



Justin Owen, CNAP

I would like to start by thanking you for 30 years of support! The Conservancy is what it is today because of people like you that have made sure that we can continue to serve our community to advance our Mission every day. Many have heard my favorite quote and I think it is the perfect way to frame this issue; "We do not inherit the Earth from our ancestors, we borrow it from our children."

This issue of Mountain Lines celebrates a milestone in our history – 30 years protecting, preserving, and stewarding our unique Sonoran Desert. As we reflect over these past three decades, we are reminded how fortunate we are to have not only the City of Scottsdale as our partner in this journey, but also the community of Scottsdale, whereby without them, this venture would not have been possible.

The Conservancy's legacy began in 1991 with the creation of a land trust, followed several years later the formation of the McDowell Sonoran Preserve, and today we are fortunate, with the support of donors and our community, to be on the forefront of being a broadly recognized scientific research and education institution

Over the past 30 years, we have transformed from a land conservation organization into a scientific research and education leader in the Sonoran Desert. Throughout this special edition of Mountain Lines, we hope to guide you through the Conservancy's history, enlighten you about

our current accomplishments and engage you with the aspirations of our future.

From our early beginnings, education and science have played a critical role in inspiring future generations about the significance of our desert. Teaming with life, the Sonoran Desert has an incredible diversity of plants and animals. And to effectively protect this fragile ecosystem, we made it our mission to understand its components, how and why it changes, and the best way to manage it. All the work we have done over the years, has enabled us to educate not only those in underserved areas within our community, but share this knowledge with other similar environments throughout the world. Who would have thought this would have been possible 30 years ago?

Educating and inspiring the next generation of stewards is truly at the core of where we started, reflects where we are today, and is dependent on our future. Our steward program, established in 1998, goes way beyond being the custodians of the Preserve—these volunteers are the lifeblood of the Conservancy. They began as a team of passionate caregivers and have emerged as citizen scientists, educators and influential team members integral to the future of our organization.

The inspiration for the next 30 years relies on our ability to keep advancing our research, expanding outreach in diverse communities, creating unique educational programs, engaging visitors and empowering our community.

I sincerely hope this anniversary edition provides perspective on how far we've come as an organization and the importance of preserving our Sonoran Desert. We are delighted that you have embarked on this 30-year journey with us and look forward to celebrating our next milestone. ▲▲

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Table of Contents

Stewardship: From Early Beginnings, Now and Beyond..... 4
Stewards – The Life Blood of the Conservancy..... 7
What is Stewardship?10
Taking the Lead on Restoration in the Sonoran Desert 13
Biodiversity Abounds!..... 16
Protecting the Preserve: Then, Now, and Beyond 19
Conservancy's Education Mission Begins With The Individual 22
Teaching Our Next Generation of Environmental Stewards 25
Individuals Can Make a Lasting Impact ... 28

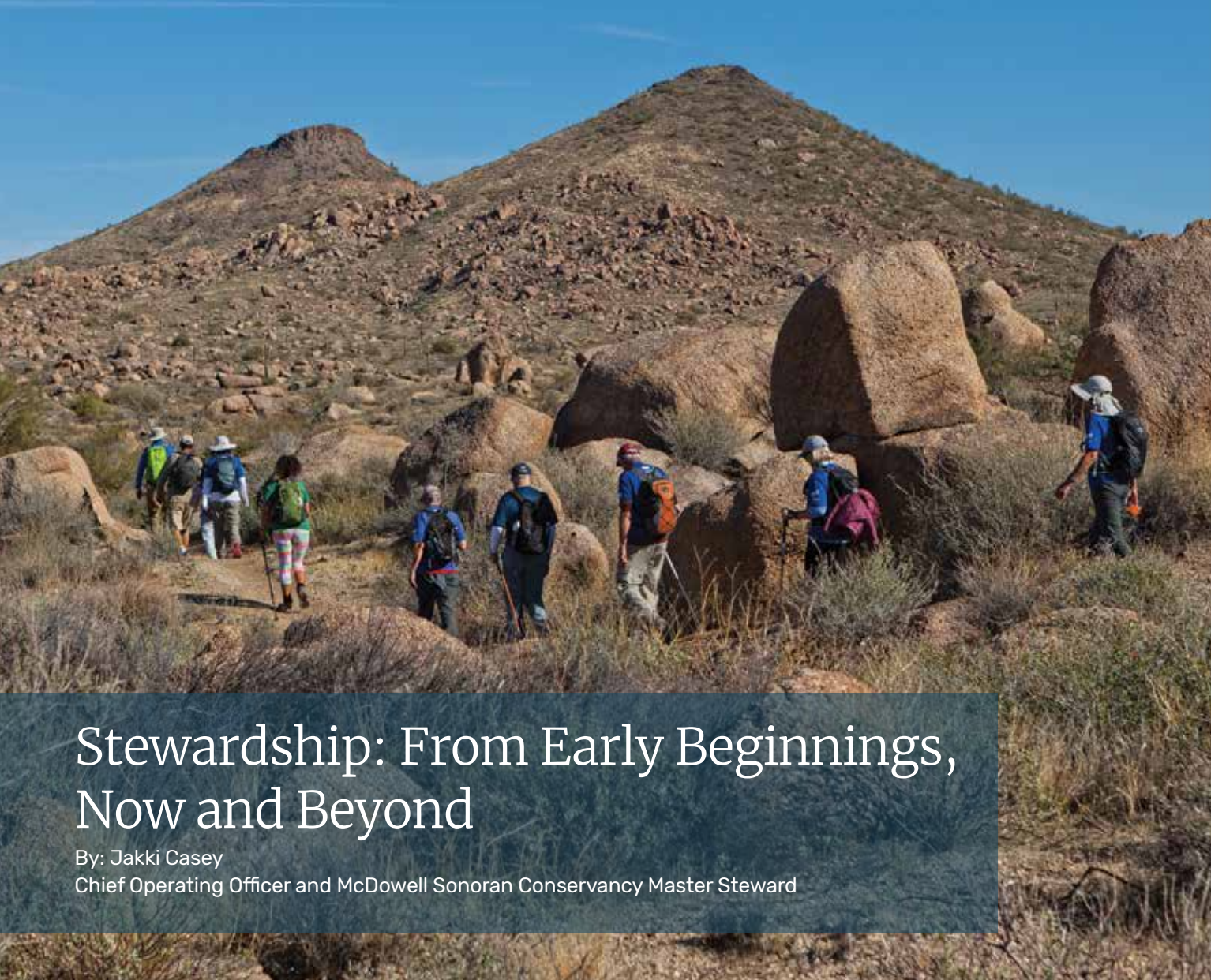
About Us

The McDowell Sonoran Conservancy preserves and advances natural open space through science, education, and stewardship. We create a culture that ensures, preserves, and values natural open spaces for all to enjoy.

