The Cactus Wren•dition

Volume LXIX No. 3 Fall - 2018

Bald Eagle
by Andrew Cahill Hoppin

Programs

Meetings are held in Scottsdale: Papago Buttes Church of the Brethren (northwest of 64th Street and Oak Street, which is between Thomas Road and McDowell Road). Southbound, you may enter from 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.

Committees/Support

Arizona Audubon Council Rep
Position Open

Bookstore
Mel Bramley
480 969-9893

Hospitality
David Chorlton
480 705-3227

Web Page
Michell Peppers
480 968-5141
burge@burgenv.com

Maricopa Audubon Website
http://www.maricopaaudubon.org

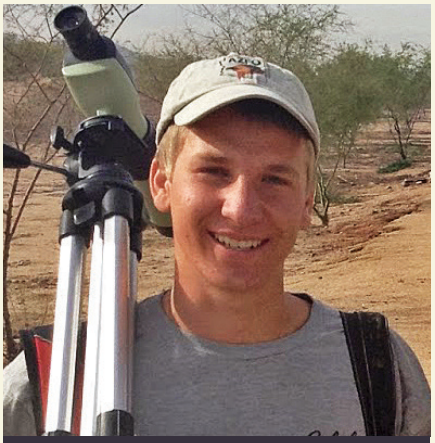
"Nature does not hurry, yet everything is accomplished."

Lao Tzu

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.



Caleb Strand

September 4, 2018

Joe Ford on Caleb's Birds

Enjoy the bird photography of Caleb Strand, taken from the age of 15 when he began both birding and photography. A resident of rural Buckeye, Caleb is considered one of the top ten birders in Arizona. Caleb is now 18 and leads bird walks and participates in field expeditions with Arizona Field Ornithologists (AZFO). Joe Strand will showcase Caleb's images with fascinating information on each local bird species. For more on Caleb Strand, see birdingwithcaleb.blogspot.com

Missouri native Joe Ford retired from a teaching career to Sun City. An active volunteer for numerous organizations, he leads bird walks at Maricopa County Parks and presents programs on bird life, environmental concerns, plants, and geology. Joe is a member of AZFO and Sonoran Audubon Society.

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!

October 2, 2018

Please go online or join our email list to see our October program announcement.

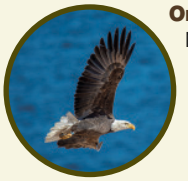
November 6, 2018

Wildlife of Tanzania with Walt Anderson

Northern Tanzania is justly famous for the Great Migration of large grazing mammals and the predation dramas accompanying the herd movements. It is equally famous for gorgeous, easily observed birds (sunbirds, eagles, falcons, hornbills, rollers, and ostriches). Join Walt for a vicarious experience of notable places like the Serengeti, Ngorongoro, Mt. Meru, Tarangire, and Lake Manyara. His photos and stories of connections among people, land, and wildlife may whet your appetite to join him on a safari to Tanzania (next January) or Uganda (next February).

Walt Anderson is Professor Emeritus of Environmental Studies at innovative Prescott College. Holding advanced degrees in Wildlife Biology and Resource Ecology, he was a biologist on national wildlife refuges, founded and co-directed a private sanctuary system in the Sutter Buttes of California, and has led ecotourism trips all over the world. He is an accomplished artist and photographer and considers his true calling to be that of naturalist.

Grey Crowned Crane.
Photo by Walt Anderson



On the Cover: Bald Eagle
Nikon D800E, Lens: Tamron 150-600mm G2, 1/2000 sec, f/6.3, ISO 640, Saguaro Lake, December 9, 2017, by Andrew Cahill Hoppin.

Andrew says: I was walking along the cliffs at Saguaro Lake when I noticed the eagle resting on its favorite perch under the white Larry Elman, Jr. cross. I went out of the eagle's line of sight to get as close as I could, found my best angle along the ledge, and carefully positioned myself to capture the take off. (See page 20 for more eagle photographs – Ed.)

President's Message

Mark W. Larson

Because of our relatively long lead times before publication, I'm writing this at the end of June on yet another 110° day. It will be a long time before we have weather fitting the description of "fall." Nevertheless, there is a lot to look forward to this fall. In addition to welcoming back many members from their summer homes elsewhere, Program Chair Laurie Nessel has an exciting slate of programs that you will enjoy immensely; Field Trip Chair Larry Langstaff has field trips lined up that will take you to some familiar haunts as well as introduce you to some new places to enjoy birds and other fascinating aspects of our natural world. Mark Horlings and his Conservation Committee have several local and regional environmental issues on their plate, and your other Board members each have tasks to perform that will improve your Maricopa Audubon Society.

I must make special note of the outstanding work being done by our Editor, Gillian Rice. Largely due to her efforts and expertise, we have gone from having a nearly black-and-white newsletter to a full color, 24-page publication of near magazine quality! She has brought together writers who have knowledge about any number of natural fields and worked with them to produce well illustrated, thoughtful pieces that shed light on some of the mysteries of our natural systems, including birds, but not limited to them. If you appreciate her work on *The Cactus Wren•dition* I encourage you to send her a note, especially if you have an idea for a story that you would like to read in a future edition.

Earlier this week I returned from a three-week trip to Costa Rica. This was my fifteenth visit there in the past twenty years and on each visit I've met more wonderfully friendly people, seen a few new species of birds and mammals, and learned more about the rich culture to be found there. On this trip, I had the pleasure of seeing my first Baird's Tapir as it crashed through the undergrowth of Tenorio National Park! And, during this trip, I kept saying to myself how much our members – you! – would be enriched by such experiences, and return home with a new understanding of what it will mean someday for our country to have, as in Costa Rica, a much greater proportion of the population appreciate the natural richness we possess.

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

Letter from the Editor

by Gillian Rice

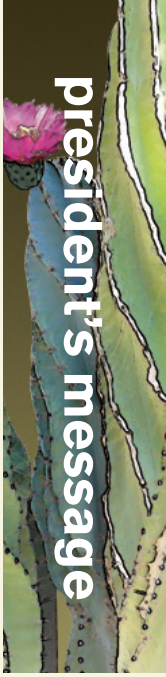
Gillian Rice

We might think of fall as the time to look for migrating birds. I find this season excellent for observing dragonflies too, some of which also migrate. I look for Common Green Darner and Black Saddlebags. These migrating insects behave like migrating birds: building up fat reserves, using favorable winds, and following the same flyways as the birds. Find out more and even contribute your own sightings as a citizen scientist at http://www.migratorydragonflypartnership.org

Like so much in nature, dragonflies are astonishing: they can control the angle and speed of each of their four wings independently to fly in any direction, hover, and maneuver acrobatically. An exhibition at the Natural History Museum in London this year (http://www.nhm.ac.uk) revealed how the dragonfly's abilities might inform airplane wing design and enable small aircraft to cope better with extreme flight conditions and unpredictable air flow.

We have so much to learn from nature: just one more reason to protect our environment. The Bald Eagle on this issue's cover reminds us that we can succeed (although we must not be complacent). With the deluge of negative news about the demise of many habitats and species, we often feel hopeless. But even small local efforts can help. Here, we share a few – adapt to where you live (our desert home, p 14); plant a native garden (good for the soul and for creatures, p 16); share your enthusiasm and be a citizen scientist (encourage youth and your community, p 10); or use your creativity to inspire others (poetry, p 5; art, pages 6 and 22; photography, p 20).

This issue would not be possible without the many contributors who volunteer their time, writing talent, art, and photography. Thank you all!



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How to walk on Arizona roads in summer

Coatimundi by FowlContent

12TH ANNUAL ARIZONA FIELD ORNITHOLOGISTS MEETING

October 26-28, 2018
Sonoran Desert Inn and Conference Center, Ajo

- Mini-expeditions led by local experts
- Research presentations/posters (abstract deadline: September 1)
- Presentations on where to go birding in Arizona
- Keynote speaker: Nathan Pieplow, author, *The Peterson Field Guide Bird Sounds of Eastern North America* – and soon a Southwestern birds version
- Bird identification quizzes

Youth scholarships
Maricopa Audubon Society sponsors scholarships for young people interested in field ornithology to attend AZFO's Annual Meeting. Application deadline: October 1.

See http://www.azfo.net/annual_meetings/annual_meetings.html

Maricopa Audubon Society 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

September-October, date TBA

Stewart Mountain Desert Tortoise Quest

Have you ever seen a Sonoran Desert Tortoise in the wild? Increase your chances of stumbling upon one of these iconic desert creatures by searching in their preferred habitat after a summer monsoon. We are not setting an exact date for this trip near Saguaro Lake until the conditions are right. We will collect email addresses and phone numbers and contact you one day before or possibly the morning of the walk. It could be a weekend or weekday. Learn about the behavior, life cycle, and status of this keystone species. Difficulty: 4 (steep, rocky terrain, and hot, humid weather). Bring snacks, sun protection, hat, sturdy hiking shoes, and plenty of water. Start near daybreak and return by noon. Limit:10.
Leader: Laurie Nessel, laurienessel@gmail.com or 480 968-5614 to get on the call list.

