VERMILION FLYCATCHER

TUCSON AUDUBON

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THE SAGUARO, HUB OF THE SONORAN DESERT

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THE HA:ṢAÑ (SAGUARO) IN O'ODHAM CULTURE

Saguaro, Matt Griffiths

The origin story of the ***O'odham*** (People) explains how all things on the land came to be as they are today. ***I'itoi*** (Elder Brother) taught the ancestors about the many uses of all that was created. He instructed the ancestors to be respectful of all things and to give offerings and prayers of thanksgiving when turning to the plants and animals for sustenance. The emergence of the first ***ha:ṣañ*** (saguaro) is a part of this narrative. This segment tells of the first ha:sañ budding from the desert floor at the exact spot where an O'odham child sank into the ground because of feelings of tremendous sadness and rejection.

As the ha:ṣañ matured, multiplied, and spread throughout the aboriginal lands of the O'odham, I'itoi instructed the ancestors on how to gather and process the ***bahidaj*** (saguaro fruit) into syrup, jam, flour, and gruel. I'itoi also encouraged the ancestors to contribute portions of their syrup to be fermented to create an intoxicating drink to be drunk during the annual, and most sacred, prayer for rain ceremony. Rain is essential for sustaining all life in the arid desert homeland of the O'odham and because of its importance, this revered ceremony continues to be held in some O'odham communities today.

There are numerous other contributions the ha:ṣañ makes to O'odham lifeways. This highly regarded cactus is respected for providing food and shelter for many birds, animals, and insects in the desert environment. The sturdy woody ribs of the ha:ṣañ are used to make the ***ku'ibad*** (picking stick), the tool necessary in harvesting the ripened fruit. The ribs of the ha:ṣañ are also used in the construction of traditional homes, ramadas and fencing.

An O'odham herbalist once shared information on the medicinal uses of the ha:ṣañ. She explained that the sticky, juicy substance in the meat of the ha:ṣañ was good for soothing burns and curing skin ailments. However, she stated adamantly that anyone seeking help should humbly, and respectfully ask the ha:ṣañ for its aid before cutting into the skin of the plant.

The desert homeland of the O'odham is teaming with culturally significant plants. There are plants that provide natural foods, have medicinal properties, and are used for building various structures. From the beginning of time the O'odham have survived and thrived on the land they were created in because of their respect and knowledge of the proper use of the plants and animals they coexisted with. The ha:ṣañ is culturally significant because of its connection to O'odham ancestry; its contributions to the annual prayer for rain ceremony; its being a natural healthy food source; its medicinal properties; and its being a source of material for the construction of traditional structures. An O'odham elder once stated "When I look out into the desert, I see my grocery store and when I look out into the desert, I see my drug store and when I look out into the desert, I see my hardware store. Everything needed in life is provided by nature". Although the elder was not speaking specifically about the ha:ṣañ, this analogy astutely describes how the O'odham view the ha:ṣañ.

Bernard Siquieros
Education Curator, retired
Himdag Ki: Tohono O'Odham Nation Cultural Center & Museum

ALMANAC *of* BIRDS

JANUARY to MARCH

Throughout the year, the saguaro cactus provides the birds of the Sonoran Desert with a variety of vital resources, including fruit and pollen, nesting locations, and hunting perches. Even in winter there is a lot of action surrounding these giants. Great Horned Owls are already looking for old hawk or raven stick nests to take over in January, and European Starlings and House Sparrows are roosting or nest building in the cavities of urban saguaros. Gila Woodpeckers and Gilded Flickers are excavating new holes in February to be used next year, and Red-tailed Hawks and Crested Caracaras may be using the tallest specimens as hunting perches. What else is happening in the saguaro forests in late winter?

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Red-tailed Hawk, Ned Harris

WESTERN SCREECH-OWL

This small, mottled owl is a year-round resident throughout its range, and here in the Tucson area it is found in the desert up into the oak-pine forest where it slightly overlaps with its close cousin, the Whiskered Screech-Owl. It is a secondary cavity nester that prefers the larger and deeper holes created by flickers. At higher elevations here, Northern Flickers perform this function. The presence of Gilded Flickers in the Sonoran Desert might have allowed the owls to move into lower elevations and take advantage of the cavities the flickers excavate in saguaros. Although male screech-owls might roost in cavities outside of the nesting season, the real activity begins in January and February when they call to females from or near the nest site. "Courtship-feeding" is common and involves the male presenting food to the female at the cavity. If she accepts the nest site, mating will take place soon after, and eggs are laid late March to early April in Southeast Arizona.

Saguaro nest cavities are at a premium and competition for them is fierce. You can help by putting up a nestbox that can be purchased at our Nature Shop. Tucson Audubon also hosts a live-streaming nestbox webcam that you can watch at any time at TUCSONAUDUBON.ORG/OWLCAM. Enjoy watching a new generation of Western Screech-Owls while getting a sneak peek at what happens inside saguaros all across our beautiful desert!

AMERICAN KESTREL

The smallest and most common falcon in North America, the American Kestrel is a year-round resident of Arizona. It too is a secondary cavity nester, another species that relies on woodpeckers to create nest sites in saguaros. Starting in February, males locate and inspect potential nest cavities within their established territories and advertise by repeatedly climbing, diving, and making loud *klee!* calls. He then entices a female to the nest with food offerings, and if she approves, the site is selected for nesting—she does not inspect cavities other than those shown to her by her mate. With winter waning, eggs are usually laid in late March. About a month later, the saguaro nest tree then becomes an active hub of hunting and feeding as the newly hatched young are frequently fed.

Kestrels also face stiff competition for the very limited large saguaro nest cavities they require. While common nationwide, in Arizona they're declining rapidly due to lack of nesting opportunities and have recently been listed as a Species of Greatest Conservation Need by AZGFD. To help, Tucson Audubon has partnered with HawkWatch International on a widespread project to provide nestboxes in strategic locations. You too can help by putting up a nestbox, available from our Nature Shop, even in many locations in town! Tucson Audubon also hosts a live-streaming nestbox webcam that you can watch at any time at TUCSONAUDUBON.ORG/KESTRELCAM. There's nothing cuter or more entertaining than watching five young kestrels crammed into a nestbox waiting for a parent to bring them their next lizard or insect meal!

HARRIS'S HAWK

Family units of multiple Harris's Hawks roam the Sonoran Desert as the "wolf packs of the sky," terrorizing rabbits and other small mammals as they cooperatively hunt using many different techniques. A hunt usually starts with an "assembly ceremony" where 3–9 birds assemble and perch together on a large saguaro or tree, sometimes all on one branch or on the back of another to gain height or take over the perch (a behavior known as *backstanding*). Interestingly, even though Harris's Hawks are also found in open woodlands and savannas throughout Mexico and South America, it may be that only the Sonoran Desert birds hunt cooperatively. Do saguaros have something to do with this? It's unknown at this time, but we do know the saguaro plays a very important year-round role in the life of this special hawk.

In addition to being hunting perches, saguaros serve as ideal sites for the hawks to build their large stick nests. In Arizona, Harris's Hawks can start building new or repairing old nests for the breeding season anytime November through January and first clutches can be laid January through March. Studies have shown that saguaros are the "preferred" structures for their nests 30–45% of the time. Although the summer breeding birds that utilize saguaros have not arrived yet, winter is still filled with the activity of young birds, all centered around this iconic desert sentinel.

Western Screech-Owl, Jeremy Hayes
American Kestrel, Scott Olmstead
Harris's Hawk, Rick Williams

PROTECTING SAGUAROS TO PROTECT THE SONORAN DESERT

Saguaros–the majestic and indomitable icon of the Sonoran Desert. Rarely has a plant that seems so hardy, independent, and long-lived, been vulnerable on so many fronts.

Beau Rogers

Wildfires, ongoing droughts, increasing freezes, and ever-spreading invasive plants all pose imminent threats to the saguaro cactus and the more than 100 species that depend on them. Arizona's two major wildfires in 2020 killed well over 400,000 mature saguaros. From birds that nest only in saguaro cavities to bats that time their migration to the nectar-laden flowers, saguaros play a key role in a healthy Sonoran Desert and a critical role for many rare species.

Tucson Audubon has a long history of working to protect intact ecosystems and since the mid-1990s has been keenly aware of the need to protect Sonoran Desert Uplands—the desert everyone sees when they close their eyes and think of Arizona. We address major conservation issues from many different angles, and protecting Sonoran Desert uplands is no different. We advocate for regional policies that reduce our collective impacts and mitigate the unavoidable ones. We directly protect and restore plant communities that are impacted or under threat. Side by side with academic partners, we conduct sound scientific research to guide our conservation efforts of the most rare bird species that rely on saguaros. Importantly, we not only look backward, we now intentionally look forward to address critical impending collapses to the ecological fabric of the desert if all the saguaros in an area are lost.

