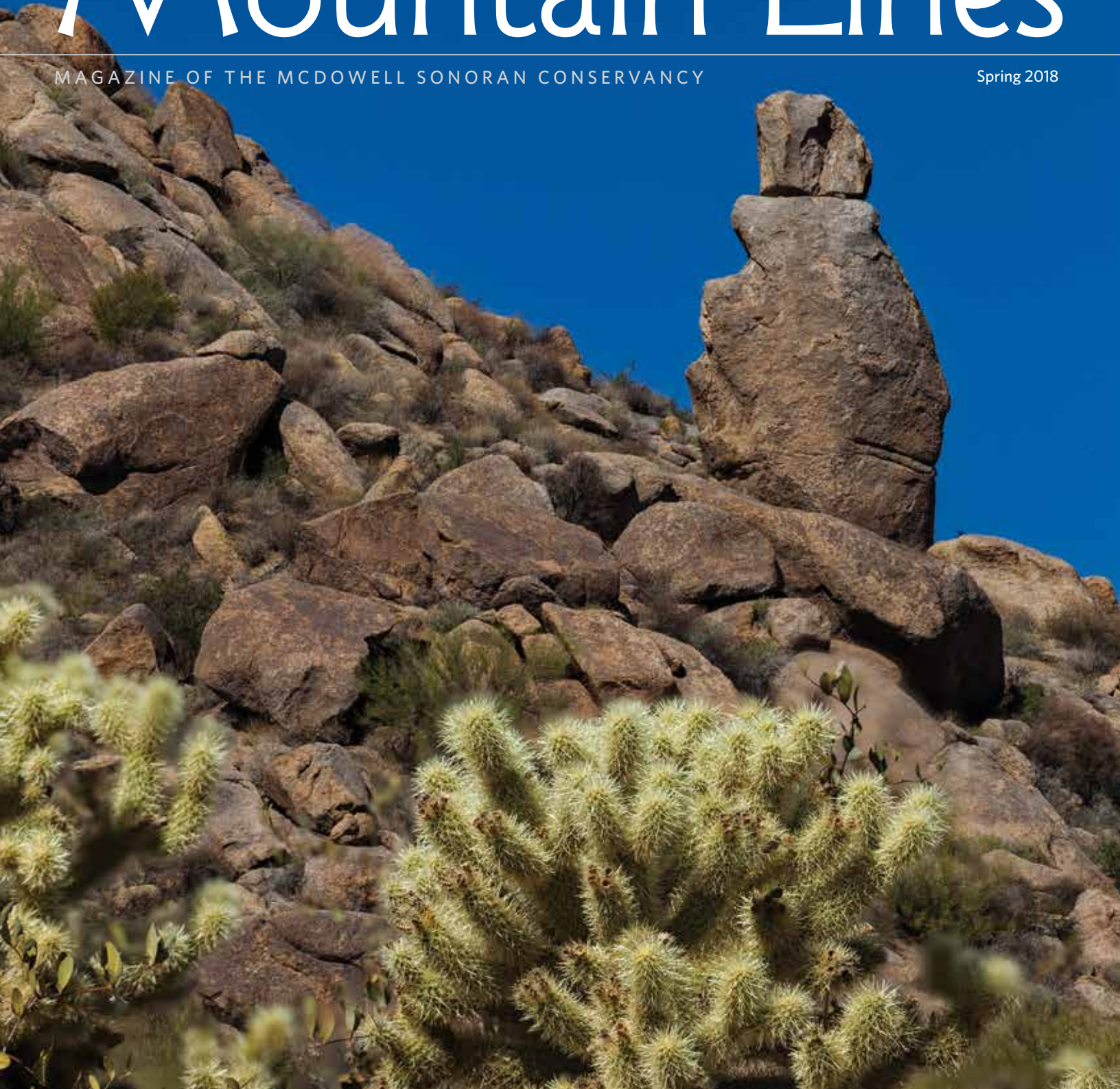


Mountain Lines

MAGAZINE OF THE MCDOWELL SONORAN CONSERVANCY

Spring 2018



Biking through
the Preserve

See more and test your skills

The Hike to
Marcus Landslide

Walk to a unique geological feature

The Magnificent
Saguaro Cactus

Learn about this iconic desert plant



McDowell Sonoran
Conservancy

FROM THE EXECUTIVE DIRECTOR



Justin Owen

Happy Spring! I'm thrilled to be the newest member of the McDowell Sonoran Conservancy team, and to serve as the Conservancy's executive director. I want to give special thanks to Paul Staker who

shepherded the organization as our interim executive director.

It's been a fantastic 2018 so far at the Conservancy. My four main priorities this year are: enhancing awareness of the Conservancy, engaging our community more, ensuring the best technology is utilized for our work, and making sure that we are effectively managing our resources. I'm delighted to recap a few highlights since I joined the organization on January 1.

- Our New Steward Orientations are at capacity with new stewards joining the Conservancy and learning the ropes every

- month. Over 650 dedicated volunteers support 11 Conservancy programs ranging from rugged outdoor work to public outreach. Each volunteer brings unique contributions to these endeavors ensuring these activities are successful in supporting and sustaining our mission and vision.
 - We hosted nearly a thousand youngsters at our Junior Citizen Science Festival giving students in our community exposure to cool science learning opportunities in Scottsdale's McDowell Sonoran Preserve.
 - We are delving into the mule deer migration project and removing invasive plants.
 - We hosted fun corporate team building service projects in the Preserve.
 - Donors attended and appreciated a special Arabian Horse lecture and cocktail party.
- Looking forward, we are hosting two big events: the Dinner Down the Orchard fundraiser on April 21 at Schnepf Farms, and the Arid Lands Symposium: Integrating Research into Action on May 4-5.
- Thanks to your ongoing efforts to champion the sustainability of the largest urban preserve in North America! 🦉

About Us

The McDowell Sonoran Conservancy champions the sustainability of the McDowell Sonoran Preserve for the benefit of this and future generations. As stewards, we connect the community to the Preserve through education, research, advocacy, partnerships and safe, respectful access.

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Mountain Lines is published quarterly by the McDowell Sonoran Conservancy, a 501(c)3 nonprofit organization and sent to members and donors.

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Creative design donated by
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Cover photo: Getting close to boulders and standing rocks is one of the thrills of hiking in Scottsdale's McDowell Sonoran Preserve. This photo was taken along the Marcus Landslide Trail. Photo Dennis Eckel.





The area around Granite Mountain in the northern Preserve is especially good for viewing spring wildflowers and is easily reached by bike. Saddlehorn Trail to the southeast of Granite Mountain abounds in native Mexican poppies (*Eschscholzia californica* ssp. *mexicana*) almost every spring. Photo by Marianne Skov Jensen

Let's Ride the Preserve Backcountry

By Art Ranz,
McDowell Sonoran Conservancy lead steward

So often when I am working as a trail guide at the Brown's Ranch Trailhead, I am asked about trails and sites that seem far away to the visitor. Hawksnest Trail, Coyote Canyon Trail, and the unusual Michelin Man saguaro cactus are just a few places people want to visit. "So, how can I

see them without hiking 15 miles?" I'm often asked. My answer is, "On a bike, of course!"

The McDowell Sonoran Preserve is quickly approaching 200 miles of trails into some of the most beautiful areas in the Valley. It has some of the widest varieties of biking experiences

in the area—the steep and rugged trails in the southern part of the Preserve and the smooth, almost groomed trails in the northern part. Within Brown's Ranch in the northern area are the technical Diablo Trails with challenging rock formations for experience mountain bikers, as well

as the smooth, rolling trails in the Fraesfield area that are perfect for beginners.

