



the Cactus Wren·dition



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SUMMER - 2021



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by Chuck Watkins

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PRESIDENT'S MESSAGE



Mark W. Larson

I am writing to you in early April, but it is already beginning to feel like summer. In a couple of days the high temperature in Phoenix may reach 100 degrees for the first time this year! Nevertheless, I will make my usual vain attempt to accept it and get used to the heat, an attempt that always fails.

Earth Day will have passed by the time you read this, but every year it is a reminder that the fate of the planet is in our hands. Our everyday decisions, ones we rarely think about such as whether to use plastic grocery bags or reusable bags, whether to make separate car trips or combine them for a string of errands around town, or whether to drive or walk to visit a nearby park. In short, think about the future and how your actions today can leave the world a better place for tomorrow.

You may be aware that there is a place in Maricopa County called the “Thrasher Spot.” It is one of the few places in the United States where one can see as many as four species of thrasher. As a result, this location has been visited hundreds of times by Arizona birders and birders from across the country and even from other countries. The survey and report that Maricopa Audubon commissioned by professional biologists to assess the potential adverse effects by an immense solar array proposed for this site was submitted to the County’s Planning and Zoning Commission. That commission has now approved the rezoning for the solar array, but the solar company has made some significant concessions as a result of our study. These concessions include no construction during the breeding season of the enigmatic LeConte’s Thrasher and setting aside several hundred acres of desert that are not to be disturbed in the vicinity of the Thrasher Spot.

Our newly instituted practice of holding “POD” field trips is proving popular. This is a way to have guided field trips locally while maintaining COVID-safe practices with small groups, separate vehicles, and social distancing in the field. The value of connecting to the natural world is too great to sacrifice, even in these difficult times.

While effective vaccines against the coronavirus are now widely available, it still makes sense to take care of yourself by wearing a mask, getting vaccinated, avoiding crowds, and continuing good hygiene habits. Please make a conscious effort to stay safe and travel safely!

If we can continue to reduce the incidence of infection in Maricopa County, we can once again have our member meetings in person, something I hope that we will be able to do safely this fall. 🐦

Mark W. Larson
President

Open Board Position: Publicity

The Maricopa Audubon Society is seeking a member to fill the role of Chairman/Chairwoman of the Publicity Committee. The Publicity Committee writes press releases and communicates with the media. If you have experience with these tasks please contact any Board member to express your interest in serving. One would not necessarily need to be a year-round resident of the Phoenix area to serve effectively in this role. Contact any Board Member if you might be interested in filling this role in Maricopa Audubon.

LETTER FROM THE EDITOR



David Chorlton

The time so many of us have had to spend indoors over the past year may have been brightened by our watching hummingbirds at feeders hung within sight of our windows. Hummers are among the most loved of birds, and especially impressive when we examine their movements, energy, and dazzling appearance. Whether in the desert or the tropics, hummingbirds have always touched the human imagination and been at the center of many myths and legends in various cultures. We are lucky in Arizona to have a variety of species, even if the number is far below that in countries south of us. So here is an issue dedicated to hummingbirds, and I hope everyone finds something new about them in these pages, along with the enjoyment of some spectacular photographs.

I hope most of you have been able to get anti-COVID vaccines by now, and that progress on that front will soon enable us to return to in-person meetings and more open field trips. It has been a time to think about solitude, even as we got to know all about using Zoom on our computers. I hope the Wren•dition helps us stay in touch with each other and the world we hope to return to soon.

Meanwhile, we follow the conservation struggles in a changed political landscape, looking for outcomes that will be good for wildlife, and for Arizona. Even as we follow at a distance, and take the chance when it comes to make a call to display support for our birds and landscapes, we stay involved and help keep our collective spirits high.

Be sure to check the MAS website for information on our last meeting before the summer. On Tuesday, May 4th, at 7:30 p.m. Dr. Sahas Barve will give a presentation: Himalayan Bird Adaptations to High Elevations. He will discuss how his findings fit into our understanding of the impact of climate change on birds living on the highest mountains in the world. Join us by Zoom for this.

It should become easier this year than last to get out and about, the Arizona summer heat notwithstanding. The coming months should have much to tell us about how we'll be able to operate come September. I wish you well if you do plan a trip, and if not, then continue to enjoy those hummingbirds. 🐦

David Chorlton
Editor

amazonsmile

Maricopa Audubon Society is now registered on Amazon as a charitable organization. Go to the MAS Facebook page for details or use the following AmazonSmile link for Maricopa Audubon Society: <https://smile.amazon.com/ch/86-6040458>
Log onto your Amazon account and a percentage of your purchase will go to MAS!

Committees/Support

Arizona Audubon Council Rep
Position Open

Bookstore
Sochetra Ly
503 860-0370

Poet Laureate
David Chorlton
480 705-3227

Maricopa Audubon Website
<http://www.maricopaaudubon.org>
Be sure to check it. You never know what you'll find!

The Earth has received the embrace of the sun and we shall see the results of that love.

Sitting Bull

An Investment in the Future

Bequests are an important source of support for the Maricopa Audubon Society. Your chapter has dedicated itself to the protection of the natural world through public education and advocacy for the wiser use and preservation of our land, water, air and other irreplaceable natural resources.

You can invest in the future of our natural world by making a bequest in your will to the Maricopa Audubon Society. Talk to your attorney for more information on how this can be accomplished.

Sign up for the e-newsletter!



To receive updates and supplements to *The Cactus Wren•dition*, sign up for the monthly (September to May) e-newsletter. No membership required. It includes meeting and field trip reminders, special events, and citizen science projects.

To subscribe, email: laurienessel@gmail.com

Note: We do not use the email list for anything other than the described purpose.

Field Trips

These modified-for-COVID precautions POD field trips are open only to Maricopa Audubon Society members. You may join MAS any time before the trip at our website: <https://www.maricopaaudubon.org/join>

On the day of the field trip participants must:

- A. Show up on time
- B. Sign the liability waiver
- C. Provide a current email address
- D. Carpool only with members of your own household
- E. Wear your mask
- F. Stay 6 feet from others when possible

Bring binoculars, a field guide, hat, water, snacks, and personal hand sanitizer.

APRIL 30, FRIDAY

Box Bar Recreation Area—Verde River

This trip, aligned with the dawn chorus around 6 a.m., will explore, for a few hours, the riparian area where Desert-nesting Bald Eagles nest in late winter. Although the nest area is protected, we may see an adult flying around. We will search for spring migrants such as orioles and warblers, but we will find desert resident birds too! Bell's Vireos and various flycatchers are probable. This area is within Tonto National Forest and requires a "Tonto Daily Pass", a one day-use parking pass (\$8) per car, available at gas stations, sporting goods stores and convenience stores. A Golden Eagle pass (now called Senior Pass) is valid too. Please buy one for your car before the day of the trip.