Tuesday October 2

Bushnell Tanks

An under-birded area off SR87 near Sunflower with great potential to host late migrants as well as attract wintering species, possibly American Robin, Western Bluebird, Townsend's Solitaire, and Cedar Waxwing, and resident species found along sycamore-lined creeks, some open fields, and nearby desert. Start 6:15 am in Fountain Hills, and finish about 11:30 am in a Fountain Hills coffee shop/restaurant. Difficulty: 2-3 (about a five-mile hike round trip, fairly flat). Limit: 7.
Leader: Kathe Anderson, kathe.coot@cox.net

Saturday, October 6

Pinal Mountains area, south of Globe

The first of many Fox Sparrows and Chihuahuan Ravens may have arrived to add to chaparral birds (Black-chinned Sparrow, Crissal Thrasher, Juniper Titmouse), oak-pine woodland birds (Olive Warbler, Williamson's Sapsucker, Yellow-eyed Junco), and likely spruce-fir forest birds (Mountain Chickadee, Cassin's Finch, Red Crossbill). Nesting species linger and unusual wintering species can appear. Difficulty: 2 (some sloped walking terrain). Bring lunch and drink. Temperatures in the 50s to the 60s most of the day as we climb to nearly 8000 ft. Limit: 11 in three vehicles.
Leader: Dave Pearson.
Reservations: Larry Langstaff, larrylangstaff1@gmail.com

Saturday, October 13

Gilbert Water Ranch Waterfowl Workshop

The purpose of this workshop is to study "eclipse-plumaged" ducks before they develop breeding plumage. This day will also reveal other species drawn to this eBird Hotspot in Gilbert. Learn to ID ducks based on their structure during this challenging period when their colors and other field marks might be confusing. Bring your field guide, and a scope if possible. Easy. Limit: 5.
Leader: Cindy Marple, clmarple@cox.net

Saturday, October 20

Family Walks in Papago Park: Dragonflies and Butterflies

Learn to identify local butterflies including Painted Lady, Queen, and Fiery Skipper as well as common dragonflies and damselflies such as Blue Dasher, Flame Skimmer, Blue-ringed Dancer, and Familiar Bluet. Easy, one to one and a half hour strolls around the lakes. Children welcome. Bring binoculars (close-focus preferred), water, and hat. *Common Dragonflies of the Southwest* by Kathy Biggs on sale for $10.00. Meet 8:00 am at Lake 2. No reservations needed.
Leaders: Janet Witzeman and Laurie Nessel, laurienessel@gmail.com

Sunday, November 4

Lower Salt River

See up to 50 bird species including Western Grebe, Green Heron, Ladder-backed Woodpecker, Rock Wren, and Vermilion Flycatcher. Impressive sightings of Bald Eagle, Sora, and Black-tailed Gnatcatcher likely. Bring lunch, and a telescope, if available. Drivers need a Tonto National Forest day use parking pass, purchased in advance. Easy. Limit: 15.
Leader: Richard Kaiser, rkaiserinaz@aol.com, 602 276-3312

Friday, November 16

Arlington Valley and Gillespie Dam

Look for hawks, Sandhill Cranes, sparrows, and wintering birds in this agricultural area southwest of Phoenix. Riparian habitat and low desert brush will boost our species total. Bring snacks, a drink, and a scope if you have one. Easy. Limit 11 in three vehicles
Leader: Dave Pearson.
Reservations: Larry Langstaff, larrylangstaff1@gmail.com

Tuesday, November 20

Baseline and Meridian habitat

Explore desert and riparian habitat at the confluence of the Salt and Gila Rivers near Phoenix International Raceway. The path leads down to the river bed, with good habitat for egrets, herons, kingfishers, Marsh Wrens, some common desert species, raptors, ducks and other waterfowl. Leave Scottsdale about 6:30 am, spend two hours birding, and look for a coffee shop where we will discuss our bird list. Return about 11:00 am. Difficulty 1-2 (uneven terrain). Limit 7.
Leader: Kathe Anderson, kathe.coot@cox.net

Saturday, December 1

Sweetwater Wetlands and El Rio Open Space

Good days at these Tucson-area eBird Hotspots can top 45 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. A morning trip, returning to Phoenix by mid-afternoon. Bring a scope if possible. Easy. Limit 7.
Leader: Cindy Marple, clmarple@cox.net

Monday, December 3

Santa Cruz Flats, Pinal County

Target species are Sprague's Pipit, Mountain Plover, and Crested Caracara. Up to eight or nine species of hawk possible. Location provides opportunities to develop sparrow identification skills. Bring lunch, water, and a scope if you have one. Easy. Limit: 11 in three vehicles.
Leader: Dave Pearson.
Reservations: Larry Langstaff, larrylangstaff1@gmail.com

Wednesday December 12

Scottsdale Ponds

This trip usually results in 35-45 species. See wintering waterfowl and common urban birds. Possible Valley rarities such as Red-breasted Nuthatches, Common Mergansers, and Bald Eagles. Start in Scottsdale at 7:45 am and finish about 10:45 am. Easy. Limit 7.
Leader: Kathe Anderson, kathe.coot@cox.net

ADEQ Prepares To Issue Clean Water Act Fill Permits

by Mark Horlings

The Clean Water Act restricts development of wetlands. The Environmental Protection Agency (EPA) relies on the Army Corps of Engineers to investigate proposed projects and to advise whether Section 404 permits to dredge or fill wetlands should be issued.

The 404 permit process can be critical to a wide variety of developments. The Rosemont copper mine proposed near Tucson has been stymied by difficulty qualifying for a 404 permit, as have the developers who hope to add 29,000 housing units near Benson in the Vigneto project.

Because the EPA and the Army Corps of Engineers are federal agencies, deciding whether to issue a 404 permit qualifies as "federal action." Therefore, courts can review decisions to fill or dredge wetlands under the National Environmental Policy Act.

In 2017, the EPA began encouraging state environmental agencies to assume responsibility for issuing 404 permits. At a December, 2017 public meeting, the Arizona Department of Environmental Quality (ADEQ) tested the idea. State legislation authorizing ADEQ to assume the program would be required, but ADEQ suggested it could offer local control, faster processing, and better understanding of desert wetlands.

On the other hand, ADEQ would need to hire specialized experts, and the program's expense would shift to the state. ADEQ (whose budget comes entirely from permit fees and federal grants) would need to charge much higher fees than EPA's. Despite the expense, industry and developers seemed universally in favor. Conservationists felt ADEQ would be too subject to political pressure, the need for ADEQ to collect fees from developers would favor issuing permits, and NEPA and Endangered Species Act protections would be lost.

The Arizona legislature easily passed a 2018 law authorizing ADEQ to assume the 404 program, and ADEQ hosted more public meetings in June. ADEQ openly stated that it wanted to assume the 404 program and would prepare plans and formal rules which it hoped to submit for EPA's approval by early 2020.

Opponents argued ADEQ would be unable to provide the necessary "equivalent" protection for wetlands because (1) ADEQ lacks qualified staff, (2) endangered species questions will arise and ADEQ lacks the resources of EPA and the US Fish and Wildlife Service, and (3) Arizona has no state statute comparable to NEPA under which ADEQ's decisions could be reviewed. Conservation groups also cited ADEQ's tendency to offer general permits, exempting entire categories of dredge and fill operations from individual review.

Those favoring ADEQ's assumption of the 404 program argued that ADEQ would act swiftly and with better understanding of local conditions. ADEQ suggested a local agency would be more likely to find and report scofflaws to law enforcement. Supporters were frank in welcoming the end of "federal action" and NEPA oversight as much as conservation groups opposed it.

Business interests seemed more divided about the wisdom of local regulation in June than they had been last December. Industry, agriculture, and mining interests could see the new fees would be substantial, and some doubted ADEQ's ability to find staff. Others felt EPA oversight of ADEQ's program would result in a dual system, forcing applicants to satisfy both regulators.

Two states already administer their own 404 permit programs. Several others, under EPA prodding, are considering assuming responsibility for 404 permits. Some of those states have enacted "little NEPAs" guaranteeing judicial oversight over state action. Arizona has not enacted a comparable "little NEPA" statute and is unlikely to do so. MAS and its allies in Arizona, therefore, continue to oppose ADEQ's assumption of the wetlands permit program.

Southwestern Willow Flycatcher Update

MAS Vice President Robin Silver and other allies have fought for years to protect habitat for the Southwestern Willow Flycatcher. In 2016, a federal court in Nevada ruled that the US Department of Agriculture (USDA) violated the Endangered Species Act (ESA) by introducing tamarisk beetles to control invasive tamarisk trees. The endangered flycatcher had adapted to nest in tamarisk, and the beetle's introduction imperiled survival of the birds.

On June 19, 2018, the court issued its Remedial Order giving USDA fifteen months to provide detailed plans to repair the damage already done. In particular, USDA was ordered to provide plans to restore, with native cottonwoods and willows, eighteen stretches of river, including, in Arizona, Roosevelt Lake and portions of the Gila, San Pedro, Bill Williams, Verde, and Colorado rivers. The Court noted USDA's "longstanding failure to comply with Section 7(a)(1) of the ESA" and stated that any delays or extensions would require USDA to file motions and show good cause.

Great-tailed Grackles

By David Chorlton

Daytime reruns on TV
bring back the nineteen sixties:
time before grackles
reached Phoenix
although their wings were still shining
in Florida; time
when Marshall Dillon showed
some quick draw compassion
in the world before special effects
burned every plot
to a crisp; when Richard Nixon could take
credit for keeping
the air clean.
While Three Mile Island
melted down they were undeterred
moving west; while Vietnam
became a dirty word
they rattled and shrieked; they slept
through the Kent State shootings;
as the presidency
came apart they made themselves
familiar as laugh tracks
all the way
to a future on the coast.
Think of what might have been:
your neighborhood
without their iridescent cries
and light skidding from
their feathers as they pose
with beaks pointing straight at
the blistering sky
as if calling down rain
from dry heat.

All Photos by Neil Rizos

A Coastal Journey to San Juan Island, Washington

by Neil Rizos

The early morning fog is slowly beginning to lift, revealing low, dark clouds above and curtains of rain showers in the distance. I am sitting nearly motionless among the dark, jagged rocks exposed by the outgoing tide. Thirty feet in front of me, nearly a dozen Harlequin Ducks emerge from the calm water and clamber up the seaweed draped rocks. Completely indifferent to my presence, the small flock of males and females preens and rests. This is exactly the moment I have been waiting for: The chance to observe beautiful, relaxed, wild birds exhibiting their natural behaviors in a picturesque setting. Several ducks are sleeping peacefully. A few are serving as sentries, constantly scanning the skies for threats from the abundant Bald Eagles or the occasional Peregrine Falcon. But most are engaged in the vital task of waterproofing and maintaining feathers – demonstrating amazing contortionist skills as they apply oil all over themselves, gathered from the preen gland at the base of the tail. I watch for some time, mesmerized by the beauty of my surroundings and enchanted by the fascinating behavior of these lovely creatures. As I photograph and sketch my subjects, ideas for paintings, etchings and sculptures flood my imagination. Predictably, the spell is broken when the heavens open and I scramble for shelter under the canopy of the towering Douglas firs on the shoreline.

