

Mountain Lines

Vol.14, No.10 March, 2009 Preserving Our Desert and Mountains www.mcdowellsonoran.org

MSC Wildflower Watch

Are you ready for some... wildflowers?!

By Dan Gruber, MSC Master Steward; Photos by Richard Buchbinder, MSC Steward

Some authorities say that we need to have soaking rain in October in order to have a good wildflower season the following spring. Others say we need rain in November, and yet others insist it's December. In addition to the timing of the first fall rains, supposedly it's vital to have rain at least once a month after that until spring. We know that wildflowers germinate in the late fall, grow slowly and stealthily over the winter, and then bloom in the early spring. We also know that in general the more total rain there is during fall and winter the better the wildflower season is. But beyond that, nobody



really knows what makes some years great and others sparse. In 2007, for example, it was dry from the end of the summer monsoon in early September until it rained in December, and then we had an incredibly wet winter. Nobody expected many wildflowers, yet spring 2008 had an amazing variety of wildflowers, including some that hadn't been seen in 10 years or more.

So what can we expect in spring 2009? Well, it's too early to make a prediction but there are some things we know already. First, we will see at least a few "reliable" wildflower blooms every spring. These include perennial shrubs like fairy duster, brittlebush, ocotillo, globe mallow, and chuparosa as well as annual wildflowers like scorpionweed, fiddleneck, desert marigold, blue dicks, lupine, desert chicory, and even the much-admired poppy. In a poor year these may be sparse, but there nearly always are some visible near the trails and on the hillsides of the Preserve. So there's something pretty to see every spring, which then leads into the equally reliable cactus and tree blooms of late spring and early summer.

As a reminder and to whet your appetite for this year's bloom, here's a list of what we saw in 2008 around the Preserve and on the State Trust land in the north:

- | | |
|-------------------------|-------------------------------------|
| African daisies | Indian wheat |
| Arizona blanket flower | Lacepod |
| Arizona fiesta flower | Lupine |
| Blackfoot daisy | Mojave desert star |
| Blue dicks | Owl's clover |
| Brittlebush | Panamint cat's eye |
| Buckwheat | Penstemon |
| California mustard | Poppies |
| California suncup | Purplemat |
| Chia | Rattlesnake weed |
| Chuparosa | Red maids |
| Comb-seed or comb-bur | Sand pygmyweed (or pygmy stonecrop) |
| Deer vetch | Blue scorpionweed |
| Desert chicory | Starpoint (also called silverpuffs) |
| Desert evening primrose | Thistle |
| Desert marigolds | Vine phlox |
| Desert wishbone bush | Western peppergrass |
| Fairy duster | Whispering bells |
| Fiddleneck | White zinnia |
| Filaree | Wolfberry |
| Gilia | Woolly daisy |
| Globe mallow | |
| Goldeneye | |
| Goldfields | |

Not a bad year!



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Scientists recognize that the Sonoran Desert and the Preserve are much more biologically rich than many people realize. The Sonoran Desert is actually the most botanically diverse place north of the tropics! The number of species is often underestimated because of their ephemeral nature. Spring's wildflowers, for example, represent hundreds of species that aren't seen the rest of the year.

I count myself lucky to be an ecologist living in the Sonoran Desert, where the mild climate and habitat diversity produce a virtual playground for nature enthusiasts! Instead of having to travel to distant places to see new wildlife, we have a new complement practically each month. From the first wildflowers, insects, and returning migratory birds in early spring, to the cactus blooms, lizards, and nesting birds of early summer, through the monsoon season's toads, tortoises, and night-blooming Datura blossoms, we enjoy months of desert beauty.

I have a ritual each spring where I hike the same trail weekly from February through April, to see the waves of different species as each reaches their prime then gives way to the next. I keep track of what I see each week, and if I were to share the different species with you, you would surely think I take a different trail each time.

The Sonoran Desert is actually the most botanically diverse place north of the tropics!

We need you, and your camera, for two activities this spring. The wildflower project featured on the cover of this issue is only as good as the input we get from you. ...so please send in your photos! Also, April is Get Into the Preserve month which we promote through our annual Focus on Conservation photography contest (see details on page 8).

I encourage you to visit the Preserve this spring specifically to enjoy the wildflowers, birds, insects, and bunnies. You only need to hike the short, easy Horseshoe Trail to see these spring beauties. If you like more of a challenge, the Sunrise Trail is sure to put on a great show too. If you hike Ringtail, you just might see me regularly as I think this will be my special trail this year.

See you on the trails!

Ruthie Carll
Executive Director

McDowell Sonoran Conservancy

A diverse ecosystem will also be resilient, because it contains many species with overlapping ecological functions that can partially replace one another. When a particular species is destroyed by a severe disturbance so that a link in the network is broken, a diverse community will be able to survive and reorganize itself... In other words, the more complex the network is, the more complex its pattern of interconnections, the more resilient it will be.

-- Fritjof Capra, *Austrian-American Physicist, Founding Director, Center for Ecoliteracy*

About The MSC

The McDowell Sonoran Conservancy champions the completion and sustainability of the McDowell Sonoran Preserve for the benefit of this and future generations. We connect the community to the Preserve through public and private partnerships, environmental education and stewardship.