Connect with us:



A family of mule deer rest alongside Latigo Trail at Brown's Ranch. Photo by Dennis Eckel



Stewardship: From Early Beginnings, Now and Beyond

By: Jakki Casey
Chief Operating Officer and McDowell Sonoran Conservancy Master Steward

Our free guided hikes are all led by stewards and provide great educational and fitness opportunities for people from all backgrounds. Photo by Dennis Eckel

As we take this opportunity to look back on 30+ years of stewardship, we are reminded of how the Preserve Pioneers and other individuals started being stewards and ambassadors for natural open space. This group realized that broad public support would be necessary to obtain the vote needed to raise taxes and secure funding to purchase the land that now comprises the McDowell Sonoran Preserve. One of their most effective tactics was leading hikes into what is now the Preserve. Another



Carla, our second Executive Director and Preserve Pioneer, reminisces as we hit 30 years.

tactic centered on education—what is more compelling than teaching our grade school students, so they can go home and share their excitement about what they learned with their families. Once you have been introduced to the Sonoran Desert, learned about the environment, and ultimately come to appreciate the beauty and ecological importance of natural open space, it is hard not to support this living treasure.

Our second Executive Director, Carla has been enjoying the trip down memory lane:

It has been wonderful to reminisce about the McDowell Sonoran Conservancy's 30 years. This provides us with a great opportunity to honor the folks who began one of our most successful outreach programs.

Before there ever was a McDowell Sonoran Preserve, public support for creating it had to be developed. Encouraging people to venture out on to the land was the most effective way to help them understand why Scottsdale needed to preserve it.

Beginning in 1992 the Conservancy's first Chairmen, Pete Chasar and Steward #1 Chet Andrews, along with archaeologist and Board Member Greg Woodall, began a public hiking program. They led thousands of potential supporters into our future Preserve.

At the same time Education Chair, Carla, and volunteer, Cindy Jaskie, created the Conservancy's first Education Program. Working with then City of Scottsdale Outdoor Recreation Specialist (now City of Scottsdale

Natural Resource Coordinator), Yvonne Massman, all 4th graders were able to learn about and experience nature's wonders. These students then went home and shared with their parents what they learned about our Sonoran Desert and mountains.

Hiking this great land was, and remains today, the most effective way to garner support for our Preserve.

Today we see so many of these early ideas continue as the Conservancy remains stewards of this amazing



Have you ever wondered why the trails are in such great condition? Our trail maintenance crews partner with the City of Scottsdale to plan and mitigate trails to keep them that way.



All applicants go through both classroom and in-field training before they graduate as stewards. Our experienced stewards are the best trainers for our newcomers. Photo by Lynne Janney Russell



Each incoming steward is also personally mentored by a more experienced steward to help them on their journey. Great new connections are formed this way too. Photo by Lynne Janney Russell



Visitors are welcomed into the Preserve by our pathfinders who are there primarily for safety but also provide great route guidance. Photo by Lynne Janney Russell

land. Currently we offer over 150 free guided hikes and bike rides each year, with many of these activities focused on sharing knowledge, whether about the life cycle of a saguaro, geology, human history, and so much more. We also offer a lecture series on ecology and human history, and numerous formal and informal youth events. As we move into the future, we continue to design and deliver a spiraling curriculum for all ages, so we can all find great opportunities for personal learning growth. As we are constantly immersed in technology, we need to move our focus to hands-on experiential learning—it is fun, interactive, we learn in the moment, and take away facts, which we can share with others. We anticipate creating a “living lab” within the Preserve that will allow every visitor to participate in our research while learning the importance of it. Experiential learning is very engaging for many groups, and something we continue to explore.

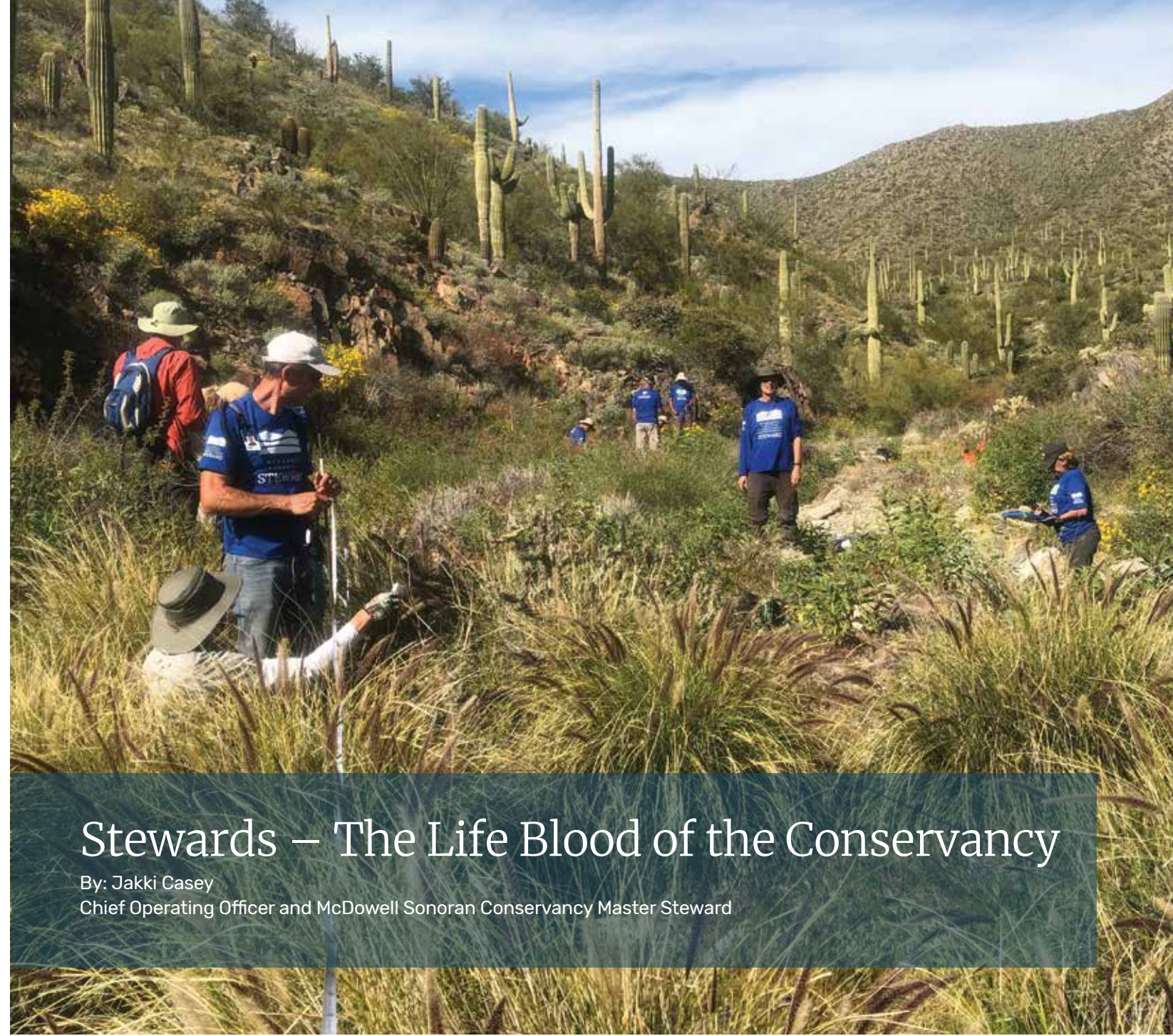
The realization has never been greater. All of us have a role to play in helping ensure our natural open

spaces remain healthy and available for generations to come. Experience Scottsdale refers to our blue shirted stewards as “super-hero’s.” So next

time you see a blue shirt, take a little time to share your stories about how you, too, are a steward of the land and ask them to share theirs. ▲▲



