



# The Cactus Wren·dition



Volume LXIII, No. 4

Winter - 2016



***Streak-backed Oriole***

*Photo by Matt VanWallene*



# Programs

**Meetings are held at:** Papago Buttes Church of the Brethren (northwest of 64th Street and Oak Street, which is between Thomas Road and McDowell Road). You may enter from either 64th Street, just north of Oak Street (if coming from the south, turn left [west] at Oak Street and then right at the Elks Lodge. Continue north along the eastern edge of their parking lot and turn right into the church parking lot. Look for signs that say "Audubon"). Come and join us and bring a friend! MAS holds a monthly meeting on the first Tuesday of the month from September through April.

**December 6, 2016**

**Robert Hobbins**

## **Dark Skies: Artificial Light at Night and its Impacts on Human Health and Wildlife**

Artificial light at night has many social and economic benefits to society such



as allowing businesses to operate at night, improving safety and security, and permitting sporting events to be held in the cool evening hours in Arizona. It is also associated with a slew of negative effects such as its ecological impacts on nocturnal wildlife, sea turtles, fireflies, predator/prey relationships, bird migration, and bird fatalities. Robert Hobbins will share the latest research regarding artificial light at night with an emphasis on its ecological impacts. Cities around the nation are considering replacing traditional streetlights with LEDs to cut costs. This change may have serious implications for human health and wildlife. This particular issue will be explored. Robert has recently facilitated a scenario planning workshop about artificial lighting and dark skies in Arizona with a diverse stakeholder group. The results of this workshop will be shared and implications for the future of Arizona's dark night skies, human health, and wildlife will be discussed.

*Robert Hobbins is a PhD student in the School of Sustainability at Arizona State University.*

**January 3, 2017**

## **Margarethe Brummermann Where and When to Find Interesting Insects in Arizona**

*Biologist, watercolor painter, and photographer, Margarethe Brummermann, PhD is originally from Dortmund, Germany. In 1995, she founded Brummermann's Art and Sciences. She sells original watercolors, insect collages, and giclée prints; teaches art classes; gives presentations;*

*is a website designer and does design and graphics for scientific publications; and licenses her nature photography. She supplies Arizona insect specimens for scientific research and leads guided, personalized tours to exciting natural areas in Arizona. She manages the digital image collection of Arthropods for the University of Arizona and is working on a photographic field guide to Arizona beetles. Brummermann has collected, identified, and photographed over 1100 Arizona beetle species.*



**February 7, 2017**

## **David and Diane Reesor Cuba**

Enjoy the Reesors' photography from their recent trip to Cuba. Highlights include the Cuban Tody, West Indian Woodpecker, Oriente Warbler, Cuban Trogon, Bee Hummingbird (the smallest bird in the world), and the smallest frog in the world.



## **Committees/Support**

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### **Bookstore**

Mel Bramley  
480 969-9893

### **Hospitality**

David Chorlton  
602 253-5055

### **Web Page**

Michell Peppers  
480 968-5141

[burge@burgenv.com](mailto:burge@burgenv.com)

### **Maricopa Audubon Website**

<http://www.maricopaaudubon.org>

**"All good things are wild and free."**

*Henry David Thoreau*

## **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.



### **On the Cover:** Male Streak-backed Oriole

Focal length 400 mm, 1/640 sec, f/5.6, ISO 1000, Canon EOS 7D Mark II, by Matt VanWallene. Yuma, January 19, 2016.

**Matt says:** I went to Yuma to meet up with a friend from Florida who was on a bird blitz of southern Arizona (720 American Birding Association lifebirds photographed). Blowing dust and cloud cover required a lower resolution shot but the beauty of the bird came through. This species is just an occasional visitor to Yuma, Portal, and Patagonia, but has been recorded in Maricopa County (for example, at Gilbert Water Ranch in 2005 and 2006).

# President's Message



Mark W. Larson

As the temperatures fall, finally, in the Valley of the Sun, the level of activity in the desert increases dramatically. I am happy to welcome more of our winter resident members back for the season and that welcome extends to the wintering White-crowned Sparrows I am beginning to see under the feeders in my backyard!

The Maricopa Audubon Society is an active organization on so many fronts. We completed a year-long project to create a field checklist of birds for the Girl Scouts' Shadow Rim Ranch north of Payson and now the City of Phoenix has asked us to update their bird checklist for the Tres Rios Wetlands at 91st Avenue and the Salt River. If you have records from this productive site from the past ten years or if you would like to help with this project please let me know.

Again this year we will be active in the Gila River Indian Community's Winter Bird Count. This count takes place the first Saturday in December, followed by the beginning of National Audubon's continent-wide Christmas Bird Counts, the first of which in our area is the Salt-Verde Christmas Bird Count, scheduled for December 14. There are also three more of these counts in our area, so see page 21 in this issue for the complete list of CBCs in Arizona.

The Field Trip Leaders Training we have been working toward is making progress and we expect to have our first graduation ceremony in December. If you or someone you know is interested in becoming a trained field trip leader please contact any Board member. The field trips you might lead someday could be about any natural history subject that interests you and you would like to share with others. Remember, the Maricopa Audubon Society is about more than just birds, we are about connecting with our natural world and helping others to form strong connections, too.

As you are well aware, MAS is strongly committed to conservation in the Sonoran Desert. To that end, we are working with several other dedicated organizations to prevent the Resolution Copper Company from covering hundreds of acres of superb desert habitat near Superior with filthy, dust-producing mine tailings waste.

Now here is some positive news: We have been accepted into Fry's Food Stores' Community Rewards Program. The company has a pot of money that they distribute every quarter to qualifying non-profit organizations in the Phoenix area. If you shop at Fry's and have one of their shopper's cards—Sign UP! It costs you nothing and we're already starting to see the rewards coming in! We plan to use any money we receive from this program to print more *Cactus Wren•ditions* and then distribute them to schools in our area. This will be especially useful to teachers with our new Green Scene environmental education section for kids in the center pages of each issue. 🌿

Mark W. Larson  
President  
MARICOPA AUDUBON SOCIETY  
Phoenix, Scottsdale, and Tempe, Arizona

## Letter from the Editor

by Gillian Rice



Gillian Rice

Backyard birds are joy in my life. A wintering White-Crowned Sparrow serenaded me this morning. Costa's Hummingbirds are a delightful distraction during my morning Tai Chi practice as they fly up for insects and squabble over the best perches. In late September, my yard hosted a Green-tailed Towhee for several days. Being a rather messy gardener and letting leaves lay under my trees and bushes has advantages. I watched the towhee dig in the leaf litter with its characteristic "double-scratch" movement. One of my favorite birds, it is easy to identify with its distinctive rufous cap, white throat, greenish wings and tail, and stout bill.

Learn more about the variety of beaks and bills in this issue's Green Scene and how they are modified for different feeding habits. In a feature article, regular contributor Gail

Cochrane examines another unique bird characteristic – the feather. Brian Sullivan writes for Science Corner and helps us understand what might be related to snake abundance. He also shows us how scientists find snakes. The flora at Phoenix's North Mountain captivates our artist for this issue, Marsha Bennett. I hope you enjoy poetry by David Chorlton, book reviews, and Tales from the Field. Our dedicated Conservation Committee is always at work behind the scenes. Learn more in Mark Horlings' Update and please support our causes.

Thank you to all our contributors, without whom *The Cactus Wren•dition* would not be possible. Please keep in touch and consider submitting an article or photograph. 🌿

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## Are you a Friend?

Do you enjoy reading *The Cactus Wren•dition*? Are you a "Friend of Maricopa Audubon?" Or have you renewed your membership this year? Please support Maricopa Audubon by becoming a Friend. Please see the back page of *The Cactus Wren•dition* for full details. Your contribution will help fund the publication of the *Wren•dition*. Thank you for your support!



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[facebook.com/MaricopaAudubonSociety](https://facebook.com/MaricopaAudubonSociety)



# Maricopa Audubon Society Field Trips

field trips

**Car Pooling:** Please make every effort to organize your own car pool, consolidate vehicles at meeting places and/or contact leaders for car pooling assistance. Be courteous to the trip leaders and help cover their gas costs. We recommend that passengers reimburse drivers 10 cents per mile each.

## Reminders:

- Avoid wearing bright colors. Wear neutral-colored clothing and sturdy walking shoes.
- Bring sunscreen, sunglasses, head protection, and water.
- Always bring your binoculars. Bring a scope if recommended.
- Submit trip and leader suggestions to the Field Trip Chair, Larry Langstaff.
- Unless stated otherwise, reservations are required.

**Day Passes:** Many locations in the National Forests require Day Use Passes. For details, see <http://www.fs.usda.gov/main/tonto/passes-permits>

## Friday, November 11

### Scottsdale's Urban Ponds

This trip usually results in 35-45 species. Targets are winter resident ducks and waterfowl, but common urban birds often appear. We might see Valley rarities such as Red-breasted Nuthatches, Common Mergansers, and Bald Eagles. Start 7:15 am in Scottsdale, and finish about 10:30 am in a local coffee shop. Easy. Limit: 8. Leader: Kathe Anderson, [kathe.coot@cox.net](mailto:kathe.coot@cox.net)

## Friday, November 11

### Oak Flat Campground

Search for Sonoran uplands and oak woodlands species including Black-chinned Sparrows, juncos, multiple towhee species, and possible resident Vermilion Flycatchers. Meet in the East Valley at 7:30 am. Return by 1:00 pm. Bring sturdy shoes, water, and a scope if you have one; lunch optional (around noon). Easy. Limit: 8. Leader: Myron Scott, [gaia\\_3@netzero.com](mailto:gaia_3@netzero.com) or 480 968-2179 (leave message).