The direct threats that saguaros face and their incredibly slow life-cycles drive multitudes of associated impacts. For species that rely 100% on saguaros for some aspect of their survival, as Desert Martins and Gilded Flickers do for nesting, we must use creative measures to facilitate their long-term survival. This is especially true in areas where fires and loss of habitat have caused a 150-year gap in nesting availability, the time needed for a baby saguaro to grow and fulfill all the roles of a mature saguaro on the landscape. Learning from the old adage 'an ounce of prevention is worth a pound of cure,' the lion's share of our efforts go to preventing the avoidable loss of intact stands of mature saguaros in the first place.

In the following pages, you're going to read a lot about saguaros, and about many birds and other plants, too. Each article looks into a different facet of the Sonoran Desert conservation prism. You'll hear about advocacy, applied conservation, research, partnerships, and on-the-ground work to build and protect a resilient landscape that must adapt to a shifting climate. My hope is that after you finish this issue of the *Vermilion Flycatcher* you'll understand very clearly why Tucson Audubon devotes so much of our effort and resources into protecting saguaros and all the species that depend on them, and that you'll join us in this essential work.

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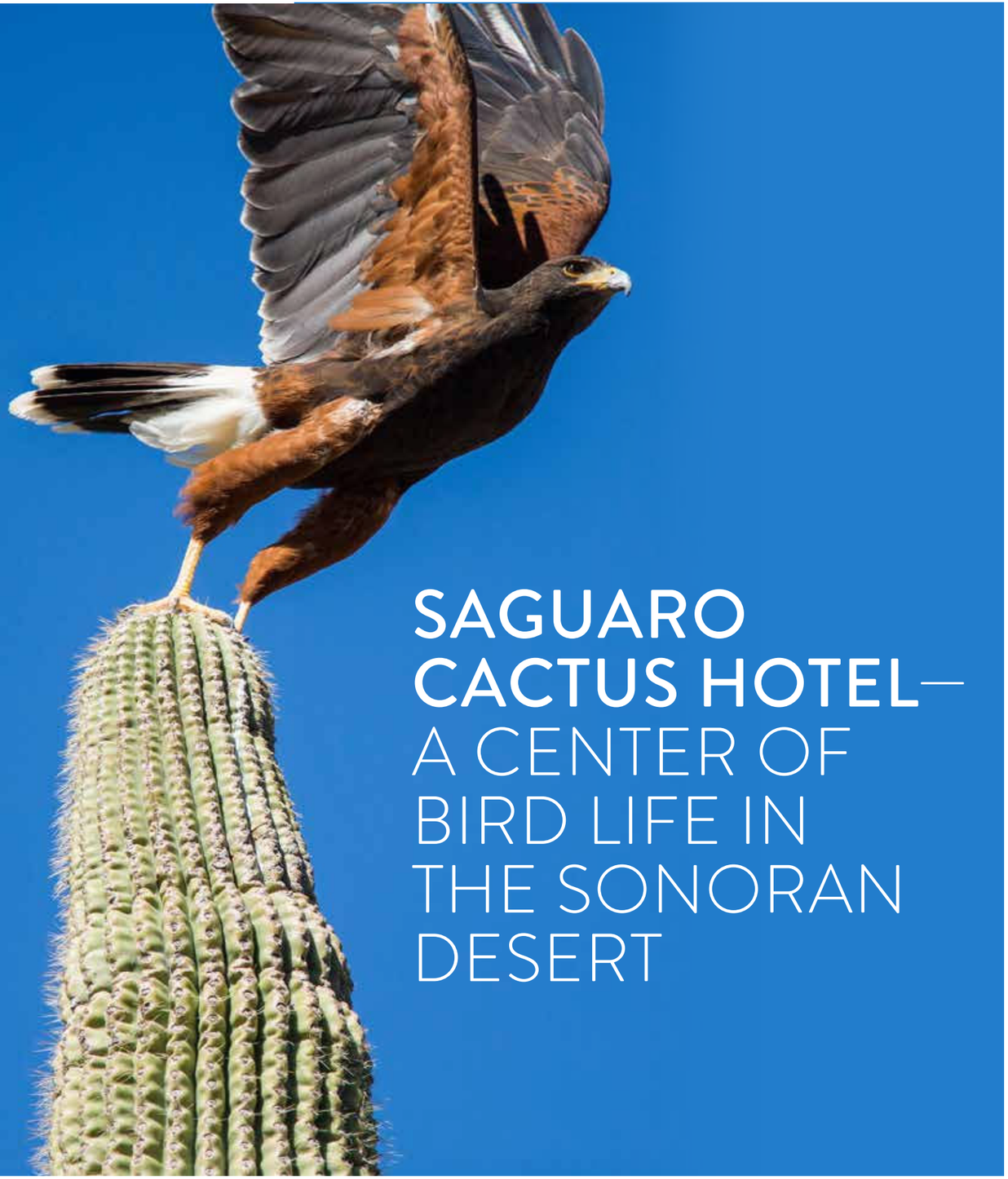
Wildlife Conservation Society, Tonto National Forest, Coronado National Forest, Pima County, SouthWest Invasive Plant Management Team, Fish and Wildlife Service Invasive Species Strike Team, Saguaro National Park, Disney Conservation Fund, University of Arizona, Northern Arizona University, Purple Martin Conservation Association, Sonoran Joint Venture, Bach's Cactus, Nighthawk Natives Nursery, private donors, and many others coming on board.



SAGUARO CACTUS HOTEL—A CENTER OF BIRD LIFE IN THE SONORAN DESERT

Harris's Hawk, Frederick L Mitchell Jr.

Great Horned Owls nesting in a saguaro, Matthew Studebaker

Hooded Oriole feeding on saguaro fruit, Dan Weisz

The bushes thrashed wildly about in the wind ahead of the oncoming monsoon rain. I watched as a huge old saguaro swayed, rocking farther and farther under the wind's onslaught. Finally the giant cactus leaned beyond recovery, uprooting itself and crashing down. The ground shook as it fell, taking out most of a palo verde tree and smashing a prickly pear. The deluge arrived moments later. I stood drenched and transfixed by the drama I had just witnessed—the death of a 200-year old monarch.

The saguaro cactus is the hero of the Sonoran Desert story. It is among the most famous and most beloved plants in the world. It has a majestic presence few other plants will ever reach (and its own national park). But even more, the saguaro is the center of life and activity for an abundance of birds and other creatures and plays an integral role in this intricate desert ecosystem.

Saguaros fill the niche of large trees in the Sonoran Desert, providing nesting places for birds and high places to perch and hunt from. Their massive arms make an ideal place for raptors such as Red-tailed and Harris's Hawks and Crested Caracaras to build their large, heavy stick nests.

Red-tails build nests up to 30 inches across and two or three feet high. They prefer a nest site taller than the surrounding vegetation, with clear access from above and a good view of the area (like on a saguaro!). They often include all kinds of other items into the nest construction, such as devil's claws or snake skeletons. One nest featured a Cactus Wren nest tucked into its base! It may seem a foolhardy home site for the wrens, but raptors don't hunt at their nest site.

Crested Caracaras, uncommon and quite local in Arizona, invariably use saguaros for their nests. They display great site fidelity, each spring refurbishing and rebuilding on top of last year's nest. Some nests might be layered up to five feet high. Caracaras are smaller raptors and live in more open, arid areas of low vegetation, their saguaro being the tallest thing around. Because their habitat contains fewer big plants, they usually gather thinner sticks, vines and twigs, giving the nest a more delicate look. The parents typically sit on top of the saguaro, leaving a telltale covering of whitewash from the top of the saguaro down to the nest. In most other raptors' nests, the whitewash is below the nest.

Great Horned Owls don't build their own nests, preferring to usurp one from a red-tail or other raptor. The owls often start nesting in January, earlier than the hawks. When a pair of red-tails comes to inspect their old nest in February, they find great horned owls already in residence. In this case, possession is 100 percent of the law.

Saguaros provide great outside homesites with their arms, but their insides are even more in demand. Secondary cavity-nesting birds search the saguaros, depending on woodpeckers to leave a cavity. Both Gila Woodpeckers and Gilded Flickers excavate cavities, although they use different parts of the saguaro. Gilas use the middle third of the cactus. These woodpeckers have powerful chisel-shaped beaks, and both male and female excavate the hole, using the space between the outer skin and the ribs inside for their nest chamber.

In response, the saguaro secretes chemicals that cause a scab to form, sealing the wound and the pulpy tissue from the air, thus protecting itself from moisture loss and bacterial infection and forming the nest chamber, or "boot." It takes several months for the scab to dry and harden before the chamber can be used.

Woodpeckers might use a nest cavity for several years, but usually begin excavating new holes in February (and sometimes again after the breeding season). These new holes won't be used until the next year. A Gila pair, which mate for life and hold their territory all that time, have favorite saguaros, preferring taller, armed saguaros located along washes. They use these again and again, and sometimes one old giant might have 30 woodpecker holes in it.