Limit 6, Difficulty 3 (uneven surface walking among vegetation)

Leader: Marceline VandeWater

To register, send an email with your cell number to: marceline@eraroni.net

MAY 4, TUESDAY

Lower Camp Creek—north of Carefree

This is on the way up to Seven Springs, north of Scottsdale. It usually hosts a Zone-tailed Hawk nest in the summer, and the birds should have arrived by late April. Other birding includes desert species, and in the creek bottom, under huge shade trees, we can hope for orioles, tanagers, grosbeaks and other migrants that frequent riparian areas. The hike out will be toasty, but doesn't last that long. Meet at 5:30 a.m., likely at the Cave Creek

Ranger Station – wrap up there about 9:30 a.m. Final logistics to be decided a few days before the trip.

Limit 5, Difficulty 2.5. No fees. No scope necessary.

Leader: Kathe Anderson

To register, send your cell phone number to kathe.coot@cox.net

MAY 13, THURSDAY

Granite Reef Recreation Area—Lower Salt River

We will be expecting more migrant birds moving through here, and summer breeding birds should be plentiful. Rob Bowker is well acquainted with this location and wants to encourage beginning-up to intermediate birders to sign up. A few duck species, and long-legged waders can be seen here, along with the mesquite bosque birds, including Lucy's Warblers and Northern Cardinals. To see the most bird activity, we shall meet at 6 a.m. at the Granite Reef parking lot, 3.5 miles north of the Power Rd/Loop 101 intersection. This area is within Tonto National Forest and requires a "Tonto Daily Pass", a one day-use parking pass (\$8) per car, available at gas stations, sporting goods stores and convenience stores. A Golden Eagle pass (now called Senior Pass) is valid too. Please buy one for your car before the day of the trip.

Limit 6, Difficulty 2

Leader: Rob Bowker

To register, send your cell phone number to: bowker657@hotmail.com

JUNE 7TH, MONDAY

Prescott

We'll head to Fain Park in Prescott Valley first, then on to Watson Woods, the Highlands Center, perhaps one of Prescott's lakes and/or Walker (above Prescott), to give us a good collection of waterfowl, woodpeckers, swallows and other songbirds of the higher elevations (Painted Redstart), including nesting tanagers and warblers if we're lucky. We'll wrap up with a box lunch at picnic tables somewhere. Some reasonable entrance fees required (not more than \$10 total). No scope necessary. Meet at 4:45 a.m., likely in Scottsdale – wrap up there about 3 p.m. Final logistics to be decided a few days before the trip.

Limit 5, Difficulty 2 (lots of walking, but mostly even surfaces)

Leader: Kathe Anderson

To register, send your cell phone number to kathe.coot@cox.net

JUNE 12, SATURDAY

Pinal County Dragonflies and Damselflies

Pierre Deviche, ASU's School of Life Sciences professor and Odonate expert, will be your guide on this dragonfly field trip to nearby Pinal County. Eighty-eight species have been recorded to date in this county and we should be able to find quite a number of them. This will be a one-day trip visiting (tentatively) Oak Flat, the Gila River at Kelvin Bridge, Kearny Lake, and/or the Dudleyville fishing ponds. All these locations are easily accessible. Be sure to bring hat, sunscreen, long sleeves and pants, hiking shoes, bug dope, and food & drinks for the day. Close-focus binoculars are helpful to observe the small species and so be sure to bring them. We will leave Gilbert at 8:30 a.m. and return mid-afternoon. Each car will be only for people of the same household.

Limit 6 to allow for good viewing and photography and insure good COVID-19 protocol, Difficulty 2

Leader: Pierre Deviche

Register, only if vaccinated against COVID 19, by emailing your cell number to Emily Thomas at thomas.emily@asu.edu

JULY 19, MONDAY

Sedona Wetlands/Page Springs

We'll start early from Scottsdale, and head directly to Sedona Wetlands, which should yield some waterfowl and perhaps early returning shorebirds, as well as the birds of the marshes – Common Yellowthroats, Song Sparrows and others. Then we'll head over to the shady areas of Page Springs to hope for Summer Tanagers, flycatchers and other mid-elevation songbirds. We'll wrap up with a picnic there. No fees. No scope necessary. Meet at 4:45 a.m., likely in Scottsdale – wrap up there about 1:30 p.m. Final logistics to be decided a few days before the trip.

Limit 5 Difficulty 2

Leader: Kathe Anderson

To register, send your cell phone number to kathe.coot@cox.net

CONSERVATION UPDATE

by Mark Horlings

NEW MEXICO JUMPING MEADOW MOUSE

Feral horses in the White Mountains threaten this small endangered species. MAS and other plaintiffs sued the Forest Service to force some action to protect the mice. The suit has been settled after the Forest Service promised to complete a boundary fence and to work to remove the horses. In a separate but probably-related development, the Forest Service announced plans to reduce the Heber feral horse herd by about 75%, from 400 horses to about 100.

SOLAR FARM SURROUNDING THRASHER SPOT WINS ZONING APPROVAL

The Maricopa County Planning and Zoning Board met March 25th and approved First Solar's application to change the zoning covering the 3200 acres of their proposed solar farm to allow utility development. The solar farm will surround the "Thrasher Spot" west of Phoenix, celebrated for containing four species of thrashers: Crissal, Sage, Bendire's and LeConte's. Upon learning of these plans last December, MAS commissioned a study of the site. That study showed that all four species used the area (Surprisingly, Curve-billed Thrashers, common in Phoenix neighborhoods, were absent), and that LeConte's and Bendire's Thrashers bred there.

MAS sent the report to the builder and the Planning and Zoning Commissioners. The report recommended some areas slated for development be left undisturbed and that construction occur outside the breeding season. As a result, First Solar and the Planning and Zoning Staff added four paragraphs to the zoning conditions. They required First Solar to hire a biologist to survey for thrashers before beginning construction in 2022, to avoid construction during breeding season to the greatest extent possible, to establish a buffer zone around

any nesting areas found, and not to enter those areas as long as nests are active.

In arguing for the zoning change, First Solar said they were leaving about 1000 acres of the total area of 3400 acres undeveloped and emphasized that they had reduced the area to be covered by solar arrays by fifty-seven acres. MAS asked that four additional areas be left undisturbed and for some additional protections during breeding season. The Commissioners approved the zoning change 9-0.