## Friday, December 9

### Sweetwater Wetlands

Good days here can top 40 species, mostly waterfowl, shorebirds, and water-related songbirds like Common Yellowthroat, Yellow-headed and Red-winged Blackbirds, and Vermilion Flycatcher, but also some unexpected sightings such as Bobcats. Start about 6:00 am in Scottsdale, and finish about 1:00 pm back in the Phoenix area. Easy (paths mostly level dirt and easily negotiated). Limit: 8. Leader: Kathe Anderson, [kathe.coot@cox.net](mailto:kathe.coot@cox.net)

## Saturday, December 17

### Santa Cruz Flats, Pinal County

Target species are Sprague's Pipit, Mountain Plover, and Crested Caracara. Many hawks of

up to eight or nine species are possible, and the location provides opportunities to develop sparrow identification skills. Bring lunch, water, and a scope if you have one. Temperatures in the 40s to the 60s. Easy. Limit: 11 in three vehicles.

Leader: Dave Pearson, ASU School of Life Sciences Professor.

Please register with [larrylangstaff1@gmail.com](mailto:larrylangstaff1@gmail.com) or text 480 710-0431.

## Monday, January 30

### Agua Fria National Monument

Start about 7:00 am, from North Phoenix, and explore two exits off I-17 leading into the Monument (south of Camp Verde) for three-plus hours. We'll find some gorgeous remote scenery of high chaparral and whatever birds make their winter home there. I'm hoping for Townsend's Solitaires, robins, Western Bluebirds, raptors, sparrows and possible Crissal Thrashers. Roads off I-17 lead to riparian areas along the Agua Fria River, and a moderate hike to some petroglyphs. If folks with two high clearance vehicles volunteer to drive, we'll probably get a little farther than with my Corolla. No services at the Monument. Wrap up with an early lunch. We'll check the weather before deciding about a picnic at a park in Anthem, or a restaurant there. Difficulty 1-2. Limit 8.

Leader: Kathe Anderson, [kathe.coot@cox.net](mailto:kathe.coot@cox.net)

## Saturday, February 4

### Higley Road/Ocotillo Road Recharge Ponds

I have enjoyed seeing seasonal changes while visiting the Higley Road/Ocotillo Road recharge ponds over the last seven years. This site has flat gravel or dirt roads to walk along. Most of the usual wintering waterfowl will be there, and I have seen some good migrants, too. We will have great views of waterfowl with my spotting scope. Bring your own scope if you have one. Not many people visit this site. It's under the Roosevelt Water Conservation District's control, and has a signed parking lot. Recently a housing development was built on the north and east sides of it. Meet at 8:00 am for a couple of hours of birding. Limit 12. Leader: Larry Langstaff, [larrylangstaff1@gmail.com](mailto:larrylangstaff1@gmail.com) or text 480 710-0431

## Tuesday, February 7

### Pima Canyon, South Mountain Park, Phoenix

Entering from the east, in Pima Canyon, we will start at 8:00 am, hiking up the road to the stone ramadas. Then we will turn up the wash 0.4 mile to the west until reaching an area that has Elephant Trees: they may hold wintering Gray Vireos! South Mountain is the place to see Elephant Trees in the Phoenix area (on a gently-sloping road, up a sandy wash, and then up the side of a steep hill). A hiking trail comes within 100 feet, above the trees, so

an alternative is hiking up that trail, and then descending down past the trees into the wash for the return trip. Bring a hiking staff, sturdy shoes, and water. More information on the MAS website. Click on Birding Arizona, then Central Arizona, then Pima Canyon. Trip will last about three hours. Limit 12.

Leader: Larry Langstaff, [larrylangstaff1@gmail.com](mailto:larrylangstaff1@gmail.com) or text 480 710-0431

## Thursday, February 16

### Queen Valley

Start about 7:00 am from the Gilbert area and wind our way into Queen Valley, a little community nestled in an area of beautiful desert north of Route 60, west of Superior. We'll do a bit of birding on the road, but concentrate in town, particularly on whatever wet areas have water. Past trips have resulted in a few waterfowl and waders, plus raptors, woodpeckers, sparrows, Vermilion Flycatchers, Greater Roadrunners, meadowlarks, and some surprises, like Pyrrhuloxia and Scott's Oriole. Wrap up back in Gilbert about 11:30 am. Difficulty 1-2. Limit 8.

Leader: Kathe Anderson, [kathe.coot@cox.net](mailto:kathe.coot@cox.net)

## Friday, March 3

### Tempe's Urban Ponds

This easy local trip will start about 7:15 am in Tempe, and explore the ponds at ASU Research Park first, before heading over to Kiwanis Park to check out the pond. Expect the usual variety of winter waterfowl to be present, plus common urban desert species. This is an excellent beginner's trip, but may include some surprises (such as Black-hooded Parakeets and mergansers), and excellent close-up views, that keep more experienced birders interested. Wrap up about 10:30 am. Difficulty 1-2. Limit 8.

Leader: Kathe Anderson, [kathe.coot@cox.net](mailto:kathe.coot@cox.net)

## Saturday, March 18

### Flagstaff Area Lakes

Meet at 8:00 am near the intersection of I-40 and I-17. Bring a lunch and warm clothing. Look for waterfowl on the lakes. Possible species include Bald Eagle, Red Crossbill and Pinyon Jay. Minimum of 6 people required. Leader: Charles Babbitt, 602 840-1772 or [cjbabbitt@cox.net](mailto:cjbabbitt@cox.net)



# The Way to the Gray Hawk

by David Chorlton

*Clouds well up into a chorus of light  
above summer hills  
stripped to their contours  
by each peal of thunder  
that rolls across them as sound  
casting a shadow.*

*In the tangles  
of birdsong along every trail  
through ash and mesquite  
the hard throated call  
from a cuckoo keeps up  
an insistent tease until  
slender wings flash  
where they glide into view  
for a second and away to where time  
cannot reach.*

*The way is marked  
by the hallucinogenic glow  
on the sacred petals  
of datura growing at the intersection  
of reality and delirium.*

*Leaves pull  
together; the sky is held in trust  
all the way along the path the erstwhile  
railway ran, where now  
the trees leave space  
only for its memory to pass  
between them, followed by  
a raven's call.  
Still far to go  
and the sun is low  
as edges rich in color draw the shapes  
of cottonwoods within them.*

*Another day;  
the grass is wet and darkness  
turns into a heron on the creek,  
gone in a wingflap  
leaving green behind in overlapping  
shades past fallen trunks  
whose textures of decay  
lie richly on the earth,  
and farther along the circuitous way  
leading into and out of  
the secrets that grow  
in riparian shade, the search continues  
with no end in sight.*

*Looking up,  
ever up high among the tall and leaning  
boughs, some broken  
and some twisted, some tapering  
to a dead point with no foliage,  
some holding a nest, leads only to  
the clear blue beyond  
all that is known, until  
a Gray Hawk's cry  
is a fingernail scraping across  
the sky.*



Gray Hawk. Photo by Matt VanWallene

poetry

## 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. You usually have 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. 🦅

### 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. It includes meeting and field trip reminders, special events, and citizen science projects. To subscribe, contact [laurienessel@gmail.com](mailto:laurienessel@gmail.com)

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





# Notes & Announcements

## Celebrate Asa Wright Nature Centre's 50th Birthday in 2017

In 1967, Audubon members rallied behind three influential people -Don Eckelberry, a renowned wildlife artist; Erma Fisk, a prominent ornithologist and conservationist; and Russell Mason of Florida Audubon Society - to raise enough money to buy Spring Hill Estate and its famous Oilbird Cave in Trinidad, creating the first non-profit, conservation-focused trust and eco-lodge in the Caribbean. Fifty years later, the renamed Asa Wright Nature Centre has lived up to its mandate to protect and conserve habitat and wildlife, and to educate.

Highlighting the role that the Centre has played in tropical conservation, a wonderful selection of celebrity birders, conservationists and artists will visit the Center in 2017. Celebrities will offer a lecture or workshop in their specialty, join tour groups on guided walks, and be available at the Centre for informal conversation and birding on the verandah.

If you have always dreamt of visiting the Centre, doing so in 2017 will benefit you as well as your chapter! In honor of the anniversary, Caligo Ventures (the US booking agent for the Centre), will provide a \$100 donation to their chapter

for every Audubon member who books a tour as a result of seeing this article in their chapter newsletter or website.

And the birding is superb. A visit to the Centre is one of the best introductions to tropical birding. Modern hotel facilities, a wonderful dining experience, and a wide range of field trips offered by highly trained Centre naturalists round out your stay. Time your trip to join a celebrity birder, and get even more out of your experience!

For more details about dates and tour options, please contact Caligo Ventures at 800 426-7781 or [www.caligo.com](http://www.caligo.com).