White-winged Doves rely on saguaro fruit in hot and dry June, Doris Evans

Red-tailed Hawk nesting in saguaro, Axel Elfner

Although Gilded Flickers are larger than Gilas, their beaks are more slender, slightly curved and less powerful since they feed on ants and ground insects rather than pecking into hard wood. Because of their larger size, flickers need to chop through the ribs and into the saguaro's central cavity to build their bigger nest chamber. However, in the middle section of the saguaro, the ribs are strong and thick and often fused, so flickers move up to the top third of the saguaro, where the ribs are thinner and easier to peck through. This damage can interfere with water and nutrient transport. Sometimes, a saguaro that has been structurally weakened in this way will lose its top in storms or heavy winds, occasionally leading to bacterial infection and possible death.

These well-insulated cavities are valuable real estate. They're safe from many predators and provide a good view of the area. They can be in short supply, and nesting birds that don't excavate their own holes—flycatchers, Elf Owls, screech-owls, pygmy-owls, American Kestrels, Purple Martins, and others—fiercely compete for them.

Gila Woodpeckers nest in early April, while Brown-crested Flycatchers migrate and don't arrive in southern Arizona until May when most cavities are already occupied. The Brown-crested Flycatchers aggressively and persistently attack woodpeckers in attempts to steal the nest cavity, but the woodpeckers usually prevail. Nests and cavities can never be left unguarded. When the female wants a break from incubating, she calls to the male to relieve her. She waits for his return before flying off on her own errands.

Sometimes when cavities are scarce, American Kestrels may also attempt to drive off occupants (like screech-owls) and kick their eggs out. An ornithologist reported finding a kestrel brood that included a baby screech-owl. The kestrel parents had apparently overlooked one of the eggs when they evicted the screech owls.

In the eastern U.S., martins use birdhouses and gourds almost exclusively, but in southern Arizona, the Desert Purple Martin subspecies nests in saguaros.Several martin pairs may nest in the same large saguaro if it has multiple cavities available. Western Screech-Owls and Elf Owls also nest in saguaro holes and often lay claim to more than one cavity. The owls use a second nest cavity to store cached food and a third as a day roost for the father owl.

The dreaded nonnative European Starlings and House Sparrows not only outcompete woodpeckers and other native birds for their cavities, but they also cram the hole so full of nest material that it sticks out of the hole. Most cavity nesters like owls and woodpeckers don't add any nesting material. The starlings so befoul the nest cavity that other birds won't use it again.

The saguaro cactus is very important as a birding nest site, but its flowers and fruits are just as important as food sources for many birds. The White-winged Dove is the most important daytime pollinator of saguaros and their reproductive cycle is closely tied to fruiting—the doves depend heavily on the fruits and seeds for their nutrition and much of their water in July. When the doves eat the fruit, the seed is destroyed, so although they are a main pollinator, they are not seed dispersers. But in other animals, such as woodpeckers, wrens, bats, or coyotes, the seed passes through the gut unharmed and germinates if the monsoon rains are generous.

Every part of this amazing cactus plays an important ecological role in sustaining other Sonoran Desert creatures. I stood in the rain musing about how many generations of birds, insects, bats and other animals this fallen saguaro had nurtured in its long life. I hoped its offspring would continue the cycle and there would be rooms in the cactus hotel for many generations to come.

See a full list of animals that utilize saguaros for food, shelter, and other purposes at TUCSONAUDUBON.ORG/SAGUARO-HOTEL.

Pinau Merlin is a nationally known speaker, naturalist, and writer. She is the author of several books and over 80 articles about the wildlife, natural history, and ecology of the Desert Southwest.

SAVING SAGUAROS THROUGH CLIMATE ADAPTATION

An estimated 420,000 saguaros were lost when roughly 100,000 acres of Sonoran Desert upland burned in Arizona's 2020 wildfires. Each destroyed mature saguaro stand leaves a 150-year void in that area for Desert Purple Martins and other birds that only nest in cavities in large saguaros. Even the void for those animals that feed on nectar and pollen is 40 years from the time a new saguaro is established until it blooms. With the finicky requirements that saguaros have for getting established in the first place—such as needing two good monsoons with a wet winter in between and healthy nurse plants—you may as well tack on an extra 50 years to those numbers if the area was burned.

A flat of two-year-old saguaroas ready for planting at the Mason Center, Jonathan Horst

But with your help, Tucson Audubon can drastically shorten these times with concentrated and strategic efforts.

Plant 14,000 saguaros. Design a saguaro cavity-replicating nestbox that Purple Martins and other saguaro-nesters will readily use. Install 750 of those new nestboxes on the landscape. Control buffelgrass on 1000 acres. Restore 525 acres of burned uplands. These numbers sound incredibly large, and for a series of overlapping 3-year projects they're ambitious. They may be a drop in the bucket compared to the numbers lost—a proof of concept to energize the community—but they're already being met with enthusiasm, unanticipated new partnerships, and other groups independently reaching the same conclusions!

Three projects, approved and funded in 2021 by the Wildlife Conservation Society's Climate Adaptation Fund and Tonto and Coronado National Forests, are now underway and include four main activities to address different aspects of healthy Sonoran Desert upland function: 1) Protect the best of what we have and buy time for adaptation processes to occur; 2) Replant saguaros after wildfires; 3) Facilitate saguaro migration to new habitat areas; and 4) Develop saguaro-replicating nestboxes.

Tucson Audubon restoration staff at the first official saguaro planting event at the Mason Center, Jonathan Horst

We have been working with numerous partners for years treating buffelgrass and other invasives to protect saguaros. We're now strategically identifying the most critical stands of saguaros to protect to support the most at-risk species that depend on them. Our saguaro replantings, both post-burn and in new habitat areas, have gotten off to a good start—10,000 seedlings are already growing for future planting and test-planting is underway at our Mason Center. We're planting head-started young saguaros, already old enough to have a high likelihood of survival and covered in hard spines. These will be planted under protective existing nurse plants, where available, and with nurse rocks where adequate plants can't be found. We will only plant when the rest of the desert is green, reducing predation pressure and ensuring good moisture for the saguaros to push their roots into the surrounding soils. We'll also be seeding other key native species, especially grasses, in the post-burn areas to assist with erosion control and moisture retention.

It's an ambitious task, no doubt. The swell of support and interest in saguaros nationwide, even up to congressional levels, and broad participation from the community, will make all the difference as we seek to save saguaros, for today and tomorrow.

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MAKING CONSERVATION CONNECTIONS: DESERT PURPLE MARTINS AND SAGUAROS

Desert Purple Martin at saguaro nest cavity, Francis Morgan

Illuminated by headlights, we do our best to quickly and quietly set up our first net. Dawn is breaking, signaling the best time for us to begin our research efforts.

We are surrounded by a vast tract of Sonoran Desert as far as the eye can see. Prickly pear, cholla, and creosote are at our level, but above us towers a saguaro: a giant, columnar cactus at least 40 feet tall with six massive spiny arms. A few soup-can-sized holes have been carefully carved into its sides. These cavities, originally created by woodpeckers, are found only on saguaros that are at least 13 feet tall.

Many species use these cavities after the woodpeckers depart, most notably, our study subspecies, the Desert Purple Martin. These martins are assumed to have high site fidelity, meaning they will use the same nest cavity year after year. Active nests can be found in and around Tucson in areas such as Tucson Mountain Park, the Mason Center, and Saguaro National Park. Our records show that they nest almost exclusively in cavities that are more than 15 feet off the ground and therefore have a strong reliance on mature saguaros. One of the most important facts we know about this understudied subspecies is that without saguaros, their nesting habitat would become extremely limited, and their populations would drastically decline. As our climate changes and saguaros are pressured with increasing drought, freezes, and fire, Desert Martins will be affected.

Making a conservation plan for a species often starts with gaining an understanding of its complete life history. For example, where do they go during the winter? What is their migration pathway? Should they be classified as a subspecies or a species? When it comes to Desert Martins, these basic facts are unknown. Tucson Audubon's Desert Purple Martin Project seeks to answer these questions.

The project's primary tasks in the summer of 2022 are to capture Desert Purple Martins, collect samples, and attach geolocators. We start by setting up a finely meshed, black mist net used to safely capture small birds. The net is held up by two 30-foot poles (about the height of a two story house!) on either side that keep the net taut. By having this tall net, we can place it just outside of an active martin nest cavity, giving us a higher probability of capture. Under normal circumstances, in front of dense vegetation, the net is nearly invisible to a flying bird, but with a sky-blue background the net is easily seen. As soon as the net is set up, the martins flock to it, zipping around and making alarm calls as they circle this strange, new object. In all of the commotion, one of the martins flies into the net and we quickly lower it and place the martin into a soft cloth bag that we use to transport it to our banding table. Most of the martins, however, handily avoid the net.

At the banding table, we collect morphometric data and two feathers that will be used for genetic testing and an ecotoxicology study. These samples will be used by researchers at Northern Arizona University (NAU) who are looking at the impacts of pesticides on martins throughout their life cycle. We are also beginning to work with NAU and the University of Arizona on genetic analysis of the three Purple Martin subspecies. Finally, we attach the geolocator to the bird. A thin piece of twine gets looped around the upper part of each leg so the bird is wearing it on its back like a little backpack. This tiny device, weighing less than a nickel, records daylight information that determines its location. From capture to backpack attachment, the whole process takes less than ten minutes. By deploying these devices on birds, we hope to be able to discover their flight routes and where they go during winter.