Mountain Lines

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The McDowell Sonoran Conservancy is a 501(c)(3) non-profit organization

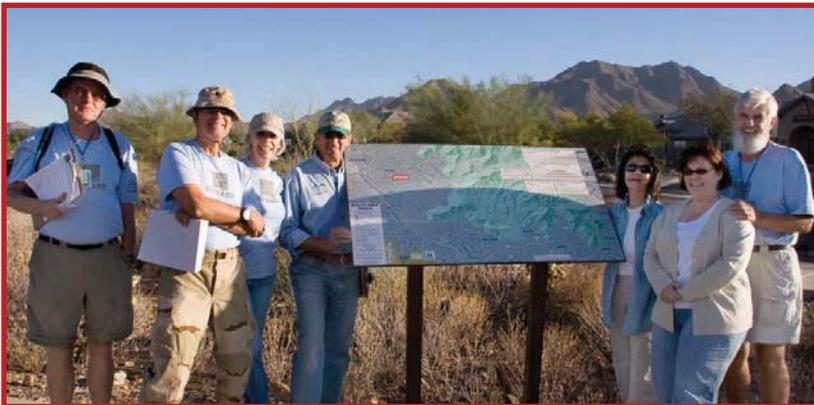
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A Historical Perspective (continued): 2000 to Today

The previous two segments of this historical perspective featured in the past two *Mountain Lines*, revealed how individuals and small groups of people can make a big difference in their community. MSC's founders and early leaders were the personification of the preservation efforts, and in some cases, the Preserve itself. Most of those who influenced MSC's success remain involved today even though the focus on individuals has lessened. Like the first tumbling boulders that set off a landslide, they are now part of the thousands of individuals that are contributing to the care and completion of the Preserve. This could not be better illustrated than through the first event of 2000.

On February 15th, 2000, the Arizona State Land Department held a hearing to determine if 16,600 acres of State Trust Land within the recommended Preserve boundary should be reclassified as "suitable for conservation" under the Arizona Preserve Initiative. MSC took the lead in organizing a turnout of over 1,500 people - a record shattering attendance for an API hearing - as well as gathering thousands of letters in support of the reclassification. As a result, State Land Commissioner Michael Anable signed an order reclassifying 78% of the land (13,021 acres) and committed to hold off public auction on the remaining 22%, thereby allowing Scottsdale time to explore funding options to purchase the land.

In 2001 and 2002, MSC focused on building community awareness of Preserve efforts. The Steward volunteer program geared up in order to lead awareness-building hikes and mitigate human impacts in the Preserve. The Stewards provided approximately 5,000 hours of service in each of these years.



Stewards Larry Shaw, Bernie Finkel, Joni Millavec, Len Marcisz and Allan Willey, along with then Mayor Mary Manross and Ruthie Carll celebrate the installation of five trailhead maps funded by MSC.

MSC's advocacy efforts, led by Carla, then Executive Director, were critical in 2003. The Hidden Hills subdivision residents raised issues regarding the planned Sunrise Trailhead which MSC helped to resolve. MSC also gathered significant community support for a 2004 ballot measure that added an additional 0.15% increase in the sales tax for land acquisition and access area amenities. The ballot measure passed with tremendous support.

In 2005, drought conditions and heat lightning closed the Preserve for the first time. MSC provided vital assistance in enforcing the closure. At the same time, construction began on the Lost Dog Wash Trailhead at 124th street north of Via Linda. The Pathfinders, a trailhead host program, began as a way to help visitors have a safe and enjoyable experience in the Preserve. This year was pivotal to MSC's future direction. The Board of Directors and city of Scottsdale Preservation Division staff identified the need for significant growth in MSC's capacity to physically care for the Preserve. The opening of two trailheads and their associated trails greatly increased both the maintenance needs and the Preserve's visitation. Because of this, the Board of Directors created a plan to hire a Managing Director to grow the organization's capacity while freeing Carla to concentrate entirely on advocacy.

In early 2006, the Board hired Ruthie Carll as the Managing Director based on her extensive experience in non-profit programming and volunteerism, as well as her background as an ecologist. Thanks to the generosity of the Pederson Group Inc., MSC also opened its first office in the Scottsdale Promenade Corporate Complex. Also during 2006, 180 volunteers with the McDowell Sonoran Conservancy gave 18,158 hours of their time to protect and enhance Scottsdale's McDowell Sonoran Preserve. That contribution, valued at \$327,752, represented a 59% increase from the previous year. That same year, the *Mountain Lines* was redesigned, becoming a full color 16-page publication that now reaches more than 3,000 people per issue.

MSC experienced gains and losses in 2007. In September 2007, Lost Dog Wash Trailhead was awarded the top Honor Award by the American Institute of Architects, Western Mountain Region for its sustainable design and sensitivity to the desert habitat within the McDowell Sonoran Preserve. MSC's personnel growth continued as 85 new Stewards graduated from training, and additional staff members joined the organization to manage community development, support office operations and coordinate the expanded volunteer program. And in December 2007, a donation of a 10.02 acre parcel of land by a long-time MSC donor expanded the Preserve boundary by 5 acres.