Mountain biking is not only a terrific way to see the Preserve, but a very healthy way to enjoy the outdoors. It combines leg, core, and upper body conditioning, as well as terrific cardio training. It develops great balance skills and maintains quick reactions—all vital ingredients in healthy aging that can be difficult to get in a single activity. And, mountain biking can be enjoyed at all levels of intensity and skills.



It can be hard work, but mountain biking in the Preserve offers wonderful views you might not be able to reach by foot. The benefits of a healthy workout also attract many bikers to Preserve trails. Photo by Denis Eckel.

So, how can you get started? Some riders just hop on a mountain bike and get going. But others find that getting some basic training makes the learning easier, faster, and safer. The McDowell Sonoran Conservancy offers free mountain bike classes every month covering basic skills with your own bike, or a rented one. It is a super way to get started, and a great way to make the transition from road biking. Flat tire repair, helmet fitting, a skills clinic, and an easy ride in the desert make the training a fun outing. Many local commercial outfitters offer guided rides that include bike rental,

and they also offer quality rental bikes for our classes or for just heading out on your own.

The Conservancy also offers several guided mountain bike rides each month. These are advanced beginner to intermediate skill rides with multiple experienced guides. It's a great way to see new places

in the Preserve and to meet new, like-minded riders of all levels. We ride for two to three hours at a casual pace, stopping to discuss techniques and interesting areas of the Preserve. Please see the calendar on our website at mcdowellsonoran.org for dates and locations of the clinics and the guided rides.



In the eastern section of the northern Preserve, smooth trails give beginner level mountain bikers the chance to explore the Preserve. This photo shows a rider on the Granite Loop Trail around Granite Mountain. Photo by Marianne Skov Jensen.



Mountain bikers love the challenge of some of the boulder outcroppings found in the northern Preserve. New trails are being developed between the Pima-Dynamite Trailhead and Brown's Ranch, which provide a great mountain biking experience for skilled riders. Photo provided by Art Ranz.

For more specific information and questions, email us at

Bike@McDowellsonoran.org

As responsible Conservancy bikers, we constantly strive to improve the multiuse trail system where bikers, hikers, and horses share the trail. We teach and encourage cooperative

courtesy with all groups. There are also significant safety concerns to heed when riding in the Preserve. Helmets are a must! With all the sticky, prickly things in the desert, the ability to repair a flat tire is essential. It can be a long, hot walk back to the trailhead pushing a bike! Like all

activities in the desert, plenty of water is high on any safety list. A charged cell phone is essential, but cell phone coverage can be spotty, so always tell someone where you are riding and when you expect to return. Navigation skills are important, and phone apps like Maprika help considerably. But one should always have a paper map, and know how to use it. Safety or sunglasses, and a small first aid kit to treat injuries and remove cactus thorns are highly recommended. Wow! Biking in the Preserve is really much more fun than this bit sounds!

I so often hear, "I would never be able to do that!" But I have seen bikers with very little skill become accomplished and safe riders with just a little instruction, and a bit of determination. There's one warning though—once you try biking in the Preserve, you will be hooked. 🦉



Mountain bike tours occur several times a month from October through April. The rides are free and open to the public. Experienced Conservancy mountain bike guides lead small numbers of bikers grouped according to experience level. The Conservancy also offers free classes in basic mountain biking skills. Check our web site for the schedules. Photo by Dennis Eckel.

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No matter what language, we toast our great partners at Total Wine & More for their generosity and support of *Dinner Down The Orchard* at Schnepf Farms, benefitting the McDowell Sonoran Conservancy.

Thank you for helping to make our event such an enchanted evening for guests and a successful fundraiser for the Conservancy. We raise our glass to you!

Q&A with Justin Owen, New Executive Director

By Nancy Robinson,
McDowell Sonoran Conservancy steward

Justin Owen comes to the McDowell Sonoran Conservancy with enthusiasm, vision, and 20 years of leadership in agency management with certification as a nonprofit accounting professional. He appreciates the majestic outdoors, working with people, and helping organizations grow and thrive.

Tell us about where you grew up and your early experiences with nature.

I was born and raised in Stillwell, Kansas, and have lived in the beautiful meccas of Colorado, Oregon, and Southern California. I moved to Arizona almost 12 years ago to be

closer to my family in Queen Creek. My outdoor passion has been a life-long journey. As a child, I was outside more than inside.

One of my earliest memories was as a toddler watching my mother work with developmentally disabled individuals in a rural therapeutic horse program. Later in Colorado, I became a Special Olympics ski coach, specializing in single leg amputees and nonsighted skiers. The bond I formed with my nonsighted skiers was amazing. They became totally trusting that I would get them safely down the mountain—a profound experience for me. I was also a summer camp counselor in Missouri, training Boy Scouts about wilderness backpacking: packing in, fixing camp meals, and packing out.

What do you like to do when you are not working?

I love to entertain friends and cook! One of my favorite meals uses a family recipe of delicious hot and spicy Italian meat sauce.

I've been a recreational mountain biker, equestrian, and hiker for as long as I can remember. I love to escape to the White Tank Mountains, Scottsdale's



Justin Owen, new executive director of the McDowell Sonoran Conservancy, manages to leave the office occasionally to enjoy and work in Scottsdale's McDowell Sonoran Preserve. Photo by Lynne Russell.

McDowell Sonoran Preserve, and the magical Tonto National Forest.

What excites you most about the work at the Conservancy?

1. The Conservancy is now in the stewardship stage. Our land acquisition period is complete. Going forward, our charter is to care for the land and to develop research and teaching programs.
2. We will become a regional and national leader for open space use. Other organizations want to collaborate with us to leverage our programs' best practices to make their conservancies more effective.
3. Our Field Institute will become a stronger center of excellence for scientific research. We will continue our work on nonnative plant removal, restoration, and human impacts.

4. Additionally, outreach is very important. We meet many interested individuals who might not have extensive free time to become dedicated stewards. I want to broaden our base of support. So, we plan on hosting informational sessions to talk about the Conservancy and describe ways individuals can become involved outside of the steward program.

What would you most like the steward community and the larger community to know about your vision and hope for the Conservancy's future?

I welcome everyone's help to make us a sustainable, service organization by working with our science endeavors that we are driving through the Field Institute, by talking about the Conservancy and Preserve to people

you meet, and by being ambassadors for this beautiful land and special organization.

We are uniquely a nonprofit and a business. We can be a successful business without being a nonprofit; however, we cannot be a successful nonprofit without being a business. We must ask ourselves in all that we do: are we being true to our mission, and are we being accountable to it?

What can we do to help you as the new executive director?

Educational outreach is vital to public understanding. Once people understand what we are really doing, they will be onboard. Thanks to everyone who is an advocate for McDowell Sonoran Conservancy. I look forward to celebrating our milestones with each of you. 🦉



Preparing budgets, procuring funding, setting priorities, writing reports, holding meetings, working on the computer, and more are a big part of the job for Justin Owen (center), new executive director of the McDowell Sonoran Conservancy. Photo by Dennis Eckel.



It was a very dirty job! Recent removal of invasive tamarisk trees in the area of Dixie Mine required chainsaws, a truck, and lots of work. Removal of the nonnative trees should allow the area to return to its natural state. Photo by Debbie Langenfeld.