Visitors participating in one of the Conservancy’s free guided hikes lead by our stewards. Photo by Dennis Eckel



Stewards – The Life Blood of the Conservancy

By: Jakki Casey
Chief Operating Officer and McDowell Sonoran Conservancy Master Steward

Our stewards collaborate with staff to identify, map and then remove invasive non-native plants. This crew is in Quartz Wash revisiting sample plots. Photo by Tiffany Sprague

Our mission is to preserve and advance natural open space through science, education and stewardship.

Throughout this special edition of Mountain Lines, we celebrate our accomplishments and set the future direction for the organization through our three pillars: Science, Education

and Stewardship.

Natural open space has never been more under threat with urbanization, weather extremes, and other environmental factors. As a way to address these influences, we need to continue to raise public awareness, share resources, research, and data with members of our community. By

working and actively participating in natural open space, we can all be stewards of the land and protect these areas for future generations.

The Conservancy’s scientific work and research on invasive non-native plants, restoration, protecting biodiversity and habitat connectivity would not be possible without the dedication



All of our activities require our stewards. Pre-COVID over 100 of them delivered Expedition Days to local 3rd and 4th graders to help them appreciate the interconnectedness of our ecosystem. Photo by Lynne Janney Russell

of our stewards. Our small staff team of scientists work hand-in-hand with qualified citizen scientists and stewards to complete research, capture data, report on results, and ultimately work together to create recommendations for land managers. Currently we have 72 stewards who have dedicated the time and steps required to become



Education comes in many forms. At a recent Children's Learning and Play Festival, youth learned about local rattlesnakes and how they are an integral part of our ecosystem. Photo by Lynne Janney Russell

qualified citizen scientists; additionally, we have many more individuals who work on our scientific research. In 2020, this amazing group of stewards, citizen scientists and staff spent over 6,400 hours on scientific research and were successful in having several articles published.

Over the last two years, the Conservancy embedded Arizona state curriculum standards into our youth education programs and partnered with school districts to design content that truly meets the educators' needs. Both the design and implementation of these initiatives were only made possible by the partnership between our staff and stewards. In 2019, stewards created an Education Strategy Committee (ESC) to determine the future of our education programs, which led to the hiring of professional education staff to provide direction and expertise. The

stewards then turned to implementing the recommendations from ESC efforts and worked hand-in-hand with our staff to create a new approach to education, which focuses on "everything is connected and always changing." Staff and stewards are tirelessly working to build this mantra into a spiraling curriculum with lots of jumping in and out points to engage students of all ages along their journey.

When the Conservancy welcomes new stewards into our organization, we focus on the Preserve as being a significant part of what we do but not everything that we do.

Our blue shirted stewards are an amazing resource and integral to everything we do; however, this takes a considerable commitment. To ensure we all become stewards of natural open space, the Conservancy is designing a program targeting those who have the



Leading the public on free hikes in the Preserve allows us to share our mission and help everyone realize they have a role to play in preserving natural open spaces. Photo by Dennis Eckel

desire but who do not have the time required to become, and continue to be, a steward. This new volunteer program will sit alongside our steward program and provide periodic volunteering opportunities. We understand that many groups—a group of friends, a group of work colleagues, multi-generational groups—enjoy finding volunteer opportunities to join together and we are confident this new program will appeal to them.

Simply put, the stewards are the life blood of the Conservancy. They are unlike any other volunteer program—they helped form the Conservancy, are part of all major decisions, continue to reinvent themselves, and allow us to grow and expand our impact. ▲▲



Restoration of degraded land remains a key priority. Our research helps identify the best techniques for each area. We continue to monitor after restoration to ensure it has been successful. Photo by Debbie Langenfeld



What is Stewardship?

By: Jakki Casey
Chief Operating Officer and McDowell Sonoran Conservancy Master Steward

Photos above and right page: Stewardship in the Preserve includes hiking, biking and riding the trails. Always looking for visitors in need of help as well as identifying potential trail condition issues. Photos by Dennis Eckel and Lynne Janney Russell

What do we mean by stewardship? Is it our amazing blue shirted volunteers whom we call stewards? Is it the advocacy work that began even before we were formally a registered organization? Is it our education programs, which are rooted in our foundation? Or is it our scientific research, which

helps the City of Scottsdale and other arid and semi-arid environments identify actions required to protect the ecological integrity of the desert? Simply put, it is all of the above and much, much more.

Stewardship isn't something complicated or something that is limited to a small group of people.

Every one of us has a role to play in the stewardship of natural open spaces. It can be as simple as respectfully enjoying the trails and learning while you are out there. Whether it's about plants, birds, butterflies or critters, sharing with others what you have discovered, the accessibility of these trails, and maybe most importantly,



enjoying the "buzz" that comes from the physical and mental health benefits of being in nature. If each and every one of us plays a role, we share the weight of stewardship, and future generations will be able to enjoy these amazing places in the same way we do today.

One of the Conservancy's exciting new programs is focused on the

cultural resources. Did you know there are hundreds of irreplaceable cultural sites and artifacts all around us? These sites and artifacts teach us so much about who and what has been here before. And as you can imagine, these areas and items need monitoring and protecting to ensure they remain available in the future for others to learn and admire. The City





As new trailheads and interpretive trails are created, we partner with the City of Scottsdale to design immersive and educational signage to give visitors a great experience. Photo by Lynne Janney Russell

of Scottsdale Cultural Resource Plan lays the foundation for protecting these sites. The Arizona Site Steward Program, led by Arizona State Parks and Trails, gives us the tools and practices for protecting in a consistent and safe way. The Conservancy has long been a supporter for launching this program within the McDowell Sonoran Preserve. To date, eight of our stewards have been certified as Site Stewards and are now qualified to lead these preservation efforts. The initial

program prioritized six cultural sites for monitoring. Initially, each of the sites was visited with our Site Stewards, an Arizona State Parks and Trails lead, an archaeologist and a City of Scottsdale representative. Given the sensitive nature of the artifacts, we are safeguarding the areas to ensure these relics remain undisturbed for future generations. We are delighted this program is up and running and look forward to adding more locations. Some areas of the Preserve have been

surveyed to identify these resources; even more are still waiting to be discovered!