Sadly, Carla resigned as Executive Director in early 2007. She remains involved in Preserve efforts as a Commissioner

on the McDowell Sonoran Preserve Commission. Her leadership during the middle years of the organization's formation will never be diminished... Her name is synonymous with preservation in Scottsdale.

The next issue of the *Mountain Lines* will feature the final segment of this 4-part series: The Future of MSC. The previous segments can be downloaded from our website at www.mcdowellsonoran.org



The Power of Flowers

By Ruthie Carll, MSC Executive Director

Photographs by Howard Myers, MSC Board of Directors

Last year, while I was leading a hike about wildflowers, one of the participants said “I think it is a miracle that nature created these beautiful flowers for us to enjoy.” This assumption of nature’s altruism didn’t bother me. As a scientist, though, I believe the true miracle is not the beauty of the flowers, but the complex, purposeful, and even somewhat mercenary business they are perfectly designed to conduct.

In order to reveal the business of flowers, it is first necessary to understand the purpose of flowers. Many people oversimplify the role of the flower to that of reproduction. Plants, however, can reproduce by many means including rooting stems (like cholla), sprouting from runners (like Bermuda grass), and producing pups (like agave). All of these forms of reproduction produce clones. While clones can be successful, having genetically different offspring increases the chances that at least one will survive when faced with adversity. Unique offspring are produced by combining a sperm and an egg, or fertilization. Herein lies the purpose of flowers; to exchange genes, thereby producing a genetically unique seed.

Plants have an interesting challenge delivering the pollen (sperm) to the egg (ova) - plants can’t move. Imagine two ancient saguaros standing as little as two feet apart yet they are unable to reproduce without help. To overcome this challenge, some plants release huge quantities of pollen to the wind and hope it lands perfectly on the ova of a distant female of the same species. In Vegas this is considered a long-shot! It works if there are significant numbers of individual plants of the same species in the area, yet plants are sparse in deserts. Jojoba and bursage are examples of two desert plants that effectively use wind distribution for pollination. Because these wind-pollinated plants don’t need to attract the wind’s attention, they have no need for colorful, fragrant, or nectar-filled flowers. They bear small, green, insignificant blossoms.

The other way to move pollen from plant to plant across a distance is to ‘hire’ a courier. This is when flowers get down to business. They have evolved highly effective ways to call the courier, give it the pollen, and compensate the courier for the service of carrying the pollen. What are nature’s couriers called? Pollinators.

Not all pollinators are created equal. Ideal couriers are able to travel extensively, have the ability to carry pollen, and have a great need for nectar. Bees, butterflies, moths, and hummingbirds

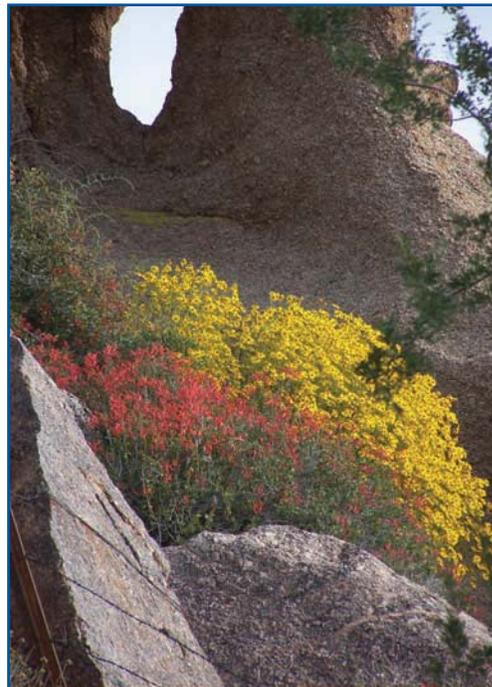
are our local pollination superstars. They each can cover a lot of ground, have hair or hair-like feathers to carry pollen, and, due to the amount of time they spend flying, have huge energy needs.

Calling the Courier

The first step in pollination is to attract the attention of the pollinator. This is done visually with color or through smell. Bees can only see yellow, blue, purple, and ultra-violet. Hummingbirds see all colors but for reasons scientists don’t know, have a preference for red. Butterflies and moths see all colors. Bees, butterflies, and moths also have a sense of smell while hummingbirds do not.

Having Courier Parking Available

Bees, butterflies and most moths need to land in order to pick up pollen. They all appreciate easy parking! Flowers provide landing platforms in different ways. For instance, brittlebush has a large, flat, up-facing flower; buckwheat clumps tiny flowers together; and sage provides a landing pad petal. While hummingbirds don’t need to park, they do need room for hovering, so they choose flowers with the opening to the side or bottom.



Bees can see yellow but not red making this brittlebush an easy target.



Penstemon flowers are perfectly arranged for hummingbirds, while a bee would find this flower arrangement awkward.

Directing the Courier to Its' Destination

Almost all flowers have markings that show the pollinator where to go. These are called nectar guides. By directing the pollinator to its goal, the nectar, the flower knows where the pollinator will be and can position the pollen-producing structure to stroke the pollinator, expertly delivering the pollen to the courier.



