenta gorgets. Females have white throats. Both sexes have coppery upper parts. Immatures resemble adult females.

Females begin nesting within 3 days of arrival on their breeding grounds. They put their nests up to about 30 feet high in coniferous or deciduous trees such as Sitka spruce, western red cedar, Douglas-fir, pines, hemlock, birch, maples, thimbleberry, and occasionally ferns or vines. Nests are hidden in drooping branches, sometimes with several nests (up to 20) in the space of just a few yards.

The female builds the nest alone using soft plant down held together with spider web. She decorates (or camouflages) the outside with lichen, moss, and bark. Finished nests are about 2 inches across on the outside, with an inner cup width of about an inch. Nests may be reused the following year, not necessarily by the same individual.

Cool Facts: The feistiest hummingbird in North America. The brilliant orange male and the green-and-orange female Rufous Hummingbird are relentless attackers at flowers and feeders, going after (if not always defeating) even the large hummingbirds of the Southwest, which can be double their weight. They've even been seen chasing chipmunks away from their nests.

The Rufous Hummingbird makes one of the longest migratory journeys of any bird in the world, as measured by body size. At just over 3 inches long, its roughly 3,900-mile movement (one-way) from Alaska to Mexico is equivalent to 78,470,000 body lengths. In comparison, the 13-inch-long Arctic Tern's one-way flight of about 11,185 mi is only 51,430,000 body lengths. (AAB).

During their long migrations, Rufous Hummingbirds make a clockwise circuit of western North America each year. They move up the Pacific Coast in late winter and spring, reaching Washington and British Columbia by May. As early as July they may start south again, traveling down the chain of the Rocky Mountains. People first realized this pattern after examining detailed field notes and specimens, noting the birds' characteristic dates of arrival on each part of the circuit. The Rufous Hummingbird breeds as far north as southeastern Alaska – the northernmost breeding range of any hummingbird in the world.

The Rufous Hummingbird has an excellent memory for location, no doubt helping it find flowers from day to day, or even year to year. Some birds have been seen returning from migration and investigating where a feeder had been the previous year, even though it had since been moved.

Special Thanks to…

….my beta team (FlintHawk, Linda, Jan, Kelvin, Rhonda and Sandra)

Species Accuracy and Reference Materials

Many birds of the same species do vary considerably in color. This package tries to emulate the colors and markings in the most commonly found variants.

The author-artist has tried to make these species as accurate to their real life counterparts as possible. With the use of one generic model to create dozens of unique bird species, some give and take is bound to occur. The texture maps were created in Painter with as much accuracy as possible. Photographic references from photographs from various Internet searches and several field guides were used.

Sources for this Volume and Field Guide

Books, Magazines and Papers

- **Birds of Venezuela (2nd Edition)** by Steven L. Hilty
- **Ecology and Behavior of the Buff-Tailed Sicklebill** (Paradisaeidae: Epimachus Albertisi) by Bruce M. Beehler, published in "*The Auk"*
- "**The Sibley Guide to Birds**" by David Allen Sibley.
- "**A Guide to the Birds of Mexico and Northern Central America**" by Steve N. G. Howell and Sophie Webb
- **"Birds of Peru"** by Thomas S. Schulenberg, Douglas F. Stotz, Antonio Brack Egg, Daniel F. Lane, John P O'Neill, Theodore A. Parker, III
- **"Birds of the West Indies"** by Herbert Raffaele, James Wiley, Orlando H. Garrido, Allan Keith, and Janis I. Raffaele (Princeton University Press)

Websites

- Wikipedia (http://www.wikipedia.com)
- Birds of North America online (http://bna.birds.cornell.edu)
- All About Birds (www.allaboutbirds.org/)
- Cornell Lab of Ornithology Neotropical Birds (http://neotropical.birds.cornell.edu)
- PBS Nature (http://www.pbs.org/)
- What Bird? (http://www.whatbird.com)
- Hummingbirds.net (www.hummingbirds.net)
- Boston University (http://www.bu.edu/)
- Bahamas National Trust (http://www.bnt.bs/)
- Juan Fernández Island Conservancy (http://www.oikonos.org/projects/firecrown.htm)