*Tufted Coquette. Photo by Mukesh Ramdass*

## Support MAS when you shop at Fry's Food Stores

Grocery shopping? Support Maricopa Audubon. MAS is now part of Fry's Community Rewards Program. Please register your Fry's VIP card and select Maricopa Audubon

#89166 as your non-profit organization. There is no cost to you. Go to: <https://www.frysfood.com/topic/new-community-rewards-program>

## Willow Beach Christmas Bird Count

It's Christmas Bird Count season! Why not travel to a CBC adventure at Willow Beach National Fish Hatchery? Its count will be held on December 28, beginning at 9:00 am.

Willow Beach National Fish Hatchery is located on the Arizona side of the Colorado River in the Mohave Desert eleven miles below Hoover Dam, within Lake Mead Recreation Area. As well as being a superb birding spot, the hatchery works with two endangered species, Bonytail Chub and Razorback Sucker, and one candidate species, the Relict Leopard Frog.

"We usually have three bird count teams. One will go out on the river on a barge, one will go throughout the hatchery and the marina, and the third will go to White Rock Canyon and hike down the river," says Joey Saccomanno, Animal Caretaker at Willow Beach. "We always have a lot of fun. Some of our highlights from last year included Lazuli Bunting, Varied Thrush, Common Goldeneye, Common



*Oilbird. Photo by Janice Petko*





*Willow Beach CBC 2015 Counting from the barge on the river.*

Loon, Horned Grebe, Short-eared Owl, Peregrine Falcon, and Bald Eagle.”

For information on other CBCs in our state, see page 21.

## Bob Witzeman in *Environmental Justice*

Supported by a research grant from MAS, Joel Helfrich, Professor of History at Monroe Community College, Rochester, NY, has published an article featuring the environmental work of the late Bob Witzeman, who served as MAS President and, for over 35 years, as MAS Conservation Chair. The article, “**Constant Pressure, Constantly Applied**”: Remembering Bob Witzeman, 1927-2014, appeared in the peer-reviewed journal, *Environmental Justice*, February 2016.

Helfrich examines the life and grassroots activism of Bob Witzeman on behalf of indigenous peoples and the environment in the Southwestern US during the last 45 years. Helfrich details Witzeman’s actions, formula for success, and victories to provide time-tested strategies and inspiration. This article is both a tribute to Witzeman’s environmental justice work and an invitation to continue the work that he began. 🦉



*Short-eared Owl. Photo by Matt VanWallene*





*Pine Flycatcher. Photo by Matt VanWallene*

## Pine Flycatcher

**By Matt VanWallene**

Dave Stejskal found this Pine Flycatcher on May 28. Subsequent AZNM listserv messages indicated the bird was building a nest. I went down four days after it was first discovered. The bird was at a campsite called Aliso Spring, east of Madera Canyon. I have a high clearance 4WD, which came in handy on the unimproved road. Within just a few minutes of my arrival the bird appeared. This is the first recorded visit of this species in the US. The closest record to the US prior to this visit was 175 miles south of the border.

## Hunting Peregrine

**By Larry Langstaff**

I have visited Telephone Lake near Show Low about 25 times, seeing a Peregrine there four times. During my first encounter there, one dived on Black Terns in 2010. In 2015, a Peregrine flashed through a large flock of swallows. I was glassing two flying ducks last August, when a Peregrine rose up behind them. They made one turn at about twenty feet above the lake, but the faster falcon caught one of them and glided with it down to the lakeshore. What luck to see the approach, catch, and glide through my 10 power binoculars! I was glad I approached the lake from the northwest as it was late in the afternoon and the brilliant sunshine shone perfectly



*Peregrine Falcon. Photo by Larry Langstaff*

on the successful "duck hawk." I watched through my spotting scope as the Peregrine rode the Mallard around in a circle on the ground, as it tried to escape. Soon, the motionless duck's neck became the first course in the Peregrine's dinner. Previously, I have seen Peregrines take a swallow, a Mourning Dove, a European Starling, and a Blue-winged Teal.

## Tri-colored Heron

**By Morry Marshall**

I photographed the Tri-colored Heron at Pond 1 at the Gilbert Riparian Preserve on October 3. This bird is outside its normal range, which is along the Gulf of Mexico, in Baja California, in the Caribbean, and in Central and South America. eBird sightings record that the heron has been present at the Preserve from August 28 to at least October 9. It has, of course, attracted a lot of attention among local birders.



*Tri-colored Heron. Photo by Morry Marshall*



# Incidental Coastal Birding

By Gillian Rice

I love living in the Arizona desert, but deep inside, part of me longs to be by the ocean. I'm a child of an island nation and grew up in England just several miles from the North Sea.

A late September vacation with my non-birder husband by the ocean in Carlsbad, CA, was not planned as a birding trip, but, you know how it is – we birders can't go anywhere without our binoculars. In my case, I must have my camera, too. Getting good images from several angles of unfamiliar birds can help with identification. As a young birder, I learned the value of taking field notes, and still do this sometimes. On this vacation, my camera and the Sibley birding app helped me identify what to me were some lifebirds and others I rarely see. Based on my photos, MAS President Mark Larson also confirmed my identifications.

I spent most days on Robert Frazee State Beach in Carlsbad. A few Willets and Whimbrels foraged close to my favorite spot for enjoying the sights and sounds of the crashing waves. The birds appeared oblivious to walkers, joggers, and surfers, but the birds engaged in altercations among themselves if one encroached on another's feeding spot. The birds would chase one another, rise up calling, circle around, and return. Sometimes walking deliberately, sometimes scurrying at the water's edge, they were far more skilled than me at anticipating how far the wave would run up the beach.

The different bill lengths and bill shapes of the Willet (a member of the sandpiper family) and the Whimbrel (in the curlew family) indicate that, as they probe the sand, they probably retrieve different kinds of invertebrate prey. According to *The Sibley Guide to Bird Life and Behavior*, in shorebirds that probe for food, the bill tip contains concentrations of tactile sensors used to locate prey. The straight bill of the Willet is used to make rapid thrusts through soft sand or mud or to pick prey off the water's surface. The decurved bill of the Whimbrel can remove long, soft-bodied prey as the bird angles its bill deep into invertebrate burrows. (To learn more about bills and beaks, see pages 12-13).

One morning an Osprey flew close overhead. Brown Pelicans glided close to the ocean's surface. These odd-looking creatures are masters of the air. Just a few wingbeats now and then propelled them for long distances. A flock of Elegant Terns preened their feathers on the beach between feeding forays out over the ocean. I also spotted dolphins and seals. A visit to La Jolla resulted in close views of Double-crested Cormorants, seals, and California Sea Lions. At Del Mar, I found a Marbled Godwit.

A week lazing on the beach was just what my husband and I needed. I eagerly agreed when he suggested we make this an annual event. The birding is easy and rewarding along the southern California coast. 🐦

## Reference:

*The Sibley Guide to Bird Life & Behavior*. 2001. C. Elphick, J.B. Dunning, Jr., and D.A. Sibley, eds. Chanticleer Press, Inc.



*Willet in winter plumage. Photo by Gillian Rice*



*Whimbrel. Photo by Gillian Rice*



*Elegant and Royal Terns. Photo by Gillian Rice*

# Book Review

by Tom Gatz

book reviews

**A Natural History of the Sonoran Desert** Second Edition. Edited by Steven John Phillips, Patricia Wentworth Comus, Mark Alan Dimmitt, and Linda M. Brewer. Arizona-Sonora Desert Museum and University of California Press, 2015, 590 pp., \$39.95 paperback.

*A Natural History of the Sonoran Desert* is the perfect book to track down answers to questions about our desert and its wild inhabitants. Following on the success of the first edition published in 2000, this second edition includes four new chapters (Sky Islands, Sea of Cortez, Conservation Issues in the Sonoran Desert, and Pollination in the Sonoran Desert). It also has updated information including the latest scientific names and the current species numbers of our Sonoran Desert plants and animals.

If you don't have the first edition and want to have the latest information about the Sonoran Desert, this is a must-have book. If you already have the first edition, should you spend over \$35.00 for this updated edition? It depends. I compared the new edition to the old one. The updated information is sprinkled throughout the text, more in some chapters, less in others. Many of the changes deal more with new taxonomic classifications, changes in scientific names and species numbers, and perhaps less with new information about life histories of the plants and animals. This is not a criticism; rather, it is a testament to how complete and thorough the first edition was and remains.

Most of the general information is still current, while the scientific names and numbers and percentages have been updated. We now learn that the Saguaro is actually 75-85% water (not the 90% stated in the first edition) or that each Saguaro fruit has an average of 3500 seeds (not 2000). The total number of described species of cacti is now 2050 (up from 1800) and the number of flowering plants is now 330,000 (up from 300,000). This level of detail is probably not all that crucial to most readers. Of course, if you are a natural history book nut like me, you will certainly want to buy this new edition.

There are quite a few new facts in this edition that should be of interest to general readers. For example, this new edition covers the effects of climate change on the Sonoran Desert (some plants are flowering up to two weeks earlier); warns us about the hazards to humans from agave sugar (90% free

fructose) and castor beans (ricin); describes the potential benefits of Gila Monster saliva (it contains a hormone that promotes the production of insulin); and gives tips on escaping Africanized bees (cover your face with your shirt to protect

your eyes, hold your breath and get indoors). On another ominous note, it shows an increase in the acreage of invasive Buffelgrass in the Sonoran Desert from 470,000 acres when the first edition was published 15 years ago to five million acres today. We now know that Boojums can grow up to two feet in wet years but 'only' live about 100 years; most of our monsoon rain actually comes from the Pacific and not the Gulf of Mexico; and spadefoots are not really toads, live up to 20 years, and adults can survive for almost a year on just one big meal of termites.