The pink stripes on these buckwheat clusters point to the center of the flower.

The yellow center of these blackfoot daisies acts as a bullseye.

Compensation for the Delivery

It may seem odd to pay for the delivery up front, as the flower does by providing nectar to the pollinator. The purpose is to convince the pollinator that “This is a great place to visit”. If the pollinator finds a flower easy to access and rich in nectar, it will likely visit the same type of flower again, and in the process, deliver the pollen.

This all sounds quite strategic and you might think that the story stops here. *Well, there's more.* Flowers have evolved ways to increase their odds of success, through more active communication or by trickery.

Providing Help

A pollinator that understands by sight if a flower has already been pollinated is able to visit more flowers than if it has to physically investigate each flower. Therefore, many flowers have “open” and “closed” signs to help pollinators to be more efficient. Look at the lupine in the picture to the right. Notice that some flowers have white on the top petal, while others have red. Bees, the pollinators for lupine, see the white but not the red and therefore see only the flowers that need pollination. Palo verde, deer vetch, and many other plants use this adaptation to encourage efficient pollination.



Photo by Ruthie Carll

Using Trickery

Usually, pollination is mutually beneficial to both the flower and the pollinator. However, in some cases, the pollinator is fooled into copulation during which time the flower transfers the pollen. This wasp is attempting to copulate with a lady's slipper flower in the picture above.

Another use of trickery is to take physical action. Cholla flowers, for example, have a rapid response to the arrival of a bee. The pollen bearing anthers will close around the bee, and as the bee climbs free of the anthers it is covered with pollen.



open



closed

The first cholla blossom has anthers that are open while the second's anthers have closed.

I hope this article inspires you to not only enjoy the beauty of our desert flowers this spring, but also spend some time thinking about how they are nature's great business strategists. Enjoy!

exercise physiology: *Hike to Taliesin Overlook*

By Nancy Howe, M.S., Director of Operations, Cancer Workout Center Inc and MSC Steward

Every MSC guided hike offers information about the Preserve. Some of them are “theme hikes”, providing education about specific topics. The exercise physiology hike has a bit of a twist. Instead of discussing plants, animals, or geology, hikers learn about what happens in your body when you hike.

This hike is about 4.5 miles long, and we stop 3 times for brief talks. At the first stop, after hiking about 20 minutes, we answer the question, “What happens in the body that improves our health?”

WHAT MAKES HIKING HEALTHY?

We all say that hiking is part of a healthier lifestyle, but what about hiking makes us healthier? Many people who know that exercise is good for them don't know WHY it is good for them. They assume that the big benefit of exercise is weight loss. No weight loss, no benefits. But in fact, the most significant health improvements that exercise brings about are mostly invisible and unassociated with weight loss. So how does hiking help you?



Your body experiences an exercise like hiking as a stress. As your leg muscles walk and climb, your circulatory system must deliver the raw materials to fuel that effort. As an activity that lasts longer than 3 minutes, hiking requires oxygen to metabolize glucose. The metabolic activities occur in the cell's mitochondria, which manufacture the muscles fuel substrate, ATP (adenosine-5 triphosphate). The muscle cells transform the ATP into contractions, which is what walking is: muscle contractions. It turns out that the body is relatively inefficient at converting energy into work. About 20 to 30 percent of the energy produced helps us move our legs and 70 to 80 percent of the energy produced is released as heat.

So what are the adaptations a body develops while hiking? One adaptation happens in our circulatory system. When we contract our leg muscles rhythmically, and with power, the muscles increase the frequency and intensity of the venous blood flow. This more powerful surge of returning blood literally stretches the heart muscle. The greater the stretch, the greater the force of the heart's next contraction, injecting more arterial blood into circulation. This surge becomes the increased stroke volume that is the primary benefit of aerobic training. Increased stroke volume is the reason why a trained athlete has a lowered heart rate - a greater volume means fewer beats are needed to deliver a given amount of blood.

A second adaptation happens in our muscle cells. When hiking, muscles demand more oxygen, which is delivered by generating

new capillary networks to service the muscle fibers. More capillaries enable greater blood access to a larger number of cells. Within the cells, the size and number of mitochondria increase in response to increased oxygen levels and demands for power. In this way, hiking increases the density of capillary networks and mitochondria.

What about when we combine hiking with trail-building and we use quick bursts of strength to dig up boulders, shovel dirt, or jump over rocks on a fast downhill stretch. Does our improved health from our long hikes help us with these anaerobic tasks? The answer is, “Not really.” Since the advantages of aerobic training like hiking are related to oxygen use, the training benefits don't leverage well to anaerobic bursts of effort. So, what healthful adaptations occur with anaerobic training?

Surprisingly to many, the body's initial adaptation from anaerobic activity happens in the brain. This first adaptation is often called “muscle memory.” Muscle memory refers to the brain's increased efficiency recruiting and firing muscle fibers synchronously. The greater the firing efficiency, the greater the power output. The benefits of “muscle memory” explain why a novice who begins weight-training experiences significant increases in strength immediately, before seeing any measurable increases in muscle size. As a person continues to perform anaerobic activities, the demands for power increase past the point where fiber recruitment and synchronous firing suffice. At this point, muscle protein production starts to increase and the new protein molecules are laid down on top of existing muscle fibers. Thicker muscle fibers translate into bigger muscles, which then translate into greater strength. That is, anaerobic training thickens existing muscle fibers; it does not increase the number of fibers in the body. This is why genetics make such a difference: people born with a greater number of fibers have a greater capacity for muscle growth.