This journey began on February 28, 2018, when my partner Stephanie and I packed the car and departed Los Angeles for a month-long visit to San Juan Island, Washington. Guided chiefly by our interest in birds and other wildlife, as well as our appreciation for places of natural beauty, we plotted a coastal route, avoiding highways whenever possible and limiting our travel to four hours each day. We had twelve days to reach Anacortes, WA, a distance of approximately 1,400 miles. From there we would take a ferry to Friday Harbor, San Juan Island. We planned for several multi-day stopovers in areas of particular interest. The west coast of the United States is a vast area, comprising everything from desert to rainforest, and one could easily explore it for a lifetime and never experience it fully. The following is a selection of highlights from our journey.

A quick, on the spot sketch of Harlequin Ducks to inspire a painting or etching. Pen/paper, 6" x7"

Harlequin Ducks in a rare, tranquil moment.

California Highlights

- Morro Bay – The off-season at Morro Bay made our visit both affordable and crowd-free. We spent the morning exploring the bay area and lagoon, but the high winds and rain were relentless. We saw at least a half-dozen Sea Otters with young, Harbor Seals and the expected assortment of birds–pelicans, cormorants, gull and shorebird species–all easily observed from shore. http://www.parks.ca.gov

- Piedras Blancas - We were excited to encounter the elephant seal rookery at Piedras Blancas, near San Simeon. The rookery was very active, and the seals may be safely viewed from walkways above the beaches. The males are enormous at four thousand pounds and thirteen feet long. Elephant seals use these areas throughout the year for birthing, breeding, molting, and rest. http://www.elephantseal.org

- Humboldt Bay NWR – A beautiful setting definitely worth visiting any time of year. Birds seen included Aleutian Cackling Goose, Tundra Swan, Brant, Northern Harrier, Marbled Godwit, Marsh Wren and a good variety of other shorebird and passerine species. https://www.fws.gov/refuge/humboldt_bay/

- Humboldt Redwoods State Park - This magnificent 51,000 acre park, (part of Redwoods National and State Parks) preserves the largest expanse of ancient redwoods on the planet. Living organisms of this size and age, standing together in silence, dissolve boundaries between the plant and animal kingdoms. These awe-inspiring groves, composed of thousands of trees, create a cathedral-like effect not soon forgotten. http://www.parks.ca.gov

Oregon Highlights

- Harris Beach State Park (Brookings) – Our first stop in Oregon merits a look, if only for the scenery. Miles of broad, sandy beaches offer ideal shorebird habitat especially during migration, and many seabird species inhabit the cliffs and

The rocky shoreline on the eastern side of San Juan Island, looking northeast.

islands. We saw Pelagic Cormorant, Common Murre, and Black Oystercatcher. https://oregonstateparks.org/index.cfm?do=parkPage.dsp_parkPage&parkId=58

- Oregon Coastal Highway - Oregon's 363 miles of coastline provide spectacular scenery, great birding, whale watching, and uncrowded beaches to explore. http://www.oregoncoasttravel.net/

- Charleston Marine Life Center and Museum - We spent two days in Charleston at the University of Oregon's Institute of Marine Biology. Worth a visit is the Marine Life Center and Museum across the street. The area's beaches and forests are great for birding; California Sea Lions also graced the harbor docks each evening. http://www.charlestonmarinelifecenter.com/

- Oregon Coast Aquarium – Located in Newport, this aquarium affords the chance to visit a seabird aviary, providing up-close encounters with Tufted Puffin, Horned Puffin, Rhinoceros Auklet, Pigeon Guillemot, Common Murre, and Black Oystercatcher. http://aquarium.org/

Washington & San Juan Island

- Heavy rains along the Washington coast meant birding during that portion of our trip was done while driving north from the mouth of the Columbia River to Seattle. The area between Seattle and Anacortes is a major migratory waterfowl wintering ground and we saw large flocks of Snow Geese in the fields along Route 5. Needing to catch a ferry, we didn't stop to look, but we'll make those fields (and birds!) a part of our next Pacific Northwest adventure.

- The ferry from Anacortes to Friday Harbor takes about an hour. During the sunny, calm passage, we saw Pelagic Cormorant, Pigeon Guillemot, Rhinoceros Auklet, Surf and White-winged Scoter. Arriving at Friday Harbor, we delighted in the slower pace of life. People were friendly and remained so, even while driving – which we came to appreciate as we explored the island on foot and by car during the month we stayed. San Juan Island is 24 miles long, 9 miles wide and, after Orcas Island, is the second largest island in the San Juan archipelago. A variety of habitats from dense forests to open fields and, of course, abundant fresh and salt water environments, support hundreds of bird species throughout the year. The tidal zone habitat is varied too, and different birds and marine mammals favored certain areas over others.

- Birds - Birds we found particularly interesting, either for their novelty or artistic significance: Trumpeter Swan, Hooded Merganser, Common Goldeneye, Bufflehead, Harlequin Duck, Pigeon Guillemot, Rhinoceros Auklet, scoters (Surf, White-winged, and Black), Cormorant (Brandt's, Double-crested, and Pelagic), Bald Eagle, Golden Eagle, California Quail, Black Oystercatcher, Red-breasted Sapsucker, Chestnut-sided Chickadee, and Pacific Wren.

- Marine Mammals – We were a few months early to see the migratory Orcas, and the resident Orca population of about 80 is too widely dispersed to be seen regularly. Moreover, the summer months are your best bet for whale watching. We did see lots of Steller Sea Lions, California Sea Lions, Harbor Seals and a few otters.

Other wildlife commonly seen are Black-tailed Deer, European Hare (introduced as a food source for humans) and Red Fox (introduced to control those same hares!). During our four weeks on the island, the daily temperature was usually in the mid-50s, with a mix of sunshine and rain, producing constant visual variety on land, sea, and sky.

Harlequin Ducks – Foggy Morning - 9" x 12" study for a larger oil painting.

And so, from my rain-sheltered place under the trees, I continued to watch the ducks, now about fifty yards away. Using my spotting scope, I was able to observe carefully the Harlequin's complex markings and note both individual and group behavior. Completely absorbed with the birds, the usual sense of time and place dissolved, and I experienced the world in a way perhaps similar to the wonderful creatures in front of me. I was gently brought back to blue skies and a rising wind as, one by one, the ducks returned to the water, also compelled by unseen forces which seek expression in form.

Neil Rizos is a professional painter, printmaker, and sculptor, specializing in birds. To learn more about the artist and his work visit www.rizosart.com and www.birdjournaling.com.

Desert Tortoise Quest

by Laurie Nessel

Sonoran Desert Tortoise. Photo by Jim Burns

The last time it rained on June 17 in the Phoenix Metro area was 1925. Ninety-three years later to the day, four hardy souls met at dawn off Bush Highway, hoping to witness the effects of such a rare occurrence. The decomposed granite ground looked dry but standing water in plastic debris confirmed that rain had fallen during the tail end of Tropical Storm Bud, a harbinger of the monsoon season. The land was so parched that it had absorbed all the rainfall.

As we climbed the hill south of Stewart Mountain a magnificent sunrise over Four Peaks reflected off Saguaro Lake. By 6:20 am, we spotted our first tortoise, *Gopherus morafkai*, at a burrow entrance. Less than a half-hour later we found a second tortoise, a large, old male, dry plant matter poking out of his beak.

He had rehydrated after three dry months. Tortoises use nitrogen and water to bind excess potassium in their uric acid to avoid toxicity. In order to conserve water, a tortoise concentrates the uric acid in its bladder until a rain event allows the tortoise to purge the acid and replenish its water reserves. Fresh water allows tortoises to feed on senescent spring annuals until summer plants develop in response to monsoon rains.

While searching for the next tortoise, Jean Janu saw an Arizona Coral Snake, *Micruroides euryxanthus*, working its way towards her before vanishing under a rock.

We spent over an hour scouring the slopes and washes until Jean found the third tortoise of the morning, parked head first in a pallet, a temporary, shallow burrow, in the dappled shade of a palo verde.

We also saw Western Whiptail, Ornate Tree Lizard, Zebra-tailed Lizard and a male Chuckwalla. It seemed that every Saguaro arm sported a helmet of fruit, split open for all to partake and spread its seed before it died of drought. Hopefully, a vigorous monsoon will alter the ominous course that many *Carnegiea gigantea* sense. Tara Deck offered us a sample of the crimson fruit that had fallen within reach. It was palatable, its sweetness concentrated by the sun.

We saw the usual desert birds, the highlight being an Ash-throated Flycatcher singing and eating from the fruiting crown of a Saguaro. He was soon joined by his mate, responding to his call.

On July 15, two of us returned to search for tortoises on an overcast, humid day. With little forage available, and the tortoises rehydrated after recent rains, we felt lucky to find two tortoises, both in pallets. We were also thrilled to discover a downy-headed Turkey Vulture, a nestling or a fledgling, in a cavernous rock-pile.

To join Laurie (MAS Programs Chair) on her next Tortoise Quest, see page 4, Field Trips, for details.

More images, and a senescent *Lipidium* and cyanobacteria from our trip location at http://jimburnsphotos.com.

Feats and Struggles of Seabirds

by Mark Horlings

Black Tern (first year). Photo by Terry Sohl

The Seabird's Cry: The Lives and Loves of the Planet's Great Ocean Voyagers by Adam Nicholson. Henry Holt & Co., 2018. 416 pp. ISBN: 978-1250134189, hardcover, $16.86.

Adam Nicholson's *The Seabird's Cry* might be subtitled "Birding for English majors." Historians and philosophers should enjoy it as well. Nicholson examines the science of seabirds but always remembers their appeal to poets, thinkers, and men at sea.