Rendering & Posing Tips

Motion Blurring for Hummingbird Wings

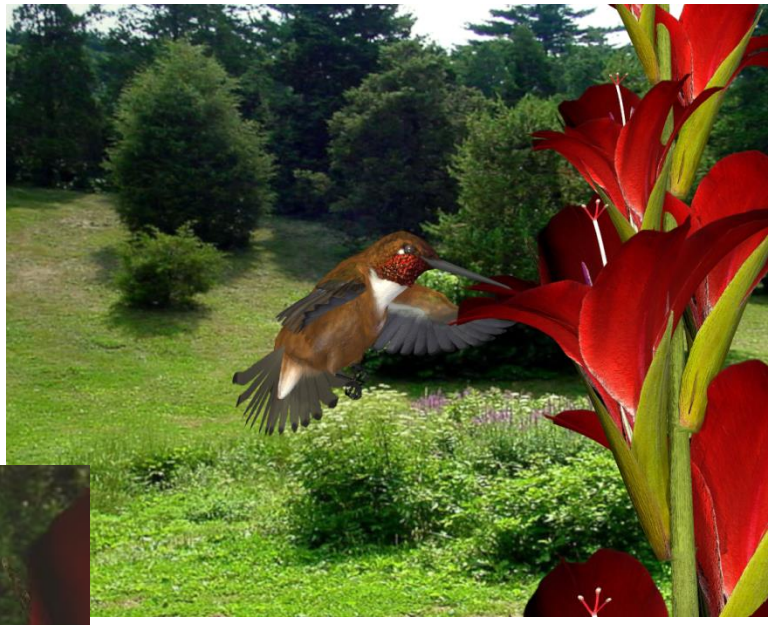
As we all know, it's rare when a bird sits still. In photography, we can capture birds in flight and provided the exposure and f-stop are set correctly, even freeze them in time. We accept this moment captured in time because it is a photograph, and photographs don't lie.

As for non-photographic art, traditional or digital, the bird frozen in time just doesn't look quite right, so the viewer assumes the artist has made a mistake-- because we all know, artists do, in fact, lie...

So, here are the secrets to making a bird in flight believable.

There are two approaches for creating the wing blur hummingbirds make. The first way, and most obvious, is to blur them with post work using smudge tools or motion blur filters. The second way and much easier is to let your 3D application do it using animation (even on a still image). The tutorial included in this manual will provide a step-by-step procedure to do both.

Post work Motion Blur

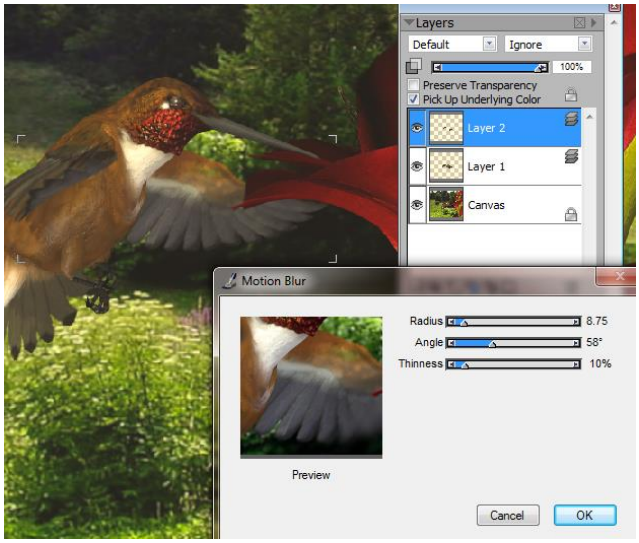


1. Load the picture into your favorite 2D art program. *(For the tutorial, we're using Corel Painter, but Photoshop or Paintshop Pro will work)*

2. Using the freeform SELECT tool, outline the wing area, Copy and Paste it directly over the existing wings and a new layer.

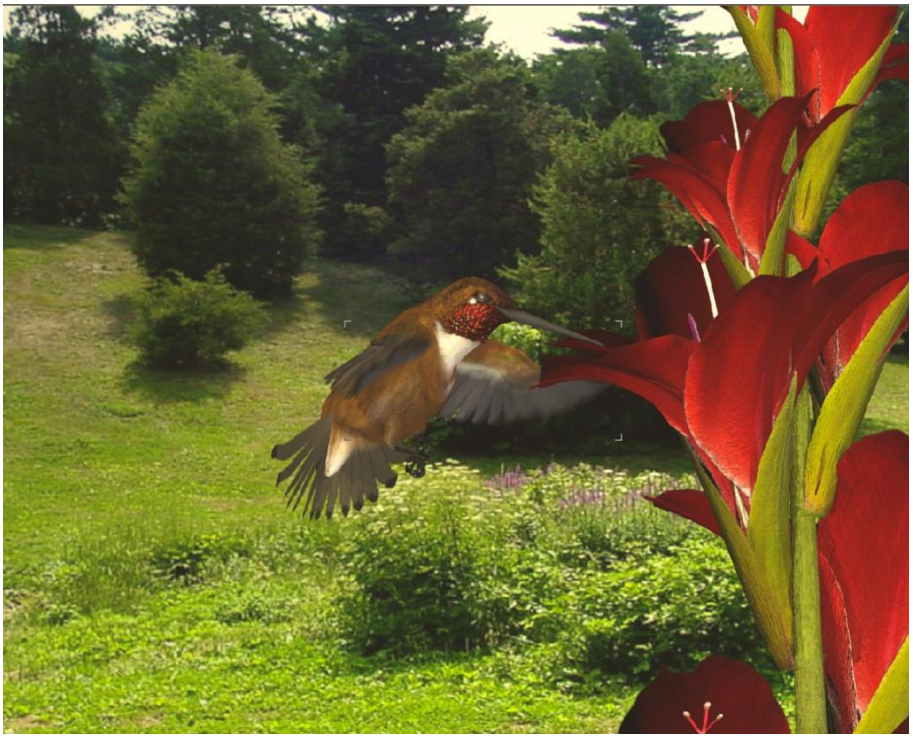
3. Select Motion Blur. It's found under Focus in Painter (or Blur in Paintshop Pro or Filters->Blur->MotionBlur in Photoshop).