THE IMPORTANCE OF WATER IN TEMPERATURE REGULATION (Cold weather hiking)

So now we know why hiking helps our physiological systems become stronger and more efficient. But problems can occur in our systems when we hike. One significant problem that can occur on a hike can happen in both cold weather and in hot weather. Can you guess what it is? Dehydration.

To understand why heat exhaustion is such a big safety concern in hot weather, let's take a step back and start with a quick review of the body's physiology, and how the body regulates temperature.

We know that the human body is an inefficient user of fuel: 70 to 80 percent of the energy produced in the body dissipates as heat. The body employs two primary mechanisms to rid itself of excess heat and keep the body core at a constant 98 F degrees (or 37 C). The



most important mechanism is evaporation, through sweating and also through breathing. The second mechanism is really a combination of different methods that result in heat loss by direct cooling. One example of this happens when heat moves from inside the muscle to the blood, where it flows toward the body core. At the body core, the heat triggers reflexes that dilate blood vessels and shunt the heated blood toward the skin, where it comes into contact with the outside environment (air or even water) and is cooled.

So why is adequate water so important in cold weather?

The primary method of protecting body temperature in cold weather is to stop the loss of heat as a result of direct contact with the environment. The best way to do this is with clothing chosen to insulate, which means wearing multiple layers of thin clothing. Because warm air rises, you want to consider a turtleneck to prevent the “chimney effect” of losing warmth out your shirt collar. If you are an arm-pumper when you hike, you want to avoid baggy clothing where the “bellows-effect” might push warm air out from under loose clothes. You want to include a hat since 30 to 40 percent of body heat is lost through the head. You want to avoid non-wicking fabrics close to your skin (like cotton) since wet clothing loses its insulating properties.

Drinking water in cold weather is important because you need to replace water lost through sweat. Also air in the Phoenix winter is very dry, and this dry air has to be warmed and humidified as it is inhaled and enters the bronchial passages. This warming and humidifying results in additional dehydration. Wearing a scarf or mask over the nose or mouth can trap heat and water vapor, which will help with both the warming and humidifying the next breath, making the process more efficient, and lowering the volume of water loss.

These are the mechanisms, but in general, dehydration isn't an issue in the cold since moderate levels of activity produce heat that is used to maintain a constant body temperature around 98 F / 37 C. Dissipating large amounts of muscle-generated heat in cold weather is rarely a problem. However, in the hot weather, all of these requirements for water combine to produce a situation in which dehydration can become a problem very quickly.

THE IMPORTANCE OF WATER IN TEMPERATURE REGULATION (Hot weather hiking)

As stated, heat is moved from the muscle through the blood stream to the body core, where body reflexes trigger the movement of heat from the core to the skin. Heat moves from the skin to the environment, primarily through evaporation and radiation. Evaporation is more efficient when there is a significant difference

between the temperature of the skin and the temperature of the air, and when humidity rates are lower.

Problems in the human cooling system occur when the outside temperature is higher than the body's, roughly 100 F and higher. When the air is this hot, the volume of water lost to sweating increases, which thickens the blood. This reduces the volume of blood, and a competition develops between the muscles which need blood to supply oxygen, and the skin which needs blood to bring heat to the skin surface for dissipation. When this competition begins, the skin always loses to the muscle, reducing the body's ability to dissipate heat.

Other conditions that can lead to problems reducing body temperature include direct sun, low wind, lack of acclimatization, lack of fitness, reduced ability to sweat (from certain diseases, as well as individual differences), and age (especially the first year of life). As core temperature rises, heat-related illnesses start to develop. Symptoms of heat exhaustion include headache, weakness, dizziness, muscle cramps, and nausea. The best treatment for heat exhaustion is fluid replacement and body cooling through external means (shade, cool water on the skin).

The best prevention of heat exhaustion is drinking enough water before and during the activity.