After we are done, we place the bird on one open hand and allow it to fly off on its own. As the bird leaves, it gives a few shakes in mid-air to adjust to its new apparel. Since the geolocators don't have any wireless data transmission abilities, we will need to recapture the same bird once it returns next summer. I look forward to coming back next year and hope the martin will return to its home inside the same saguaro.

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Joe Siegrist of the Purple Martin Conservation Association installs a geolocator on a male Desert Martin, Jonathan Horst

Project participants hold mist nets up near a colony saguaro with multiple martin nests while tagging in 2022, Jonathan Horst

DESERT PURPLE MARTINS NEED YOUR CREATIVITY!

Join our Nestbox Design Challenge for a chance to win a cash prize.

The Sonoran Desert subspecies of Purple Martin nests exclusively in cavities in giant saguaro cactus and their population size seems limited by available nest holes. Unfortunately, fires fueled by invasive grasses are leading to a decrease in suitable saguaros, and it takes 100–150 years for saguaros to be large enough to host martin nests—that's too long for martins to wait!

That's where you come in. Tucson Audubon and project partners are sponsoring a nestbox design competition with $2000 in cash prizes. Can you design a Desert Martin house that will help facilitate their long-term survival? Contest deadline is February 15, 2023. Good luck!

To participate, visit:
TUCSONAUDUBON.ORG/MARTINCONTEST

TWO ACCOUNTS OF KILLING BUFFELGRASS TO SAVE SAGUAROS

CoATIS in the field treating buffelgrass

Aftermath of the Mercer FIre, Kim Franklin

Emerging buffelgrass after a fire, Kim Franklin

CoATIS in the field

THE FEDERAL-LANDS PERSPECTIVE

"Have you pulled it all yet?"
"Is that buffalo grass what y'all are looking for?"

It's likely that every person treating buffelgrass has encountered similar quips from the general public. It's understandable when you see a bunch of sweaty people on trails or clambering up hillsides to reach inaccessible buffelgrass populations. It's a good thing too; the Tucson community is keenly aware of invasive plants and the threat they pose to a healthy Sonoran Desert. Tucsonans vividly remember the Bighorn Fire of 2020 and are now aware that buffelgrass is a high fire threat to saguaros and native vegetation, as well as urban communities surrounded by the stuff. This is why Tucson Audubon's local strike team now works with neighborhoods to lessen the fire risk posed by buffelgrass.

Our CoATIS crew (Collaborative Audubon Treatment and Inventory Squad) focuses on managing buffelgrass populations within natural landscapes throughout the Southwest in partnership with federal agencies including Fish and Wildlife and the Park Service. While the local crew is saving saguaros you can see from Tucson, we CoATIS regularly spend our time traveling hither and yon fighting the threat of invasive species. Our summers are usually spent "mountain goating" up hillsides in Saguaro National Park, where the park service has been working to manage buffelgrass since the early 2000s.

Summers in the park are a time of commitment to the cause, sheer will, and more Gatorade than anyone would like to admit. Mornings start early, often at 5:00. The crews gather, go over the game plan, and after a safety circle, an obligatory short hackysack game (limbers a body up, you know?), we're off. It's hot already, even before we get to the park and don our 34 pound backpack sprayers and gear. By the time the 10 am break rolls around, our frozen Gatorades have melted into a lovely slush. At lunch, everyone huddles around scant palo verde, saguaro, or cliffside shade, grateful for whatever we can find. Temperatures are likely well over 100. Buffelgrass is most readily treated when plants are rapidly growing; monsoon season is ideal. As we watch for building afternoon storms and continue the day, the topic of food and dinner plans somehow resurfaces again and again. Early in the afternoon, we debrief the day and are ready to start again the next morning.

Though it may look like a smurf has just vandalized a hillside with blue spray paint, fear not, the indicator dye in the chemical concentrate shows progress. We know that after successful buffelgrass treatments, the chance for native vegetation to repopulate an area is strong thanks to a healthy seedbank, and that the saguaro stands we have been so gingerly working around will be grateful for a chance to breathe again after being given a little space. Disrupting the endless flow of buffelgrass connecting critical habitat, saguaros, and homes is just one way Tucson Audubon Society works to enhance and restore this landscape we call home.

Jaemin Wilson
Invasive Plant Strike Team Lead
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THE LOCAL CREW PERSPECTIVE

Few cities have the sort of connection to their environments that Tucson does. Tucson is positioned in the heart of the Sonoran Desert and its residents are often tied very directly to the seasons. Summers bring oppressive heat and torrential rains. We find ways to thrive here despite these challenges though, and it creates a culture uniquely Tucsonan.

Unfortunately, the saguaro cactus and the species systems that depend on it are under threat. Buffelgrass has invaded these environments and upset their balance. The native plant communities in the saguaro forests are naturally sparse, with low growing grasses like slender grama and twiggy shrubs like limberbush. These plants don't burn vigorously, and if lightning strikes a palo verde and ignites it in a healthy desert environment, the fire will not spread. A fire started in a patch of buffelgrass, however, will spread quickly through the grass and into neighboring tree canopies burning at temperatures over 1,400 degrees Fahrenheit—hot enough to melt aluminum. After such a fire, buffelgrass re-emerges with the next rains, quickly monopolizing the freshly burned area. What's left is an invasive plant monoculture that animals struggle to use and poses an even greater fire danger. This is already the unfortunate reality of many places around Tucson.

There are ways we can prevent and combat these situations, including Tucson Audubon's invasive plant work. We've already seen dramatic returns of native ecosystems in some of our treatment areas after just one visit. The opportunity to take part in the restoration of such a unique environment has been really gratifying for me.

> We often find ourselves in some pretty extreme conditions, sometimes scaling rock faces in temperatures well over 100 degrees just to reach an isolated population of grass. In situations like these, danger is ever present and every step has to be carefully calculated. **It can be very demanding. For me, though, it's more than worth it to have a hands-on role in the preservation of such a uniquely biodiverse region of our planet.**

I should note that participating in conservation doesn't necessarily have to be as intense as the work we do. I encourage everyone to find something about nature that interests them and do something to take care of it. Even small things such as starting in your own backyard can be incredibly rewarding, and I look forward to a future in which we can take pride in our stewardship of the natural world.

Loftin Cudney
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SURVEYING FOR FLICKERS AND OWLS AMONG THE SAGUAROS

Arizona's 48 Important Bird Areas (IBAs) encompass many differing habitat types. Two large IBAs near Tucson include beautiful portions of Sonoran Desert. Towering saguaro cacti are an iconic sight within both the Tucson Mountains IBA, west of Tucson, and the Tucson Sky Islands and Sonoran Uplands IBA located east of Tucson.

Owl Surveyors, Erica Freese

Surveys focusing on the priority species of Gilded Flicker and Elf Owl have been ongoing for several years within these IBAs. Both of these species are strongly associated with saguaro cactus and will nest in cavities, all of which are created by flickers and Gila Woodpeckers.

The Gilded Flicker surveys have been somewhat independent with volunteer birders selecting a trail section and surveying on a morning of their choice in March or early April.

The Elf Owl surveys are organized differently and held just before the full moon in April. Since teams are surveying assigned trails at night, these surveys are done in partnership with Saguaro National Park and Pima County. On these fun surveys we find lots of Elf Owls, Western Screech-Owls, and other nighttime critters. Our survey maps give landscape scale information on where these birds are located, and years of data collection have shown that both Gilded Flickers and Elf Owls are not evenly distributed throughout the habitat. Both species are more likely to be found in large, unfragmented patches of desert. Flickers prefer areas of desert that are biorich with an abundance of ants, their main source of food. Elf Owls were more likely to be found near healthy desert washes than in stands of saguaros further from washes. This may be because these owls primarily prey on moths and other insects that are more abundant in and near washes.

As Gilded Flickers and Elf Owls prefer particular saguaro patches, the occurrence data gathered by volunteers and Tucson Audubon staff on these surveys can be very helpful for focusing habitat restoration efforts. Tucson Audubon's ongoing and expanding work to control invasive grasses and conduct other habitat improvement projects will use past and future bird survey data to guide which areas are targeted before others. This important and demanding work helps protect our local Sonoran Desert for all native bird species.

Jennie MacFarland
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Gilded Flicker, Ned Harris

Elf Owl, Jeremy Hayes

Michael Wilson

The saguaro is the most prominent species of the Arizona Upland desert. Saguaros are a keystone species providing benefits for over 100 species including perching and nesting places for birds and food for many organisms during the hottest and driest part of the year. Birds and bats are the primary dispersal agents of the seeds that are eaten with the pulp. Deer, javelina, rabbits, and rodents take whatever fruit scratchings fall. Large lizards like desert iguanas, chuckwallas, and tortoises also love fallen fruits. They all spread seed widely across the landscape. Doves and ants, conversely, are highly efficient seed predators receiving nourishment from the seed itself. Humans also relish the red, sweet, and refreshing ripe fruits of the saguaro during the desert's bleak foresummer.