Dixie Mine, a Return to Natural

By Debbie Langenfeld,
McDowell Sonoran Conservancy steward

One minute, you're hiking through dry desert, enjoying panoramic views. The next minute, you're brushing away low-hanging branches as you walk through a thick stand of trees. It's noticeably cooler here. You are still in Scottsdale's McDowell Sonoran Preserve, but you're on a trail leading to Dixie Mine, a place completely different from any other

in the Preserve because there's water there. This small riparian microclimate in the middle of the desert is inhabited by unique plants, animals, and fungi found in such systems. It's a place where Fremont cottonwood (*Populus fremontii*) and Goodding's black willow (*Salix gooddingii*) are found, 53 species of birds, more than 20 species of butterflies, and four species of bats.

The Dixie Mine area has been changing. In 2005, Joni Millavec, a McDowell Sonoran Conservancy steward and certified citizen scientist, volunteered in that area. She remembers "the ground being very marshy with areas of surface water and lots of cottonwood and willows." A walk through the area now reveals a much different scene. Other than pools of

water that form after rain and tall grasses in the spring, the area is mostly dry. Some trees are still there, but you have to maneuver around fallen branches and trees. Feathery leaves whisk across your face as you pass through areas thick with nonnative tamarisk trees (*Tamarix sp.*).

What's causing these changes? Reduced precipitation and higher temperatures in the Southwest have definitely stressed the ecosystem. The proliferation of tamarisk has added a second element of distress.

Tamarisk is a deciduous shrub that originated in Eurasia. It was first brought to the Southwest in the 1800s to be planted as ornamentals, later as windbreaks, and to stabilize river banks. Once established, tamarisk becomes invasive in riparian communities, often nearly completely replacing native vegetation with impenetrable thickets and stealing native plants' much needed water.

In 2016, the McDowell Sonoran Conservancy's Field Institute initiated



The tamarisk remains filled two trucks. But the work doesn't end with the removal of the debris. Monitoring the area will continue for years to make sure the trees don't reestablish themselves. Photo by Debbie Langenfeld.



The maintenance crew from McDowell Mountain Regional Park, adjacent to the eastern border of the Preserve and close to the Dixie Mine, came with their chainsaw to cut down the tamarisk trees. A team of Conservancy stewards loaded the tree limbs onto the park truck for removal from the area. The crew poses after work. Photo by Debbie Langenfeld.

a project to monitor the trajectory of the plant community, especially the cottonwoods and willows, following tamarisk removal. But first, we needed to know if there were enough reproductive cottonwoods and willows. We determined the sex and size class of these trees and collected leaf material to test genetic variability. Additionally, we measured characteristics of the perennial plant community and conducted several bird surveys in the canyon to be able to track the community's diversity, composition, and health over time.

Based on these surveys, we determined that enough healthy, reproductively viable trees remained for the area to recover if the tamarisk was removed. But, what removal method should we use? Published literature indicated that while there are several possible options for eradication, the most common and effective measure is a chemical method involving cutting the stump and quickly treating it with herbicide. Other options, such as spraying foliage with herbicide in the fall risks herbicide drift onto native

plants; while mowing, cutting, and root plowing cause high soil disturbance. Due to the ease of removal and extent of infestation, the chemical method was selected.

In November 2017, a crew from McDowell Mountain Regional Park and from the Conservancy's Construction and Maintenance and Citizen Science programs congregated at Dixie Mine to begin the arduous removal task. With chainsaw in hand, production line and loading teams formed, and the removal began with a flurry. For three hours, the buzz of the chainsaw drifted through the canyon. By noon, the tamarisk had been cut, removed, compacted, and piled high by a very tired crew! Paul Bunyan would have been impressed by their efforts!

It's a great start, but we're not done. The ecosystem must continue to be monitored for many years in order to determine the effectiveness of the removal and response of the native vegetation and wildlife. We hope that these efforts will prove successful and that native species will continue to flourish in this area. 🦉

An Update on Scottsdale's Preserve Trailheads

By Scott Hamilton,
City of Scottsdale preserve planner

The City of Scottsdale currently has three trailheads in Scottsdale's McDowell Sonoran Preserve in various stages of the design process—the Fraesfield, Granite Mountain, and Pima Dynamite Trailheads.

The first two sites, the Fraesfield and Granite Mountain Trailheads, opened for public use in 2013 with minimal amenities. They essentially consist of gravel parking lots surrounded by pipe rail fencing to prevent motor vehicles from straying into the desert. There is also a trail map display at each site. Fraesfield is accessed from Rio Verde Drive at the 134 Street alignment, and Granite Mountain is on 136 Street, two miles north of Rio Verde Drive.

The intention in 2013 was to provide additional access to the northern Preserve trails in these two alternate locations, and to complement the opening of the Brown's Ranch Trailhead farther to the west. The Brown's Ranch Trailhead has a full array of trailhead amenities and has become quite popular with Preserve visitors. To accommodate the increase in users, we are improving the amenities at the Fraesfield and Granite Mountain Trailheads.

These two trailheads will be similar in size and amenities to the Lost Dog Wash and Tom's Thumb Trailheads, with

improvements to include restrooms, passenger vehicle parking, equestrian trailer parking and staging areas, regulatory and interpretive signage, shaded seating areas, drinking fountains

(Fraesfield only), and storage areas for maintenance supplies. The needs of the McDowell Sonoran Conservancy are also being considered, including display and presentation areas designed



City of Scottsdale's design consultant, Smith Group JJR, prepared the conceptual renderings for the Fraesfield Trailhead (top) and Granite Mountain Trailhead (above). Renderings courtesy of City of Scottsdale.



Crews install the monument sign at the Pima Dynamite Trailhead. Photo courtesy of City of Scottsdale.

to maximize visitor exposure and provide space for storage of Pathfinder (trailhead hosts) supplies.

Conceptual planning occurred for these trailheads in 2016 and early 2017. The public hearing of the *Municipal Use Master Site Plan* occurred in late 2017 and early 2018. Construction is anticipated to begin in summer 2018, with completion in 2019. The City's goal is to maintain public access to these two sites during construction. However, there may be the need for temporary closures and other access restrictions during construction.

The third site, the Pima Dynamite Trailhead, is located on the northeast corner of Pima Road and Dynamite Boulevard. The public hearing process for the *Municipal Use Master Site Plan* will occur in the first half of 2018, with

construction estimated to begin near the end of 2018. The City expects the permanent facility to open for public use by 2020.

In the meantime, the City has completed construction of a temporary parking area for the Pima Dynamite Trailhead. The limited amenities are similar to what has existed at the Fraesfield and Granite Mountain Trailheads for the last five years. The temporary lot is accessed on the north side of Dynamite Boulevard, just east of Pima Road. The temporary trailhead provides access into an area with a significant number of unmapped and unsigned trails. The current routes that are signed on the ground are shown on the northern region trail map. All other significant routes in the area are signed with red and white "Leaving Mapped

Area" signs.

Once fully improved, the Pima Dynamite Trailhead will be on par with the Brown's Ranch Trailhead. The site will include restrooms, parking for passenger vehicles and horse trailers, equestrian staging, shaded seating areas, regulatory and informational signage, water for humans, dogs, and horses, an office for City staff, and a small shaded educational amphitheater. The needs of the Conservancy are also being considered here.

For up-to-date information, please visit the City of Scottsdale website at www.scottsdaleaz.gov and search for "Preserve." You can also contact me, Scott Hamilton, directly at 480-312-7722, or email me at Shamilton@scottsdaleAZ.gov.

Ecology Explorers Partnership: Enhancing Science Education

By Tiffany Sprague,
McDowell Sonoran Conservancy Field Institute Manager
Helen Rowe,
McDowell Sonoran Conservancy Field Institute Director

Thanks to the generous financial support of Thunderbirds Charities, hundreds of students from Title 1 schools in the metro Phoenix area are benefiting from science-based field trips to explore the Sonoran Desert and to learn life science concepts. A new partnership between the McDowell Sonoran Conservancy and Arizona State University Ecology Explorers is providing innovative multigrade science education opportunities in the Sonoran Desert and in the classroom.