4. Set the amount of blur, the angle and thinness (in Painter). Since we've outline the whole wing, we're barely going to blur it with a setting of 1.58. I've also adjusted the angle to be more in-line with the feather movement.



5. Now freeform SELECT the wing again on the wing layer, but this time only select the outer extremities of the wing. Now Motion Blur it again-- that's why we went easy the first time!

6. You could depending on the result you want repeat the process again with just the wing tips...



Using Motion Blur in Poser

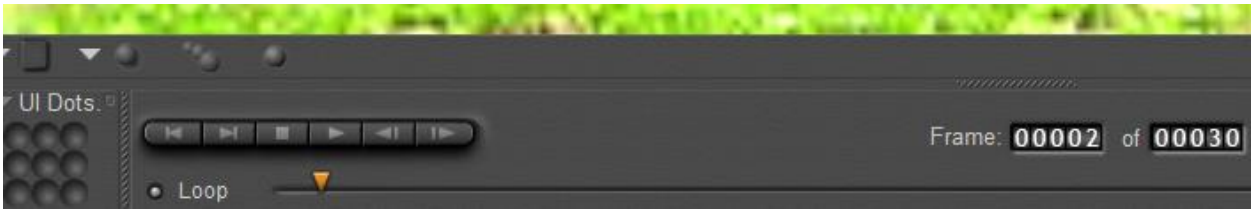
This tutorial will work with any version of Poser or can be adapted to Vue. DAZ Studio does not currently have motion blur capabilities.

1. Load the Hummingbird Base Model and select a species MAT/MOR preset (for this tutorial I'm using the Rufous hummingbird, but any species will work).

2. Create your scene with the hummingbird in flight using a prebuilt pose or adjusting it manually. Go ahead and do everything you normally would do before the final render (tweaking poses, adjusting lights, etc)

3. Now that your scene is set, you will need to decide how much wing blur you want. First, the way we are going to create wing blur is by slightly animating the wings; the more movement you create, the more blur you will get.

4. I'll use a couple different settings and show how much blur you can expect from certain types of wing movements. To show maximum blurring effects, we'll first move the **Animation slider to Frame 2.**



5. Select the Left Wing, add or subtract about 30 from **UpDown** in the Parameter Dials. Do the same with the Right Wing. **Make sure you do not move any other dials or items in the scene or they will blur too**.

6. Go back to **Frame 1 on the Animation slider**. In Render settings, check the Motion Blur Box and render. As you can see from my example to the right or from your render, the wings are so blurred they almost don't exist. While most hummingbirds beat their wings 40-90 times a second, we don't need that type of movement to create a still image --- in fact, doing the 30 point movement up and down over the

normal 30 frames a second animation will give you a believeable animated hummingbird (though it's only going 15 wingbeats a second).

7. For a still image, I'd suggest only making 2-3 point moves up or down. In Frame 1, Copy the Left Wings settings (CTRL+C). Select the Frame 2 and copy the settings (CTRL+V). Now add or subtract 2 or 3 from the **UpDown Dial** in the Parameter Dials. Do the same with the Right Wing. **Make sure you do not move any other dials or items in the scene or they will blur too**.

8. Go back to **Frame 1 on the Animation slider**. In Render settings, check the Motion Blur Box and render. Remember still image motion blur always looks to the next animation frame. If you render on frame 2, the render engine will compare frame 3 with frame 2 for blur information. Since we did nothing to frame 3, there won't be any blur and that's why we need to return to Frame 1 before rendering.