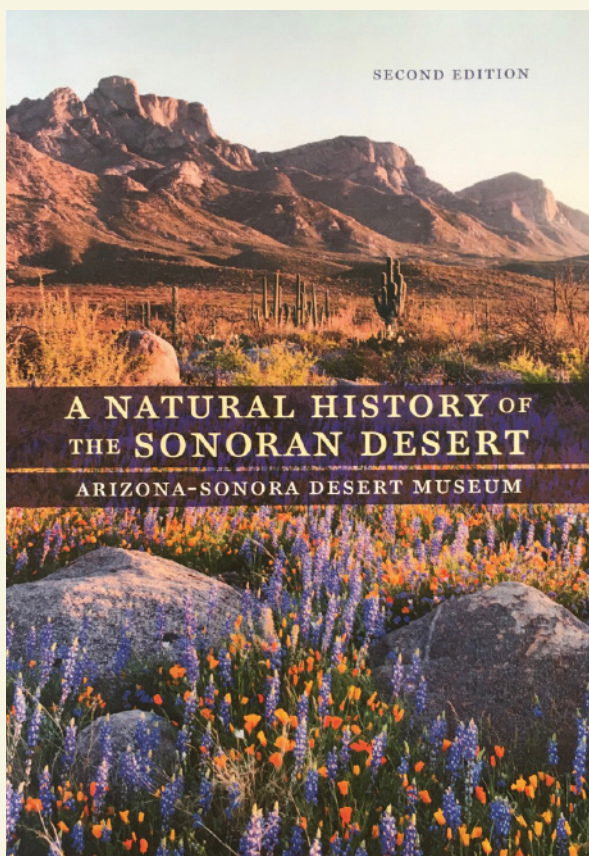
There is one minor change I might suggest on page 185. It says that Saguaro seeds pass undigested through the White-winged Dove gut intact. While this is true for bats, thrashers, woodpeckers and Cactus Wrens with gentler guts, doves have powerful digestive systems and likely no Saguaro seeds survive

passage through their gizzards. On page 393, it correctly states that White-winged Doves drop some seeds when regurgitating food to their young; so some seed is dispersed. However, for every seed they drop, they consume hundreds of others.

The four new chapters are really good but fairly short (the Sea of Cortez chapter is one and a half pages). The new chapter on Sky Islands has some impressive statistics. These sky islands support one third of all snake species found in the US. The Chiricahua Mountains alone support one third of all bird species in North America, and 500 species of bees are found in the Chiricahuas and surrounding valleys. The new chapter on Conservation includes the importance of natural areas to humans, citing studies that show patients heal faster if they have contact with nature; even a view of a tree through a window is beneficial.

We can be grateful to the Arizona-Sonora Desert Museum and all of the editors and contributors to this book for meticulously updating this invaluable resource. I know I will use it often. 🌵

*Tom Gatz has been a MAS member since 1981.*





# Book Review

by Pierre Deviche

**A Field Guide to the Damselflies & Dragonflies of Arizona and Sonora** by Rich Bailowitz, Doug Danforth, and Sandy Upson. Tucson, AZ: Nova Granada Publications, 2015. 459 pp., ISBN 978-0-9909023-0-0. Available to buy at MAS monthly meetings at the discounted price of \$30.00.

Interest in odonates – dragonflies and damselflies – is rapidly growing as more and more amateur naturalists, professional biologists, conservationists, and nature photographers are drawn to these fascinating insects. A decisive factor that sparked this interest was the publication in 2000 of *Dragonflies through Binoculars* by S. Dunkle – the first such book aimed at the public at large and that described North American dragonflies and their geographic distribution. However, Dunkle's book did not include damselflies – a large component of the North American odonate fauna – and a lot has changed in the past 15 years. As a result of many people becoming interested in odonates, we have learned much more about their biology, identification, and distribution, and this, in turn, has fueled the development of numerous web sites and listserv groups on the subject, as well as the publication of many new books including regional guides.

The newly published *Field Guide to the Damselflies & Dragonflies of Arizona and Sonora* by Bailowitz, Danforth and Upson is a welcome addition to this list. It is the product of many years of tedious, meticulous, and systematic field work by the authors and describes all the approximately 170 odonate species that have been recorded to date in Arizona and Sonora, Mexico. Information is provided in standardized format that makes the book easy to peruse. Each species account begins with a short overview of this species' general biology, followed with its distinguishing characteristics. Readers will appreciate the fact that for each species, these features are summarized clearly and succinctly, in an easy to read and understand bulleted form. Following this section, each account includes a comparison with similar species as well as information on the known flight period and overall distribution. The book concludes with a series of short essays on locations that are particularly species-rich and a list of species that have not yet been recorded in Arizona or Sonora, but are good candidates for future addition.

Bailowitz et al.'s book stands out from comparable field guides in several ways. For starters, it is the first field guide to comprehensively describe the odonate fauna of any Mexican state. As such, it will be particularly useful to those visiting

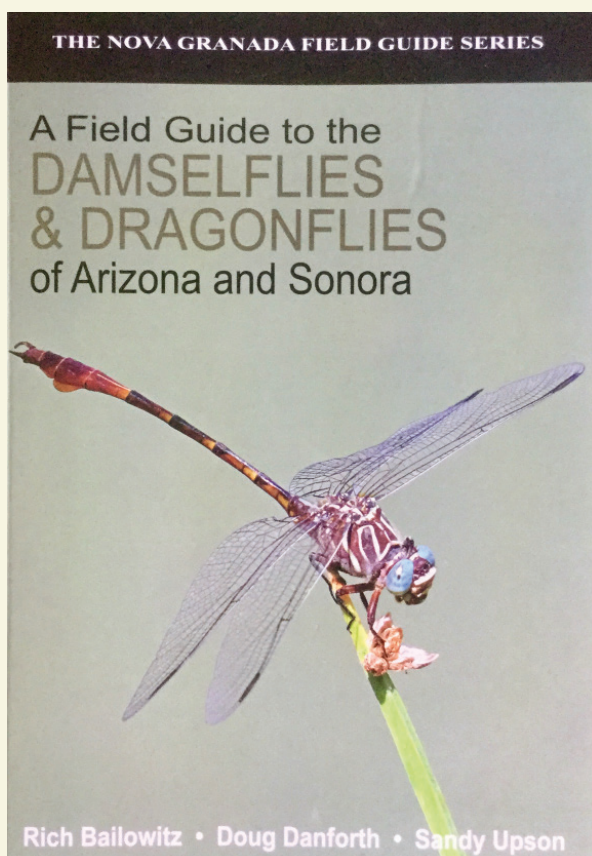
the state of Sonora where, just as is the case for birds, an impressive number of odonate species – some of which, such as the stunningly attractive leaftails – are found that have never or rarely been recorded north of the border. The book is beautifully illustrated with large, high quality photographs as well as with hand drawings of specific morphological features such as male appendages, which, in some cases, must be examined for definite identification. Some odonate groups, such as the clubtails and the amberwings, include species that resemble each other. To assist identification, the book includes sections that describe and lavishly illustrate differences between such species – a feature that beginners will appreciate. Another aspect of the book that separates it from most current regional field guides is that the distribution maps, rather than just showing the overall range of

each species, indicate the exact locations within each state where a species has been recorded. Thus, studying these maps reveals not only on where each species may be expected but also whether, within its range, it is widespread or limited to a small number of locations.

I highly recommend this book. To those who never paid attention to odonates, it will bring a sense of discovery and wonder at the diversity of colors, shapes, and sizes of these photogenic insects and, hopefully, a desire to start studying them and contributing to our understanding of their biology. And to those already familiar with odonates, the book will become an indispensable source of additional information that is simply not available elsewhere in such a compact, user-friendly format. 🦋

*Pierre Deviche is Professor of Environmental Physiology in the School of Life Sciences, Arizona State University.*

*Editor's note: Visit Pierre's website, [www.azdragonfly.org](http://www.azdragonfly.org) to learn more, view his spectacular photographs, find out where you can see Arizona odonata, and download worksheets and handouts.*



# Connecting with nature makes Arizona a fun and better place to live!

compiled by Vicki Hire



green scene



Flamingo. Photo by Vicki Hire

## Green Scene Go Take a Hike

To observe a wide variety of bird species, grab your binoculars and visit the Riparian Preserve at Water Ranch at 2557 E. Guadalupe Road in Gilbert, Arizona. Notice the birds' bills and feeding habits, making a list of what each bird eats. Think about where the bird lives and how its beak has adapted to allow it to eat certain food. For additional information about bird beaks and adaptations visit: <http://projectbeak.org>

## Green Scene True or False?

- T F 1. Birds with strong, stubby beaks use them to crack open and crush seeds for food.
- T F 2. Some beaks have adapted to dig insects from tree trunks.
- T F 3. Hummingbirds have needlelike bills used to probe into flowers.
- T F 4. Birds with long straight beaks often use them to spear fish.
- T F 5. A damaged beak cannot grow back.