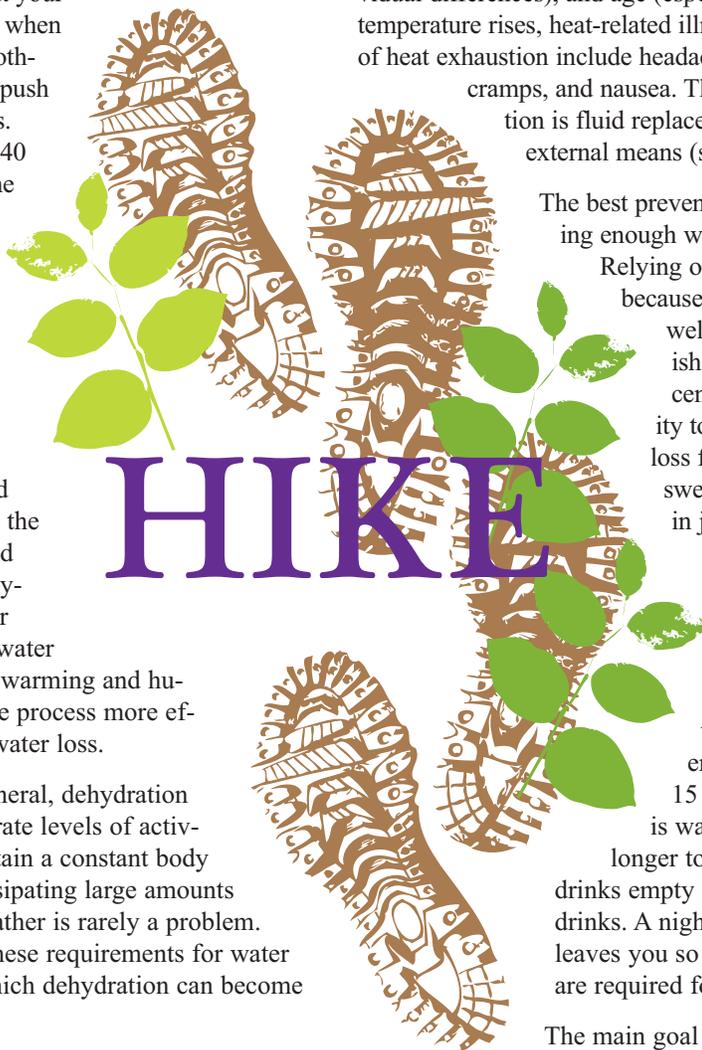
Relying on thirst will always be misleading, because by the time you are thirsty you are well beyond the threshold for diminished capacity. It takes only a 2 percent loss of body weight during activity to inhibit performance. A 2 percent loss for a 150 lb hiker is equivalent to sweating the amount of fluid contained in just 2 water bottles.

Guidelines for hydration include drinking lots of water the day before an event, and then, drinking an additional water bottle about 2 hours before the effort. During the event, hikers should strive to sip water every 15 minutes. The best fluid to drink is water. A flavored sweet drink takes longer to empty from the stomach. Cool drinks empty faster than either ice-cold or warm drinks. A night of drinking beers with friends leaves you so dehydrated that almost 48 hours are required for rehydration

The main goal of all group hikes is to help hikers enjoy themselves in the Preserve and be confident and safe, whether you hike MSC trails with a group or by yourself. Please come join us!

MSC Stewards Reidun Daeffler and Nancy Howe offered the first Exercise Physiology themed hike in January 2009.

MSC offers guided hikes every Saturday and Sunday, October through May. For a list of upcoming hikes, visit our website at www.mcdowellsonoran.org



Focus on Conservation

Photography Contest
2009



Category: Geology
Division: Advanced (R. Buchbinder)

Get into the Preserve this April
and take your best shot for conservation.



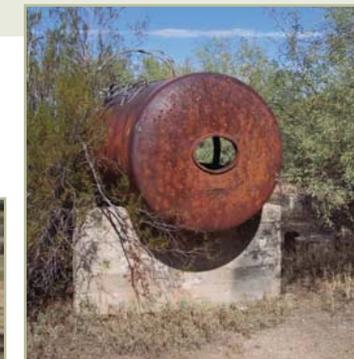
Category: Plants or Animals
Division: Advanced (B. White)

Participating in MSC's annual *Focus on Conservation* photography contest is one way you can help us achieve our mission. Through your photographs, we bring the Preserve into the community as a traveling exhibit, through our website, and in a printed exhibit catalog. For some, this may be their introduction to the Preserve, sparking their interest in hiking, mountain biking, or volunteering. For others, it may be an accessible way for them to experience the beauty of this living treasure.

This year's judges will consider both technical merit and the illustration of the rich biodiversity and unique nature of the Preserve. The three top images will be recognized with a monetary prize (grand prize: \$500, second place: \$250, and third place: \$100.) We will also recognize three division winners (advanced, amateur, and youth) for each topic category. This year's topics are plants or animals, geology, human impacts, and recreation.

Entry Guidelines*

- Photographs must be taken in the Preserve, and during the month of April, 2009.
- Submissions must be titled, be between 8x10" and 9x12", and include both a borderless print image and a digital copy at 200 dpi.
- Submissions will not be returned.
- Photographs with date stamps or those that are mounted or matted will not be considered.
- MSC reserves the right to use all photos, with photo credit, for any purpose. Photographer retains copyright.
- Proceeds from the sale of print items associated with the contest will solely benefit of MSC.



Category: Human Impacts
Division: Amateur (J. Woelke)

Category: Recreation
Division: Advanced (M. Jensen)

* Expanded guideline and contest information can be found on MSC's website: www.mcdowellsonoran.org

McDowell Sonoran Conservancy 2009 Focus on Conservation Entry Form

Please complete and sign this entry form and attach a copy to each submission.

Please deliver your submission to the MSC office no later than 5 p.m. on May 15, 2009. We recommend that you deliver rather than mail your entry if at all possible. If you mail your entry, please package it appropriately. Damaged entries will not be considered.