Many children suffer from nature deficit disorder. In fact, only 31 percent of kids regularly spend time outdoors. Despite living in the desert, many children in underserved areas rarely leave urban neighborhoods to experience the spectacular natural Sonoran Desert. This reality can make it challenging to

understand life science concepts taught in the fourth and fifth grades. Outdoor environmental education can close this gap and improve academic performance. In addition, time spent outside can help improve fitness, enhance attention spans, and decrease stress and aggression.

STEM (science, technology, engineering, and math) careers are vital for innovation and improved quality of life, and they offer a promising pathway out

of poverty. However, underserved populations are poorly represented in STEM occupations. A key factor in improving these communities' access to STEM is experiential learning.

Through our program, students visit Scottsdale's

McDowell Sonoran Preserve to explore the wonder of the desert while learning basic science concepts and approaches. At our Junior Citizen Science Festival, a signature event of the Arizona SciTech Festival, youth become scientists for a day. They wind through a half-mile nature loop adventure with more than 15 interactive learning stations. Armed with a field notebook, students make scientific observations and learn about Sonoran Desert natural history and

how scientists study the environment. Other students participate in the Sonoran Field Trips program during which school groups engage with three learning stations, take a guided tour of a nature loop with teachable moments, and participate in a nature scavenger hunt. Trained volunteers teach key concepts to the students while showing them real life examples of those concepts in the natural desert, such as how plants and animals cope with desert aridness.

After their field visit, learning continues in the classroom. Conservancy volunteers team up with the award-winning ASU Ecology Explorers program to deliver classroom lessons that meet Next Generation Science Standards and tie closely with information learned on the field trip. Students learn about "Our Successful Desert System," enabling them to understand why scientists study plant life in our Phoenix area desert, to explain the important role plants play in an ecosystem, and to identify and explain relationships between components of a desert ecosystem.

"Students in the Phoenix area are surrounded by a rich, successful ecosystem," says Lisa Herrmann, K-12 outreach specialist for ASU's Central Arizona-Phoenix Long-Term Ecological Research project and its Ecology Explorer program. "Understanding the way people and the urban environment are knit into this system will deepen students' appreciation of this special place, empowering them as future decision-makers."

We are grateful to Thunderbird Charities for enabling this incredible opportunity for Arizona students!



Children record their scientific observations in their field notebook at the Junior Citizen Science Festival. Photo by Dennis Eckel



McDowell Sonoran Conservancy Field Institute

Arid Lands Symposium: Integrating Research into Action



Join us for this exciting and educational two-day event that brings together researchers, land managers, students, community leaders, and stakeholders to share practical implications from regional natural resource research and novel ideas for implementing monitoring, research, and management programs.

May 4 & 5 Main Event (Friday, Saturday)
Scottsdale Community College
9000 E. Chaparral Rd, Scottsdale, AZ 85256

May 4 Twilight Tour Cocktail Party
Desert Botanical Garden
1201 N Galvin Pkwy, Phoenix, AZ 85008

HIGHLIGHTS

KEYNOTE SPEAKERS:

- Todd C. Esque, Research Ecologist, US Geological Survey, CA -- From the ground up: developing effective strategies to inform regional ecological restoration
- Jan Schipper, Field Conservation Research Director, Phoenix Zoo, AZ -- From local to global: ensuring wildlife connectivity and habitat conservation

Panel discussion: Integrating science into management
Plenary: Citizen science to inform management
Hands-on workshops
Concurrent sessions covering wildlife and habitat management, citizen science, restoration and much more.

For more information and to register, visit http://bit.ly/MSC_research_symposium

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The Tiniest Owl

By Cathy Wise,
Audubon Arizona education director



The elf owl, common in areas with saguaros, is no bigger than a sparrow. Photo by Bruce Taubert.

If you spend a lot of time hiking in the spring through saguaro rich areas of the Sonoran Desert, you may be lucky enough to spy a set of tiny golden eyes glaring down at you from a cactus cavity. The eyes will then fade from view as their wee owner leans back from its doorway into the safe gloom of its nest. Return to this same spot come nightfall, and you will most likely be greeted by surprisingly loud yipping sounds—the call of the elf owl (*Micrathene whitneyi*).

The elf owl is the smallest owl in the world. At an impressive height of about five inches, the elf owl resembles a can shaped sparrow and weighs a little over one ounce—the same as about four French fries. In appearance, the elf owl's cryptic coloration blends into a variety of backgrounds, and it can be quite difficult to see. Although it lacks ear tufts, it makes up for this with prominent white eyebrows that lend to the bird's perpetually surprised—or annoyed—expression. If frightened or to evade capture, an elf owl will pretend to be dead, only to spring to life when its would-be captor least expects it. The small owl gets plenty of time to practice this trick, as it is believed to live to the ripe old age of five to six years in the wild, and longer in captivity.

This species is migratory in Arizona due in large part to its diet, which consists primarily of insects. It journeys south to Mexico's Pacific coast for the winter and returns to its breeding ground in early March. The tyke seeks out cavity-rich areas and has been documented nesting in mesquite, cottonwood, and willow in lowland areas, as well as in the iconic



An elf owl in the Sonoran Desert often builds its nest in a saguaro and flies out at night to hunt mainly insects. Notice the insect in this elf owl's beak. Photo by Bruce Taubert.

saguaro. The elf owl can occur up to about 5,600 feet in elevation. In the higher areas, it nests in sycamore, walnut, and even the occasional telephone pole. Interestingly, an elf owl will share its nest tree with other avian species and aids the community in deterring predators. Nests are typically placed fairly high, 10 feet or more above ground, presumably as a precaution against predation. Egg laying usually begins in early May and clutch sizes range from two to four round, white eggs. Fledglings have been observed as early as May and as late as mid-August. However, late nests are likely replacements for failed nests, as the species is believed to be single-brooded. Fall migration typically occurs from late August into September.

Like other owls, the elf owl is capable of silent flight. So even if centipedes had ears, they'd never know what got them. Other favored foods include moths, scorpions, and beetles. Although the elf owl has excellent eyesight, it hunts primarily by

sound. Unfortunately for this owl, its small size makes it an attractive prey item for other owls, snakes, coyotes, bobcats, and even ringtails.

Less tolerant of human activity than the western screech-owl, an elf owl is not commonly encountered near town. To find one, observers do best to leave the beaten track and find areas offering rich arrays of nesting possibilities. (Note that off-trail and nocturnal activities are not allowed in the Scottsdale's McDowell Sonoran Preserve without a permit.) Main threats to the small bird include habitat loss and pesticide use, both on nesting and wintering grounds.

The McDowell Sonoran Conservancy is dedicated to protecting the plants and animals of the Preserve for this and future generations. You can help these owls by supporting open space protection, the use of alternative methods of pest control, and local wildlife rehabilitation facilities that rescue owls, raptors, and other wildlife. If the elf owl could thank you, it would!





On the Marcus Landslide Trail looking south, we see Weaver's Needle (upper left) and the Flat Iron to its right with the flat top and cliff to the right. They are both in the Superstition Mountains. The range below and in front are the Goldfield Mountains. The lake in front of them is the Fountain Hills Lake where the fountain erupts. Photo by Dennis Eckel.