## Green Scene School Projects

If you would like to apply to the MAS Education Committee for funding for a school natural history project or field trip, please contact Carol Langdon at [clangdon2@cox.net](mailto:clangdon2@cox.net)

Send us your photos! Did you take a hike or field trip? If so, we'd like to hear about it! Send us your bird or nature photo and a brief description of where and when you took the photo. It's ok if you aren't sure what species the bird is – just say so and we will help you to identify it!

## Guess this Bird



Photo by Michael Gearey

Clue: It uses its needlelike bill to feed on tiny insects, and probe for nectar from desert plants such as agave, Chuparosa and Desert Honeysuckle. This desert bird breeds in the Sonoran and Mojave deserts of California and Arizona.

Answers on page 17





*Black Vulture. Photo by Vicki Hise*



*Northern Cardinal. Photo by Vicki Hise*



*Snowy Egret. Photo by Vicki Hise*

## The Bird's Beak or Bill – a Fowl and Fair Question!

Whether it's a Beak or a Bill, one thing is for sure – it was designed for a purpose. With only two parts, the Upper Mandible and the Lower Mandible, a bird's beak or bill amazingly makes up for not having teeth, paws, hands, and much more! Beaks and bills have adapted to just the right shape and size that allow each species to enjoy their favorite food, defend themselves, feed their young, build their nests and even make themselves attractive to other birds.

**Did you know** that a beak is considered the bill of a bird? The words beak and bill are interchangeable to describe the mandibles of many birds such as sparrows, crows, finches, and perching birds. For birds of prey and other pecking birds, however, the term "beak" is used. And for hummingbirds, pigeons, wading birds, and web-footed birds we refer to the bird's "bill."

**Did you know** that beaks are covered with skin, and a substance called keratin? When the keratin dries it gives the beak a shiny appearance and also makes the bill hard and durable. As the keratin wears away, it is replaced – just like a fingernail of a human.

**Did you know** birds that eat flying insects have bills that are wider at the base than they are long? Their beaks act as a funnel or scoop, which makes it easier to catch bugs while in flight. Swallows, flycatchers, and nighthawks can fly for hours, snapping up insects!

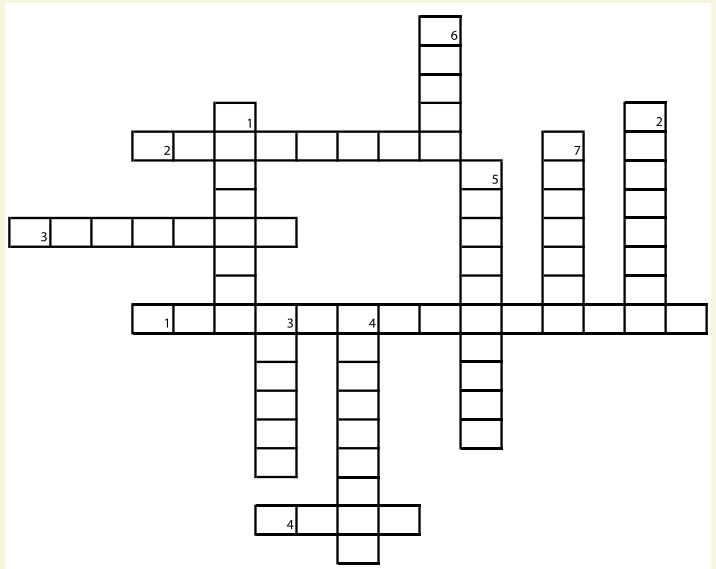
**Did you know** a bird of prey such as the Bald Eagle, the Great Horned Owl, and the Black Vulture has a very strong, sharp-curved hook at the end of its beak? That is because birds of prey use their beaks for removing fur and feathers from their prey, and for tearing and shredding their food.

**Did you know** that flamingos use their beaks upside down? A flamingo's lower mandible is much larger than its upper mandible, which is not fixed like other birds. The flamingo first uses its feet to stir up food from the bottom of lakes and other bodies of water. Then, with its bill upside down it uses its tongue to filter water in and out, to catch shrimp and algae.<sup>1</sup> Other birds that can use their beaks upside down are storks, penguins, and toucans.

**Did you know** that some birds have recurved bills that are curved up while others have bills that are curved downward? Shorebirds such as the Long-billed Curlew and the Glossy Ibis use their long, downward curved bills to probe through mud looking for crabs and shrimp. Another shorebird, the American Avocet, has a bill that is curved upward, which it swings through shallow water stirring up small invertebrates to eat.

<sup>1</sup> <http://www.flamingos-world.com/flamingo-feeding>

## The Bird's Beak or Bill Crossword Puzzle



### Across

1. This bird often spears fish using its long sharp bill
2. These birds catch insects in flight with their beaks that are wider at the base than they are long
3. A substance found in the skin of beaks that makes beaks strong and shiny
4. Term used for beaks of wading birds, hummingbirds, pigeons, and web-footed birds

### Down

1. Another word for lower half of bill
2. Uses its beak upside down to filter water for food
3. Its bill is curved upward and this bird swings it from side to side stirring up shallow water looking for food
4. This bird has a strong beak with a curved hook at the end used for tearing its food
5. This bird has a very strong and straight bill that is used to drill holes in trees as the bird probes for insects
6. How long a Lesser Nighthawk can fly looking for insects
7. This bird uses its beak to remove fur and feathers from its food

### Links to additional information on bird beaks:

<https://www.allaboutbirds.org>

<http://www.audubon.org/news/the-true-nature-bird-beaks>

Answers on page 17

# The Feather: Beauty Through Distinction

By Gail Cochran

The fanciest designer clothing from the highest end merchants cannot compare with the plumages of birds. Feathers are miraculous in their ability to provide protection from the elements and to send birds soaring. Feathers keep birds dry, provide camouflage and warmth, and enable aerodynamic flight. From bold brilliant colors to muted delicate hues, birds communicate with their plumages during courtship rituals and territorial displays.

Although every feather contains the protein beta-keratin, the range of forms and uses varies widely. The basal portion of the hollow shaft of a feather, the part embedded beneath the skin of the bird, is the calamus. Extending from this point of attachment is the rachis, which branches into barbs. Each barb further projects barbules.

On pennaceous feathers, miniscule hooks on each barbule interlock with those of adjacent barbules. This interlocking structure forms the vane of the feather, which is stiff and mostly flat. The vane is a barrier to wind and water. Regular preening keeps the barbules properly interlocked and smooth.

Plumulaceous feathers are fluffy. They also have a calamus that embeds in follicles of the bird's skin, but the barbs are flexible and the long barbules do not interlock. These very soft feathers trap air close to the warm body of the bird. This insulation is essential in regulating body temperature. Many feathers have both fluffy plumulaceous regions and more structured pennaceous areas.

Wing feathers have windproof vanes on either side of the central shaft. The interlocking microstructure allows for lift in flight. The leading edges of the primary and secondary wing feathers are narrower and less flexible. The asymmetric design of wing feathers provides stabilization and prevents twisting in midair.

In addition to wing feathers, birds have tail, contour, down, semiplume, filoplume, and bristle feathers.

Tail feathers, called rectrices, are used primarily for steering. Six pairs of tail feathers arranged in a fan shape is the most common assemblage. These feathers also have an interlocking microstructure. The two central tail feathers attach to bone.

Contour feathers cover the bird's body in an overlapping pattern like shingles on a roof. These are often a combination of pennaceous and plumulaceous forms, waterproof and interlocking at the ends, but fluffy close to the body. Coverts are



*Northern Mockingbird nest showing altricial young. Photo by Matt VanWallene*

contour feathers that cover the bases of the wing feathers. Coverts smooth the area where the flight feathers are attached to bone and contribute to aerodynamic efficiency.

Semiplumes grow near the body, providing a fluffy layer of warmth and insulation underneath the other feathers. Filoplumes are sensory feathers that give the bird an awareness of the position of its contour feathers. These are short with very few barbs. Closest to the body are the short down feathers which have little or no central rachis. Bristle feathers are mostly found on the head, protecting the eyes and providing tactile sensation around the mouth. They usually have no barbs at all.

Preen glands located under a bird's tail hold oils that waterproof and coat the feathers when a bird grooms itself. Even with this self-care, feathers wear out. So birds molt regularly, growing new feathers that push out the old. Each species has its own timing and frequency of molting. Many birds have a partial molt before breeding season to establish courtship colors and then a complete molt of all feathers after breeding and before migration. In most species, molting happens gradually so birds are able to maintain stable body temperatures and continue to fly.

Baby birds require a high protein diet to produce their first feathers. Many seed eaters eat protein-rich insects during breeding

season and feed these to their young. Precocial chicks that are capable of moving around on their own soon after hatching emerge with a full coat of natal down include our desert favorites, the Gambel's Quail chicks. The insulation of natal down allows waterbird babies like Mallards or American Coots to swim and run after their parents. After a few weeks, these babies replace the natal down with adult feathers.

Most songbirds or altricial species hatch naked, with their eyes closed, and little or no down. These babies are commonly raised in cozy nests where parents brood them until their adult feathers grow.



*Bristle feathers on a Northern Mockingbird. Photo by Matt VanWallene*



The rich beautiful colors on feathers come from pigments. Reds and yellows are formed from carotenoids and blacks, browns, and greys from melanins. Different pigments make up blue and green feathers. Some birds use bright colors to advertise breeding status; others utilize drab shades to hide.