None of the four thrasher species in the area is listed as threatened or endangered, and suing was not an option. The MAS report noted that total global population of the Bendire's Thrasher is estimated at 70,000 to 120,000 birds. All of them would fit easily within a single one of the 25,000 containers on the ship which clogged the Suez Canal in March. Once the birds qualify as endangered, protections will become available. Until then, their habitat and thus their numbers will continue to shrink.

OAK FLAT SLIPS THE NOOSE - FOR NOW

On January 15, 2021, the Forest Service published its final Environmental Impact Statement (FEIS) covering the copper mine Resolution Copper proposes to build near Superior. According to the special legislation for a land transfer, Resolution Copper would own title to Oak Flat within sixty days. Lawsuits ensued. The Arizona Mining Reform Coalition, of which MAS is a member, attacked the FEIS, the San Carlos Apache Tribe challenged the FEIS and the Forest Service's record of consultation, and individual Apache tribal members, acting as Apache Stronghold, sued on grounds of personal religious freedom. The MAS Board granted \$10,000 toward the legal efforts.

Early results were disappointing. In

February, the U.S. District Court, after hearing extensive testimony about the importance of Oak Flat to the Apache, denied the emergency injunction sought by Apache Stronghold. An appeal to the 9th Circuit followed. In early March, however, the situation changed. The Biden Administration ordered the Forest Service to withdraw the FEIS. MAS members will remember that the FEIS was originally scheduled for publication near the end of 2021. The Trump Administration apparently rushed its release to trigger the land transfer.

It remains to be seen whether the canceled FEIS means a better result in this fight or simply a delay. The Forest Service will take a second look, and bills to prevent the land transfer have been filed in Washington. Meanwhile, Arizona Governor Doug Ducey and other development interests continue to push for the mine.

GROCERY SHOPPING?

Support Maricopa Audubon when you shop at Fry's Food Stores.

MAS is part of Fry's Community Rewards Program. Register your Fry's VIP card and select Maricopa Audubon #89166 as your non-profit organization at no cost to you. Go to <https://www.frysfood.com/topic/new-community-rewards-program>



Flying

The hawk who watches the days end
from a limb stripped bare
looks out at the frost that lines the sky
from gloss on the desert
to a collar of snow
on Four Peaks until he wraps
a closer mountain in his wing and darkness
follows him,

 while last
to fly of all the birds
is a hummingbird the sound
of whose wings is
a thimbleful of thunder.

David Chorlton

Virtuoso mockingbird,
your song enralls.
I, too, forget to sleep.

Roberta Chorlton

Crane-speak

You can hear the ancient chatter of the Sandhill Cranes
before you turn your ear toward the dots of
a ribbon murmuring across the
dusk-colored sky.

Are they giving thanks for their day of rest
and refueling in stubbled Nebraskan cornfields?
Or stuttering words of encouragement
to their mates?

Onward!
Find the perfect sandbar!
You can do it!

It's a near-lost language spoken by the not-so-few.
The plus or minus 600,000 red crowned cranes that
funnel their way through a 100-mile stretch of Platte that says
"Here is your safe haven. This is your protected nightspot."
And they listen.
And land.
And are safe for one more day.

Sue Crabb

Sue Crabb is a MAS member, now living in Lincoln, Nebraska.

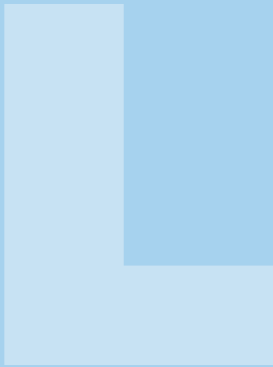
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That Hummingbird Glow

by Gail Cochrane



Like the colors of a rainbow, the iridescent hues of hummingbird feathers thrill us with their intensity. Their ephemeral appearance is dependent on angles of light and the position of the viewer. When everything lines up just right hummingbirds display their stunning color.

A hummingbird's feather structure is similar to that of a tree, with a central shaft and branching barbs that form the surface of the feather. Interlocking barbules act like Velcro, holding the barbs in place and creating a shield against wet and cold. It is the microscopic structure of the barbules that split sunlight into rich hues, much like the beam of colors from a prism.

Evolution biologist Chad Eliason and an international team of scientists put together the largest ever study of hummingbird feathers, examining thirty-five species. The use of transmission electron microscopes allowed the researchers to compare hummingbird feathers with those of other brightly colored birds including male Mallards.

Barbules on certain feathers of hummingbirds hold pigment producing organelles called melanosomes. The structures of melanosomes resemble pancakes, and hold lots of tiny air bubbles. Some light is reflected from the outer surface of the feather and some travels through the air bubbles and reflects from



Anna's Hummingbird
by Matt Van Wallene

That Hummingbird Glow

the inner surfaces, similar to the way colors shine from a soap bubble.

Light with wavelengths that match the thickness of the air bubbles is amplified as the reflected waves from the inner surfaces match up and combine with reflected light from the outer surfaces and create the iridescent colors. This overlap is why the colors on certain parts of hummingbirds are so pure and intense.

The male Mallard mentioned earlier has rod shaped melanosomes, with no air pockets. Although the opalescence of his feathers is similarly created by their structure, the solid melanosomes do not provide multiple layers of refraction.

The colors of most birds are formed not by complex feather structure, but by pigments. Pigments called carotenoids are produced by plants. When birds eat plants, or something that has eaten carotenoid filled plants, they take on that coloration. Examples include the red of a cardinal, or the



Costa's Hummingbird
by David Chorlton

bright yellow of goldfinches and yellow warblers.

A bird's colors may also come from melanins, which are tiny granules of color in both the skin and feathers. These create a range of colors from pale yellow to reddish brown to black, depending on the concentration of melanins and their location on the bird. Carotenoids can interact with melanins to create more hues. Melanin also makes feathers stronger and more resistant to wear. Consider that many white birds have black on wing or wingtips, just a bit of melanin strengthens those feathers most subjected to wear and tear.

The study on the discovery of complexity in hummingbird feathers appeared in the February 2020 issue of the journal *Evolution*. <https://onlinelibrary.wiley.com/doi/abs/10.1111/evo.13893> 🐦

Gail Cochrane has lived in our desert for close to two dozen years and is a frequent contributor to The Cactus Wren•dition

Help MAS with an EMPLOYER MATCHING GIFT



Many Maricopa Audubon members aren't aware that their employers may include a matching gift program in their benefits package. Programs vary from business to business, but they generally offer a dollar-for-dollar match when an employee makes a personal gift to a nonprofit organization like Maricopa Audubon Society.