Despite the apparent stability of plant communities of the southwest, in climate-time, saguaros are a recent arrival to the northern reaches of the Sonoran Desert. These stately plants are the leading vanguard of a slowly moving army of tropical plants coming from the heart of the dry forests of central Mexico where they evolved. Many tropical species like the Elegant Trogon, the jaguar, the coral tree, and the saguaro—just to cite a few—find their distribution limits in the Sonoran Desert of Lower Arizona, a place at the edge of the Neotropics.

Earth is experiencing a reversal of the long trend of cooling that started about 55 million years ago during the Paleocene–Eocene thermal maximum; a time when the global average temperature was almost 8°C above the last-century average. The melting at the end of the last glaciation, roughly 10,000 years ago, marked the birth of the modern Sonoran Desert ecosystem. The saguaro and other species, previously confined to the dry lowlands of Mexico, started arriving. However, today greenhouse gas concentrations have greatly increased, raising earth's average surface temperature at an unprecedented rapid rate, especially in drylands like the Sonoran Desert.

Sonoran Desert species face enormous challenges as suitable conditions are rapidly shifting. According to Dr. Fabio Albuquerque, from Arizona State University, annual precipitation and maximum temperature of the warmest month greatly affect saguaro distribution. He predicts a 7–8% habitat loss before the end of the century and that the ancestral saguaro distribution in the eastern and central region of the Mexican state of Sonora is the area most sensitive to change. Limited expansion into new habitat will occur, mainly at the expense of sites in higher elevations, further reducing unique montane communities.

A drying and warming Sonoran Desert is changing saguaro distribution, and changes in saguaro abundance will initiate a cascade of effects impacting many other species. The importance of the saguaro cactus in the face of these changes highlights the need for urgent measures to ameliorate the impact of global climate change and protect our strongest refuge populations.

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SAGUARO STORIES
TUCSONANS SHARE THEIR PERSONAL CONNECTIONS TO THE SAGUARO

When I first moved to Tucson the first thing I noticed were the saguaros. It seemed like they were everywhere—in parks and yards, but also as logos, on stickers, and home decor! It was immediately clear to me that the saguaro is an important plant not only in the environment, but also as a source of pride to many people who live in Tucson. To highlight this joy, we have selected a few stories written by Tucsonans about the connections they have made with this iconic plant.

Read more Saguaro Stories at TUCSONAUDUBON.ORG/SAGUARO-STORIES.

—Aya Picket

My volunteering with Tucson Audubon took me to the Mason Center in the early 2000s, training volunteers to lead groups on the desert trails. One day we noticed tiny arms emerging from a saguaro alongside the trail. I snapped a photo and one of the trainees said, somewhat jokingly, "You should come back every year and take a photo." This was midmorning in November 2006, and every year since I return at the same time, walk the trail to my old friend and take one more photo. What a surprise to see how quickly the arms grew those first years and note how the main stem inches its way upward. It has now been seventeen years and I feel a close kinship with this saguaro. Each November it's a special day as I trek out to the Mason Center and visit my buddy, still standing tall along the trail, take a few minutes to visit with it, snap my photo, and add it to my Saguaro Growth chart which I post on Facebook and Flickr each year and use in my "Life of a Saguaro" program I present to groups. Folks now look forward to the annual addition to the chart to see the progress. What a fun and enlightening project this has been.

—Doris Evans

SLOW, SLOW SAGUARO

I wave at the sunset with one arm held high. Standing on top of a mountain, I am a silhouette in the distance. Prickly sometimes, I accept myself as such. I need very little to be happy. Patience, I think. The sun will rise again and again. I'll take the light in as I wait and wonder. Tomorrow, or when? When will I bloom? It may be a while. It may be soon. I'll take my time–as much time as I need. Like a slow, slow saguaro, I am content here.

—Mindee Bahr

Saguaro silhouette, Eric Vondy

Saguaro spines, Tom Held

The saguaro's spines are not a defense, but an advertisement. We had moved into an old West University house—creaky floors, faded wallpaper, all the usual complications of an annual lease and swamp cooler. In the backyard was a saguaro. "There's a bird living in it," she said. She leaned against me and we looked up. Forty feet high, a circle was gouged into the saguaro's pulp. Spines lined either side like battlements, protecting the wrens flitting about its several spiky arms raised in obscure vegetable triumph. The wrens came for the protection offered by the spines and in return they spread the saguaro's seeds and ate the insects that threatened it. This arrangement had existed for hundreds of years. We moved in together because it felt grown-up and exciting, the next chapter of our lives begun, and besides that just the practical thing to do after dating someone for a certain length of time. The moment passed and she broke away to the UHaul. I watched the birds spar and dip among the arms for a moment more. A desert fortress bristling with defenses, alone in inhospitable terrain, sending one message from heat-flattened summer to water-whelped monsoon to cold winter night: Come to me as you are. Take me as I am, and build your home in my heart. "Am I going to unload this entire truck myself?" she yelled from inside. We had a good time, but I never quite realized that about her.

—Doug Wykstra

HOME

Running through the Desert on a starry night,
Running from the pain that tends to weigh me down.
Crying tears that heal a weary broken heart,
Finding home is hard when the river is dry.
But you guide me through the night with your arms held high,
Your presence makes my life make sense. I let go of pride.
You are the breath of fresh air,
My soul needed to thrive.

—Bea Mendivil

Back in the 60s, my parents discovered a small, volunteer saguaro on their midtown property. Excitedly, they took pictures of it next to a yardstick—I still have that photo. Now, 50 years later, this beautiful thing stands proudly, lifting its six arms high, as if in benediction to the shrinking desert around it. Birds make it their home, and people stop and admire its solitary majesty.

—Karen A. Matsushino

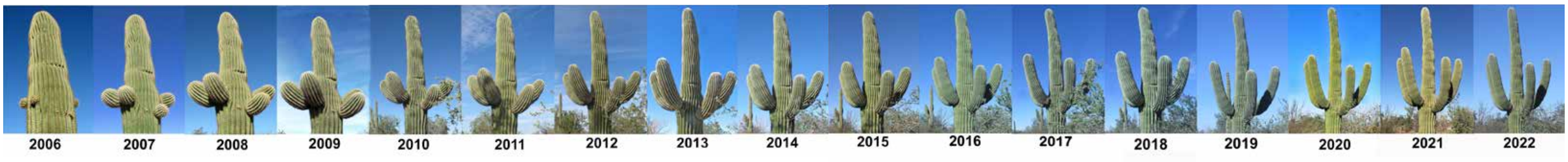
MORE INFO

Learn more at TUCSONAUDUBON.ORG/SAGUARO, **including:**

- SPONSOR A SAGUARO HOTEL — Your support will help keep old-growth saguaros safe and open for bird business
- ADOPT A SEEDLING — Create a fundraising page to adopt a saguaro seedling
- VOLUNTEER OPPORTUNITIES — Plant saguaros!

Save Our Saguaros Month: February:
DESERTMUSEUM.ORG/BUFFELGRASS

Tucson Audubon Mason Center Saguaro Growth Chart, Doris Evans



25 YEARS OF TUCSON AUDUBON'S EFFORTS TO PROTECT THE CACTUS FERRUGINOUS PYGMY-OWL AND ITS HABITAT

Cactus Ferruginous Pygmy-Owl adult male; Sonoran Desert owl habitat, Bob Wick, BLM; Cactus Ferruginous Pygmy-Owl in saguaro nest cavity, Dan Weisz

The Cactus Ferruginous Pygmy-Owl (cFEPO) is endemic to the Sonoran Desert and it now nests almost exclusively in cavities in saguaro cactus. It created a panic within the regulated homebuilding community when it was first listed as endangered in 1997 due to the extent of dense residential development occurring in the owl's preferred habitat. Headlines threatened economic collapse and an end to all building in 11 Arizona counties. Fear and mistrust were palpable.

Looking back, we have that tiny terror of an owl to thank for many regional conservation wins. It was the impetus for Pima County's community-driven, national award-winning Sonoran Desert Conservation Plan (SDCP, tucsonaudubon.org/SDCP), and later the Multi-Species Conservation Plan (MSCP, TUCSONAUDUBON.ORG/MSCP) and 30-year Incidental Take Permit (ITP).

In response to public consternation following the 1997 listing, Tucson Audubon co-founded the Coalition for Sonoran Desert Protection, which created a platform for community and environmental interests to have a voice in land use policies and practices to preserve regional biodiversity.

Throughout, Tucson Audubon has led the way in collaborating with scientists, the U.S. Fish and Wildlife Service (FWS), Pima County, other jurisdictions, the community at large, and other stakeholders. Over the last 25 years, volunteers and staff representing Tucson Audubon have served on the SDCP Steering and Implementation Committees, the FWS cFEPO Recovery Team, and attended countless committee meetings to support various jurisdictions efforts to improve land management policies and practices protecting saguaros and intact cFEPO habitat.

What began as a fearful community response to finding a tiny endangered bird in the path of sprawling development has resulted in a stronger, more self-aware community. The process of mindfully creating space where diverse voices may be heard, the strong leadership of multiple jurisdictions, the active collaboration of many stakeholders, scientists, and concerned citizens has created a community-led effort that continues to this day.