A number of birds have evolved fascinating modifications to their plumages. Owls have feathers that allow these stealthy predators silent flight. Their feathers have a number of features that remove the aerodynamic noise from their wings as they slice the air. One feature is a soft, downy material distributed on the top of the wing, giving it a velvety texture.

Woodpeckers brace against trees with special tail feathers that provide extra support while they drill into wood to forage for food or to excavate a nesting cavity. *The Sibley Guide to Bird Life & Behavior* explains how these tail feathers work. The two central feathers are pointed and reinforced by longitudinal ridges. These feathers have barbs that curve inward toward the tree, creating a concave structure that increases the tail's strength.

Sandgrouse are a family of birds found in the deserts of Africa



A Gambel's Quail chick is precocial.  
Photo by Matt VanWallene

and Asia. These birds fly to gather water for their young. Special curled barbs on the breast feathers collect moisture from water sources. The sandgrouse carries the precious fluid back to babies that sip water from the cupped feathers.

Some birds, like the Anna's Hummingbird, have tail feathers that create a sound during courtship and territorial display flights. The male might fly upwards to over 100 feet before plummeting in an almost vertical dive. He ends with an explosive squeak produced by a 60 millisecond spreading of his tail feathers – faster than the blink of an eye. According to research conducted at UC Berkeley's Museum of Vertebrate Zoology, the dive chirp is produced when the vane of a feather vibrates. The outer tail feathers vibrate like a reed in a clarinet.

This is all to say that feathers would have to be considered the most distinctive attribute of birds. Next time you are out birding, take a moment to wonder at the complexity of this unique bird feature. 🐦

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- <https://academy.allaboutbirds.org/feathers-article/>
- <http://udel.edu/~gshriver/pdf/feathers.pdf>
- US Fish and Wildlife Service. <https://www.fws.gov>

*Gail most admires the feathers on Great Horned Owls, for the feathers' beautiful and muted hues, their protective camouflage, and for the silent flight they provide these magnificent hunters.*



Rectrices showing rachis variations on the tail of a Rufous Hummingbird. Photo by Matt VanWallene



Gila Woodpecker. Photo by Gillian Rice

## Know The Law

The feathers, along with bird eggs, nests, and parts of all migratory birds are protected under the Migratory Bird Treaty Act. Some migratory birds like waterfowl can be legally hunted and possessed, but all North American birds of prey are strictly protected. Thus it is illegal to be in possession of feathers from eagles, Ospreys, hawks, falcons, kites, owls, vultures and all other native North American birds of prey.

The local non-profit Liberty Wildlife works cooperatively with the US Fish and Wildlife Service to provide Native Americans with a legal source of non-eagle feathers. The Liberty Wildlife Non-Eagle Feather Repository is one of two non-eagle feather repositories in the country and the only non-Native American one.



# Conservation Update

By Mark Horlings



*Juvenile Zone-tailed Hawk. Photo by Matt VanWallene*

## Resolution Copper Mine, Tonto National Forest

### Lawsuit:

On September 15, Maricopa Audubon Society (MAS) joined local citizen and environmental groups in a lawsuit against the USDA Forest Service, seeking to stop Resolution Copper Company (RCC) from using Tonto National Forest land to dump mine tailings. The San Carlos Apache Tribe filed a companion suit against the Forest Service at the same time. RCC immediately announced that it would seek to intervene in both lawsuits. MAS President Mark Larson filed a declaration accompanying the lawsuit explaining the unique features of the land RCC wants to bury beneath tailings and noted the nesting Zone-tailed Hawks Mark, Lisa Fitzner, and I saw on a spring trip around the area.

RCC plans to drill at fifty-four sites and to excavate thirty-two trenches near Superior and the Boyce Thompson Arboretum to test the geology and hydrology of the proposed tailings site. Work would take a year. The Forest Service approved the project using a simplified environmental assessment (EA), although it would disturb more than 75 acres of National Forest

land and require storage yards and road improvements in addition to drilling sites, wells, and trenches.

MAS' suit was filed in Phoenix, in Federal District Court. The Sierra Club, Earthworks, Center for Biological Diversity, Arizona Mining Reform Coalition, and the Concerned Citizens and Retired Miners Coalition joined as plaintiffs. Violations of the National Environmental Policy Act (NEPA) and other federal laws are alleged. MAS and the other plaintiffs offer several reasons that the drilling, in conjunction with other RCC projects near Superior and Oak Flat, required the Forest Service to prepare an environmental impact statement (EIS) investigating effects and analyzing alternatives. Instead, the Forest Service relied on a summary EA and its finding of "no significant impact" upon the environment.

RCC can complete its drilling and other work before the District Court sets a trial date. Therefore, unless an agreement to suspend work can be reached, MAS and the other plaintiffs will need to seek an injunction-temporary relief avoiding further damage while the Court deliberates.

### Scoping Comments:

The 2014 Defense Authorization Act (Act) forced the Forest Service to surrender 2400 acres of public land RCC wants for the mine at Oak Flat. The Act requires the transfer and also directs the Forest Service to prepare an EIS assessing the mine's impact. The transfer will occur 60 days after the Forest Service submits its EIS.

Under these circumstances, it's reasonable to ask: "Why bother?" Normally, an EIS analyzes potential effects and



discusses alternatives. If the effects are too great or the alternatives too attractive, citizen suits under NEPA can force a project to be dropped or modified. At Oak Flat, however, the Act dictates that the Forest Service must transfer the land, putting it in RCC's private hands and beyond the reach of NEPA. (This does not apply to RCC's plan to use Forest Service land for its tailings pile).

However, the San Carlos Apache Tribe, Representative Raul Grijalva, and others are working hard to modify this law. Preparing the EIS will take at least six years; lots of time for things to change.

Accordingly, when the Forest Service requested scoping (or preliminary) comments, asking MAS and other groups to identify issues they felt the EIS should address, we participated. Environmental groups may lose the right to sue about an issue if they have not identified it during scoping comments.

Mine opponents met and conferred throughout the spring and summer, assigning different issues to different groups. Lisa Fitzner of MAS drafted comments on wildlife issues, which, after input from Tucson Audubon and others, showed how much may be lost if RCC's plans for this mine proceed.

## Tonto Forest Plan:

Tonto National Forest will revise its Forest Plan over the next couple of years. MAS has commented on wildlife, recreation,



Zone-tailed Hawk at Oak Flat. Photo by Matt VanWallene

cattle grazing, and mining issues within the Tonto for years. The Tonto plan has not been revised since 1985, and we hope a revised plan will offer better protection of wildlife and address other environmental issues. A draft assessment has been published, and public meetings offer MAS and others a chance to comment in the coming months. 🦅



## Green Scene Puzzle Answers

### Answers to True or False

1. True. Cardinals, sparrows and finches love to crack open seeds and nuts with their short beaks. Using its tongue to move seeds into a special groove in its lower mandible, the bird can then crush a seed's shell to eat the seed inside.<sup>1</sup>
2. True. Woodpeckers and sapsuckers use their strong beaks to drill holes into trees in search of insects, which they are then able to capture and extract using their long tongues.
3. True. A hummingbird looks for flowers best suited for the size and shape of its beak. Its beak serves as protection for its tongue, which it uses to get the nectar from flowers.
4. True. The Great Blue Heron and Great Egret are two birds that stalk fish in shallow water and use their bills to spear prey.
5. False. Depending on the species, beaks grow about 1-3 inches per year, which allows for a chipped beak to grow out. However, if a beak has major damage, the bird often does not survive because it cannot eat properly.

### Answer to Guess this Bird

Costa's Hummingbird. Although this is a desert hummingbird, it leaves the desert in the hottest days of summer and moves to chaparral, scrub, or woodland habitat. Plant Chuparosa, with its tubular red flowers, to attract this tiny bird.

### Answers to The Bird's Beak or Bill Crossword Puzzle

#### Across

1. Great Blue Heron
2. swallows
3. keratin
4. bill

#### Down

1. mandible
2. flamingo
3. avocet
4. Bald Eagle
5. woodpecker
6. hours
7. vulture

<sup>1</sup> [http://projectbeak.org/adaptations/beaks\\_cracking.htm](http://projectbeak.org/adaptations/beaks_cracking.htm)



# Annual Variation in the Snake Community at Cave Buttes

By Brian K. Sullivan



*The numerically dominant snake at Cave Buttes, Western Diamond-backed Rattlesnake (60% of all snakes observed) basking at the opening of a caliche tunnel.*

Urban development has profoundly altered the northern edge of the Sonoran Desert. To understand how this development affects herpetofauna (reptiles and amphibians), my colleagues and I have been conducting surveys and radio telemetry studies in the Cave Buttes (CB) area of the eastern Union Hills, on the northern edge of the Phoenix Metropolitan region. Over the past three decades, we have examined amphibians breeding in the creosote flats, tortoises inhabiting adjacent slopes and washes, and lizards found throughout the site. Recently, we reviewed the composition of the snake community; here I briefly compare CB with other snake communities of Arizona, and examine annual variation in abundance of snakes at CB over the past five years. It is important to note that the majority of snakes observed at CB were encountered incidentally, during other fieldwork (e.g., radio tracking tortoises), but we also used coverboard arrays and dedicated road riding surveys to sample snakes each year (see sidebar on page 20).