The natural history can be depressing. Success often requires a single chick, long incubation, and longer nurturing in the nest. Threats abound, as general as climate change, and as specific as long-line finishing. Many seabird populations have suffered declines. Nicholson notes, however, that other families are thriving. Seabirds adapt. Albatross species facing rapid population declines breed early, cutting their age of first breeding from 20 years a century ago to 10 now.

Each chapter covers a different family of seabirds, scrutinizing biology and life strategies. Cormorants and most gulls hug the coast. Kittiwakes are gulls that have abandoned the shore for ocean fishing. Puffins, guillemots, and Razorbills fly underwater, using wings compromised to work in water and air but perfect in neither. Effective, nevertheless: puffins dive to 200 feet and guillemots to six hundred. Gannets plunge at surface shoals of fish; if a first plunge fails, wings and feet can take them to depths of 90 feet in pursuit. Fulmars, shearwaters and the albatrosses (probably Nicholson's favorite) range over vast ocean distances.

Nicholson traces the work of the principal researchers of each bird family. He excels at summarizing in one interesting paragraph the facts field researchers have teased from years of tedious, windswept observation. The good and bad points of seabird colonies are revealing. Colonies allow the birds to resist predators and share fishing information but at a tremendous cost in kidnapped, lost, and murdered chicks.

The book discusses anatomy, nesting behavior, care for chicks, and what we have learned since scientific instruments have been fitted to the birds. Scientific data are not confined to GPS readings showing flights in thousands of miles. Instruments also monitor how often birds dive, how deep they dive, and heart rates. An albatross's heart rate is high when feeding and taking off, but as low while flying as when it sits on its nest. Instruments divulge not just where a bird flies, but also shifts in humidity and temperature which guide the bird to winds where it can thrive. Drops in stomach temperature reveal how often the bird finds food. Wet/dry monitors show when a bird is aloft and how often it lands on the ocean's surface.

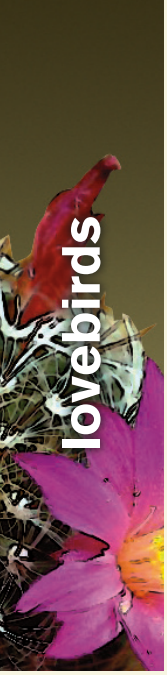
Nicholson also delves into the history of human attitudes toward seabirds. In general, we do not come off well. Poets are an exception. For them, seabirds are "reservoirs" for the imagination, "summer ambassadors from the winter ocean."

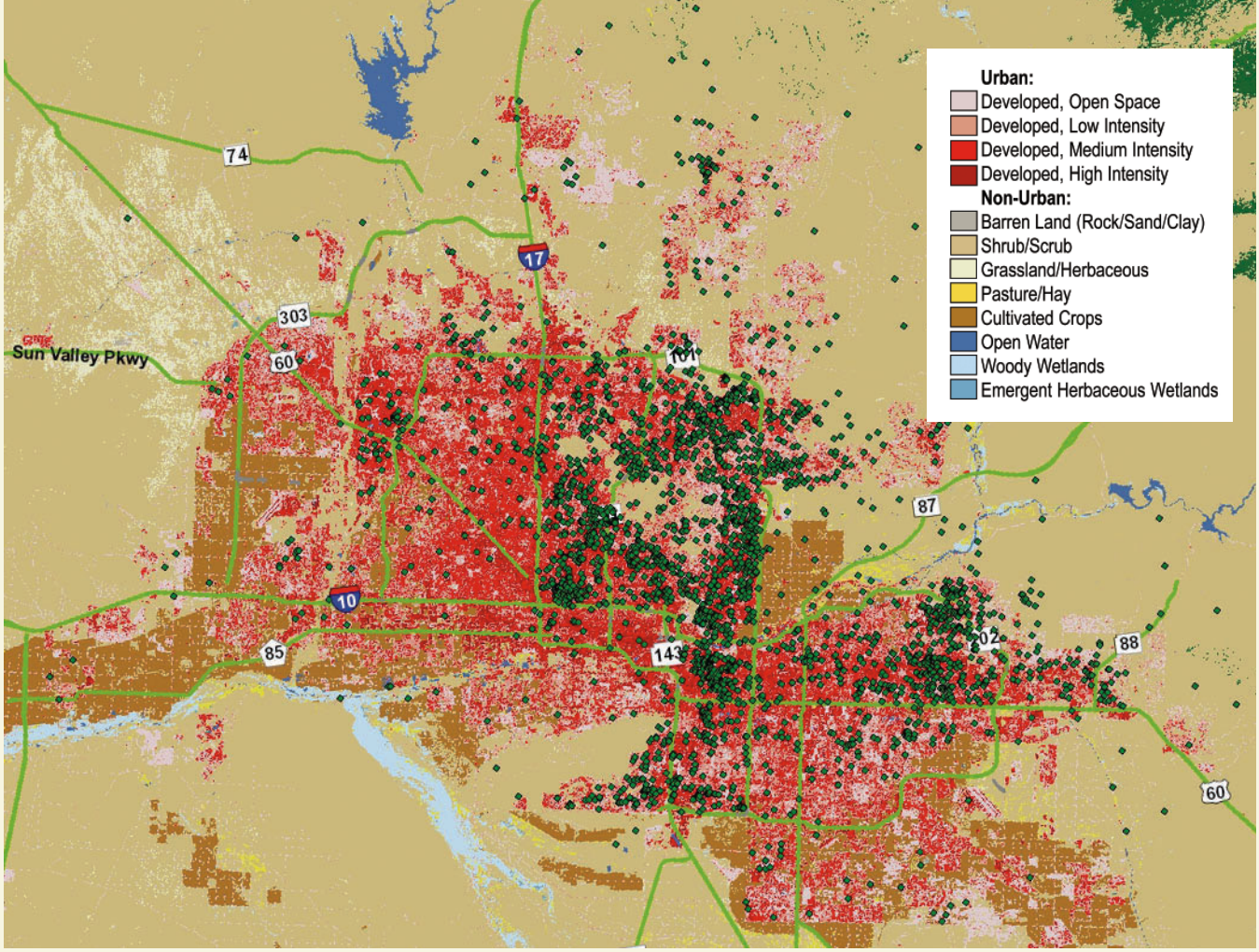
Nicholson dates environmental awareness to Coleridge's *Rime of the Ancient Mariner.* Previous poems about the albatross saw menace in their size and presence. Killing a shadowing albatross ended a threat. Coleridge reversed this notion: his albatross lingers overhead to protect the ship and crew. Killing it upsets the order of the universe and seals men's fate.

Seabird populations suffered long before modern times. Nicholson describes Europe as hunted out, its rivers as fished out, and even its coastal fisheries as degraded by the mid-1600s. Seabird populations in the eastern Atlantic had already dropped as a result.

Fish and seabird populations in North America were larger and healthier. However, New World settlers were sent not to manage resources better but as a vanguard for their further exploitation. Tons of North American fish quickly found their way to Europe, and seabird colonies on our coasts paid the price.

Despite many sad realities, Nicholson always finds hope in these "creatures whose lives have stepped beyond the ordinary into environments of such difficulty that they can respond only with a slow, cumulative mastery..." To Nicholson, seabirds' lives are "assertions in a world of denials." His book deserves that recommendation as well.





Map of Metropolitan Phoenix area with reported lovebird locations marked as green dots. Map color scale indicates land cover types. (NLCD 2011, created in ArcGIS)

The Love(bird) Connection: My Journey of Discovery Through Citizen Science

by Kate Studey

"I saw a weird bird in the garden this morning. It was bright green with some orange on it. Any idea what it might be?" As the unofficial resident naturalist at my school, I had become accustomed to these types of questions. At first, I wondered whether the art teacher had really seen what she described and decided to check it out for myself. The next morning, I arrived earlier than usual, prepared to make a stop at our school garden. Before I could even get there, I heard a high-pitched "squeak". Following the sound, I discovered that the art teacher was right. In the trees over my head were small, green and orange parrots. They were lovebirds!

Now, this wasn't the first time I had seen lovebirds in the wild in Phoenix. One had shown up in a tree in my front yard some years ago. At the time, I knew enough about lovebirds to realize this was an unusual sighting. I thought this must be someone's pet that had escaped. After some searching online, I learned that the Rosy-faced Lovebird (*Agapornis roseicollis*) is a parrot native to southwestern Africa (BirdLife International, 2016). Due to a number of releases of captive birds in the Phoenix Metropolitan area, this species of lovebird has established a feral population in the Valley. While I was researching lovebirds, I also discovered Greg Clark's website for reporting lovebird sightings (Clark, 2017). I posted my observation on the map on his site. Without even realizing it, I had just become a citizen scientist, contributing my observations to the overall knowledge of the scientific community. Citizen science allows researchers to collect information over greater areas by tapping into the resources and knowledge of individuals submitting observations from around the world. Little did I know that this one observation would start me on a journey of discovery through citizen science.

When I realized that we had lovebirds in my school garden, I quickly became obsessed with listening and watching for lovebirds. I also made sure to report my observations. As a fourth grade teacher with a love for the outdoors, I saw the opportunity for connecting my students to nature while also contributing to citizen science. My students became involved in making observations, too. Citizen science became a big

part of a larger plan to develop more outdoor learning opportunities for students at my school.

After a few more observations, I discovered that the lovebirds were only present in our school garden, not anywhere else on campus. Why is that, I wondered? Is the success of lovebirds in Phoenix because of humans? Would lovebirds be able to survive and thrive in a natural desert landscape, or are they relying on the non-native plants, bird feeders, and man-made water sources in this urban setting? The lovebirds in our school garden were foraging on sunflowers, a plant not typically found in the Sonoran Desert. I saw the opportunity to try to answer some of my questions about lovebirds and their habitat preferences through my own research. I set out to discover if lovebirds would be found more often in urban habitats rather than in the desert because of the resources available in urban settings. Using citizen science data to answer my own questions gave me the unique opportunity to change my role from citizen scientist to researcher.