Great Hikes in the Preserve: Marcus Landslide

By Barbara Pringle,
McDowell Sonoran Conservancy master steward



Sunrise from the Marcus Landslide Trail is always a moving experience with the McDowell Mountains in the background. Photo by Jacques Giard.

Quiet time—it's hard to find in our sometimes hectic daily life. For many people, a visit to Scottsdale's McDowell Sonoran Preserve provides a chance to escape noise and traffic, and recharge with a peaceful hike on a beautiful trail.

Today, the Marcus Landslide Trail offers peace and serenity, but this wasn't always the case. During the last ice age, about 500,000 years ago, an earthshaking rock landslide occurred near the east side of the McDowell Mountains near its central summit. That sudden collapse generated energy equivalent to one atomic bomb, releasing over 194 million cubic feet of rock, soil and vegetation, enough material to fill six Arizona State University Sun Devil Stadiums! Scientists estimate that the slide material weighed nearly 26 billion pounds, and the largest of hundreds of freed boulders measured 30 feet in diameter and weighed as much as 2.4 million pounds. Whew! Can you imagine that monster rock rolling down the mountain?

The landslide evidence lay unexamined until 2002 when three Arizona State University scientists discovered it.¹ The area was eventually named the Marcus Landslide in honor of Melvin Marcus, PhD, an ASU geography professor and avid alpinist, pilot, and musician. Following its discovery, researchers have tried to determine the landslide's cause. The primary theory posits that thousands of years

of "exposure to water, ice and rain, combined with root and ice heaving along pervasive fractures probably weakened the granitic rock below the East End to the point of collapse. Steep slopes combined with water saturation in the 'pocket' primed the hill slope for failure. Poised for collapse, a heavy rain, a bolt of lightning, or an earthquake could have spontaneously triggered release of nearly 12 billion kilograms of rock."¹

When hiking the Marcus Landslide Trail today, it's hard to imagine that this place was once the site of such an earthshattering event. It's a beautiful spot with spectacular vistas and a variety of flora and fauna, so...

Let's Go Hiking!

Access the Marcus Landslide Trail via the Tom's Thumb Trailhead. Scottsdale Preserve staff rate this trail as moderate in difficulty, with mild inclines, an overall elevation change of roughly 300 feet, and a one-way distance of 2.3 miles. Because of its remarkable geologic history, the trail is enhanced with interpretative signs created and paid for by the McDowell Sonoran Conservancy.

About 0.4 miles along the trail, check out the fanciful forest of chain fruit cholla (*Cylindropuntia fulgida*). Characterized by long drooping clusters of green, spineless fruit, the



Along the trail to Marcus Landslide, you will stroll thorough a large chainfruit cholla forest. Photo by Marianne Skov Jensen.

chain fruit cholla is the largest cholla cactus, growing up to 10 feet high and eight feet wide. The fruit often remains attached for several years as new fruits are added each season, creating a chain of spineless fruit up to two feet long, and giving the plant its nickname—chain fruit cholla.

Moving further down the trail, you'll encounter giant mushrooms. No, this isn't Alice in Wonderland! The mushrooms are shaped granite boulders that were carved when underground rock sections underwent subsurface erosion. As time passed and the boulder bases were exposed, they came to resemble mushrooms with a wide cap at the top and a narrow (eroded) stem at the base.

Signage marking the site of the Marcus Landslide can be found about 1.5 miles along the trail. A large concave scar along the upper slope of the East End ridgeline marks the site of this gigantic slide. Nearby levee walls of rock help identify the sides of the



The moderately rated hike to the Marcus Landslide rewards the hiker with wonderful vistas. Several signs along the way explain the history connected with the naming of the slide and its geology. Photo by Dennis Eckel.

slide area, as do helpful photographs that outline the landslide borders.

The last section of the hike is a 0.7-mile loop which winds through large boulders and offers a good aerobic up-and-down climb. Beautiful vistas of Four Peaks Wilderness and the Verde Valley complete the scene. 🦉

Further reading and references:

1. Gootee, Brian F., The Arizona Geological Survey, 2006. "The Marcus Landslide, An Ancient Landslide in the McDowell Mountains, Arizona."

The trail to the Marcus Landslide offers beautiful views. The landslide is also one of the most interesting geological features in the Preserve. The Conservancy schedules guided hikes where you will learn about its origin from experts on the subject. Check the Conservancy website for the schedule. Photo by Dennis Eckel





This beautiful view from the Marcus Landslide Trail shows Rock Knob in the foreground, and Four Peaks in the distant Mazatzal Mountains. Photo Dennis Eckel.



The Michelin Man cactus is a well-known saguaro located in the northern Preserve. This photo shows why so many people want to visit this interesting specimen. You can find the Michelin Man cactus on the Desperado Trail, very close to the giant double crested saguaro on Coyote Canyon Trail. Photo by Marianne Skov Jensen.

Our Desert Icon

By Steve Jones,
botanist



The northern Preserve has the largest and oldest specimens of saguaro. Many people explore the area by mountain bike. This giant saguaro is located on the smooth Granite Loop Trail around Granite Mountain. Photo by Marianne Skov Jensen.

Cartoonists would have us believe that the saguaro cactus (*Carnegiea gigantea*) is the universal symbol for a desert. For this, they can be forgiven; it's a handy icon, easily drawn and readily recognizable. But saguaros are only found in the Sonoran Desert—and only in the eastern portion at that. Excepting a few stray populations across the Colorado River in California, they are found only in the states of Arizona and Sonora, Mexico.

In central Arizona, saguaros flower in late April into early June. The flowers are white, opening late in the day and remaining open until midday the following day. Although nectar-feeding bats pollinate the flowers in Mexico and southern Arizona, these bats rarely travel north of Tucson. Here in central Arizona, birds and bees are the principal pollinators.

In July, the saguaro fruit ripens and splits open to reveal red inner rinds that signal the feast is on. Fruit-eating birds eat the sweet pulp and pass the undigested seeds, usually while roosting in a tree. The tree provides shade and cover for the tender seedling saguaros, nursing the young cactus.

Saguaros are famous for their slow growth rate. In the center of their range where conditions are ideal, it takes 30 years to reach two feet in height. At the margins of their range where conditions are



The inner walls of the open fruit of the saguaro are red, a signal to fruit-eating birds that the juicy pulp is available. Doves, woodpeckers, and finches are among the birds that enjoy this bounty. The tiny black seeds are not digested and will pass through the birds. Photo by Steve Jones.

less than ideal, it takes longer.

Flowering first occurs when the cactus is about eight feet tall and about 40 to 55 years old. Saguaros begin to develop arms between 50 and 100 years of age and, contrary to the common myth, don't produce arms for balance but to grow larger without growing taller.

Armless saguaros are called spikes. One notable spike in Cave Creek, Arizona, reached the record height of 78 feet before falling over in 1986. Saguaros are able to reach such heights due to a ring of woody ribs that serve as a skeleton.

Most of the plant's mass is a tissue called parenchyma, which consists of large cells composed mostly of water. When fully hydrated, the plant is about 90 percent water by weight. As it uses stored water, its pleated surface allows it to fold inward, reducing the circumference of the plant; it can then expand in rainy seasons.

As with its frequent companion, the foothill palo verde tree (*Parkinsonia microphylla*), photosynthesis takes place in a layer of specialized cells

beneath its thick, water-conserving epidermis. Both plants are therefore highly susceptible to death from wildfire. Saguaros do have one advantage, though—if the damage is not too severe, they will scar over with a dense, hard material called callus.