Please visit your human resources department or charitable giving department to see if this opportunity is available to you. Your employer may require you to fill out and submit a form, which is sometimes done online. If you have already made a donation to MAS in the past year, you may be able to get a matching gift after the fact from your employer for up to 12 months later.



Black-chinned Hummingbird

The Turning Year: *Hummingbirds in Arizona*

By David Chorlton, with thanks in assembling this to Charles Babbitt, a former President of MAS; Kathe Anderson (see Kathe's article on hummingbird Anatomy in this issue), Eric Hough is the Ranger at the Hassayampa Preserve, and Jackie Lewis oversees the George Walker House in Paradise in the Chiricahua Mountains.

Photos by Matt Van Wallene

The One Day hummingbird species record for Arizona stands at fourteen and was set in 2002 at Beatty's Guest Ranch in Miller Canyon. The number was matched in 2006. I remember being there at the time and seeing twelve of the fourteen species on the special occasion. My first visit to Beatty's was an earlier time when it was known to be a great place to see a White-eared hummingbird.

Anna's are the most frequent year-round hummingbirds for those of us in Phoenix, and I see Costa's too here, close to South Mountain. Black-chinned Hummingbirds are common summer residents here, though I have seen few in the urban setting in recent years.

In northern Arizona, nesting Broad-tailed hummingbirds return from mid-March, as do nesting Black-chinned. Migrating Rufous Hummingbirds are not often seen in spring migration but they can be common later, beginning as early as July with a peak passage in late August. Migrating Calliope Hummingbirds are rarely spotted in spring but more likely to show up in good numbers in August and September. Rivoli's Hummingbird (formerly called Magnificent) is a rare summer visitor and possible nester in northern Arizona.

At the Hassayampa Preserve near Wickenburg we can find Anna's year-round, Black-chinned as breeders from spring-summer, small numbers of Costa's in spring, Broad-billed as a sparse local breeder

The Turning Year: *Hummingbirds in Arizona*

from late spring through fall, and small numbers of Rufous, Broad-tailed, and rarely Calliope, as migrants during spring and fall. There are single records of Allen's and Ruby-throated Hummingbirds, and Blue-throated Mountain-gem (formerly called Blue-throated Hummingbird) from here. Anna's are birds of more riparian and urban garden settings, so they outcompete the Costa's in the riparian zone here, the latter nesting more abundantly in desert washes surrounding the area.

Looking back at the south of the state, a popular attraction at Tucson Audubon's Paton Center for Hummingbirds in Patagonia, is the Violet-crowned Hummingbird, just one of the many bird species that make a visit there worthwhile. Visiting Patagonia on a September weekend, I saw busy traffic at feeders with Broad-billed, Black-chinned, Anna's, and Rufous all involved.

Madera Canyon is a good place to see hummers, and I've been lucky enough in the past to see a Berylline Hummingbird nesting there. Visitors today should see Anna's, Black-chinned, Broad-billed, and Rivoli's. There have been reports of Rufous and occasional Calliopes. The feeders by the Santa Rita Lodge are excellent for hummingbird watching.



Rufous Hummingbird

Hummingbird migration in the Chiricahuas begins in late March and continues through mid April. Regular breeding species are Broad-billed, Blue-throated, Rivoli's, Black-chinned and Broad-tailed. White-eared had a successful nest in 2019. Berylline is seen every year but has not had any recent successful nests. Costa's breed in a private yard south of Portal on the eastern flank of the mountain range. Violet-crowned nested in Portal in the early 2000s but is now only seen occasionally. Lucifer bred in



Rivoli's Hummingbird

Paradise in 2020. Calliope, Rufous and Anna's are spring and fall migrants. Allen's has been identified in the fall migration. Plain-capped Starthroat is very rare.

As of March 30, 2021: Broad-tailed, Black-chinned, Broad-billed, Rivoli's, Rufous and Anna's were seen at the George Walker House. A Lucifer was reported in Portal in a private yard. Blue-throated are currently being seen in Portal and in Sunnyflat Campground.

As a note on species in other parts of the state, Broad-billed is expanding northward, with its current known limits at Wickenburg, Black Canyon City, Superior, and the upper Gila River east of Safford. They seem to do especially well where there are populations of tree tobacco, an introduced plant from South America that is naturalized across southern AZ and into Mexico. Rivoli's has expanded in central AZ over the past couple of decades, now found locally along the Mogollon Rim between Oak Creek Canyon and the White Mountain, and there have been some sightings in the Prescott area as well. 🐦

HUMMINGBIRD HELPER

by Tom Gatz

D

Don't worry, this isn't a recipe for hummingbirds. It's about an amazing relationship discovered by Dr. Harold Greeney between hummingbirds and hawks in the Chiricahua Mountains of southeastern Arizona that was shown on a recent PBS Nature television program. I contacted Dr. Greeney at his research station in the Ecuadorian rain forest and learned that, while working in Arizona, he and Susan Wethington noticed Black-chinned Hummingbirds tending to cluster their nests near Cooper's Hawks and Goshawks. They wondered if this behavior could have evolved for protection, since these very vocal, bird-eating hawks, known as Accipiters, can't catch the little hummers but love to dine on the predators of hummingbirds such as jays, woodpeckers, wrens, thrashers and even squirrels. Further study revealed that, in fact, hummingbird nests within 300 meters of active hawk nests had significantly higher probabilities (46% vs. 9%) of successfully fledging young. They published these interesting findings in *The Wilson Journal of Ornithology* 121(4): 809-812, 1990.