As I began to compile lovebird observations from different citizen science sites, I was amazed at the number of lovebird observations that had been reported in the Phoenix area. Cornell Lab of Ornithology's eBird site (www.eBird.org) was my primary source, and it provided thousands of data points for me to use, which at first, was a bit overwhelming. I also learned that one of the benefits of using a well-established citizen science program like eBird is that individual observations go through a rigorous review process. I reflected on my own checklists that I had submitted to eBird, and it was exciting to think about how my own data might be used the same way by other researchers.

Thanks to the data collected by thousands of citizen scientists (green dots on the map), I was able to compare lovebird observations with habitat types. I used Geographic Information System mapping (GIS) and the National Land Cover Database (NLCD) to complete my project. The results of my research indicated a significant trend in habitat preference by lovebirds. Although a large portion of the study area consisted of scrub and shrub desert habitat, the majority of lovebird observations took place in urban areas. The data supported my initial hypothesis.

As my interest and excitement for my research grew, I started talking to more people at school about lovebirds. This created a ripple effect as that excitement spread to others at my school. I was also hearing and seeing lovebirds everywhere on campus. Before I knew it, I had other teachers, students, and even the principal, looking for lovebirds! Our observations of lovebirds expanded to include other species on campus. I started

Rosy-faced lovebird in the Maryland School garden. Photo by Kate Studey

a citizen science project on iNaturalist to track plants and animals, shared the project with the school staff, and encouraged everyone to participate. We started taking pictures of every bird, bug, and plant we saw. The office manager even sent me a picture of a cool grasshopper that she saw one day. I talked to my students about how our observations can contribute to research, and I was able to show them my own research as proof. My school participated in Cornell's Project FeederWatch (https://feederwatch.org) for the first time ever, and now my students are creating their own investigations around the birds and feeders in our garden. My school is more engaged in the outdoors than ever, and it all started with a funny-looking green bird in our garden.

If you're already a wildlife watcher, it's easy to take the next step to become a citizen scientist. For birds, check out www.eBird.org, or visit Greg Clark's lovebird site to add to his data collection: http://mirror-pole.com/maps/maps_test_2/peach-face_map/index.html. If you're looking at other flora and fauna, try out www.iNaturalist.org or their new app called Seek: https://www.inaturalist.org/pages/seek_app that lets you earn badges while discovering new species in your area. There may even be a researcher out there who could use your observations to make some new discovery!

Kate Studey is a fourth grade teacher at Maryland Elementary School in Phoenix, Arizona. She completed this project as a part of her graduate work through Project Dragonfly at Miami University in conjunction with the Phoenix Zoo. She presented the results of her lovebird research at the American Ornithological Society meeting in Tucson, Arizona in April 2018.

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GREEN SCENE
MARICOPA AUDUBON

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

Compiled by Vicki Hire

Golden Eagle (captive)
Photo by Vicki Hire

Golden Eagle Photo by Mick Thompson

Juvenile Bald Eagle, Oregon
Photo by Vicki Hire

The Extraordinary Eagle

Did you know an eagle is a "bird of prey" or "raptor?" Eagles have four characteristics that make them successful predators: 1) sharp talons or claws to catch their prey; 2) strong feet and toes for holding their prey (their grip strength is 10 times that of the average human); 3) strong hooked beaks for tearing their food; and 4) sharp eyesight, four to seven times better than humans. They can see prey up to a mile away!

Did you know two kinds of eagles live in North America: the Bald Eagle and the Golden Eagle? Golden Eagles are more aggressive than Bald Eagles, and they often hunt in pairs. The Golden Eagle is found mostly in the western half of the United States. Its name comes from the golden color of its head and neck. It is also the one of the fastest animals in the world and can reach almost 200 miles per hour in a full dive!

Did you know the Bald Eagle has been the national symbol of the United States since 1782? Benjamin Franklin objected because he felt that the Bald Eagle is dishonest because it sometimes steals its food from other birds. A congressional committee chose the Bald Eagle because it is found only in North America and because during a Revolutionary War battle several Bald Eagles flew above the troops, circling and calling, which the troops believed was a call for freedom.

Did you know a Bald Eagle is not bald, but has white feathers on its head and neck? Its name comes from an old English word "balde," which means "white." These white feathers appear after the Bald Eagle is four to five years old. Bald Eagles have 7,000 feathers! When a Bald Eagle loses a feather on one wing, it also loses a feather on its other wing. This is to keep its wings balanced.

Did you know in the United States killing a Bald Eagle is a felony (a very serious crime)? There may have been as many as 75,000 Bald Eagles when they were adopted as our national symbol in 1782. But because of illegal shooting, contamination of their food sources by pesticides, and destruction of their habitat, by the 1960s, fewer than 450 Bald Eagle nesting pairs remained in the lower 48 states. Laws such as the Migratory Bird Treaty Act have helped the eagle population increase.

For more information on Bald Eagles, see pages 20-21.

Green Scene True or False?

T F 1. Bald Eagles are found only in North America.
T F 2. The Golden Eagle is the national symbol of the United States.
T F 3. A Bald Eagle has approximately 10,000 feathers.
T F 4. A Golden Eagle can see prey from one mile away.

Bald Eagle, Liberty Wildlife

Green Scene Go Take a Hike

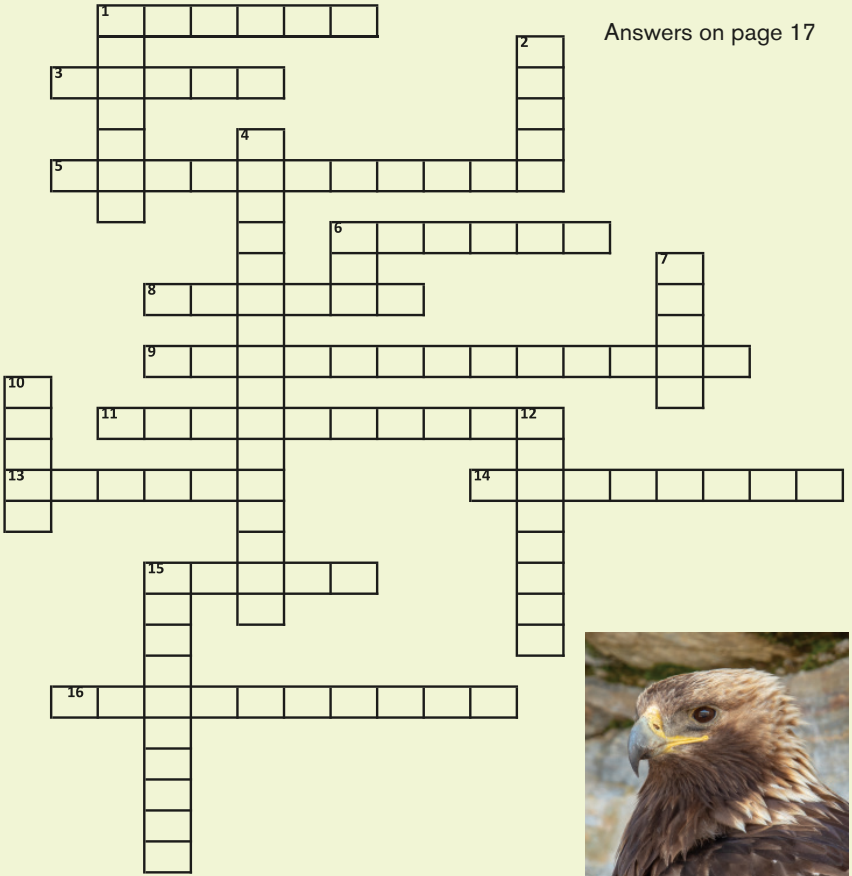
You can see Bald Eagles along the Lower Salt River if you are lucky. Why not join a MAS Field Trip and try to spot an eagle? See page 4 for details. Or, to see eagles up close, visit Liberty Wildlife. For more information, go to: http://libertywildlife.org

Guess this Bird

Clues: This shorebird searches shallow water wetlands for small aquatic invertebrates and flies. It has the second longest legs in proportion to its body of any bird except the flamingo. Its pink legs look like they bend backwards.

The Extraordinary Eagle Crossword

Answers on page 17



Across

1 A very serious crime, such as killing an eagle
3 Raptors have strong, hooked _____, which they use to tear their food
5 This raptor's name comes from the color of its head and neck
6 Claws or nails used by raptors to catch their prey
8 A representation, emblem or logo
9 This committee chose the Bald Eagle as a national symbol for the US
11 Golden Eagles are more forceful and _____ than Bald Eagles
13 The color of a Golden Eagle's head and neck feathers
14 A Bald Eagle has approximately 7,000 of these
15 Golden Eagles often hunt in _____
16 These raptors are found only in North America

Down

1 Liberty or independence
2 A Bald Eagle's head and neck feathers are this color
4 This congressman objected to the Bald Eagle as the US symbol
6 There are only _____ kinds of eagles found in North America
7 An eagle's grip strength is ten times that of a _____
10 If an eagle loses a feather on one of these, it will lose a feather on the other to keep them in balance
12 An eagle's _____ is 4-7 times better than a human
15 Number of inhabitants or residents

Golden Eagle Photo by Mick Thompson

Nature's Desert

by Gail Cochrane

It seems the D word drought, is frequently heard in newscasts these days. Perhaps we should remember that other D word, desert. Drought is a normal part of the Sonoran Desert weather pattern, and native plants and animals are well adapted. It is nothing new that Phoenix receives just eight inches on average of rain per year.

Yet green trees line busy boulevards and tightly pruned landscaping breaks up expanses of asphalt surrounding our strip malls and master planned communities. Ubiquitous black plastic drip lines provide life support to every green plant, while irrigation canals, green golf courses, and artificial lakes help us forget that we are plopped down in the midst of a desert. The Colorado River, the Salt, the Verde, the Gila, and various aquifers allow the urban southwest to grow and prosper in our arid environment. More and more residents come, craving mild winters and ever-present sunshine.