Our analysis suggests the snake community on the northern edge of the Phoenix Metropolitan area is lower in species richness (15 species) and evenness (abundances of the 15 species vary dramatically). Two snake species, the Western Diamond-backed Rattlesnake and Coachwhip, accounted for 75% of all 420 snakes encountered over the past five years. Prior studies, surveying three sites in the Sonoran Desert and two sites

in the Chihuahuan Desert and adjacent grassland, documented that Western Diamond-backed Rattlesnakes generally represent one of the top (numerically speaking) four snake species encountered (three sites: 8%, 8%, and 15%; two non-Sonoran Desert sites: 16% and 20%). Nonetheless, these proportions pale by comparison to the dominance we observed at CB, in which Western Diamond-backed Rattlesnakes represent 60% of all snakes encountered.



*Western Diamondback Rattlesnake ingesting a young cottontail rabbit*

In southeastern Arizona, Western Diamond-backed Rattlesnakes were relatively numerous in both Chihuahuan Desert Scrub (16% of snake species), and Plains Basin Grassland (20%) habitats. Scientists hypothesize that Western Diamond-backed Rattlesnakes have increased at the expense of closely related rattlesnakes due to the conversion of grassland to desert scrub habitat as a result of over-grazing by cattle, and other

anthropogenic activities in recent decades. One area in which Western Diamond-backed Rattlesnakes do dominate the snake community (46% of species) is southcentral New Mexico, along the Rio Grande in a heavily impacted area dominated by agricultural activity and considerable road traffic. These studies are consistent with the hypothesis that disturbed communities may allow for the increased abundance of Western Diamond-backed Rattlesnakes. This may be true for CB as well, since this rattlesnake might take advantage of increased prey available on the desert-urban interface such as cottontail rabbits.



In spring 2016, during field work with tortoises and horned lizards, my research assistants and I were struck by how few snakes we encountered—at least at our CB study site. We noticed fewer snakes than usual: fewer snakes on roads, under coverboards, or while radio-tracking. One hypothesis to account for annual variation in the abundance of snakes is that a dry monsoon leads to either increased mortality or decreased reproductive output, or both, such that snakes might be lower in abundance the following year. For example, in the fall of 2011 and 2015, years of low summer rainfall, we observed extremely emaciated Western Diamond-backed Rattlesnakes; in early January 2016 one very thin individual was found dead on the surface in a wash, with no apparent injuries.

We examined the relationship between monsoon rainfall and numbers of snakes encountered in the following spring for CB. We analyzed the numbers of snakes observed each spring (1 January to 15 June, each year) for CB, relative to the previous summer monsoon rainfall totals (15 June through 15 September): low rainfall precedes lower numbers of snakes in the subsequent year, although we have only a handful of years to assess this relationship. These data are consistent with the notion that a relatively dry monsoon (rainfall ~ 26 mm [an inch] or less) is followed by a spring with reduced encounters of snakes, at least using the sampling methodology we employed at CB (see table on page 20). Each spring from 2011 to 2015, a minimum of 31 and a maximum of 69 snakes of 8–9 species were observed at

CB; in 2016, only 19 individuals of 4 species were encountered. No doubt other factors impact snake abundance, but these observations indicate that annual variation is considerable, and must be evaluated in any long-term monitoring program. These data, while suggestive of general trends, will require additional work to examine hypotheses to account for our observations. 🦋

**Acknowledgments** – For help with access and facilitating our research efforts, I thank L. Amos, S. Brown, D. Cunningham, A. Long, R. Moncayo, and R. Patterson. My family, (Betty Ann and the boys) assisted with observations. This contribution is dedicated to Mr. B.

*Brian Sullivan is Professor, Adjunct Curator for the Herpetological Collection, and a Senior Sustainability Scholar at Arizona State University.*

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*continued on next page*



*All photos by Brian Sullivan*

*Other snakes encountered at Cave Buttes: Tiger Rattlesnake (< 1% of snakes encountered; upper left), Mohave Rattlesnake (3%; upper right), Sonoran Whipsnake (< 1%; lower left), and Coachwhip (15%; lower right).*



# Annual Variation in the Snake Community at Cave Buttes

Abundance of snakes during the spring (January through 15 June) by year and monsoon rainfall during the previous year (15 June to 15 September) at Cave Buttes. Rainfall provided by the Maricopa County Flood Control District office (one gauge at the center of the site). Note that 2016 was the only year in which Western Groundsnakes ("WG" below) were more abundant (most abundant snake = "primary", followed by percentage of total snakes observed that season) than Western Diamond-backed Rattlesnakes ("WDB" below).

Year	No. of snakes (species)	Primary sp.	Monsoon rainfall (year)
2011	69 (9)	WDB (68%)	1.14" (2010)
2012	31 (8)	WDB (68%)	0.79" (2011)
2013	43 (8)	WDB (49%)	2.32" (2012)
2014	52 (9)	WDB (61%)	5.25" (2013)
2015	50 (8)	WDB (43%)	4.80" (2014)
2016	19 (4)	WG (48%)	0.43" (2015)



Coverboard: Desert Nightsnake



Road riding: Variable Sandsnake

## How To Find Snakes: Coverboards And Road Riding

Snakes are notoriously difficult to find—those who live in fear of an unexpected encounter might be surprised to learn just how difficult it can be to survey these elusive reptiles. Ask any herpetologist, and they tell you two approaches to increase your chances of finding snakes, both of which take advantage of their inclination to seek refuge or alternatively, to warm themselves. Because they are ectotherms, organisms that elevate their body temperature by external sources, snakes may thermoregulate by flattening their body against the warm surface of a paved road after sunset. In the arid Southwest entire communities of snakes have been sampled effectively using this method, termed "road riding" by herpetologists. However, it has long been recognized that this approach is biased toward nocturnal species; active, diurnal forms like whipsnakes and racers, are often only detected when individuals have been hit and are subsequently found "dead on the road" (the term "DOR" was coined for such specimens decades ago). Small, secretive species may not be easily detected when crossing or thermoregulating on the pavement, or may be reluctant to move into the relative open of the roadway. Herpetologists have developed sampling methods for

these species, and we adopted one of those, "coverboards," for Cave Buttes.

As ectotherms, snakes of arid regions must take refuge from extremes in temperature. Many do so by retreating to rodent burrows, or burrowing under some surface object. "Coverboards" exploit this behavior. Rocks and logs are often "flipped" by herpetologists as they walk through an area looking for snakes; these represent natural cover objects under which snakes may take refuge only to be exposed by the surveyor. Herpetologists have recognized that one can greatly increase the probability of encountering snakes by placing pieces of wood in sheltered sites (e.g., in the shade of a large Palo Verde tree) that can be lifted subsequently to detect any snakes that have taken refuge under the object. Cave Buttes is near a county landfill site, and hence, many objects to use as coverboards were available when we started our surveys: pieces of plywood, 15 mm (1/2 inch) thick and roughly a meter (yard) square, were found at the site, and placed more systematically along a path that was revisited once a month over a three year period. Some snakes such as the Western Groundsnake were primarily encountered using this method. 🐍



# ARIZONA CHRISTMAS BIRD COUNT SCHEDULE [2016-2017]

By Walter Thurber, Arizona Field Ornithologists

The National Audubon Society has conducted Christmas bird counts since the year 1900. Volunteers from throughout the Western Hemisphere go afield during one calendar day between December 14 and January 5 to record every bird species and individual bird encountered within a designated 15-mile diameter circle. These records now comprise an extensive ornithological database that enables monitoring of winter bird populations and the overall health of the environment. Participants are typically assigned to teams based on their bird identification skills and endurance. Many counts hold a compilation dinner at the end of the day where results are tabulated and stories shared. There is no longer a participation fee. Help is needed on most of these counts, so find one or more of interest to you and contact the compiler for information. 🐦