This got me wondering Every year we find a dozen or so hummingbird nests almost always near, and often directly over, the busiest pathways in the Garden on which dozens of people pass each day. We even find them nesting in our propagation shade



Costa's Hummingbird
by David Chorlton

houses. What is going on? The most parsimonious answer would be that they nest near the paths in spite of all the people and not because of them and we usually find them along the paths and in shade houses because that is where we spend most of our time. But maybe, just as the presence of accipiters makes it safer for nesting hummingbirds, could the activity of so many people along the Garden paths also deter some predators? Wouldn't it be interesting to see if their nesting density and success rates were higher near the trails compared to

areas away from the trails where their nest predators, undisturbed by people, perhaps have more opportunities to hunt for and eat hummingbird eggs and young? We appear to have an artificially elevated density of Cactus Wrens, Curve-billed Thrashers, and three species of squirrels at the Garden compared to natural desert areas due to all of the extra food, water and breeding habitat here. These predators apparently do eat many of our hummer eggs and young every year, even along the trails; however, the nests in our shade houses are often successful. The predator pressure at the Garden is likely high enough so that just a slight increase in nesting success as a result of picking a somewhat safer nest location would make a big difference from a natural selection standpoint. It would take a graduate student level study with surveys comparing nest density and success between trail and non-trail areas of the Garden to get a definitive answer, but I did locate several scientific articles that found higher nesting success in urban versus non-urban habitat for some bird species and a study in Colorado that found a tendency for nest predation rates to increase with distance from trails. Perhaps, to a hummingbird, we are sort of like big, noisy, flightless (and harmless) "accipiters" whose presence and sounds might trigger an instinct that says "safe zone, nest here." Thanks to Drs. Harold Greeney and Andrew Salywon for reviewing this article. 🐦

Tom Gatz has been a Maricopa Audubon Society member since 1981



Violet Sabrewing
by Cindy Marple



VARIETY in the HUMMINGBIRD WORLD

Article and photos by Cindy Marple



Long-tailed Sylph



Gorgeted Woodstar

Here in Arizona, we're lucky to have more hummingbird species than anywhere else in the U.S. and Canada. The sixteen or so species that have occurred here, though, are only a small fraction of the 360 species on the current IOC checklist! The hummingbird family is the 3rd largest in terms of number of species, behind flycatchers and tanagers. This strictly New World family is most diverse in northern South America. They can be found in habitats ranging from lowland rainforest up high into the Andes. While our hummers are similar to each other in size and appearance, there is considerable variation across the large family. Let's take a look at some of this diversity.

Our typical hummingbirds are about 4" long, which is mid-sized for the family. The tiny Bee Hummingbird found in Cuba is only 2 $\frac{1}{4}$ in. and is the smallest bird in the world. The largest hummingbird is the Giant Hummingbird of the Andes region at 6 $\frac{1}{2}$ in., and the Violet Sabrewing (2 $\frac{1}{4}$ --2 $\frac{3}{4}$ in.) are reminiscent of bumble bees in the way they move and sound. Their wings beat an incredible eighty times per second, compared to an average of fifty-three for most of our species. The larger hummers have much slower wingbeats, around twenty-two per second, so you can actually see the wingbeats in these species.

Some hummingbirds have co-evolved with certain types of flowers, with their bill length and shape matching what's needed to reach the nectar in those blooms. These include many

of the hermits, which have strongly decurved bills and are associated with heliconias. The incredibly long bill of the Sword-billed can reach into flowers with long corollas, such as *Passiflora sp.* It has to hold its bill high to balance when perched, and it preens with its feet.

Most hummers, including all of our species, feed from a wide variety of flowers. The bill length of these generalists is quite varied. Some, like that of the Tyrian Metaltail, are considerably shorter than what we think of as a hummingbird bill.

While green backs are common, hummingbirds can also be overall brown, bronzy, cinnamon, or even purple. The iridescent feathers that we associate with gorgets and crowns, are not restricted to those areas. The Shining Sunbeam, for example, has beautiful iridescence on its back, and many species have a metallic look over the whole body. The Puffleg family is notable for its fluffy "pantaloons"- this high elevation family has feathered tarsi. Helmetcrests and coquettes sport flashy crests of various colors and lengths. And just to be showy, the males of some species, like the trainbearers and sylphs, have ridiculously long tails.

So that's a look at some of the extremes within this huge family of tiny birds. One thing they all have in common? Their ability to captivate and delight us, as we watch these tiny jewels zip around gathering their nectar. 🐦

More on Cindy Marple's work is at www.cindymarplephoto.com



Brown Violetear



Shining Sunbeam



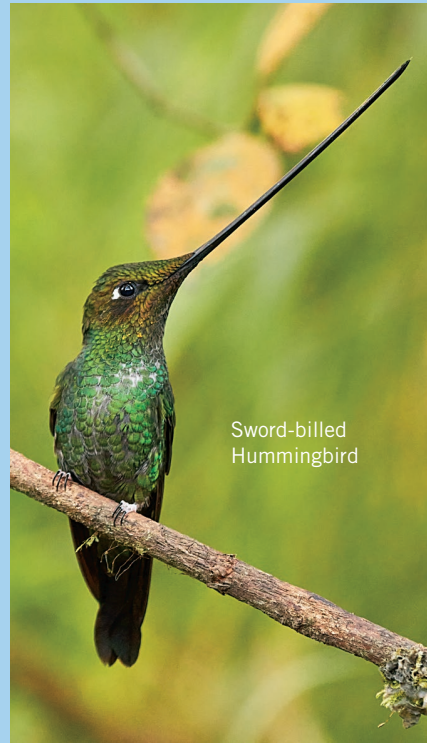
Tyrian Metaltail



Giant Hummingbird



Green Hermit



Sword-billed Hummingbird



Glowing Puffleg



Black-tailed Trainbearer



Coppery-bellied Puffleg
by Cindy Marple

HUMMINGBIRD ANATOMY



by David Chorlton

The magic of hummingbirds intrigues us, even if we don't know quite why. They are tiny packages of color, speed, personality and wonder! A short primer on some aspects of hummingbird anatomy only increases our amazement!

Hummingbird Tongues

You know that hummingbird tongues aren't hollow straws, but did you know that they have split tips, like snakes? Each tip is basically a trough with a fringed retractable roof attached along the side of the trough. When a hummingbird sticks its tongue into nectar, the fringed roof is open, allowing nectar to flow into the trough. As the tongue is retracted, the fringed roof curls over the trough, directing the nectar into the hummingbird's mouth. Rather than sucking nectar, this arrangement is an elaborate licking system with capillary action. And it's rapid fire – a hummingbird licks nectar at the rate of thirteen thrusts into nectar per second!

Hummingbird Hearts and Metabolism

You know hummingbird hearts must beat exceptionally fast. How fast? About 250 times per

minute, average, and about 1,220 times per minute in flight. Compare those beats to the average human heartbeat of about eighty beats per minute. Moreover, a hummingbird heart is approximately 1.75 - 2.5% of its weight; a human heart is only about 0.5% of our weight. This relatively large heart and its ability to beat so quickly contributes to the hummingbird's speedy rate of metabolism, digesting up to twice its body weight in food every day. Hummingbirds hold the record for the fastest metabolic rate of any vertebrate; from bill to evacuation, food is processed in only twenty minutes. If we burned sugar at the rate hummingbirds do while they hover, we'd have to drink a twelve ounce can of sugared soda every minute!