When temperatures rise, Pronghorns raise patches of their hair, releasing heat trapped beneath their fur. Photo by Tom Koerner, US Fish & Wildlife Service

A Harris's Antelope Squirrel takes advantage of the ripening pods on a palo verde tree. Few of the tree's tiny leaves remain. The palo verde is drought deciduous: during dry, hot weather, it drops its leaves to prevent water loss. The tree is still able to photosynthesize (use sunlight to synthesize food from carbon dioxide and water) because its green bark contains chlorophyll. Photo by Gillian Rice

If you step outside the man-made world that cushions us and enter the natural environment beyond, you come face to face with reality. Here palo verde and ironwood trees stand leafless in the hot still days of summer, Brittlebush has clothed itself in furry leaves, and many other native plants have entered a dormancy that resembles death. These native plants are uniquely adapted to arid conditions. Growing without the continual irrigation that introduced landscaping plants require, the native plants of the Sonoran Desert have acclimated to eke out a survival – with or without rain.

Drought tolerant plants have a remarkable ability to draw moisture from dry soil and are masters at continuing photosynthesis with very low leaf moisture. Among the hardiest desert plants, Creosote Bush can extract water from soil that feels dry to the touch. Its small leaves, coated with a waxy resin to reduce water loss, are self-shading and oriented perpendicular to the sun. The roots of creosote spread out extensively from the shrub itself and lie in the top layer of the soil so that even a scant half inch of rainfall can wet the root zone. The plant will drop its leaves if necessary to save itself and even shed branches in the driest conditions. When desert plants enter dormancy to survive drought, it can take them two weeks or more after a soaking rain to reawaken and begin to metabolize, as roots and leaves must be regrown.

The animals of the arid desert live on a finer edge of survival. They must balance the constant water use required by bodily functions such as digestion and respiration with finite opportunities to drink. Some critters of the Sonoran Desert never drink "free" water. These animals gain their moisture from their food and some utilize even more stringent methods. Kangaroo rats are superbly water thrifty. They cache seeds underground where meager amounts of moisture are absorbed. When the kangaroo rats eat these seeds, they attain soil moisture as well as water produced by the metabolization of the carbohydrate rich seeds.

Brittlebush leaves are pubescent: short soft hairs reflect sunlight. Pubescence reduces leaf temperature (keeping it within a photosynthetically stable range) and lessens water lost from the plant. Photo (R) from http//:swbiodiversity.org/seinet/index.php. Photo (L) by Gillian Rice.

Other rodents such as pack rats and the Cactus Mouse survive on the water in cactus fruit and insects. The small amount of juiciness found in katydids and scorpions sustains Elf Owls, while the Desert Kit Fox's diet of rodents and rabbits provides adequate succulence for survival. Pronghorn eat cholla cactus when no other moisture is available.

The Sonoran Desert has a number of rivers that drain extensive watersheds. These riparian corridors lie like green ribbons on the dry landscape and teem with life. Here diverse species more dependent on water thrive. Predators with large arid territories can survive if they can access a river or even a trickling spring. Riparian areas extend life beyond their boundaries.

The dominant life form in the Sonoran Desert these days is human. Humans require great quantities of water for drinking, sanitation, industrial use, landscaping, and agriculture. Public works projects including the Central Arizona Project move water from sources such as the Colorado River to thirsty cities. This water moves through cement lined canals to reduce loss by seepage, but the habitat does not benefit from the water as it does from a natural river. Humans also rely on water from underground aquifers that have accumulated seeping water over millennia. The rate that we draw down these resources is far higher than can ever rebuild.

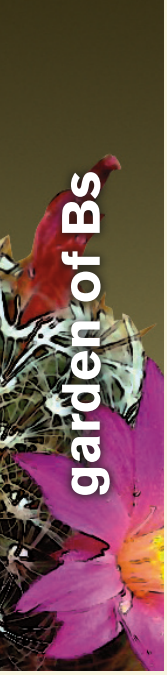
Kangaroo rats have kidneys that reduce and concentrate their urine to an almost crystal-like consistency, thus greatly reducing the amount of water they lose. Photo by George Harrison, US Fish & Wildlife Service

Elf Owl. Photo by Terry Sohl

Indigenous peoples live in close concert with the desert environment and even grow food in the windows of time when there is water for the soil. Hydrologists and crop scientists are reconsidering rainfall and floodwater harvesting and gaining appreciation for desert adapted food crops. In his book, *The Desert Smells Like Rain*, Gary Paul Nabhan advocates the study of Tohono O'odham (Papago Indian) stewardship of the desert land: "The Papago have evolved field management skills that have allowed them to sustain food production for centuries without destroying the desert soils." The Papago farmers' subsistence strategy developed hardy crops as well as microorganisms and weeds, pests, and beneficial insects that created a fertile environment.

As long as the water runs when we turn our taps, as long as green plants grace our immediate surroundings, it remains difficult to grasp the implications of water scarcity. Yet it falls on us to keep this issue in mind. Using our imaginations and creativity we can find ways to live in greater harmony with our desert environment.

Gail Cochrane has lived in the Sonoran Desert for 21 years and has adapted to appreciate the necessity of shade hats and water bottles.



Garden of the Bs: A Story of Restoration

by John Jung

Arizona's oldest high school, Mesa High, once offered its students a thriving agricultural education program that included use of a field on campus for growing crops and grazing animals. But since the retirement of the program's last teacher over 25 years ago, that one-acre lot was ignored, grew weeds, collected wind-blown trash, suffered from occasional vandalism, and lost any appearance of its Ag Ed roots.

Two science teachers envisioned alternative uses for the field of weeds. The first plan, one that had received grants and had a groundbreaking ceremony attended by then Secretary of the Interior Manuel Lujan, would have created a riparian ecosystem complete with a pond and endangered native fish. A soil analysis revealed nitrogen concentration too high for sustainable management; this project was canceled shortly after the groundbreaking.

But the second plan, facilitated by a series of fortunate events, developed into a native Sonoran Desert garden designed to be an outdoor classroom and to attract bees, birds, butterflies, beetles, bugs, bats, and bunnies. The winner of the name-the-garden competition among students was "Garden of the Bs." Now three years old, the Garden hosts nearly 90 species of native plants, has attracted countless insects and 35 species of birds, and has been recognized or awarded multiple times, including in September 2017, an "Award of Merit" from Arizona Forward's Environmental Excellence Awards.

As Mesa High's Environmental Science teacher and a MAS member, I directed the Garden's development starting in the winter of 2014 by gaining permission from the district's superintendency, practicing designs with students, networking with master gardeners, and applying for grants. The big break came when I met Cliff Douglas, owner of Arid Zones Trees, who donated 29 trees and introduced me to a landscape architect. The internationally known award-winning architect, Steve Martino, performed his work on Mesa High's garden pro bono. This was followed by a series of grants from Donors Choose, Lowe's, the Arizona Diamondbacks, Project Learning Tree, SRP, Tucson Cactus and Succulent Society, Maricopa Audubon Society (whose $500 grant enabled the purchase of 40 Creosote, globe mallow, and Pink Fairy Duster bushes and Ironwood trees), Ewing Irrigation, and Seeds for Education. The total value of donations and grants is over $30,000.

Jeremy Spilsbury, a Mesa High parent and owner of Tree Doctors, power-augered over 300 holes into the concrete-like caliche soil, saving enormous amounts of manual labor.

The physical appearance of the Garden of the Bs changed both in spurts and gradually. The field of weeds and trash was scraped clean by Mesa Public Schools Operation's heavy equipment in late August 2014 and, following the record flood of September 2014, was cleared of the returning weeds by about 50 community volunteers.

The decomposed granite path, drip irrigation system, and a new south entrance were installed in April 2015 along with the planting of the initial 29 donated native trees. About 40 student-grown shrubs were added the next month. November 2015 showed a flurry of additions, beginning with community volunteers planting 100 shrubs and 80 small cacti, followed by the professionals planting seven large saguaros and 16 ocotillos. For each of the next two Novembers, 30 to 40 more shrubs were planted in the

On November 21, 2014, over 50 Mesa High School community members spent their Saturday morning weeding and raking the field in preparation for springtime planting.

This April 2017 image faces southwest and shows part of the decomposed granite path and an assortment of native plants, including a palo verde, an Ocotillo, Brittlebushes, globemallows, and Velvet Mesquites.

APS and the Phoenix Suns named Mesa High School a "Green Team" at a February 2017 Lakers basketball game.

ever-decreasing open space. A Mesa High parent and Tree Doctor owner, Jeremy Spilsbury, dug almost 300 holes during this time span, a task for which he received the Mesa Public Schools "Volunteer of the Month" award.

Every time it rained from August 2015 until today, my students buried a variety of native seeds into open spaces of the rain-softened soil, resulting in the desired naturalistic and minimally manicured look of today.

The mission of the Garden is "to create a natural Sonoran Desert ecosystem and outdoor classroom where students, faculty, and the Mesa High School community can learn about indigenous flora and fauna, local geologic characteristics, and our relationship with the sun." To that end, plant species had to be native to the Sonoran Desert and attractors of pollinators. Although the Garden supports a few non-native but complementary species, close to 98 percent of the total plant population are indigenous.

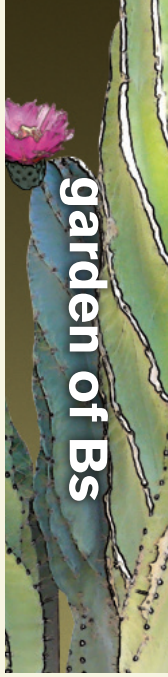
The GIS plant identification tool helps visitors identify 80 different plants from their smart phones, tablets, or laptops. Signs were created by students to identify and tell stories about the plants. Bird feeders, baths, and houses, as well as bee boxes and bat houses draw in winged creatures of many varieties. A field guide and checklist for the Bs is available as well.