Saguaros produce callus in response to other damages as well. Native woodpeckers, the Gila woodpecker and the gilded flicker, dig nests into the body of the plant. The flicker, being a larger bird, nests high on the plant, drilling through the skeleton, then downward. The Gila woodpecker nest is built lower on the plant, and the bird drills to the skeleton, then down. In response to the digging, the plant secretes a material that hardens into callus. As a downed saguaro decomposes, the boot-shaped nest remains behind. The saguaro boots will take many years to degrade.

Many other life forms take advantage of a newly downed saguaro and its stored water. Bacteria and fungi

break down the tissues. Flies and other insects lay eggs in the flesh. These maggots are in turn preyed upon by pseudoscorpions, tiny arthropods with claws like a scorpion but no tail. As the food source is reduced, the pseudoscorpion grabs the leg of a departing adult fly and hitches a ride to the next downed saguaro. 🦋



This deceased saguaro reveals both the woody ribs that gave it the ability to grow to great height and the callus tissue (top) that formed when the cactus was damaged, likely when its arms broke off. Photo by Steve Jones.



Saguaro flowers are funnel-shaped with a nectar reward at the base of the funnel. The digger bee (*Centris pallida*) at upper right will pass through many pollen-laden anthers on the way to the nectar and will carry the pollen to other flowers. The fingered structure at the center is the stigma where pollen is incidentally deposited. Photo by Steve Jones.

Effects of Fire on the Preserve

By Kara Barron,
2016-17 McDowell Sonoran Conservancy biodiversity fellow

The immediate aftermath of a fire produces obvious evidence. Vegetation is scorched or dead, and animals have fled to safer places. It takes time for the land to return to its pre-fire state, and the key to the area's ability to do this lies hidden in the blackened soil. It is the seeds.

Seeds are the future potential vegetation of an ecosystem, but can be wiped out by fire. They reenter the burned area in various ways though—on the wind, or on the backs and through the stomachs of animals. The process can be facilitated by humans too, through replanting or reseeding after a burn.

Some ecosystems, such as ponderosa pine forests, are known to be fire adapted. This means that fires occur often enough that the plants have evolved ways to thrive despite this disturbance. The Sonoran Desert, however, historically incurred fires only once every 100 to 1,000 years, so it is not considered fire adapted. The migration of humans and invasive species into this ecosystem are contributing to more frequent fires. Scottsdale's McDowell Sonoran Preserve has had four fires over the last 30 years, burning approximately 11,000 acres, or one-fourth, of the land. With this change in fire frequency, are

the plant communities in the Sonoran Desert going to return to their pre-fire state?

The areas where the fires occurred on the Preserve were left to recover naturally, so they presented an opportunity to begin to answer the above question. Because no data was available about what those plant communities looked like before the fires, they are being compared to adjacent unburned plant communities in order to determine actual effects of the fires.

To do the comparison, three sites were established within the burn perimeters, and three sites were

established as controls on nearby unburned land. Each site contained 10 plots along a 100 meter transect. In each plot, botanists and stewards measured percent cover (the portion of space the species occupy within the plot) for each perennial species, and recorded frequency (presence or absence) for all annual species. Measurements were taken in the fall and spring of 2016-17.

Results show that, when it comes to cover, plant communities in the burned areas appear to be approaching their pre-fire state. However, there are changes in cover and frequency for individual species. Specifically, there seems to be a reordering of perennial species. Species that normally dominate the Sonoran Desert, such as little-leaf palo verde (*Parkinsonia microphylla*), creosote (*Larrea tridentata*), and cacti, showed a significant



This photo from 2009 shows how a fire that passed through an area affected the top of a saguaro. The fire was carried to the top of the plant as the spines burned. Photo by Steve Jones.



Project lead and article author, Kara Barron, ASU graduate student, marks off one corner of an area where she will study how plants recovered after a fire. The plot crew then measures off one meter to the other corners of the study quadrant. Barron and volunteers then record the amount of coverage for each species inside the quadrant, comparing burned and unburned quadrants to determine recovery. Photos by Debbie Langenfeld.



The remains of a canotia tree still stand years after it was burned. When fire burns the canotia tree, it hollows out the trunk, leaving the rest of the trunk standing. Photo by Steve Jones.

decrease in cover in the burned plots. They were replaced by increases in species such as globe mallow (*Sphaeralcea ambigua*) and brittlebush (*Encelia farinosa*). Frequencies of annuals, such as scorpion weed (*Phacelia crenulata*), broadfruit combseed (*Pectocarya platycarpa*), and fiesta flower (*Pholistoma auritum*), showed a significant decline in the burn plots too, while the western tansy mustard (*Descurainia pinnata*) increased in frequency.

So, are the plant communities in the Sonoran Desert able to return to their pre-fire state? The answer isn't as straightforward as one might like it to be. Some experts think that deserts need 75 years or more to fully

recover after a fire, but each desert is unique. So, testing this hypothesis in the Sonoran Desert is valuable. It's not hard to imagine that if an area were to sustain multiple burns, some species might drop out of the plant community completely. Conversely, if these areas are given another decade undisturbed and monitored again, the pre-fire dominant species might be closer to their pre-fire cover. This is something that will need continued investigation. But this study informs what steps can be taken now to continue to preserve the beauty and diversity of places like the McDowell Sonoran Preserve for generations. 🦉



The Preserve Fire Watch

By Janice Holden,
McDowell Sonoran Conservancy lead steward

Volunteers at the Gateway Trailhead post watch some fireworks before they end their shift. Photo by Lynne Russell. Background fireworks photo by Dennis Eckel.

A few days after the summer equinox, when the days are longest and the desert sun hottest, numerous dedicated McDowell Sonoran Conservancy stewards don their blue Conservancy shirts and the special neon vests issued by the City of Scottsdale. They leave behind traditional July Fourth celebrations and head out in the summer heat to sit at trailheads across 12 locations in the Scottsdale's McDowell Sonoran Preserve. Every July Fourth, the City of Scottsdale closes the Preserve at 3 p.m. to protect it from the risk of fire due to fireworks and other incendiary devices used to celebrate this day. The stewards take up their posts at 6:30 p.m. to guard the entrances to the Preserve, advise the public of its closure,

and prevent people from entering between 6:30–9 p.m. Last year, I arrived at my post at 6:30 p.m. hoping for another fire-free Fourth in the Preserve. Here's what happened during the 2017 fire watch.

"All quiet at Pima and Dynamite," reported one post. "Same at the north end of 136th Street," said another post. "Uneventful!" stated a third post.

A steward on duty at the Gateway Trailhead later noted, "For the first time in my eight years of fire watch at Gateway, no one showed up except my steward friends who watch with me each year."

"Up at 104th Street and Bell Road, it was quieter than

previous years," said volunteers on duty there. "That gave us time to recruit two residents to potentially become stewards!" they added.

But the trailheads at the higher elevations attract people wanting a view of the Valley's firework show below. At the Horseshoe Trail, five separate groups showed up wanting access to watch the fireworks put on by various municipalities. They were turned away by the fire watchers. Fortunately, all the visitors responded favorably to the rules.

At Tom's Thumb Trailhead, just prior to 9 p.m., stewards reported that a few young men approached and were advised the Preserve was closed. They appeared frustrated, but drove back down the road. However, they began setting off sparklers on their way out. While sparklers are not illegal, they are a danger because of the sparks they create in a very dry, fire-prone Preserve. Scottsdale Police were called and arrived within minutes.