If you are interested in learning more about the role you can play, think about where your interests and passions lie. For a number of you, it will be joining our steward program; for others joining our hikes and lectures to learn more; for some it may be helping educate; and for many, it could be investigating places for your friends and family to explore. Locally we are so fortunate to have access to so many natural open spaces – how many have you experienced? One thing we can all do is spend a few minutes each time we are out in nature simply appreciating it. Nature does not care about your background or your current situation—we are all equal on the trail, so let’s use this diverse resource to stretch and grow with others. ▲▲



Taking the Lead on Restoration in the Sonoran Desert

By: Mary Fastiggi
McDowell Sonoran Conservancy Restoration Manager

Stewards work with ecologist, Dr. Helen Rowe to identify plants along a transect on the side of Brown’s Mountain as part of our non-native plant removal experiments. Photo by Jim Tillinghast

Close your eyes and imagine a stereotypical desert from an old movie. What do you see? A dusty field with tumbleweeds blowing across a desolate landscape? Contrast this image with what we experience when we hike through the Sonoran Desert. We see a beautifully lush, but harsh, ecosystem with a rich array of plants and animals that are somehow adapted to this heat and dryness, with the occasional and welcomed monsoon and winter rains to keep it all going.

If you close your eyes out in the McDowell Sonoran Preserve, you might convince yourself that you’re in a wild, unspoiled wilderness. But, when you

look more closely at the trails and signs, and listen to the sounds around you, you can feel the hint of human impacts on the landscape. Did you know that tumbleweeds actually originated from Eurasia? These seemingly iconic “Old West” plants are here as a result of human travel around the globe.

The Sonoran Desert, like much of the world, is being impacted and changed, intended or unintended by human actions. Over time, ranching, mining, recreational use, and urban development have degraded sections of our precious desert. Once degraded, desert ecosystems can be difficult to restore and support fewer native plants

and animals (think of that dusty field). That’s where ecological restoration comes in. Ecological restoration involves taking action to address degradation and support ecosystem health for the long-term.

At the McDowell Sonoran Conservancy, we are taking the lead to combat degradation thanks to the hard work and dedication of our stewards and staff. Last year, despite lock-downs, social-distancing, and canceled activities, stewards dedicated over 2,500 hours to our restoration projects. Restoration is a critical part of conservation, because not only do we need to preserve land, but we need to



Our youth programming, delivered by stewards, provides immersive, hands-on opportunities for 3rd and 4th graders to learn while they explore. Photo by Lynne Janney Russell



We also provide some great informal educational opportunities to explore other local residents to the Sonoran Desert. Photo by Lynne Janney Russell



A smiling team of citizen scientists head out on Prospector Trail to remove non-native plants in the Preserve. Our teams map, remove, and monitor key non-native species using both physical removal and herbicide. Photo by Jim Tillinghast

understand what's changing and what we can do about it.

In 2015 – 2016, while working with the City of Scottsdale to identify what land managers need to know in order to make the best restoration decisions, we launched our first restoration projects. We looked at common restoration techniques that were already being used in the McDowell Sonoran Preserve and set up experiments to test what was working and what could be improved. Around the same time, we began to survey the Preserve for non-native plants, mapping problematic species that displace native species and increase wildfire risks. Using this information, stewards headed into the field and began removing plants and monitoring sites for re-treatment.

As we worked closely with the

City of Scottsdale, we began to ask ourselves: How did a five to eight year-old restoration attempt work over time? How could we quickly and accurately map where degraded sites



Stewards help with the installation of our RestoreNet plots near Granite Mountain trailhead to test different seed mixes and methods to help seeds get established. Photo by Mary Fastiggi

were across large landscapes? Where were the non-native plants and what risks did these species present? What were the most cost-effective and successful techniques to remove buffelgrass and fountain grass?

As we began to address these questions and more, we developed new partnerships and shared our results more broadly. Currently, we are working with NAU faculty on growing soil crust, by collecting it from disturbed sites, cultivating and transplanting it, with the aim to grow it out more quickly than has ever been achieved. Additionally, we have mapped over 81,500 acres of open space among the McDowell Sonoran Preserve, McDowell Mountain Regional Park and White Tank Mountain Regional Park to help land managers identify and prioritize degraded sites.

Our RestoreNet project is part of a US Geological Survey experimental network to improve seeding outcomes.

Our non-native plant projects have expanded regionally. The Conservancy is working with the Central Arizona Conservation Alliance (CAZCA) as key partners in the Desert Defenders project, which is a large-scale effort to map and remove invasive species in Maricopa County. We are leading a CAZCA working group to increase regional collaboration on non-native plant management and outreach. All of this momentum is a great sign of our restoration progress. We have been able to publish our results in peer-reviewed journals, launch education and outreach campaigns, and hire additional staff to work on these projects. There is certainly more work to do to protect the Sonoran Desert through ecological restoration. Volunteer opportunities are always available – so get involved in fieldwork, education and outreach events, and more! ▲▲



What is soil crust anyway? Biological soil crusts are communities of fungi, lichens, cyanobacteria, algae, and bryophytes that grow on a thin layer at the surface of soils. These species together compose soil crust and provide important benefits to the environment including, soil stabilization, nitrogen fixation, and carbon fixation. Photo by Leona Weinstein



Our restoration research and projects have a regional impact. This photo shows (L-R) US Geological Survey (USGS) field manager Katie Laushman and Tonto National Forest botanist Robert Madera with McDowell Sonoran Conservancy's Mary Fastiggi and Dr. Helen Rowe at our Tonto National Forest RestoreNet restoration site. Photo by Mary Fastiggi



Steward Debbie Langenfeld works as a citizen scientist recording data on soil crust salvaged from the Preserve and moved to Scottsdale Community College to test various methods to cultivate soil crust. Photo by Jane Brady

Biodiversity Abounds!

By Tiffany Sprague
McDowell Sonoran Conservancy Biodiversity Manager



Radio telemetry allows us to monitor the movements of species, such as mule deer (*Odocoileus hemionus*) and Sonoran desert tortoises (*Gopherus morafkai*), to determine habitat use and what may influence their behaviors. Stewards quickly learned this technical skill. Photo by Tiffany Sprague

Mountain lions, tiger rattlesnakes, and teddy bear cholla—oh my! Scottsdale’s McDowell Sonoran Preserve is teeming with life. Its large size, varied habitats, and unique location enable an incredible diversity of plants and animals to thrive. Combined with its beauty, cultural history, and recreational opportunities, it is no wonder people worked so hard to designate these lands as a Preserve.

The McDowell Sonoran Conservancy plays an important role in understanding and protecting

the impressive biodiversity of this Preserve. We do this through a variety of means—research and monitoring, active management, coordination with partners, and educating and inspiring others.