Name

Phone

Email

Address

Indicate the category for your entry (select only one)

- Plants and/or Animals Geology
 Human Impacts/Evidence Recreation

Indicate a division for your entry (select only one)

- Youth (under 18) Amateur Advanced

I have read the entry guidelines and hereby attest that my entry meets the criteria and I agree to contest guidelines.

Sign and Date

Gateway Access Area Grand Opening *Celebration*

Please join us for the public Grand Opening Celebration for the Gateway Access Area on Saturday, May 2, 2009 starting at 8:00 a.m. The Gateway is located east of Thompson Peak Parkway, one-half mile north of Bell Road.

Grand Opening Celebration events will include a dedication by Scottsdale Mayor Jim Lane, refreshments, talks by MSC Stewards in the 60-seat Gateway Amphitheater, hikes on trails in the area, and special guest appearances. Pete Chasar, first chair of the MSC Board and accomplished artist, will be a featured guest. He will be signing limited edition posters of his work, "The Gateway", an oil painting of the McDowell Mountains as seen from the Gateway Access Area.

In June 2008, construction began on the Gateway Access Area, the largest and most significant entry point to the Preserve. The facility will have 200 parking spaces, restrooms, a dog comfort station, water

fountains, and an equestrian staging area with 16 trailer parking spaces, water troughs, hitching rails, and a shade ramada.

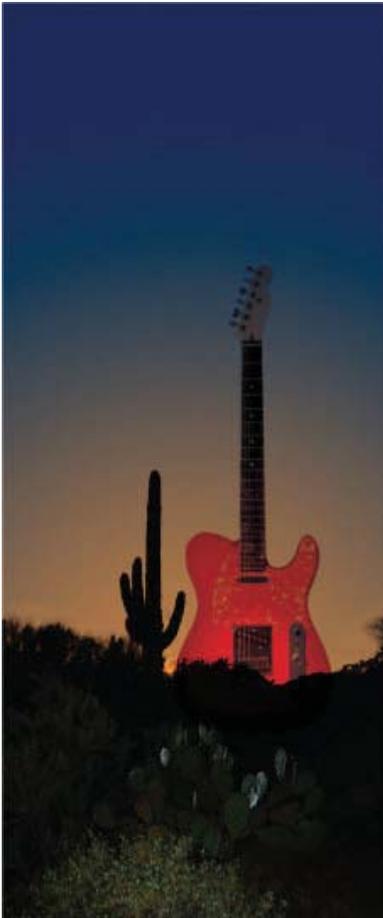
The Gateway is designed to have minimal impact on the fragile desert environment. Green building elements incorporated in the facility include solar power generation, rainwater harvesting, solar water heating, rammed earth walls constructed of native soil from on-site excavation, structural steel made of high recycled content, highly efficient mechanical equipment, and parking lot and path surfaces made of stabilized decomposed granite.

Tours of the area, with architect Phil Weddle on hand highlighting these LEED project details, will be offered during the Grand Opening Celebration. All activities are free and open to the public. For more information, please visit our website.

McDowell Sonoran Jazz Fest

Saturday, March 14th, 2009 4 p.m.-8 p.m.

at the Promenade Courtyard, 16435 North Scottsdale Road



The inaugural McDowell Sonoran Jazz Festival brings together the music that moves mountains and the mountains that have moved Scottsdale.

Enjoy great jazz in an outdoor setting in the shadow of the McDowell Mountains-- all for a great cause. Proceeds benefit the McDowell Sonoran Conservancy, and will be used to support our efforts in the completion and sustainability of the McDowell Sonoran Preserve for the benefit of this and future generations.

The jazz music will be as spectacular as the mountainous backdrop, as the event is being orchestrated by Don Z. Miller who has produced the Paradise Valley Jazz Party in the Valley for the past 32 years, and features top acts from Arizona and California.

Non-stop music from 4 p.m. to 8 p.m. Performances by . . .

Bruce Forman and Cowboy Bop: A perfect match . . . the McDowell Sonoran Conservancy and another piece of the golden west, the jazz/cowboy music of Cowboy Bop!

Raul Yanez and "Zona Libre" . . . Latin jazz quartet

Mike Kocour Jazz Trio: International jazz performer and the Director of Jazz Studies at Arizona State University

Beth Lederman Jazz Quintet . . . One of the Valley of the Sun's favorite pianists and her swinging straight ahead jazz quintet

Guests will spend a lovely afternoon sitting under a beautiful spring sky. A picnic dinner will be served, and a cash bar with wine and beer will also be available.

Tickets are available for \$45 per person and can be ordered online at www.mcdowellsonoran.org or by calling Linda Raish at 480-998-7971 x101.

Family Fun Page

MSC youth education programming is supported by 

Building Words

Sometimes, you can figure out what a word means by breaking it into its parts.

For example, hummingbirds, bees, and butterflies are **pollinators** - but what does **pollinator** mean?

If you break it down, you get **pollin** (spelled pollen when alone) and **ator**. Pollen is the powdery stuff inside flowers and 'ator' usually means "someone who does something" (You know - like the **Terminator** terminates things!) So a **pollinator** (**pollen** + **ator**) is something that moves pollen from flower to flower.