Hummingbird Feathers

You know that hummingbirds must have tiny feathers, but did you know that their feathers are more densely packed on their tiny bodies than any other bird? Nor do they have down feathers, which probably explains the necessity of feather density. Pity the poor graduate students who had to count hummingbird feathers to prove that a Ruby-throated Hummingbird has about 1,000 feathers!

Hummingbird Wings

You know that hummingbirds are remarkable flyers. They are the only birds that can truly hover and fly backwards. Other species that hover, like kites and kingfishers, have just mastered the controlled flight into the wind to stay in one place, an achievement of its own. A hummingbird, because it can generate lift on both the upstroke and downstroke of each wingbeat, can hover regardless of wind speed. How does it do that? There are a couple of anatomical features that are unique to hummingbirds. First, the muscles to fly are relatively supersized; those that raise the wings are particularly large – about five to ten times the size of those same muscles in other birds. Second, their wing bones are “locked” at the wrist and elbow, making their wings more like inflexible blades. Third, their shoulder bone is a ball and socket arrangement like ours, allowing the upper wing bones (equivalent to our humerus) to rotate almost 180 degrees. These adaptations allow the hummingbird, while hovering, to turn its blade-like wings partially upside down so the forward edge faces backward, creating lift on the upstroke. While a hummingbird hovers, it inscribes a flattened figure eight with the tips of its wings. No other bird is equipped or able to do that!

Hummingbird Feet

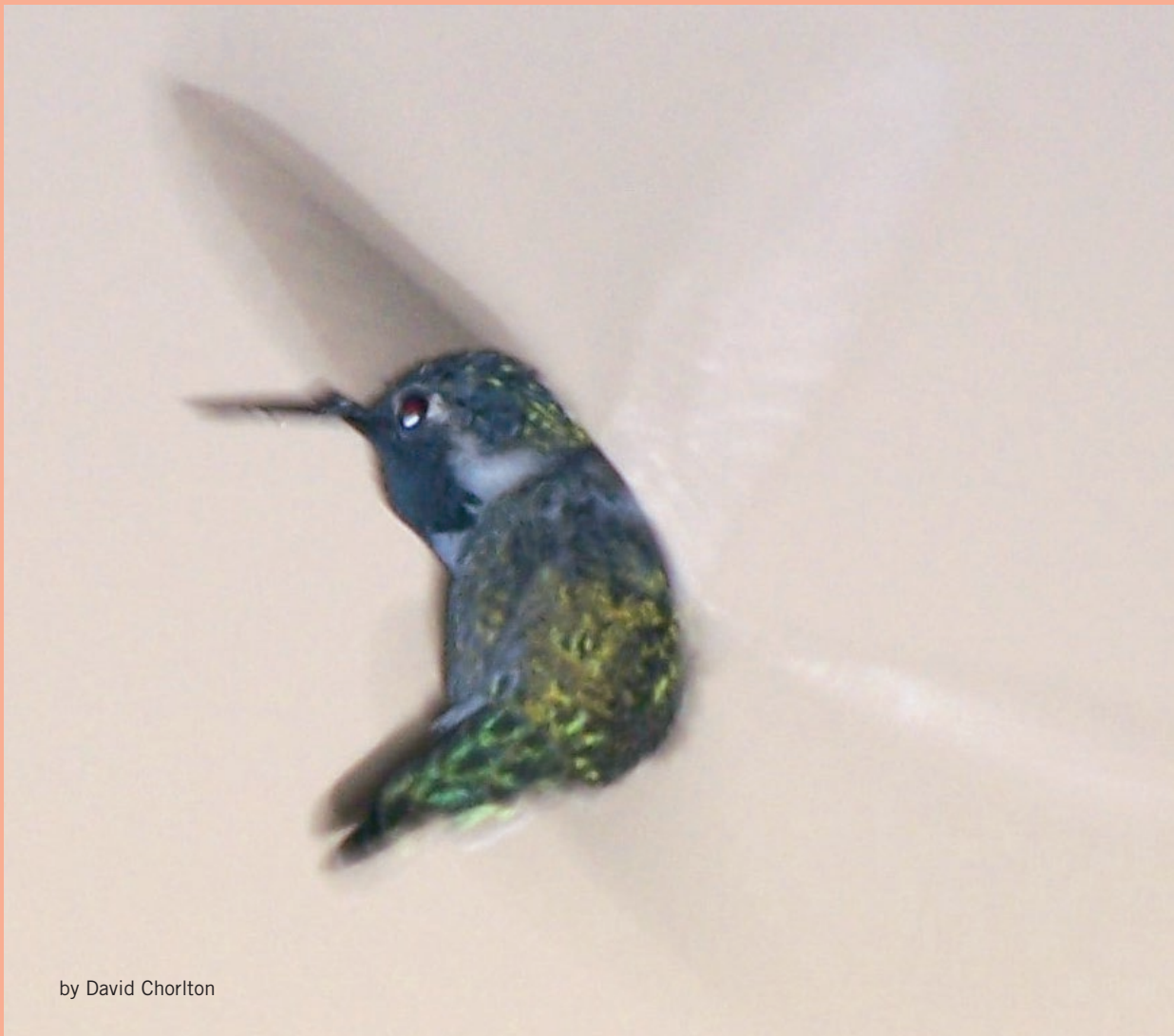
You know that hummingbird feet are tiny – and you’ve never seen them walk on the ground. That’s because they are unable to walk, other than sidling along a branch. With their remarkable wing muscles, they burst into instant flight without a spring in their legs that most birds use to launch. So their feet and leg muscles are small and weak, helping to reduce their size and weight – necessary for such a diminutive bird.

This overview is a partial window into the extraordinary adaptations of hummingbird anatomy. The web is an excellent resource for more information. In particular, the World of Hummingbirds website <https://worldofhummingbirds.com/> has a very approachable section on anatomy. Enjoy the treasure hunt of finding out more about hummingbirds!

Resources:

What it is Like to be a Bird by David A. Sibley
The World of the Hummingbird by Robert Burton

See the Field Trips page for information on trips to be led by Kathe Anderson.



by David Chorlton

ARIZONA'S SPECIAL SPECIES BROAD-BILLED HUMMINGBIRD

by Jim Burns

az's special species

There are nine hummingbirds that may be considered Arizona special species, species found only here or more easily here than in any other state. The real gem amongst them is *Cynanthus latirostris*, our Broad-billed, yet this species is often taken for granted or overlooked because it is not uncommon (Violet-crowned), not hard to find (Lucifer), and not structurally unique (Costa's). It is simply stunningly beautiful.