To effectively protect an ecosystem, one needs to understand the components of that system, how and why it changes, and the best way to manage it. To start this process in 2011 through 2013, the Conservancy conducted baseline flora and fauna surveys. These baseline surveys gave us a good indication of what resources

were in the Preserve and helped guide our early research and management efforts. But the Preserve ecosystem is not static; it is always changing. Because of this, we began long-term monitoring projects for many of the species groups: amphibians, birds, invertebrates, mammals, reptiles, and plants. Most of these projects continue today, and this regular monitoring allows us to determine how these resources are changing and to tease out causes for those changes. Are they due to natural occurrences, such as temperature or precipitation? Or are



Arthropod project One of our longest-running projects assesses how urbanization is influencing the ground-dwelling arthropod community in the Preserve. Although our data dates back to 2012, this long-term monitoring project is still in its infancy and has a lot more information to provide in the future. Photo by Derek Uhey

they due to human activities, such as urbanization or climate change? Understanding the causes enables us to determine if management intervention is needed to better protect these species or the ecosystem as a whole.

Those first surveys documented 730 types of plants and animals in the Preserve. Since then, that number has increased to 1,020, and we continue to discover more every year. Imagine what that count will be in another 30 years! Some of those species have likely been there the whole time, and we just hadn’t observed them; some are just passing through; and some are new to the area, including native species expanding their ranges and non-native species we need to keep our eye on to ensure they don’t become a problem.

A key aspect to protecting this biodiversity is maintaining connectivity within the Preserve and the larger region. The Preserve is uniquely situated to connect nearly three million acres of protected lands, with Tonto National Forest to the north and McDowell Mountain Regional Park and the Fountain Hills preserve to the east. This large, connected landscape



Birding Birding is a fun way to engage new people as citizen scientists. Our long-term monitoring project has engaged dozens of people and provides important information about the health of the Preserve.

is one of the primary reasons so many species live here. As the land around the Preserve continues to be urbanized, as traffic increases on adjacent roadways, and as recreation increases on the trails, we are working with our partners to determine what is needed to maintain a biodiversity connection.

All of our wildlife projects factor into understanding connectivity in the Preserve. Several additional projects have been devoted to this topic. In 2016 through 2019, we used wildlife cameras to document mammal presence in the Preserve and an acoustic study to determine how urban sounds propagate across the land. We are now coordinating with partners to continue these projects and monitor changes over time. From 2016–2018, we worked with the Arizona Game and Fish Department on a mule deer telemetry study, which showed that roads and trails in the Preserve form barriers to deer movements. This year, 2021, we initiated a Sonoran Desert tortoise telemetry project to supplement the deer results. We anticipate additional telemetry projects in the future to help inform management actions, such as wildlife crossings on major roadways.



Bat project – Bat monitoring has occurred at this gated mine in the Preserve since 1981, before the Parsons Field Institute was created. When we took it over, we expanded the project to better assess the bat population, which includes Townsend’s big-eared bats (*Corynorhinus townsendii*). This project provides a unique opportunity to partner with a variety of entities, including students. Photos by Debbie Langenfeld

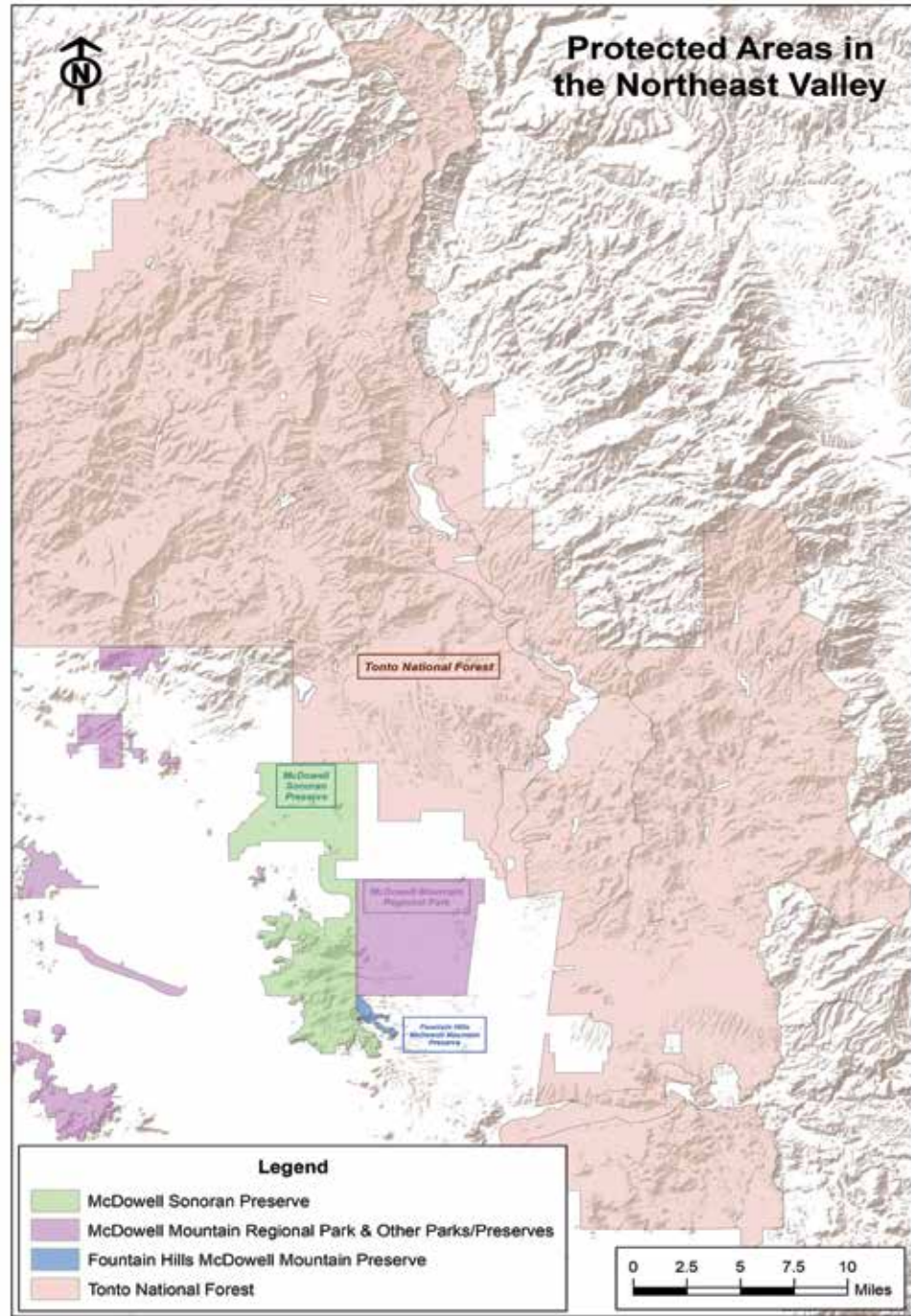


Sonoran desert tortoise
Our new Sonoran desert tortoise project is generating important information about this species in the Preserve and how to best protect the Preserve ecosystem. Photo by Scott Sprague