Teachers often visit the Garden of the Bs without students for the type of rest, relaxation, and reflection that only a garden setting can provide.

The Garden of the Bs has been recognized or awarded several times in the last two years. The National Wildlife Federation certified the Garden as Wildlife Habitat #200,924. Monarch Watch certified the Garden as Monarch Waystation 9999 because the nectar plants and 30 milkweeds provide food and shelter as the butterflies migrate through Arizona. The first monarchs were spotted a year ago. Arizona's Department of Environmental Quality presented Mesa High its Copper Level Certificate of Appreciation for the Voluntary Environmental Stewardship Program Awards. Arizona Public Service and the Phoenix Suns named Mesa High School students as a "Green Team" on center court at half time during the Lakers' game in February 2017 as a result of the students' work in the Garden and the essays they wrote for the application process.

And most recently, I was selected by the North American Association for Environmental Education as the 2017 K-12 Educator of the Year and was the subject for an ABC15 News feature story on November 8. For more information about Mesa High School's Garden of the Bs, visit https://sites.google.com/mpsaz.org/garden/home

John Jung retired this year after 28 years of teaching math and environmental science to thousands of Mesa High School students. His retirement plans include Garden of the Bs maintenance, traveling, cooking, and birding.



Green Scene Puzzle Answers

Answer to Guess this Bird

The Black-necked Stilt has thin stilt-legs and a needle-like bill. Both parents take turns incubating the 3-5 eggs at the nest site, which is on ground near water.

True or False? Answers

TRUE 1. Bald Eagles are found only in North America.
FALSE 2. The Bald Eagle is the national symbol of the United States.
FALSE 3. A Bald Eagle has approximately 7,000 feathers.
TRUE 4. A Golden Eagle can see prey from one mile away.

Answers to The Extraordinary Eagle Crossword Puzzle

Across
1 felony
3 beaks
5 Golden Eagle
6 talons
8 symbol
9 congressional
11 aggressive
13 golden
14 feathers
15 pairs
16 Bald Eagles

Down
1 freedom
2 white
4 Benjamin Franklin
6 two
7 human
10 wings
12 eyesight
15 population

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 Jasper at yellowbirdphilosophe@gmail.com

Who Is Not Eating Our Prickly Pear Fruit?

by Tom Gatz

Have you ever noticed how so many ripe, red fruits on the prickly pear cactus (*Opuntia)* often remain uneaten on the plants sometimes well into November, eventually fermenting and drying up, still unconsumed? It's not just in our backyards either. We've noticed this out in the desert as well, especially in areas without cattle present. Why in the world would a desert plant expend so much precious water and energy producing such a large quantity of fruit if nothing is around to consume most of it? After all, the whole point of a plant producing fruit is to get some bird or animal to eat it and spread the undigested seeds contained in the fruit to new areas. Could there be a seed-dispersing animal missing from our modern desert landscape?

The tiny seeds of Saguaros are inadvertently swallowed and dispersed by several species of desert birds that consume almost all saguaro fruits the same day they ripen. However, the relatively larger and very hard seeds of *Opuntia* cacti are less likely to be swallowed by small birds that consume only a small portion of the prickly pear fruits produced each year. Coyotes, Javelina, and Desert Mule Deer are now

Most of the fruits on this Opuntia *remain uneaten in October at the Desert Botanical Garden. Photo by T.A. Gatz*

the largest native mammals that regularly eat *Opuntia* fruits but there are just too many for them to consume and some fruits are high up in the middle of the patch and inaccessible to them.

Some biologists hypothesize that *Opuntia* fruits, set up high on the edges of the cactus pads and protected from many smaller animals by formidable spines and glochids, may have originally evolved to be consumed by large, plant-eating mammals, known as "Pleistocene herbivorous megafauna" (try to say that fast three times) that have since gone extinct. Among the known or suspected extinct megafauna consumers of *Opuntia* fruit were the Giant Ground Sloth, and perhaps relatives of camels and elephants that once roamed the southwestern US and Mexico. The southwestern ground sloth was 9 feet tall.

These huge animals could have easily plucked the ripe fruits from the tops of the cactus pads and they would likely have swallowed many large *Opuntia* seeds when they wolfed down partially chewed *Opuntia* fruits. We know that these hard seeds passed undigested through at least some of these browsing mammals because *Opuntia* seeds have been found in fossilized ground sloth dung in southwestern caves.

Were extinct Giant Ground Sloths once one of the primary seed-dispersers of the prickly pear cactus? Photo by D.H. Jansen

Where did these herbivorous megafauna go? Perhaps not coincidentally, they died out about 10,000 years ago; around the time that spear-bearing humans colonized the southwest.

Another cactus that some biologists hypothesize also may have depended upon the now extinct Pleistocene megafauna for more widespread dispersal than currently occurs is the cholla cactus (*Cylindropuntia*). Large grazing and browsing mammals plowing through a cactus patch would have made ideal "transportation vehicles" for cholla segments. When the megafauna disappeared, and before "cholla-magnet" cattle and city slickers arrived, cholla had to settle for only the occasional inexperienced jackrabbit or Coyote to move their segments to new areas to take root.

As Mark Dimmit comments in the wonderful resource *A Natural History of the Sonoran Desert* regarding this possible extinct megafauna/ *Opuntia* relationship: "It's an intriguing theory and, if proven true, further illustrates the already established fact that natural systems are anything but static."

Thanks to Raul Puente and Andrew Salywon for helping me research this article.

Tom Gatz has been a MAS member since 1981.

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

Monday Morning Bird Walks at the Desert Botanical Garden

by Morry Marshall

All photos by Morry Marshall

Cactus Wrens always provide plenty of entertainment at the DBG

Pyrrhuloxia, a rare winter visitor to the DBG

Western Screech Owls are uncommon permanent residents of the DBG. Their cryptic plumage makes finding them at their daytime roosts a challenge.

New to birding? A long-time, experienced birder? A wildlife photographer? There's something for everyone on the Monday Morning Bird Walks at the Desert Botanical Garden in Phoenix.

The Desert Botanical Garden is a superb bird habitat, with a wide variety of plants for food and cover. Water is available. It isn't unusual for forty or more species to be seen on a bird walk. Many birds are in the Garden year-round, but they also vary by season. Hummingbirds, warblers, and others migrate through in the spring and fall. Phainopeplas and White-winged Doves arrive in spring to breed. Orange-crowned Warblers, and Yellow-rumped Warblers arrive during fall for their winter stay.

If you're new to birding, Monday Morning Bird Walk leaders and regular attendees will be happy to help you locate and identify birds. You will learn to recognize and identify common Sonoran Desert birds: Gambel's Quail, Curve-billed Thrasher, Cactus Wren, Anna's Hummingbird, Costa's Hummingbird, and many more. You can also get help selecting birding books, binoculars, or other birding equipment.

If you're an experienced birder, you may see uncommon birds. During winter 2017-2018, a Rufous Hummingbird and two Green-tailed Towhees over-wintered in the Garden. This past spring, a large flock of American White Pelicans was spotted, circling a nearby butte in a thermal, attempting to gain altitude for their migration to their breeding grounds on the Great Plains. You can also help less experienced birders.

If you're a wildlife photographer, you will have an opportunity to photograph birds, reptiles, and small mammals up close. Because the Garden sees a constant stream of visitors, the wildlife is accustomed to people, often allowing pictures at five to ten feet.

Diana Herron, the primary Monday Morning Bird Walk leader, is an expert, world-class birder. She led bird walks in Balboa Park in San Diego and at various locations in Northern Arizona for many years and has been one of the leaders for the Monday Morning Bird Walks since early 2005. Usually at least four or five other leaders, experienced birders, join each bird walk.

The Monday Morning Bird Walks begin just inside the Desert Botanical Garden entrance at 7:00 am May through September and at 8:00 am October through April. The bird walks are included in Desert Botanical Garden membership or admission.

Morry Marshall is a life-long birder and an enthusiastic photographer who has become a regular on the Monday Morning Bird Walks at the Desert Botanical Garden.

A Love of Bald Eagles

by Gillian Rice with Andrew Cahill Hoppin

All Photos by Andrew Cahill Hoppin

Mother eagle with young along the lower Salt River. This eaglet has since succumbed to predation during a fledge attempt. With the exception of humans, few species are able to prey on immature or adult Bald Eagles. The situation is different for eggs, nestlings, or fledglings. Ravens and Raccoons are examples of species that would eat an eagle egg. Hawks, owls, ravens, Bobcats, Raccoons, and Black Bears would kill a nestling. Up to half of nest departures fail. A fledgling on the ground, perhaps because of an unsuccessful nest departure, is vulnerable to mammalian predators, even though eagle parents continue to feed such fledglings until they can fly.

A multiple exposure image of the mother eagle along the Salt River.

Lower Salt River mother eagle letting out a call. As defense behavior, territorial adults give a high-pitched peal called a "threat vocalization," when other birds or humans approach nest site.

When I saw Andrew's Bald Eagle photographs, I had to find out how he achieves them and what inspires him. This is what he told me, Gillian Rice.

Who's that guy with an Aussie hat standing in the middle of a river wielding a bulky camera with a large lens? On a calm day he might be kayaking with that camera. Often, he's climbing a cliff above a lake, also lugging along the camera. That guy is me. Maybe 300 feet up. Eye level with a Bald Eagle. Chasing the buzz of a special photographic moment.

I've always been drawn to eagles. I didn't see them growing up in the Bay Area but when Mom took me camping I discovered nature to be a magical escape. When I moved to Arizona I took a boat tour on Canyon Lake and saw my first Bald Eagle. A crown jewel. Cool.

I frequent certain locations around the rivers and lakes close to the Valley, as do the eagles. Birds have "favorite spots" in their territories.

I haven't yet used a blind. That would be very hot. I try to find a comfortable place to be without "sleeping on the job." I must always be alert. Snacking on sunflower seeds keeps me occupied. I drink plenty of water and often freeze my water bottles. I might sit on a cliff for hours waiting for the right opportunity. I watched the Prairie Falcon tussle with the Bald Eagle for 45 minutes. That drama was far away and so my image is not as crisp.