The rather pedestrian common name, Broad-billed, is derived from the species name, *latirostris*, which literally translates from the Latin as "wide beak." It has been suggested that the wonderful black tipped red bill is relatively broad at its base to facilitate the capture of insects which make up a larger proportion of the Broad-billed's diet than that of most other hummingbirds.

Broad-billeds, like many of our state's special species, reach the northern limits of their breeding range in southern Arizona, migrating south into Mexico for the winter where the species is resident year round from sea level to over 7,000 feet. In Arizona they nest in desert washes, foothill riparian, and lower mountain canyons to just over 5,000 feet. Nesting has also been recorded

in southwestern New Mexico and in Big Bend and the Davis Mountains of west Texas. Two new distribution trends have come to light in recent years: Broad-billeds are now being banded in fall and winter on the Gulf Coast, and some now overwinter in the Tucson and Nogales suburbs around residential nectar feeders.

Favored natural nectar sources are ocotillo, chuparosa, paintbrush, and tree tobacco, and Broad-billeds will take insects as large as spiders and wasps. Nests are built by females, often in sycamore or mesquite, 4 to 7 feet off the ground on small branches. Grasses, plant down, and bits of bark are the common materials but, unlike other hummers, Broad-billeds do not use lichens on the exterior of their nests. Two white eggs are laid, and two broods are raised each year.

In Arizona Broad-billeds can be found from April through August in the creekbeds and washes of our southern mountains, from the Huachuclas west to the Baboquivaris. They are easily seen in the lower reaches of Madera Canyon and are typically the most common hummingbird at the Santa Rita Lodge feeders at an elevation of 5,000 feet. They are not common at all, however, around the feeders in Miller and Ramsey Canyons,

apparently because the hummingbird stations there are at least 500 feet higher.

In a family of birds known for its aggressiveness, Broad-billeds are among the least combative species. They are characterized by nearly habitual wagging of the frequently fanned tail, steel blue and notched on the males

which have the inner rectrices tipped with gray, steel blue and rounded on the females which have the outer rectrices tipped with white.

No discussion of Broad-billed Hummingbird is complete without a cautionary note regarding the visual similarity between juveniles and females of this species and those of the White-eared Hummingbird. Both species have black-tipped red bills and a white postocular (behind the eye) stripe, and undoubtedly many overzealous birders have ticked White-eared on their lists after seeing young Broad-billeds, particularly in the Huachuca canyons where wandering, post-breeding juveniles may be the only Broad-billeds and White-eared is an eagerly sought rarity. The White-eared is a smaller, plumper hummer with a short, straight bill. The Broad-billed is longer and leaner with a longer, decurved bill. White-eared, as its common name implies, has a wide, striking, and very obvious white postocular stripe, while that of juvenile and adult female Broad-billeds is thin, dirty white, and often indistinct.

But make no mistake. You haven't seen a Broad-billed until you've seen an adult male in full sunlight—iridescent blue gorget on shimmering emerald body. Indeed, this jewel is closely related to the Emeralds of Mexico and its common name could have more imaginatively been taken from its genus name, *Cynanthus*, which literally translates from the Greek as "bright blue." When you find your sunlit male, walk slowly around it and watch the colors change with the angle of light. Watch the blues and greens suffuse and merge and throw off glints of gold. This is a breathtaking light show which no other hummingbird in Arizona can produce. ↓



This Broad-billed male was photographed along the Continental Wash below Madera Canyon in April, 2001.



The Hummingbird

Nature's Tiny Wonder by Vicki Hire



LEGENDS, MYTHS & FACTS

There are more than 325 species of hummingbirds in the world, and they are located entirely in the Americas which is where their legends and mythology originates. Their family name, Trochilidae, comes from the Greek word that Aristotle used for a small bird. The average hummingbird has 940 feathers, with its feather colors produced from prism-like cells within the top layer. They are the tiniest birds in the world and can see and hear better than humans. The retina in their eyes has a fourth cone allowing them to see ultraviolet light, which human eyes cannot see. Hummingbirds do not have a sense of smell but use their eyes to find flowers.

LEGENDS

Did you know there are many legends about hummingbirds? The Mayans believed that the very first wedding on Earth was between two hummingbirds. And Taino people who lived in areas now known as Colombia believed hummingbirds were a symbol of peace and protection. The people of the Caribbean thought the spirits of their relatives lived on in hummingbirds. Aztec warriors believed that when they died, they would transform into hummingbirds so that they could fly back to their God

Huitzilopochtli, whose name means "Hummingbird of the South".

Did you know people of Mexico believed that a hummingbird taught an Indian woman how to weave beautiful baskets, which were used during the Day of the Dead festival? Hopi and Zuni people believed hummingbirds could convince the Gods to bring rain to Earth, and so they painted their water jars with images of hummingbirds. In North America, many indigenous tribes see the hummingbird as a sign of good luck. Some people see them as a symbol of eternity and infinity because of the pattern created when a hummingbird flaps its wings. Seeing a hummingbird in your dreams is thought to be a reminder to trust your instincts.

MYTH "Hummingbirds sip nectar through a straw like tongue".

Did you know a hummingbird's tongue is shaped like a "W"? The hummingbird uses the tip of its tongue which has a forked end with featherlike edges, to lap up nectar thirteen times per second. The nectar travels through the grooves in the "W" shaped tongue towards its throat. After

the nectar is part way through their tongue, the hummingbird then pulls its tongue in and forces the nectar into its throat.

MYTH "Hummingbirds only drink nectar, they do not eat bugs".

Did you know hummingbirds require between 8,000 and 10,000 calories of food per day to survive? That is four times the calories that the average human requires. Hummingbirds digest and excrete nectar within fifteen to twenty minutes, therefore they feed about every fifteen minutes but cannot live off sugar water or nectar alone. They also need protein to aid and strengthen their muscles, and they often eat flies, ants, aphids, gnats, and mosquitoes. Hummingbirds are big eaters and eat over twice their weight every day with a diet of both nectar and insects

MYTH "Adding red dye to sugar water will attract more hummingbirds".

Did you know it is not necessary to add red dye to sugar water? Adding the red food coloring is potentially harmful. Using hummingbird feeders that have red parts is enough to attract the attention of



The Hummingbird

Nature's Tiny Wonder

hummingbirds. Red Dye #40 has proven carcinogenic, inducing tumors in rats and mice, so avoid it and let the red feeders do the work of attracting this tiny bird. Also avoid yellow flowers on the feeder, as yellow attracts bees.