Camera project Wildlife cameras provide a great way to monitor species presence in an area and can help us monitor connectivity within the Preserve and larger region. They also yield incredible photos that help engage and educate people! Photo (of Tom Hillman) by Tiffany Sprague

Regional collaboration and public education are vital for protecting biodiversity. The Preserve is an important part of many species' ranges, so understanding larger trends helps determine what is needed to help conserve these species in the Sonoran Desert and beyond. Similarly, educating visitors and the public about what they can do to help protect these species and their habitats is essential. We all have an important role to play in this, and we encourage you to get involved and do your part. With your help, the beauty and biodiversity of the Preserve will be just as awe-inspiring 30 years from now. ▲▲



Regional map Not only does the Preserve protect important landscapes, but it forms a vital habitat connection for the plants and animals. Maintaining this connection is essential for many of the species that occur in the region. Map created by Dan Gruber



The Conservancy's science work feeds into its other pillars of education and stewardship. At Expedition Days 2020, students learned about how non-native plants such as buffelgrass (*Pennisetum ciliare*) affect the environment. Photo by Lynne Janney Russell

Protecting the Preserve: Then, Now, and Beyond

By Tiffany Sprague
McDowell Sonoran Conservancy Biodiversity Manager

Nature is amazing. Think of your top five favorite places in the world, and it's likely that at least one natural area makes the list, and perhaps Scottsdale's McDowell Sonoran Preserve is among them. These special areas offer escape and relaxation, learning and growth, wonder and amazement. They also provide the resources we need to survive.

What does it take to effectively protect these natural open spaces? It

takes a lot more than just designating lands as "protected" and setting them aside. It requires careful planning, collaboration, and management, which is where the McDowell Sonoran Conservancy shines.

As the Conservancy shifted from advocating for establishment of the Preserve into stewardship of those lands, we realized the need to base our work on solid scientific data about the resources we sought to protect.

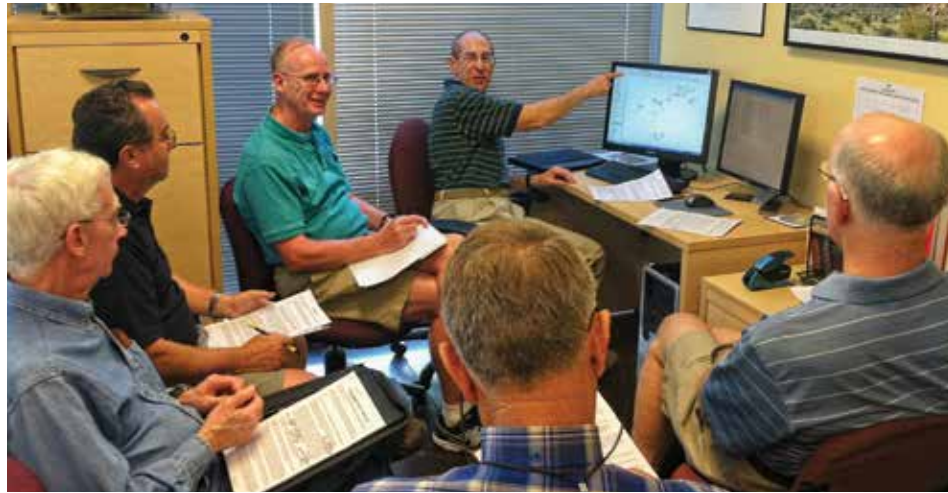
We also knew that, with appropriate training and guidance, our stewards could lead efforts and collect credible data. Thus, the Conservancy launched the Field Institute, which was later renamed the Parsons Field Institute.

Early Field Institute projects focused on baseline inventories of Preserve resources—in order to effectively protect resources, you need to know what it is you're trying to protect. With this in mind, we launched

surveys to document plants, animals, and geology of the Preserve. These early projects set the stage for how the Parsons Field Institute continues to function today, by designing and implementing projects in partnership with stewards. From this initiative also brought about the Parsons Field Institute's mission, which is to conduct ecological research through partnerships and citizen science to inform long-term natural resource management of the Sonoran Desert, to contribute to broader scientific knowledge, and to inspire stewardship of the desert.

As our list of projects began to grow, we worked with the City of Scottsdale and consultants to produce the Ecological Resource Plan. Using this framework, we focused our efforts into three primary areas: 1) understanding how human and environmental pressures influence the Preserve, 2) researching the most effective ways to manage Preserve resources, and 3) implementing appropriate conservation measures.

Over time, we have engaged in a wide variety of scientific projects. Over the next 30 years, you will see the Conservancy continue with several of these projects, expand into others, and launch new ones to help us better understand this special place and what is needed to protect it. The importance of this work doesn't stop at the Preserve boundaries. Although much of what we do is focused on the Preserve and the Sonoran Desert, our efforts and discoveries have much farther-reaching impacts and



As citizen scientists with the Conservancy, stewards engage in more than just field work. They can be involved in many aspects of our projects, from initial design through processing data and reporting results. Here, stewards are being trained to use ArcGIS to map our data. Photo by Melanie Tluczek



As visitation to the Preserve continued to increase, the Conservancy conducted a study in 2014–2015 to evaluate impacts of recreation on adjacent plant communities and soil crust. The results were published in a peer-reviewed journal (see <https://bit.ly/MSP-TIS>). Photo by Lisa Miller



Controlling non-native plants is a high a priority for the Conservancy and its partners. We have worked on this issue for more than 25 years and will continue well into the future. In 2019–2020, six stewards became certified herbicide applicators, which has extended our control efforts. Photo by Doug Jensen



Partnerships are a vital component of the Parsons Field Institute's work. These partners help develop and implement projects, plus train and engage stewards. Here, steward Tom Hillman and biologist Colin Beach process the first Sonoran Desert tortoise (*Gopherus morafkai*) captured on a project started in 2021. Photo by Won Fogel

can be applied to other natural arid environments. By determining how to best manage the Preserve, we are helping inform management at much broader scales. We continue to expand our partnerships throughout the region and beyond so that we can learn from each other, develop solutions together, and work collaboratively to ensure long-term protection of the places and resources we love.