Date	Day	Count Name	Compiler	Phone	Email*
12/14	We	Salt-Verde Rivers	Kurt Radamaker	480-585-1606	kurtrad@mexicobirding.com
12/14	We	Sedona	Rich Armstrong	928-282-3675	richarmstrong@q.com
12/14	We	Tucson Valley	Rich Hoyer	520-325-5310	birdernaturalist@me.com
12/15	Th	Patagonia	Abbie Zeltzer	520-394-0146	tarny@theriver.com
12/17	Sa	Avra Valley	Claudia Johnson	509-264-9076	claudialj@mac.com
12/17	Sa	Cabeza Prieta NWR	Kim Veverka	520-387-4987	kim_everka@fws.gov
12/17	Sa	Hassayampa River	Vanessa Montgomery	623-465-0012	hassayampacbc@yahoo.com
12/17	Sa	Martinez Lake-Yuma	Lin Piest	928-341-4049	lpiest@azgfd.gov
12/17	Sa	Mormon Lake	Terry Blows	928-774-8028	terence.blows@nau.edu
12/17	Sa	Nogales	Michael Bissontz	520-577-8778	seetrogon@comcast.net
12/17	Sa	Santa Catalina Mountains	Brian Nicholas	520-760-3583	weehawker2@yahoo.com
12/18	Su	Buenos Aires NWR	Bonnie Swarbrick	520-240-3737	bonnie.swarbrick@gmail.com
12/18	Su	Grand Canyon	Brian Gatlin	928-638-7893	brian_gatlin@nps.gov
12/18	Su	Jerome	Julie Wills	928-300-9775	jwills282@hotmail.com
12/19	Mo	Chino Valley	Russell Duerksen	928-925-5567	duerksen@msn.com
12/19	Mo	Lukeville	Joe Veverka	520-387-6849	joe_everka@nps.gov
12/19	Mo	Phoenix-Tres Rios	Marceline VandeWater	602-689-4356	marceline@eraroni.net
12/20	Tu	Organ Pipe Cactus NM	Joe Veverka	520-387-6849	joe_everka@nps.gov
12/21	We	Prescott	Carl Tomoff	928-778-2626	tomoff@northlink.com
12/26	Mo	Superior	Cynthia Donald	480-283-4515	planres@earthlink.net
12/27	Tu	Gila River	Troy Corman	602-717-2928	aplomado@cox.net
12/28	We	Bill Williams River NWR	Kathleen Blair	928-667-4144	kathleen_blair@fws.gov
12/28	We	Green Valley-Madera Canyon	Sally Johnsen	520-399-4050	empidonax@netzero.net
12/28	We	Willow Beach	Joseph Saccomanno	928-767-4772	joseph_saccomanno@fws.gov
12/29	Th	Havasupai NWR	DeeDee DeLorenzo	928-758-2707	deedeedelorenzo@gmail.com
12/30	Fr	Carefree	Cathy Wise	602-301-7530	cwise@audubon.org
12/31	Sa	Flagstaff-Mount Elden	Terry Blows	928-774-8028	terence.blows@nau.edu
12/31	Sa	Portal	Jackie Lewis	520-558-2287	winjac12@vtc.net
01/02	Mo	Atascosa Highlands	John Yerger	520-495-0229	john@adventurebirding.com
01/02	Mo	Camp Verde	Holly Kleindienst	928-853-6887	hollykleindienst@gmail.com
01/02	Mo	Dudleyville	Doug Jenness	520-909-1529	d_jenness@hotmail.com
01/02	Mo	Payson	Dave Hallock	928-474-9475	eldoradh@rmi.net
01/03	Tu	Appleton-Whittell	Suzanne Wilcox	520-455-5522	swilcox@audubon.org
01/04	We	Glen Canyon	John Spence	928-608-6267	john_spence@nps.gov
01/05	Th	Timber Mesa	Mary Ellen Bittorf	928-367-2462	mcbitt30@cableone.net

## Nearby New Mexico Count

01/01	Su	Peloncillo Mountains	Nicholas Pederson	505-417-8665	ndpederson83@gmail.com
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Issued 10/17/2016

# Nature through the Artist's Eye: Marsha Bennett



Marsha Bennett hiking the ACE Gap trail in the Great Smoky Mountains National Park. Photo by Susan Cooper

Combining nature and art has been my passion for the past 11 years. I needed a focus for my nascent art skills and the Desert Botanical Garden's Botanical Art and Illustration Program became that target. I, along with 13 others, including your editor, Gillian Rice, completed the program in 2010. While the program no longer exists, its ripple effect continues.

We provided illustrations for the exhibition, *Grand Canyon's Green Heart* in 2011. Using watercolor, pen and ink, and colored pencil, we illustrated rare plants of the Canyon. We contributed pen and ink illustrations for a newly revised scientific volume of *Intermountain Flora: Vascular Plants of the Intermountain West*, published in 2012.

I began to volunteer at the North Mountain Visitor Center located along Trail 100 in the Phoenix Mountains Preserve. I suggested a botanical art exhibition to Leslie Spencer-Snyder, Vice President of Save Our Mountains Foundation, the non-profit organization that manages the daily operations of the Center. Her response was: "We want a permanent exhibition of the plants being collected through the citizen science-based North Mountain Plant Inventory Project (a component of the Plant Atlas Project of Arizona)." I thought: "Wow! What artist doesn't want his or her work on permanent display?" I already had 10 illustrations (five of which were part of my Certificate program; the others were completed as part of a dream of producing an illustrated book of the plants of Trail 100. But we needed more.

I enlisted the help of my fellow botanical artists, now members of the Southwest Society of Botanical Artists (SWSBA), to submit illustrations. We needed financial support so Stacey Beute of the Central Arizona Conservation Alliance (CACA) provided funding. She, artists Elaine Hultgren and Joyce Peters of SWSBA, and I designed the exhibit *Drawing Us Together: Live, Learn & Fall in Love with the Flora of North Mountain*. Within six months of our first meeting in 2013, we had the exhibition up and running in the Center's Education Room.

We also hung two smaller exhibitions. One comprises the work of Wendy Hodgson, Curator of the DBG Herbarium, artist, botanist, teacher, and an inspiration to us all. The second features the work of Joyce Peters: *Pollinators – More than just Birds and Bees*.

My botanical illustration efforts have slowed down because Leslie keeps finding more projects for us to do. In 2014, SWSBA members contributed line drawings of plants, animals, and birds of the Preserve for a child's coloring book, *DRAWN TOGETHER Plants and Animals of the Phoenix Mountains Preserve*. This educational book, sold at the Visitor Center, uses poetry to explain each animal and plant, and includes activity pages and reference information. All proceeds go to the Save Our Mountains Foundation.

Last year, Cass Blodgett and I produced a 3"x5" trail guide of the major plants of the North Mountains Preserve, with

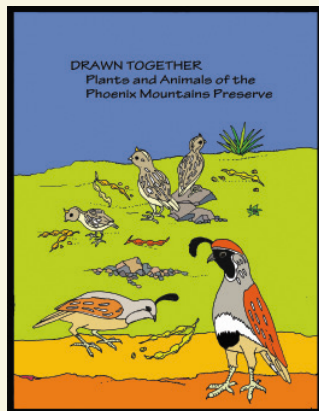
photographs by Max Licher and plant descriptions.

Titled *What Plant is That?! (a frequent question my mother asks when she visits Arizona)*, we aim to help the casual hiker and visitor learn about our wonderful flora. Again, proceeds go to the Save Our Mountains Foundation.

While I don't draw and paint as much as I like, I am trying to encourage others to do so. We have established an art program at North

Mountain Visitor Center (see box).

What's next? More rotating exhibits for the Visitor Center and maybe more trail guides about the approximately 130 plant species of the Preserve. My next year will also be devoted to reviving my art skills. As a pebble generates ripples in a pond, one project has led to so many more. Who knows what might happen next? 🐦



***Cylindropuntia acanthocarpa***

Buckhorn Cholla

watercolor and colored pencil, 16" x 20"





***Ribes cereum***  
Wax Currant  
watercolor, 16"x20"



***Cylandropuntia leptocaulis***  
Christmas Cactus  
watercolor, 14"x11"



***Sphaeralcea ambigua***  
Desert Globemallow  
colored pencil, 16"x20"

## Botanical Art Classes

**Location:** North Mountain Visitor Center  
12970 N. 7th Street, Phoenix

Beginners and experienced artists welcome. Explore the wonders of the North Mountain Area through botanical art. Four 9-hour art classes are offered with lectures on the geography and flora of the North Mountain Area as you illustrate examples from the preserve. While the classes are designed in a sequential manner, each class can be taken separately.

**Class One: Rocks & Cacti - Basic drawing in graphite**

Wednesdays, November 2, 9, and 16.  
6:00-9:00 pm

**Class Two: Legumes of North Mountain - Colored Pencil**

Thursdays, January 5, 12, & 19. 6:00-9:00 pm

**Class Three: Asters of North Mountain - Watercolor I**

Sundays, February 5 and 19. 9:00 am - 3:00 pm (one hour break for lunch)

**Class Four: Creosote & Herbs of North Mountain - Watercolor II**

Sundays, March 5 and 19. 9:00 am - 3:00 pm (one hour break for lunch)

**Fee: \$120 per class**

Instructors hold a Certificate in Botanical Art and Illustration from the Desert Botanical Garden and have extensive teaching experience in botanical subjects. For more information contact Marsha Bennett, Program Coordinator, at: [Marsha.Bennett@DignityHealth.org](mailto:Marsha.Bennett@DignityHealth.org)

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### Monthly Meeting

First Tuesday of the month, unless otherwise announced, September through April, 7:30 p.m. Our meeting place is Papago Buttes Church of the Brethren, 2450 N 64th Street, Scottsdale, AZ (northwest of 64th Street and Oak Street, which is between Thomas Road and McDowell).

Please contact a board member if you have any questions, or check out our web site at [www.maricopaaudubon.org](http://www.maricopaaudubon.org). Pre-meeting dinners (September through April) are held at Rolling Hills 19th Tee Restaurant, 1405 N. Mill Avenue, starting at 6:00 p.m.

### Membership Information and How to Receive *The Cactus Wren*•dition

Two distinct memberships exist: membership of the National Audubon Society (NAS) and membership of the Friends of Maricopa Audubon Society (MAS).

To become a member of the NAS please go to:  
[www.audubon.org/audubon-near-you](http://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 download the form from our website,  
<http://maricopaaudubon.org>

For specific questions please contact our Membership Chair.

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Copy for *The Cactus Wren*•dition must be received by the editor by e-mail, by January 15, April 1, July 1, and October 1. Articles not received by the deadlines may not appear in the upcoming issue. Email to: *The Cactus Wren*•dition Editor, Gillian Rice: [editor.wrendition@yahoo.com](mailto:editor.wrendition@yahoo.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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