"Having several people at each location does help with the stewards' personal safety, as well as dealing with an occasional disappointed user," said John Loleit, the northern Preserve natural resources coordinator. Loleit was the City of Scottsdale's coordinator for the 2017 fire watch. Bill Murphy, community services director for the City of Scottsdale, acknowledged the importance of the annual fire watch, and praised the long-term partnership between the City and the Conservancy. "Last year's fall and spring brought a display of colorful wildflowers and plants to the Sonoran Desert. We all enjoyed it daily," Murphy said. "Unfortunately, the flip side is that as things dry out, the potential fire danger is greatest," he continued. "With the assistance of Conservancy volunteers, we were able to survive this Fourth with no serious incident in the Preserve, or its surrounding areas."

The outlook is encouraging. Each year, there is an increase in the number of stewards participating. In 2017, 28 stewards participated, an increase of four over the previous year. And each year, as the public becomes more aware of the closure, fewer people show up.

As I sat with my brother near the end our watch that night, we got a special treat. At about 9 p.m., when the fireworks around town started, the coyotes began howling across the Preserve, perhaps in response to the strange noises and strong vibrations that commemorate this special occasion. 🦉

Anyone wishing to volunteer for the 2018 fire watch should contact: patrol@mcowellsonoran.org



The fire watchers wear their blue Conservancy shirts and "KEEP SCOTTSDALE BEAUTIFUL" vests provided by the City of Scottsdale. Photo by Lynne Russell



These volunteers came prepared with food, drink and chairs for their fire watch shift. Photo by Lynne Russell.



Volunteer stewards stand guard at every trailhead in the Preserve every July Fourth. The volunteers are there to advise visitors that the Preserve is closed, even to fireworks watchers. Photo by Lynne Russell.



Thank You Sponsors!



The Junior Citizen Science Festival this spring happened through the generous support of the above sponsors. Thank you, Sponsors!

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Thank you for supporting the McDowell Sonoran Conservancy!

What's All the Buzz about STEM?

By Blythe Sweeney
McDowell Sonoran Conservancy chief development officer

The McDowell Sonoran Conservancy citizen scientists will be the first to say that STEM stands for science, technology, engineering, and mathematics. According to the United States Department of Commerce, STEM occupations are growing at 17 percent, while other occupations are growing at 9.8 percent. STEM degree holders have a higher income even in non-STEM careers. Workers in STEM disciplines play a key role in the sustained growth, and in our regional and national economy. STEM education creates critical thinkers, increases science literacy, and enables the next generation of innovators.

Under the umbrella of our Conservancy Kids youth and family outreach programs, our semiannual Junior Citizen Science Festival is held each year in Scottsdale's McDowell Sonoran Preserve. The festival content aligns with the State of Arizona's STEM curriculum standards. We are honored that Arizona SciTech chose our festival as a signature event! More than 1000 children, plus teachers and parents, are excited to partake in interactive lessons and activities in our spring and fall Junior Citizen Science Festivals. Even more, we are expanding engaging classroom instruction in Valley area schools in underserved neighborhoods.

The McDowell Sonoran Conservancy's Junior Citizen Science program is made possible by the Conservancy's talented and dedicated volunteer stewards who work tirelessly to deliver a fun, educational experience to Valley area youth in an outdoor living classroom. Thoughtfully crafted educational activities and games teach children and families about Sonoran Desert ecology and conservation, while inspiring young minds to love science.

The Conservancy has been able to extend its reach to the broader metro Phoenix community through the generous financial support of sponsors such as Cox Communications, Thunderbirds Charities, Arizona State University, Bass Pro Shops, Arby's, and the City of Scottsdale. We are so grateful to all our volunteers and partners for encouraging more kids to smile for science!



Photo by Dennis Eckel.



Get a Jump on Shopping for Moms, Dads and Grads!

Sunday, May13, is Mother's Day, followed shortly by Father's Day, and don't forget about graduations right around the corner! Consider making your online purchases through AmazonSmile, and share the love with the McDowell Sonoran Conservancy.

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McDowell Sonoran Conservancy 2017 Annual Report

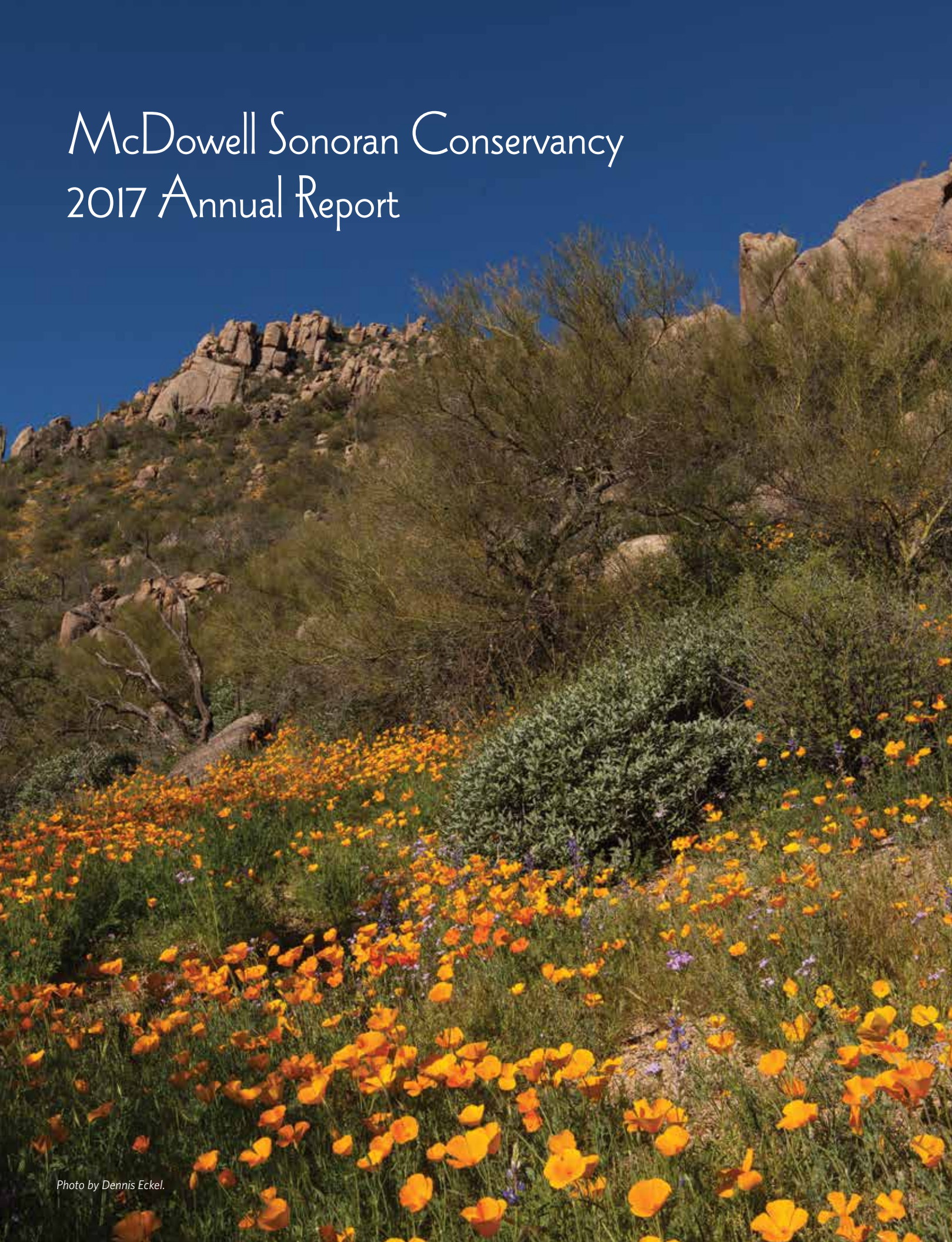


Photo by Dennis Eckel.