Similarly, the importance of the Field Institute's work isn't just scientific. Protecting nature requires people to care about it, which



Engaging as a citizen scientist with the Conservancy certainly has its benefits, including exploring stunning scenery that many people don't get to experience in the Preserve. The Conservancy has special permits from the City of Scottsdale that authorize these off-trail activities. Photo by Tiffany Sprague

requires people's understanding of its importance and how their actions influence it. The Conservancy's science work enables this in two ways: first, by engaging people as citizen scientists, we help intimately connect them with nature and empower them to become ambassadors and advocates; and second, by sharing with others what we are learning about the Preserve,

we help spark interest and wonder, educate them about the role they play in conserving nature, and provide them with the tools they need to be stewards of the land. As the Conservancy's scientific endeavors continue to grow, its education and stewardship emphasis will also expand and thrive into the future. ▲▲



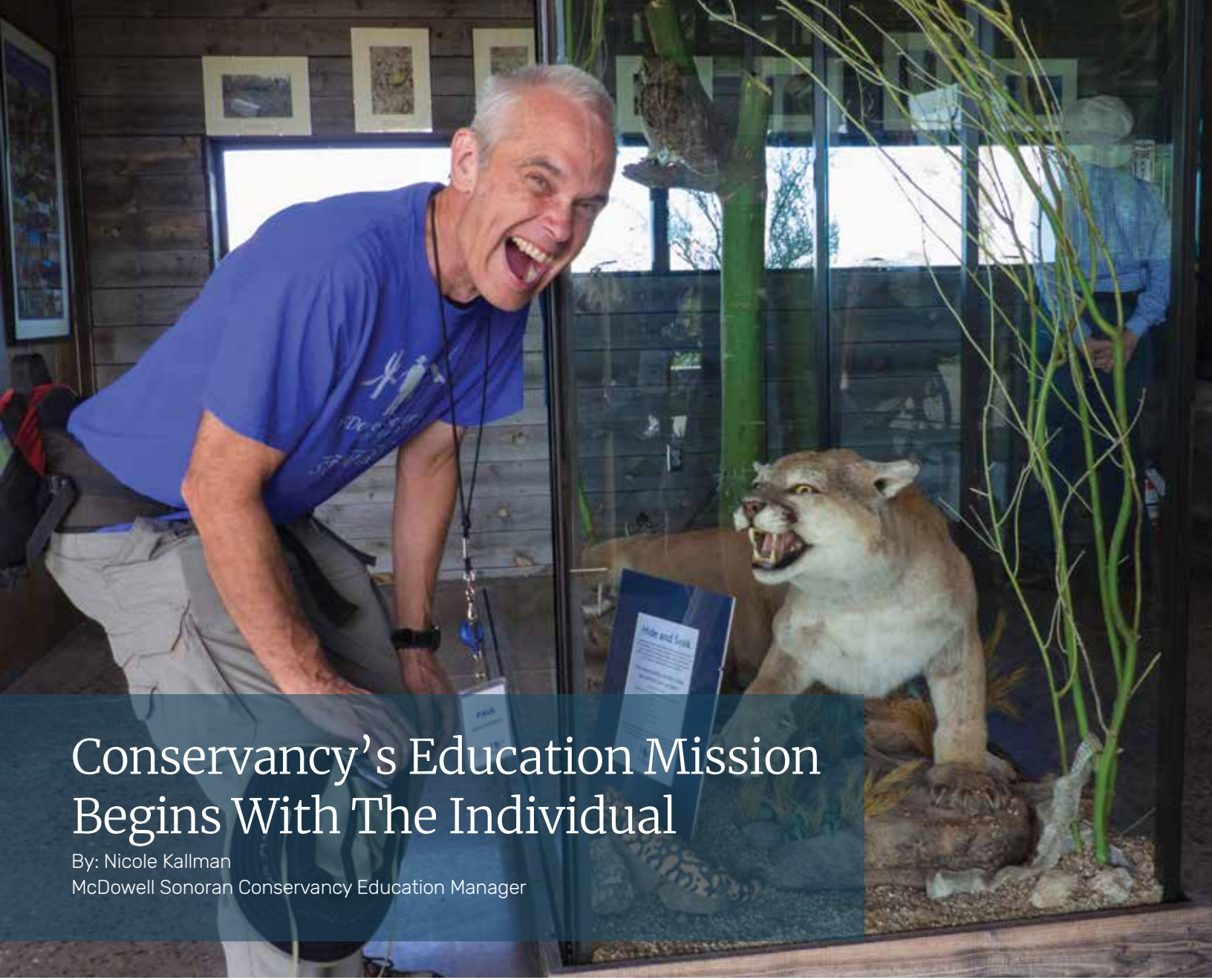
Sometimes, you just need to get down and dirty to do a job well. Botanist Steve Jones has partnered with the Parsons Field Institute from the beginning and excels at teaching stewards how to identify plants.



Stewards have engaged in a number of geology projects. In 2014, we partnered with the Arizona Geological Survey to map quartz veins in the Preserve. Balloons such as this were used to take aerial images. Photo by Mike Conway



Stewards quickly became experts in identifying types of rocks and geologic formations. Photo by Marianne Jensen



Conservancy's Education Mission Begins With The Individual

By: Nicole Kallman
McDowell Sonoran Conservancy Education Manager

Environmental education, at its best, combines information and impact with a healthy dose of fun and excitement. Photo by Lynne Janney Russell

After its initial chapter as an advocacy group for the protection of what is now the McDowell Sonoran Preserve, the McDowell Sonoran Conservancy turned its attention towards educating the public about the amazing Sonoran Desert, using the Preserve as its living lab. The Conservancy's public education goal originated in the hearts and minds of our incredible stewards. Those with a passion for the outdoors and an interest in a specific subject,

developed and curated educational opportunities to include a mixture of educational guided hike and bike rides, along with topic-specific library lectures. As the steward population grew, so too did the number of the Conservancy's educational programs. After 30 years, we now have a robust number of educational opportunities that teach people about the Sonoran Desert, and how they are connected to this vast ecosystem.

As the Conservancy looks ahead

to its next goals for public education, we hope to engage even more people. Our first goal is to help people gain a deeper and more meaningful understanding of the interconnectedness of the Sonoran Desert ecosystem; and second, to personally empower and inspire people to take action and help protect this amazing environment. Our main goal for public education is to go beyond any singular topic, and instead help people find their own personal connection and commitment to this

environment. This new direction is supported by the recent development of the Conservancy's education mission, with an overarching education theme, and core Ideas.

The Conservancy's education mission emphasizes stewardship of natural open spaces at the level of the individual. We want our educational offerings to have impact that is sustained to help people integrate both the appreciation of and advocacy for nature into their values, beliefs, and actions. This is what we call education with impact.

So how does environmental education go beyond the surface-level facts and actually influence people's deeper belief systems?

We first start by developing the overarching theme that everything is connected and always changing. This speaks to the complex relationships that create the amazing Sonoran Desert, along with the understanding that no environment is static—there are both natural and human processes that change the landscape over time. This theme of connection and change allows us to initiate discussions

around human impact on the environment. The environment changes for many reasons. Unfortunately, over the past hundred years, industrialization has greatly increased the rate of change in the Sonoran Desert. Native plants and animals are struggling to adapt to this change, and what we see with the Sonoran Desert is an example of what is happening to ecosystems all over the world. Environmental education provides people the foundational knowledge necessary to appreciate the delicate systems of life that have evolved over thousands



The tradition of educating children about the wonders of the Sonoran Desert continues during Expedition Days in February 2020. Photo by Lynne Janney Russell



Interactive learning helps connect both kids and adults alike to nature and build a personal connection to it. Photo by Lynne Janney Russell



Education helps people understand the Conservancy's research work, why it's important, and how they can use the information in their everyday life. Photo by Lynne Janney Russell

of years. However, truly successful environmental education takes that knowledge and invites people to think deeper about how they as humans fit into this larger system of life.