MYTH "Leaving hummingbird feeders up late into fall delays migration south".

Did you know hummingbirds know to fly south as the days get shorter, so you will not interfere with their migration? You should leave feeders up for late migrating hummingbirds because they need to quickly refuel after the cold nights. And not all hummingbirds migrate south for the winter. Anna's hummingbird stays along the west coast year-round and in the Phoenix area.

MYTH "If a hummingbird hangs upside down it's dead".

Did you know hummingbirds sometimes go into a state of torpor (pronounced TOR-per) or sleep? During torpor, a hummingbird's heart rate drops from 1,200 times per minute when flying to fifty beats per minute. When this happens, the hummingbird can be found hanging upside down from a feeder and their body temperature can drop to the point of becoming hypothermic. It takes a hummingbird twenty minutes to recover from torpor, slowly wake up and regain its bearings.

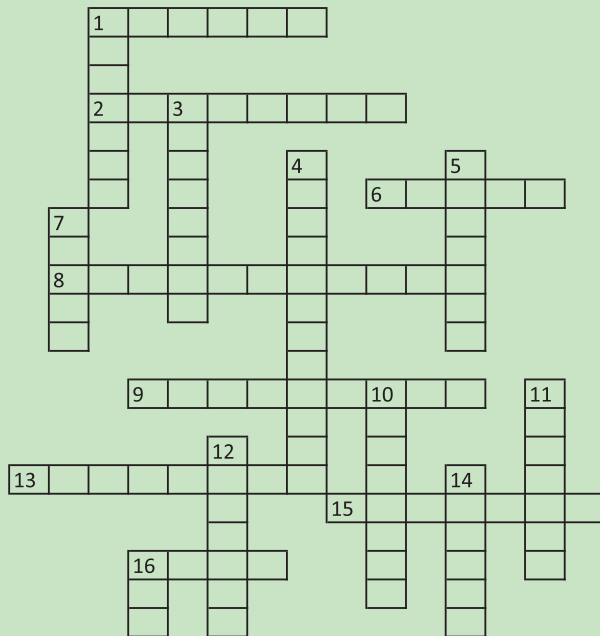
MYTH "The honking sound made during a dive display is vocalized".

Did you know hummingbirds can make sounds using their tail feathers? Each species has its own combination and tone. When hummingbirds descend and come to a complete stop at the bottom of their dive, they open and close their tail feathers causing air to pass through the tail feathers. This makes a honking sound and is misunderstood as a vocalization. The faster a male hummingbird dives, the more sounds he makes which attracts the attention of the female hummingbird.

References

<https://az.audubon.org/conservation/fun-facts-about-hummingbirds>
<https://www.discoverwildlife.com/animal-facts/birds/facts-about-hummingbirds>

The Hummingbird Nature's Tiny Wonder - Crossword Puzzle



Across

- 1 A hummingbird state of sleep or inactivity.
- 2 Hummingbirds are often seen as a symbol of eternity and _____ because of the pattern created when they flap their wings.
- 6 Hummingbirds eat over _____ their weight every day.
- 8 Unlike humans, hummingbirds can see _____ light.
- 9 Seeing a hummingbird in your dreams is believed to mean you should trust your _____.
- 13 Aztec _____ believed that when they died they would transform into hummingbirds.
- 15 A hummingbird's W-shaped tongue has _____.
- 16 Zuni people believed hummingbirds could convince the Gods to make it _____.

Down

- 1 Hummingbirds are the _____ birds in the world.
- 3 Hummingbirds have 940 _____.
- 4 Hopi people painted their water jars with images of _____.
- 5 It takes a hummingbird twenty _____ to slowly wake up and recover from torpor.
- 7 Hummingbirds know to fly _____ as the days get shorter.
- 10 Hummingbirds require four times the _____ that the average human requires daily.
- 11 Hummingbirds need _____ to aid and strengthen their muscles.
- 12 During a dive display, hummingbirds can make a _____ sound with their tail feathers.
- 14 The end of a hummingbird's tongue is _____ with featherlike edges.
- 16 Adding _____ food coloring to sugar water is potentially harmful to hummingbirds.

In Changing Light:

CHUCK WATKINS' HUMMINGBIRDS



Chuck Watkins lives in Tucson, and has been painting for over twenty years, the last nine of them as a full-time professional artist. This takes him to around six different states where he participates in close to thirty shows a year.

Having a hummingbird garden brings these particular subjects close enough to study in detail and enjoy. Chuck has spent time observing how hummingbirds move and how their colors change with the surrounding conditions, all of which has led him to paint up to 500 hummingbird works.

He helps run a Facebook group called “The Hummingbird Whisperer” that reaches thousands of people intrigued by hummingbirds, and helps teach them what to do (and what not to do) when feeding them, as well as offering help in the event of an emergency. 🐦

Find Chuck's website at: [The art of Chuck Watkins \(shopwatkinsart.com\)](http://TheartofChuckWatkins.com)



“Angel in Flight (Anna's)”, 24x18 inches, oil.



"Splish Splash (Broad-billed)", 24x18 inches, oil.



"Dancing Angels (Anna's)", 24x18 inches, oil.



"Fluffy (Costa's)", 24x36 inches, oil.



"Gloria-Shutter and Flutter (Anna's)", 12x12 inches, oil.

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Due to coronavirus, we have delayed resuming our regular meetings. Contact a board member if you have questions, or check out our website at www.maricopaaudubon.org

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To become a member of the NAS please go to:
www.audubon.org/audubon-near-you

We send *The Cactus Wren•dition* to all current members of NAS if you are assigned to or choose MAS as your local chapter. NAS provides MAS \$3.00 per year for each member assigned to us.

To become a Friend of MAS, please pick up a form at the book sales table at our monthly meeting or visit our website, <https://www.maricopaaudubon.org/join>

For specific questions please contact our Membership Chair.

SUBMISSIONS

Copy for *The Cactus Wren•dition* must be received by the editor by email by January 15, April 1, **July 1**, and October 1. Articles not received by the deadlines may not appear in the upcoming issue. Some issues may feature a specific focus, so please feel free to enquire and take the theme into account. Email to: *The Cactus Wren•dition* Editor, David Chorlton: chorltondavid3@gmail.com

OPINIONS

The opinions expressed by authors in this newsletter do not necessarily reflect the policy of the National Audubon Society or the Maricopa Audubon Society.

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