Wanting to learn more about these magnificent birds, I studied how eagles became endangered because of habitat loss and persecution, and specifically, in the 1950s and 1960s, because of the pesticide DDT. I interviewed representatives of the Southwestern Bald Eagle Management Committee and discovered many people and organizations work together to protect and manage Arizona's eagles. Maricopa Audubon has long been active in eagle conservation, beginning the Nest Watch Program in the late 1970s under the direction of the late Dr. Robert Witzeman.

Now, the Arizona Game & Fish (AZGFD) oversees the Nest Watch Program. Nest watchers deserve our admiration. They camp in the field in tough conditions, eat simple food, and gather data on nesting pairs, breeding success rates, nest locations, fledglings, migration patterns, and much more. One nest watcher I interviewed told me both fledglings died in the nest she monitored by the Salt River so AZGFD sent her up to another nest on the Mogollon Rim. The Arizona resident population of Bald Eagles numbered 65 pairs in 2017. They face challenges such as extreme desert heat, aridity, Mexican chicken bugs (which infest eagles' nests and suck blood from the chicks), ticks (*Argas* spp.), and recreational pressures.

In conjunction with SRP, Kenneth "Tuk" Jacobsen, AZGFD's Bald Eagle Management Coordinator, uses non-invasive tracking packs on nestlings living near or around urban areas. The goal is to learn about migration, as well as Bald Eagles' activities around SRP power structures. The subsequent analysis will advise on how best to adapt technology to suit the needs and tendencies of urban Bald Eagles.

Whatever the eagle means to you – whether it's freedom, national pride, bravery, or wilderness – I can guarantee it means *something*. Many years ago, we chose the eagle to represent us, to draw from us a spirit we wished to display. That same spirit helped us come together to save the eagle when it needed us most.

Visit http://www.swbemc.org to learn more about groups and agencies who help manage the sustainability of Arizona's bald eagle population.

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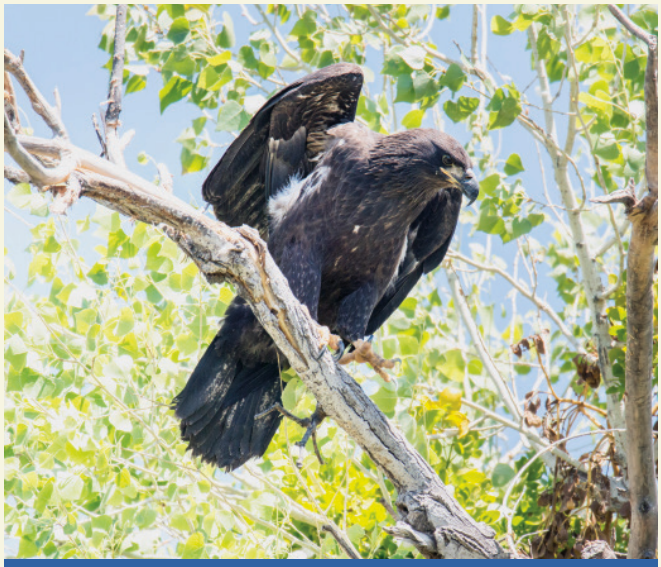
Professional photographer and native Californian Andrew Cahill Hoppin is an avid adventurer and lover of wildlife and the outdoors. He volunteers as a Wild At Heart Volunteer Raptor Rescue Transporter. https://www.hoppinphoto.com



Juvenile bald eagle surveying the river near Goldfield. A Bald Eagle doesn't gain its complete distinctive adult plumage until the age of five and a half.

Juvenile bald eagle takes flight near Goldfield along the Salt River.

*Mature bald eagle thwarting a pesky Prairie Falcon over Saguaro Lake Marina. Interactions between Bald Eagles and other species most often relate to competition for food. Bald Eagles steal food from Ospreys; harass and are harassed by Golden Eagles, other raptors, and corvids; and are chased or mobbed by blackbirds (*Icterid *spp.). Bald Eagles also defend their nest sites by driving off intruders without preying on them, including other raptors.*

Nature through the Artist's Eye: Vicky Earle

"As a natural history artist for conservation, I strive to highlight birds, animals, and natural phenomena that too often go unnoticed. I share their stories with a wider audience. We can all be better guardians of environments around the world. When people connect emotionally with a species or habitat, they are more likely to take positive action to preserve it."

Natural science and botanical illustrator, Vicky Earle delights in connecting people to nature through art. A graduate of the University of Toronto with a degree in scientific/medical illustration and biocommunications, Vicky worked in health care for thirty years in Vancouver, BC. She became passionate about rainforests during excursions to the tropics and began painting watercolors to raise awareness about fragile ecosystems. Vicky has provided artwork for conservation organizations in Mexico, Peru, Bolivia, and Canada. Her preferred medium is watercolor on paper. Her work has been part of numerous national and international juried exhibitions. Most recently, she was selected to represent Canada in the Botanical Art Worldwide Exhibition (May-October, 2018) and the 27th International Ornithological Congress (August, 2018) in partnership with Artists for Conservation, a group of international artists dedicated to raising awareness and support for conservation organizations around the world. Vicky is a member of the Guild of Natural Science Illustrators, the American Society of Botanical Artists, the Health and Science Communications Association, and is a signature member of Artists for Conservation.

To learn more, visit https://drawinnature.com

White-bellied Sunbird and Bird of Paradise Flower
This painting was one of thirteen panels created for *Duets: The Dance of Symbiotic Relationships*, an exhibition highlighting mutually beneficial interactions between plants and various birds, animals and insects in tropical environments. The shape of the sunbird's beak has evolved to fit the nectary of the bird of paradise flower. The flower needs the weight of the bird standing on the stamen to expose pollen. As the bird seeks nectar, it gets pollen on its feet, which it then transfers to other bird of paradise flowers in its quest for food.

Cerulean Warbler and Coffee
This painting, also done for the *Duets* exhibition, brings attention to the impact of monocrop coffee plantations on the decline of North American migratory songbirds. Millions of North American songbirds winter in tropical climates from Mexico to South America. More than 42 different species of birds prefer coffee farms over other types of habitat. Typical coffee plantations are devoid of the critical biodiversity needed to supply food for birds to gain enough weight to endure long migrations back to nesting sites in the US and Canada. Certified shade-grown coffee plantations are reversing this trend.

Rufous Hummingbird and Succulent
This painting highlights the importance of different habitats for the survival of migratory birds. The Rufous Hummingbird (*Selasphorus rufus*) can travel 3,000 miles from Alaska to Mexico for the winter. Desert flowers like *Echeveria subsessilis* play a critical role in providing hummingbirds with enough energy to complete their long journey. Hummingbirds, in return, serve as pollen couriers between plant populations often located miles apart. This makes hummingbirds a "mobile keystone species" because of their extensive movement over large geographic areas. Banding studies show that once a hummingbird learns its migration route, it often retraces that route every year, revisiting the exact same flowering plants as long as it lives.

The following paintings are part of *Silent Skies*, an international collaborative super-mural mosaic featuring all 678 endangered species of birds of the world. The 100 ft installation for the artistic centrepiece of the 27th International Ornithological Congress, August 2018 at the Vancouver Convention Centre will tour internationally after the Congress. Proceeds from the sale of this project's paintings raise funds and awareness for endangered species and contribute to conservation efforts around the world.

Gray-breasted parakeet *(Pyrrhura griseipectus)*
The Gray-breasted parakeet is currently located largely on just one isolated hilltop forest in Brazil. Between habitat loss and poaching for the pet trade, the global population of this species is only around 250. Conservation efforts are underway to reduce poaching, increase reproductive rates, and expand the bird's habitat range.

Short-crested Coquette *(Lophornis brachylophus)*
This small, critically endangered hummingbird is only found along one 15-mile stretch of road in the Sierra Madre del Sur in Mexico. Its population is decreasing. The biggest threat to this species is habitat loss from corn, coffee, and fruit plantations, as well as illegal drug production. We can all make a positive impact by being aware of the products we choose to purchase. Consumers have a lot of power. A small switch for us – like drinking organic shade-grown coffee, can make a tremendous impact on the survival of species like this Short-crested Coquette.

Baudó Oropendola *(Psarocolius cassini)*
The Baudó Oropendola is rare and endemic to a small area of moist tropical lowland forests in Colombia. It prefers forests along rivers and coastal plains, which are the first areas to be deforested for development. The bird's numbers continue to decline largely due to habitat loss for agriculture, logging, mining, and palm oil plantations. Palm oil is the most widely consumed vegetable oil on the planet. Demands for this oil have led to uncontrolled expansion around the world and are connected to the destruction of habitat not only for the Baudó Oropendola, but also other endangered species, including orangutans, tigers, elephants, and rhinos. Look for products that have the Roundtable Sustainable Palm Oil (RSPO) certification trademark to ensure you purchase products produced in ways that conserve natural resources and protect biodiversity. This label gives you confidence the palm oil was produced in a socially and environmentally responsible way.

Sri Lanka Whistling Thrush *(Myophonus blighi)*
This thrush is a secretive, ground-dwelling bird found only in dense mountain forests above 2900 ft. It prefers habitat close to streams, especially those in ravines and gorges. It builds nests on rock ledges and in the forks of trees near waterfalls and fast-moving water. Serious threats to this species are the extensive clearance and degradation of mountain forests for agriculture, single species plantations, and gem mining.

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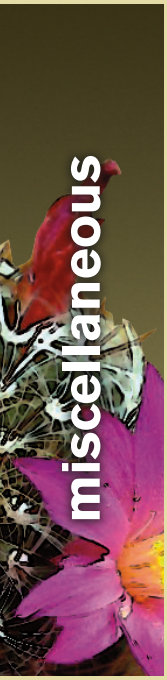

Monthly Meeting

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. 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

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.

Submissions

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

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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