The Conservancy's core ideas combine a broad framework of primary topics--Life Sciences, Earth Sciences, Ecology and Environmental Science, and Human Ecology. All provide

different lenses through which to explore and understand the Sonoran Desert. The Conservancy wants to make sure these Core Ideas are not taught in silos. Instead, each of these facets work together in harmony to both affect and respond to each other within an environment--we impact the Sonoran Desert, and in return, the Sonoran Desert impacts us. Our survival is deeply intertwined with the survival of this ecosystem, and this is an important concept we hope to convey through a cohesive and engaging network of educational offerings.

As we look ahead to the next 30 years of the Conservancy, we aim to create lasting change through education that positively impacts both the individuals who join us and the amazing Sonoran Desert that we call home. ▲▲



Millions of important relationships between living things and the environment come together within the incredible Sonoran Desert ecosystem.



Teaching Our Next Generation of Environmental Stewards

By Nicole Kallman
McDowell Sonoran Conservancy Education Manager

By learning about Sonoran Desert organisms, students broaden their understanding of their connection to the ecosystem. Photo by Lynne Janney Russell

Over the past 30 years, the McDowell Sonoran Conservancy has been committed to connecting people with nature and helping them see the wonder of the natural world. For many years, we worked tangentially with student groups, providing experiential learning opportunities to explore the outdoors. However, in the past few years, the Conservancy has consciously shifted its focus to work directly with school districts to support teacher needs in the classroom and help get students excited about their learning.

We began this initiative when we revamped the Expedition Days in February 2020 to align the interactive



Students are ready for a day of interactive, place-based learning at Expedition Days. Photo by Lynne Janney Russell



Individuals Can Make a Lasting Impact

By: Nicole Kallman
McDowell Sonoran Conservancy Education Manager



Guided hikes and bikes connect people to the land, helping visitors develop a relationship with this ecosystem and their place in it. Photo by Lynne Janney Russell



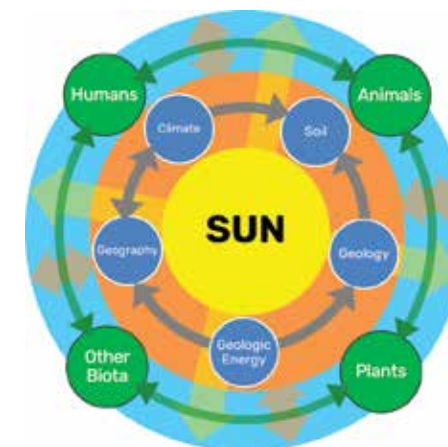
Interactive lectures connect information about the Sonoran Desert to the broader perspective of why the Sonoran Desert is important and how humans are a part of the ecosystem. Photo by Lynne Janney Russell

From the beginning of the McDowell Sonoran Conservancy, education has been deeply embedded in the organization’s work. When the Conservancy was first established as an advocacy group, dedicated members took children on educational hikes in the Sonoran Desert to garner support from Scottsdale citizens to protect what is now the McDowell Sonoran Preserve. Education is a key piece of making people feel connected to the land and understanding the importance of having a personal relationship to nature.

After achieving their goal of creating the McDowell Sonoran Preserve, the Conservancy stewards continue to champion for the appreciation and preservation of natural open spaces. Over the past 30 years, the Conservancy has educated thousands of individuals about the wonders of the Sonoran Desert ecosystem. These educational efforts include guided hikes, lectures in the public library, public workshops, interpretive trailside stations, school field trips, family presentations, and more. Education

is one of the Conservancy’s three pillars through which we are able to do incredible work with lasting impact.

In the past several years, the Conservancy has made great strides in growing its Education pillar, hiring in 2019 its first official staff member dedicated entirely to education. Since then, we have created an education mission statement, an overarching educational framework to support a cohesive network of offerings, and established the Sonoran Education Center. Our mission—to inspire, develop and support environmental



Our Core Ideas graphic demonstrates the interconnectedness of these topics and, ultimately, the interconnectedness of the Sonoran Desert itself.

stewardship of the Sonoran Desert and natural open space through impactful education—emphasizes our focus on impactful education. The Conservancy specifically wants to emphasize the use of education as a catalyst to inspire individual action to protect natural open spaces. Going beyond more passive forms of teaching, we aim to incorporate actionable pieces into all of our offerings, so participants walk away feeling motivated and empowered to make a positive change in their personal lives.

In order for people to care about the environment, they first have to understand how they are connected to it. Environmental education covers topics like the life sciences, ecology, and geology, but many organizations fail to connect these pieces in a way that helps individuals derive personal meaning from the information. For example, highlighting the relationship between invasive plants and the intense wildfires across the country, brings relevancy to information about invasive species and its overall effect on the environment. A

person's learning is no longer limited to just listening to facts, but instead builds in the opportunity for them to make connections between larger environmental concepts and how those concepts play out in the real world. The Conservancy has developed a framework of interconnected environmental topics to guide our efforts of creating a more holistic network of educational offerings that highlight the interconnectedness of the Sonoran Desert. The Sonoran Desert is a complex system of relationships between living things and

their environment. Humans are part of this ecosystem—what we do affects the health and survival of this landscape. Our goal is to help people understand the ecosystem we live in and the role they have in protecting it.

As we continue to move forward in education, the Sonoran Education Center looks ahead to new and innovative ways of engaging diverse audiences in the wonders of nature. From online learning to in person interpretive hikes, the Conservancy recognizes the need to invite people

from all different backgrounds and belief systems to be a part of the important work of acting on behalf of our amazing Sonoran Desert. The McDowell Sonoran Conservancy is built on the incredible work by individual citizens who wanted to advocate for nature when nature could not advocate for itself. Moving forward, it is important to remember the message of the story—when inspired and empowered, individuals can make a lasting impact for generations to come. ▲▲

Located in the Brown's Ranch area of the Preserve, Cathedral Rock was once used by Native People for shelter. Photo by Dennis Eckel



Study Sites

The Conservancy is expanding its education into the virtual space, creating videos that are accessible anytime, anywhere and share knowledge about the Sonoran Desert and our work.



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Connect with us:



30

The Scottsdale McDowell Sonoran Preserve is owned by the City of Scottsdale and is managed through a unique partnership between the City of Scottsdale and the McDowell Sonoran Conservancy. Our shared goal for the Preserve is to maintain it in a natural state while providing appropriate recreational and educational opportunities for this and future generations.



Hikers explore Bootlegger Trail from the Granite Mountain Trailhead. The trail offers views of the Matatzal Mountains and Four Peaks in the distance. Photo by Dennis Eckel