What will the next twenty-five years look like?

When the owl was originally listed in 1997, climate change was not a widely acknowledged threat to the future of life as we know it on Earth. It is now. While water has always been a concern in the arid west, a Tier 2 B shortage declaration under the region-wide Drought Contingency Plan was unanticipated in 1997. It is now. This shortage will restrict the number of building permits granted until such time as we achieve a sustainable water balance for our state and region.

In December 2022, the cFEPO is anticipated to be re-listed as threatened, with particular emphasis on Pima County as an example of where development can be balanced with preservation and conservation, encouraging a vibrant economy and healthy community while incorporating constructive steps to adapt to our ongoing drought and climate change.

The RTA is planning to ask for voter approval of another 20-year plan before 2026. Will it focus on multi-modal transportation and decreasing greenhouse gas emissions, or will it support more gas guzzling automobile infrastructure? Will it again include robust efforts to connect fragmented landscapes and create safe passages for wildlife?

If we, as Tucson Audubon and as a community, continue to strongly advocate for what is essential for our dwindling resident and migratory bird species and an intact Sonoran Desert, we have a fair chance of continuing the good work of the last 25 years.

To see a timeline of Tucson Audubon's role in protecting Cactus Ferruginous Pygmy-Owls and their habitat, please see TUCSONAUDUBON.ORG/CFEPO-TAS.

Chris McVie is a life member of Tucson Audubon and former Vice-President and Conservation Chair. During her tenure, she chaired the Cortaro-Thornydale Site Selection Committee, served on the cFEPO Recovery Team, the SDCP Steering and Implementation Committees, and numerous others. She serves as Board President of the Coalition for Sonoran Desert Protection and was the "standing" for the successful lawsuit to re-list the cFEPO.

CACTUS FERRUGINOUS PYGMY-OWL IN ARIZONA

Historically in Arizona, the diminutive Cactus Ferruginous Pygmy-Owl was never widespread, but as recent as the early 1960s, it ranged north of Phoenix, most-common in the mesquite bosques and riparian at the mouth of the Verde River, but also found near Saguaro Lake, and Superior. Pygmy-owls were also found sparsely near Tucson, west to southern Yuma County (Cabeza Prieta NWR), and are known to live in saguaros, mesquite forest, and mesquite-cottonwood riparian habitats. By the 1970s and 1980s, the species had become very rare in Arizona, and had disappeared from the northern portion of its range in the state, most likely a result of habitat change. During this period, there were only scattered reports of breeding birds mostly from northwest Tucson, the San Pedro River near Dudleyville, and west to Organ Pipe Cactus National Monument.

As Tucson became more developed during the 1990s and 2000s, the Cactus Ferruginous Pygmy-Owl became even more difficult to find, to the point where it was listed as Endangered in 1998. This resulted in an effort to monitor and conserve this species in Arizona, with a collaborative effort by Tucson Audubon, the U.S. Fish and Wildlife Service, and other conservation groups. The listing was eventually removed, but recent reanalysis is underway with an expectation of future relisting. Recent surveys found the owls in remote areas of the Altar Valley, and Organ Pipe Cactus National Monument, where there is a mix of saguaro and mesquite desert. Tucson Audubon requests that any birding efforts to see these rare owls in Arizona must be done in the most sensitive and non-disturbing manner possible.

Cactus Ferruginous Pygmy-Owl, Stephen Vaughan

Gary Rosenberg is Secretary of the Arizona Bird Committee and co-author of the season bar graphs section of *Finding Birds in Southeast Arizona*.

Saguaro flower and buds, ©bryanjsmith

SAGUARO

SCIENTIFIC NAME: *Carnegiea gigantea*

FAMILY: Cactaceae (Cactus)

NATIVE RANGE: Rocky hillsides and outwash slopes below 4000'; southern Arizona, extreme southeastern edge of California, and Sonora, Mexico

WILDLIFE VALUE: Important sites for cavity-nesting birds; hawks may build large bulky nests in angles between the main stem and arms; good hunting and resting perches; flowers attract many pollinators including bees, bats, moths, and birds; red masses of seeds and pulpy fruits are devoured by almost every desert creature; fallen plants provide homes for snakes, rodents, and lizards.

Saguaro, Matt Griffiths

If you have a saguaro on your property, count your lucky stars. It makes an excellent focal point in the landscape and is probably the best wildlife plant in the Sonoran Desert.

Saguaros grow only from seed. Seedling establishment is improved by nurse plants or rocks that protect young plants against heat, cold, and hungry critters. Mesquites and palo verdes are common nurse plants. Once the cactus is large enough to survive on its own, it may compete with nurse plants for soil moisture. Saguaros have a tap root extending to about two feet, but most of the root system is shallow and widespread, able to readily intercept rainwater. Hardiness varies with age: temperatures in the low 20s can wipe out seedlings while older plants can withstand the high teens.

Plants are extremely slow growing; they may take 40–50 years to reach 10' high! The main stem can eventually reach 2' in diameter. Vertical ribs enable the stems to expand and contract based on water availability. Spines on the stems of older plants shade the trunk, reducing heat and water loss.

Saguaros grow best in full sun or light shade. If you elect to transplant one, note that success decreases with age. You'll have more luck with a specimen that is 1–2' tall than with one that is much larger. Plant no deeper than it was originally growing and fill hole with excellent draining soil. Be sure to orient the plant in the same direction it was growing to avoid sunburn. Plants require only occasional irrigation for the first year.

First flowers may not appear until a plant is about 8' tall. Large, white and funnel-shaped, they appear from late April to early June (occasionally at other times of year), opening in the late afternoon and remaining open until the afternoon of the following day. Each flower only blooms once. They smell like overripe melons, attracting bats and moths at night, and birds (mostly White-winged Doves), bees, and other insects during the day.

Following bloom, 3–4" long, red pulpy fruits ripen from late May until mid-July. They are a staple for many animals, providing one of the few moist foods during the hottest, driest time of year.

Lynn Hassler
Green Gardeners Volunteer Captain
Historic Y

WHITE-CROWNED SPARROW

White-crowned Sparrow, David Kreidler

The White-crowned Sparrow is one of the most abundant winter birds in brushy habitats throughout Southeast Arizona. While this region is renowned for its rare and local sparrow species that are highly sought after by visiting and local birders alike, such as Rufous-winged, Five-striped, and Botteri's Sparrows, there is much to appreciate about the common White-crowned Sparrow.

Sparrow identification is often a frustrating exercise of parsing out subtle clues of shape and plumage from birds that excel in remaining hidden, but quite often you don't have to search for a White-crowned Sparrow—it finds you! There is something refreshing about an adult White-crowned Sparrow boldly teeing up in the top of a bush, sporting its black and white bicycle helmet cap.

Without too much difficulty, one learns that accompanying birds with the same head pattern (but with the white and black replaced with a more subdued gray and reddish brown) are the immatures of the species. An even closer look reveals two slightly different types of head patterns, representing subspecies from different parts of the continent. Most of our wintering birds have pale gray between the eye and the bill; these are Gambel's White-crowneds that hail from the taiga and tundra of Alaska and northwest Canada. Another subspecies has more extensive black in the front of the face, lending it a more stern look than the gentle expression of the Gambel's; this subspecies (*oriantha*) breeds in the Rocky Mountains, with a few hiding their nests as far south as the higher reaches of northern Arizona's tallest mountains.This groups winters primarily in Mexico, so we see them mainly on spring and fall passage.

One of the most enjoyable places to watch White-crowned Sparrows throughout the winter is at the Paton Center, where any bench can become a front row seat to sparrow behavior theater. Once they begin stirring in the early morning, there is almost always a flock cavorting around one brush pile or another, some scratching around in the leaf litter, some sentinels standing guard on the highest stick. With such a bold head pattern one can readily observe how the raising and lowering of the long feathers atop their heads can greatly change their appearance. See every member of the flock scatter in different directions and learn that's when you begin searching for the Cooper's Hawk.

The resident races of White-crowned Sparrow in California have been subjects of research for decades, contributing important data on song development and many other aspects of bird biology. One of the more recent discoveries comes from research conducted in 2020 in San Francisco that showed that White-crowned Sparrows quickly modified the volume and quality of their songs in response to the quieter conditions resulting from pandemic lockdowns. This could suggest that a reduction in the volume of urban traffic sounds could lead to beneficial outcomes for urban and suburban birds in very short time periods.

Louie Dombroski
Paton Center Birder-In-Residence

BIRDATHON 2023: April 7–May 7

A "High Flyers" field trip with Luke Safford in 2022


The Nekkid Jaybirds team in 2022

THE 2023 BIRDATHON is your chance to enjoy birds while raising critical funds to support the mission of Tucson Audubon. It's fun and easy to participate—visit **TUCSONAUDUBON.ORG/BIRDATHON** to get started or contact Luke Safford at lsafford@tucsonaudubon.org.