Photo by Dennis Eckel.

From the Board Chair and the Executive Director

Thanks to your support, the positive impact of the McDowell Sonoran Conservancy continues to grow. It is our privilege to champion the sustainability of Scottsdale's McDowell Sonoran Preserve, the largest urban preserve in North America. More than 30,500 protected acres are enjoyed by over 750,000 hikers, mountain bikers, and equestrian riders each year.

To insure this continues, we do the following:

- Preserve and conserve our natural resources.
- Collaborate with the City of Scottsdale to ensure that paths and trails are safe and in good condition.
- Recruit and train stewards who volunteered over 58,000 hours during 2017.
- Encourage fitness and a healthy appreciation of the great outdoors.
- Conduct ecological research using citizen science to detect change and protect our Preserve.
- Host Junior Citizen Science Festivals in the spring and fall with hands-on, interactive learning stations that educate youngsters about the Preserve.
- Advocate for STEM (science, technology, engineering and math) by introducing, teaching, and engaging visitors about the wonders of the Sonoran Desert in the classroom, at the library, and in the Preserve.
- Work with Central Arizona Conservation to spearhead a regional open space conservation strategy. Our McDowell Sonoran Conservancy Field Institute aligns, elevates, and scales efforts to conserve, enhance, and restore highly valued open spaces that contribute to our local and regional quality of life and economic vitality.

- Create partnerships with scientists and actively involve volunteers in research as citizen scientists. We use research results to build best practices for long-term resource management and detect change in plant and animal communities, provide educational opportunities for every age, and contribute to the broader scientific knowledge of natural areas.

Financially, 2017 was another challenging year for the Conservancy. Revenue, including contributed hours and services, reached \$1.87 million. Contributions of all kinds accounted for the majority of revenue and the Conservancy continued to rely on charitable giving to fund its operating expenses. Expenses increased to \$2.15 million. The deficit was offset, in part, by multi-year grants and pledges that were recognized in prior years but planned to be spent in 2017. Spending on programs represented 82% of all expenditures, with fundraising at 11% and administration at 7%. The numbers summarized on page 37, are from our audited 2017 Financial Statements and are available by contacting the Conservancy office. The McDowell Sonoran Conservancy Board, staff, stewards, and partners work together to share ideas and expertise, inspire one another, build public support, and find better ways to be good stewards of the Preserve. Your ongoing friendship and support is deeply appreciated, and we thank you for the critical part you play in this great effort.

Greg Kruzal
Chair, Board of Directors

Justin Owen
Executive Director



Thank YOU to the many individuals and community partners that support the great works of the McDowell Sonoran Conservancy throughout the year. Your generosity helps in so many ways – from maintaining and patrolling trails for the benefit of hikers, mountain bikers and equestrians – to investing in leading-edge scientific research studies through our Field Institute – to hosting many education events and interactive outreach programs that engage families and school children in our community.

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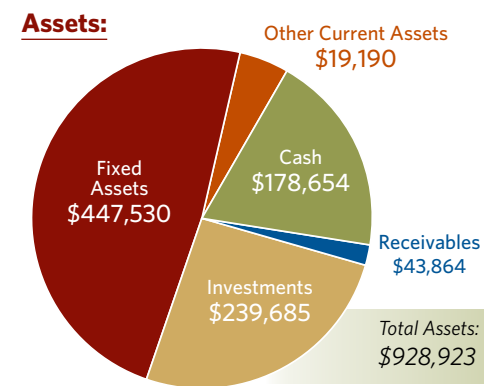


How We Measure Success

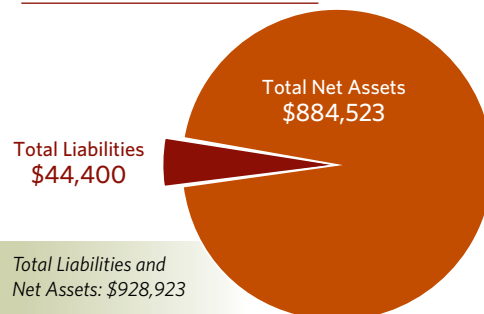
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Financial Position

as of June 30, 2017



Liabilities and Net Assets:



Statement of Activities

as of June 30, 2017

2017 Support and Revenue:

74% Contributed **VOLUNTEER** Services

- 21% Cash & Pledges
- 2% In-Kind Donations
- 1% Program Service Revenue and Special Events
- 2% Investments

Total Support and Revenue: \$1,870,691

2017 Expenses:

- 82% Program Services
- 11% Fundraising
- 7% Administration

Total Expenses: \$2,150,610

Audited financial statements available upon request.

Notable Achievements

- Continued to provide leadership in regional open space conservation planning through the Central Arizona Conservation Alliance
- Expanded major research projects on Preserve wildlife movement corridors, control of invasive plant species and restoration of degraded habitats
- Completed the first study cycle of the impacts on restoration using heavy equipment versus restoration done by hand
- Substantially increased interactive community family events and youth education programs



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“Nature is not a place to visit... it is home.”
 —Gary Snyder, Pulitzer Prize Winner



Photo by Jacques Giard.



The McDowell Sonoran Conservancy Field Institute is grateful to the Bob & Renee Parsons Foundation for their extraordinary support of important environmental science, preservation and conservation programs to protect Scottsdale's McDowell Sonoran Preserve for this and future generations to enjoy.



Thank you to Thunderbirds Charities for supporting the growth of the Conservancy Kids Junior Citizen Science outreach programs and innovative STEM education to underserved children in Valley-area school classrooms, while inspiring young minds to love science.



Arabian Horse Association of Arizona

Thank you to the Arabian Horse Association of Arizona and the Scottsdale Arabian Horse Show for championing McDowell Sonoran Conservancy events and programs. We're so appreciative of your support and community partnership to aid Development outreach efforts.



We appreciate Bass Pro Shops and their team members for supporting the McDowell Sonoran Conservancy's Junior Citizen Science Festivals through their commitment to encouraging family-friendly outdoor recreation, fitness and education activities.



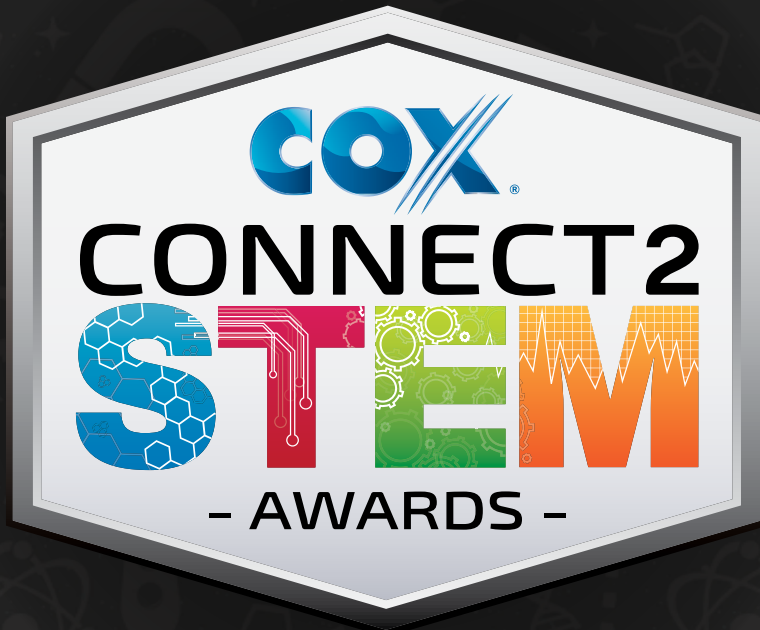
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