9. You can experiment with moving the tail or moving the entire bird. Just remember a little movement goes a long way in a still motion blur image. One thing I often do is just slightly move the wing parts (+/- 1) and then move the feather controller parts more significantly (+/- 8). This make the wing tips blur significantly but the actual wing much less.

Working with Songbird Remix morphs

Because birds in the Songbird ReMix series use generic bird bases and morphs, adding morphs upon morphs more often than not will create undesirable results. Case in point is the Parrot base which defaults with the “Parrot” morph loaded (which is found in the HEAD section (*Creations morphs : Specific Bird morphs*)). Adding the other creation morphs on top of that will be a hit and miss experience. Press **CTRL + E** to clear all the morphs in that section.

The reason why I have chosen to leave non-parrot morphs on for instance the parrot base is for experimentation and creating unique and imaginary species. In some cases, such as with a parakeet, it’s better to shape the parakeet head from the standard Songbird ReMix head than the default parrot morphs.

Another example is the BK-Close morph use. When BK-Height or BK-Length morphs are used often the BK-Close will require only a 0.7 or 0.8 setting to close the beak which normally takes a 1.0 setting. When applying a pose to a bird with a thicker or thinner than normal beak, you may need to adjust the BK-Close setting. The same is true with legs with shorten shins or thighs. One size does not fit all with a generic bird model.

Often when BK-Close morph is in use (partially opened) with the Frown morph active some overlapping polygons may show. To resolve this, dialing down the Frown will help (but also alter the “look” of the bird somewhat.)

In VUE…

Vue has trouble with back-facing polygons which tend to show-up in certain wing and “Fluff” poses. The easiest and fast solution is to limit the amount of bending in the Forearm, Hand and Feather controllers and to hide or limit the ‘Fluff’ used

Bake it! The better (but much slower solution) is to in “Polygon Mesh Options”, **bake the model**. You might also click “Force double-sided baking” as well as playing with the Max smoothing angle and checking Dynamic Subdivison. Put Quality boost into the + area. Then bake it—“baking” will take hours on most computers.

The “Eye” material uses a Poser reflection map; since Vue has a built-in environment, it’s better to use the Vue one and cut down the reflection to 20-50% depending on light in the scene.

I also often find it better to also cut down the “Highlight Global Intensity” to 40% and “Highlight Global Size” to 50% on Plumage, Wings and Beak materials in the “Highlights” section.

In Carrara…

Carrara can have multiple issues with Songbird Remix models. The most common are scaling issues; Carrara does not accept internal Propagating Scale (a scale variable tied to the parent that tells all attached children to do the same) so will not import Poser files correctly. Songbird

ReMix uses Propagating Scale in the wings, feet and head regions. Most issues seem to be tied to the Foot Scaling. Determine the amount of scaling in the foot and scale the 8 talon parts to match each foot.

The second most common problem is weird shapes or depressions in the rump area. This is because Carrara does not understand how to interrupt the scaling of the thighs. The best and easiest solution is to set each Thigh parts YScale to 100%.

I have seen some issues (primarily with the wings exploding) when importing a Poser scene file (.pz3) into Carrara. This doesn't appear to happen all of the time. I've corrected it by going into the BODY and each WING part and turning off/on the Wing Fold morph and making sure the BODY section's Wing Shapes are all in the default setting.

There is a Carrara Fix package available in the SongbirdReMix.com downloads that provides foot scaling poses.

In DAZ|Studio…

DAZ Studio can have multiple issues with Songbird Remix models when using the Poser Version**. Download and Use the DAZ|Studio version.** I used to provide each bird as a saved scene (.daz) in Studio but unfortunately with each newer version of Studio, the .daz format from previous versions is less stable; something not loading, sometimes mismapping textures. The current approach (described in the "Creating a Bird in DAZ Studio), while less convenient, does load and display the birds correctly with all versions of DAZ Studio (to 4.0.36).

The primary issue with using the Poser version with DAZ|Studio is Scaling; DAZ|Studio does not accept internal Propagating Scale (a scale variable tied to the parent that tells all attached children to do the same) so it will not import Poser files correctly. Songbird ReMix uses Propagating Scale in the wings, feet and head regions. Most issues seem to be tied to the Foot Scaling. Determine the amount of scaling in the foot and scale the 8 talon parts to match each foot.

The second issue is that material setting will be off. The DAZ|Studio version has Material files tuned to DAZ|Studio included. This version also has Character files so it is possible to load the Poser .cr2, then apply the DAZ|Studio character setting which will fix the scaling and material issues. This method can be helped if updated Songbird Remix CR2s are available.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