WHO? You! Absolutely anybody can participate in this tradition begun in 1987. You can:

- Form Your Own Team
- Donate to a Team

WHEN? April 7 to May 7. You make the call: Take 24 hours, half a day, a week, or the whole month!

WHERE? Take your birding anywhere on the planet you like.

PRIZES? Yes! We're continuing our **COMPETITION CATEGORIES** and introducing new ways to win!

WHY? Birdathon is a great way to have fun with friends and family, spotting birds while helping with this community fundraiser to support Tucson Audubon.

Never done a Birdathon or want new ideas to make your Birdathon the best yet? Stay tuned for our workshops!

TUCSONAUDUBON.ORG/BIRDATHON

TUCSON AUDUBON BIRDATHON 2023


Costa's Hummingbird, Shawn Cooper

2022: A YEAR OF UPS AND DOWNS FOR CONSERVATION, CLIMATE, AND DEMOCRACY

Looking back on 2022 and the issues that most greatly impact Tucson Audubon's advocacy, I find myself asking: Is the glass half empty or half full? My answer: It's both. Here's why:

CONSERVATION. In 2022, the biodiversity crisis worsened, with continued declines in both numbers of species and overall populations. Still, the COP15 UN Biodiversity Summit concluded with a historic agreement to protect at least one third of Earth's land and water by 2030, in order to turn the tide on global mass-extinction.

Meanwhile, 2019's staggering report on the loss of 3 billion North American birds since 1970 was confirmed by the 2022 State of the Birds report. But one of its key findings—the remarkable recovery of wetland birds—shows that well-funded, policy-supported conservation works! And with 2022's new digital tools—the Bird Migration Explorer, eBird Trends maps—bird conservationists can direct their efforts even more precisely for maximum impact.


Great Egreat, David Kreidler

CLIMATE. The effects of climate change were more visible and deadly than ever. Massive wildfires, record-breaking heat waves, and devastating mega-storms affected hundreds of millions of people worldwide. In Pakistan alone, unprecedentedly severe flooding impacted more than 33 million people and left a third of the country—an area the size of Wyoming— underwater.

But not all news was bleak. The Inflation Reduction Act, which includes the largest-ever U.S. investment to combat climate change, was passed. And notwithstanding concessions to Sen. Manchin on fossil fuels, the law dramatically boosts climate action in energy, transportation, manufacturing, agriculture, environmental justice, and more, setting us on the road to reducing carbon pollution by 40% by 2030.

The outcome of the COP27 gathering in Egypt was less positive. Several oil-producing countries, plus China, blocked an agreement to phase out all fossil fuels, instead of just coal. But the conference did result in a major victory: the countries most responsible for climate change finally agreed to set up a fund to help the most vulnerable countries deal with climate impacts.

DEMOCRACY. As I wrote in the fall issue of *Vermilion Flycatcher*, every issue Tucson Audubon addresses is profoundly impacted by the outcome of elections. And the outcome of elections is profoundly impacted by the state of our democracy, which in 2022 provided another study in stark contrasts. While election-deniers ran for office across the country, most of the highest-profile ones lost—a huge victory for democracy. But most election-deniers running for federal or statewide offices won. And some of the most extreme, including candidates for very high office in Arizona, lost by only the tiniest of margins.

Meanwhile, in December, the Supreme Court heard arguments in a case about a fringe theory claiming the Constitution gives state lawmakers sole power to draw maps and set election rules, regardless of a state's laws or constitution.

Of course, Tucson Audubon can't advocate on every issue or on every level. We always ask ourselves: "Is this issue closely tied to our mission?" "Could our voice make a critical difference?" "Do we have the capacity for this fight?" "What are the risks of acting—and of not acting?" We amplify the advocacy of our national allies on national issues, but we direct the lion's share of our resources to local and state issues, from Tucson's Climate Action Plan; to proposed new mines, transmission lines, freeways, and housing developments; to management of public lands; to local and state water policy.

For each issue, we try to learn as much as we can. Sometimes our research reaffirms positions and strategies we've adopted in the past. Sometimes it leads us to new ones. As the world continues to change, so must our advocacy.

Here's what won't change: Our advocacy will continue will continue to be impassioned and ambitious, but also strategic and pragmatic. We hope you'll join us in this work, as we do our best to fill the glass more than half full in 2023!

David Robinson
Director of Conservation Advocacy
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TUCSON YOUTH INSPIRE US TO REIMAGINE TEACHING CONSERVATION

Fall was a great time for growth in the Education department at Tucson Audubon. We were welcomed into many schools with open arms. Working with youth inspires us to reimagine the way we do conservation. Teachers and their feedback have been the most valued components in our lesson planning. We are grateful for the deep commitment our Tucson teachers have to their students.

As community educators, our team is working on leveraging spontaneity, resourcefulness, empathy, and critical thinking, to create a framework that is equitable and seeks to fill the gaps in existing available resources. We now know that there is no "one size fits all" when it comes to conservation outreach.

Listening to the needs of educators out in the community everyday has led us to create diverse collaborations. Our ongoing partnership with Palo Verde High School has opened up doors for engagement with students and other organizations in the Tucson community. Working to restore their wetlands, students are learning about native plant species in the Sonoran Desert and the key role they play in the diversity of bird species.

Exploring creative ways of teaching about habitat conservation allows us to transform both the educator and the student. This includes stepping out of the classroom, bringing new questions and possibilities, plans for action, and radically re-perceiving our place in nature.

Our education team at Tucson Audubon has been working diligently to make sure that our lessons are centered on the needs of local youth. We have one goal, and that is to inspire all students to feel connected to their natural surroundings. It has very little to do with instructing, and more with letting students tell us the many unique ways they are one with nature. Equity in education relies more on supporting youth ideas, and less on dictating standards.

Bea Mendivil
Education Coordinator
bmendivil@tucsonaudubon.org

KID'S CORNER

WHERE'S VALDO?

Can you spot the Vermilion Flycatcher?

STUDENTS STEP UP: THE NEXT GENERATION TAKES THE LEAD

Tucson Audubon is, at its core, a community organization. One reason why I love working with volunteers is that they exemplify what it means to work as a team to tackle a goal. A great example of this teamwork occurred just a few weeks ago when we partnered with University of Arizona student extraordinaire Rhianyon Larson to organize a volunteer trash clean-up event at one of our restoration sites along the Santa Cruz River.

For the past few years, Tucson Audubon restoration crews have been hard at work felling and treating invasive salt cedar along the Santa Cruz River as part of the Corazon Sin Fuego restoration project. In partnership with Pima County Regional Flood Control and Northwest Fire District, we've been removing fire-prone invasives from the floodplain to protect this valuable riparian habitat and lay the groundwork for future restoration along the river. Some of you may remember a firewood pick up event last year at this site in an effort to get rid of some of the felled saltcedar. This is where our story begins! Rhianyon was one of our volunteers at that event and while there she noticed the *incredible* amount of garbage in the area. Most people, myself included, noticed the garbage, expressed sadness at its presence, and then moved on with the task at hand. Rhianyon, however, isn't most people! She decided to spearhead an effort to *do something about it* and truly got the whole community involved!

Event organizer Rhianyon Larson (L) and another university student in good spirits before taking on a very heavy tire. All photos by Taylor Rubin.

Eegee's donated 30 of their old pickle buckets to use as trash receptacles. (Fun fact: we stored them in my office, so if you visited me in the month of November, you were treated to the pickle smell that…lingers.) The University of Arizona Honors College donated granola bars to keep the volunteers well-fueled. Tucson Clean & Beautiful lent us gloves, trash bags, and trash pickers to keep everyone safe. The Sonoran Institute came out to help and even collected some data about the trash. Finally, Blue Chip Leadership Experience students helped us get everything set up and make sure all of the volunteers knew where to park.

Collectively, 44 volunteers (almost all were students) contributed 178 hours of work and filled an entire roll-off dumpster! That means we removed 240 32-gallon trash bags or 16 standard pickup truck loads worth of trash. That's a LOT.

Thanks to every volunteer who gave up their Saturday to help make the world a little bit cleaner. Special thanks to Rhianyon and all of the young people like her who are the next generation of impactful volunteers that the world needs!

Taylor Rubin
Volunteer & Education Manager
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The whole group about to start tackling some trash, posing in front of the still empty dumpster.

The University of Arizona Blue Chip team.

We'd love to welcome more people to the Tucson Audubon volunteer team! Visit TUCSONAUDUBON.ORG/VOLUNTEER to learn more.

TUCSON AUDUBON SOCIETY

BIRDS & COMMUNITY

REGISTER ONLINE AND FIND DETAILS AT:
TUCSONAUDUBON.ORG/NEWS-EVENTS

Saturday, January 7, 10–11am, In person
GEMS IN YOUR GARDEN—HOW TO ATTRACT AND SUPPORT HUMMINGBIRDS IN YOUR YARD with Jennie MacFarland
We'll talk about native plants, efficient water use to support your gardens, and best practices for hummingbird feeders.
LOCATION: Green Valley Recreation Center, 1111 S GVR Dr, Green Valley

Tuesday, January 10, 6–7pm, Virtual
DESERT PURPLE MARTIN NESTBOX DESIGN CHALLENGE with Olya Weekley and Jennie MacFarland
Join Olya to learn more about Purple Martins and our nestbox contest. More information is found at: TUCSONAUDUBON.ORG/MARTINCONTEST.

Thursday, January 19, 1–2pm, Virtual
ENTERING THE EBIRD WORMHOLE with Luke Safford

Thursday, January 19, 4–8pm, In person
BIRDS 'N' BEER with the Feminist Bird Club of Tucson
Join us for an evening of birds, beer, and fun with other birders, as we bird Fort Lowell Park followed by a drink at the Tucson Hop Shop!

Thursday, January 26, 6–7pm, Virtual
CREATIVE LIGHTING FOR BIRD PHOTOGRAPHY with Hunt's Photo
In this presentation, 15-year-old wildlife photographer Christopher Smith will discuss how he approaches creativity and light in bird photography.

Monday, January 30, 7–8pm, Virtual
BIRDS 'N' BEER—RARE & INTERESTING BIRDS IN SE ARIZONA with Luke Safford

Saturday, February 4, 10–11am, In person
SECRET LIVES OF LUCY'S WARBLERS: TUCSON AUDUBON'S RESEARCH OF AN ENIGMATIC CAVITY NESTER with Olya Weekley
Join Olya Weekley to learn more about our Lucy's Warbler work and the conservation impact of our findings.
LOCATION: Green Valley Recreation Center, 1111 S GVR Dr, Green Valley

Thursday, February 16, 5–7pm, In person
BIRDS 'N' BEER IN CELEBRATION OF LUCY'S WARBLERS!
Lucy Nestboxes will be available for purchase. LOCATION: TBD.

Tuesday, February 21, 11am–12pm, Virtual
IBA SPECIES PROFILE: CHESTNUT-COLLARED LONGSPURS AND WINTER GRASSLAND SURVEYS with Jennie MacFarland
We will discuss the life history and survey results of the steeply declining Chestnut-collared Longspur.

Monday, February 27, 7–8pm, Virtual
BIRDS 'N' BEER—RARE & INTERESTING BIRDS IN SE ARIZONA with Luke Safford

Lucy's Warbler, Greg Lavaty

Tuesday, February 28, 11am–12pm, Virtual
SECRET LIVES OF LUCY'S WARBLERS: TUCSON AUDUBON'S RESEARCH OF AN ENIGMATIC CAVITY NESTER with Olya Weekley
See description above.

Thursday, March 2, 11am–12pm, Virtual
TIPS ON IDENTIFYING BIRDS with Luke Safford

Saturday, March 4, 10–11am, In person
BIRDS, CLIMATE, ADVOCACY, & JOY: HAVING FUN WHILE PROTECTING THE PLANET with David Robinson
LOCATION: Green Valley Recreation Center, 1111 S GVR Dr, Green Valley

Tuesday, March 7, 1–2pm, Virtual
PREPARING FOR THE TUBAC HAWK WATCH with Steve Vaughan

Thursday, March 9, 11am–12pm, Virtual
IBA SPECIES PROFILE: SAGUARO CAVITY NESTERS: ELF OWLS & GILDED FLICKERS with Jennie MacFarland
We'll talk about the amazing life histories and the survey data that has been gathered on these species over the last several years

Tuesday, March 21, 11am–12pm, Virtual
BIRDING THE CALENDAR—WHERE TO GO BIRDING DURING SPRING MIGRATION with Luke Safford

Thursday, March 30, 6–8pm, In person
BIRDS 'N BINGO at Bawker Bawker Cider House

WOO HOOT!

BIRDY NEWS BITES WORTH CELEBRATING

SONOITA CREEK INVASIVE PLANT TREATMENT

Tucson Audubon is thrilled to announce that we have secured $179,000 in funding from Arizona State Forestry to control invasive plants, restore overbank floodplains, and grow a new generation of cottonwood trees along a two-mile stretch of Sonoita Creek in Patagonia, Arizona! The agreement has been signed and we expect work to begin in January. The project stretches from just upstream of the Hwy 82 bridge over the creek to the downstream end of The Nature Conservancy's Patagonia-Sonoita Creek Preserve.

Sonoita Creek riparian area, Dan Lehman

GIFTS IN HONOR OR MEMORY OF

In memory of Bernice Kulongowski from Donna & Mike Mardis

In honor of Caleb Strand from Colleen Dugan

In honor of Canny Clark from Susan Clark

In honor of Carl Baldwin from Erin Baldwin

In honor of Ellen Barker & Tom Shoup from Mary Louise Brown & Elbert Williams

In memory of Garry Loucks from Kristen Patrick

In honor of Janel & Scott Feierabend from Bale Worsley

In memory of Jeanne & Bill Casey from Leslie Carter

In honor of Jim Hoagland from Glenna Matthews

In honor of Jim Hoagland from Sharon Passov

In honor of Jim Hoagland from Stephanie Kapolnek

In memory of Joel Sharrow from Kirsten Howe & Justin Sharrow

In honor of Landon Roberts from Mariah Michas

In memory of Mary Anderson from Peter Anderson

In honor of Patti Caldwell from the MET Foundation Inc.

In memory of Ray Reynolds from Julie Reynolds

In honor of Ruth & Steve Russell from the Elizabeth Wakeman Henderson Charitable Foundation

In honor of Sara DeRouen Pike from Christi Valley

In memory of Surrie Melnick from Lena Melnick

In memory of Terry Alston from Lois Manowitz

In honor of The Roszels from Peggy & John Smith

In memory of Wayne Collins from Ellen Blackstone

Black-tailed Gnatcatcher, Martin Molina

OUR MAGICAL CONNECTION TO SAGUAROS

I grew up in Upstate New York, metaphorically a million miles from the Sonoran Desert. For about a week every year, my family would leave behind the slush and snow and make a pilgrimage to Tucson. The Catalina Mountains, looking so unlike our own Catskill Mountains, were a majestic sight, but it was really the saguaros that made us feel we'd finally arrived in our home away from home.

There's something magical about saguaros, and I think everyone who encounters them feels that magic in a different way. For me, it is their *duality*—they are beautiful to see, but dangerous to touch. They're seemingly inhospitable, yet home to dozens of species. They're hardy to extreme desert conditions, yet, as we've seen in this issue, their very existence can be threatened.

In the pages of this magazine, we've shared with you how much the saguaro means to our desert home, and how much we're doing to ensure their long term survival and health. The saguaro is truly the hub of the Sonoran Desert. There is no healthy desert biome without a healthy saguaro population.

Whether Tucson is your forever home, your home away from home, or an occasional vacation home, you probably have your own magical connection to saguaros. If protecting and nurturing the saguaro population is as important to you as it is to us, I'd encourage you to use the envelope included with this magazine, or go to TUCSONAUDUBON.ORG/WINTER, and make a donation to support the work we do.

We, the saguaros, and the birds who call them home, all thank you.

Ethan Myerson
Director of Development and Communications
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Gila Woodpecker at saguaro nest cavity, Francis Morgan

TUCSON
AUDUBON
SOCIETY

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VERMILION FLYCATCHER
Winter 2023 | Vol 68 No 1

The *Vermilion Flycatcher* is the newsletter of the Tucson Audubon Society, a chapter of the National Audubon Society. National Audubon Society members and members of other chapters may receive the *Flycatcher* by becoming a member of Tucson Audubon. For more information visit: TUCSONAUDUBON.ORG.

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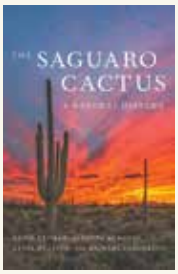
There's never any sales tax since we're a non-profit. All purchases support our mission to protect birds and their habitat.

SAGUAROS & OTHER CACTI



The Saguaro Cactus: a Natural History
by Yetman, Burquez, Hultine and Sanderson | $20.00

The Saguaro Cactus offers testimony to the cactus' prominence as a symbol, the perceptions it inspires, its role in human society, and its importance in desert ecology.

Cacti of the Desert Southwest
1000pc Puzzle | $22.00

The saguaro and its desert family are featured on this linen-finished puzzle. One of the shop favorites!

Locally Made Saguaro Tiles
by Carly Quinn Designs | $20.00

Each of the retro colorways on these tiles are unique and hand-glazed in Downtown Tucson. Cork back hanger included to easily decorate your home. Additional styles available in the shop.

Owl/Kestrel Nest Box
Crafted with Saguaro Ribs | $250.00

Ribs from a natural fallen saguaro adorn this nest box designed for screech owls and kestrels. Donated by Fred Dardis, 100% of the proceeds benefit the Desert Nestbox Program.

Cactus Hotel
$8.00

An oldie but goodie! In words and pictures fascinating to all levels of readers, the desert world is brought to life in the poetic story of the giant saguaro and its place in the desert ecosystem.

Ben's Bells Saguaro Ornament
$25.00

Be Kind or Se Amable is embossed on these ornaments from a local organization. Your purchase supports the Ben's Bells Project and promotes the positive impacts of intentional kindness and empowers individuals to act with that awareness.