See how many words you can create using the letters in the word:

pollinator

How did you do?

15 words = Desert Tortoise

20 words = Coyote

25 words = Jackrabbit

30 words or more = Great Horned Owl



ASK ANGIE

GO AHEAD -
ASK ME...



Dear Angie, I'm afraid of bees. What should I do when I'm hiking and I see a swarm of bees? - Ethan

Hi Ethan,

Bees have gotten a bad rap. They aren't mean and they don't want to sting you. Usually when someone is stung, it's because they scared the bee. The best thing to do if a bee comes near you is to

be still. Don't flap your arms or swat at it or it may become frightened. Then it may sting you in self defense.

The same thing goes for a bee swarm. In spring, a large colony of bees may split in two, half staying in their current home and half going in search of a new home. When you see a big cloud of bees flying by, the bees are concentrating on finding a new home and not on you. You should be still and let them go by undisturbed. At night, they will land and form a ball around the queen. They are just resting and should still be left alone.

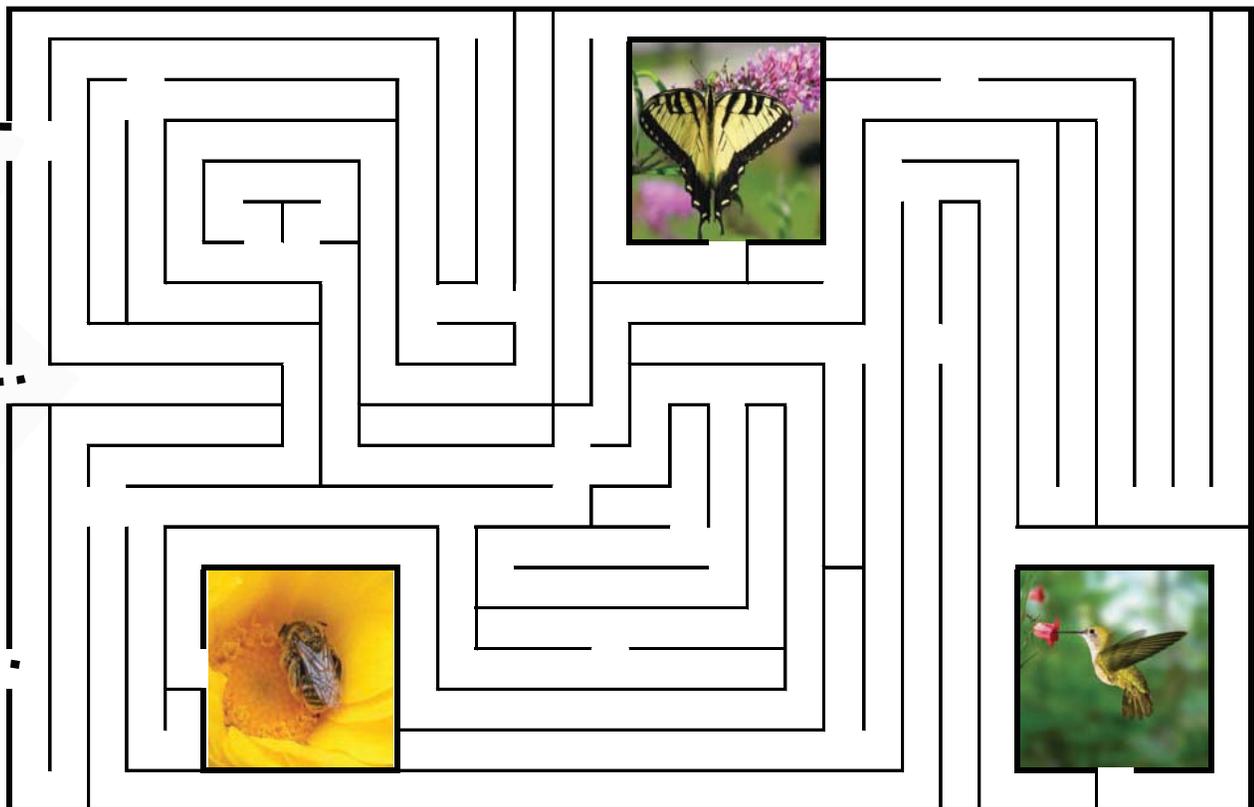
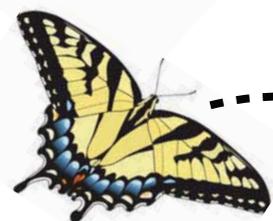
The Matchmaking Game Hummingbirds, butterflies, and bees visit flowers to collect pollen and nectar. They don't visit just any old flower though. They each need to find their flower match!

Hummingbirds hover in front of flowers and use their long tongues to reach in and get pollen and nectar. They need flowers that have space around them for hovering and with an opening pointed to the side. Even though hummingbirds can see all colors, for some reason, they prefer red.

Bees are not agile flyers and so they need to land in order to collect nectar and pollen from flowers. Broad, flat flowers with lots of landing space are best. Since bees mostly see only yellow, a flat yellow flower is the perfect match!

Butterflies can see all colors and they seem to like them all! Because their big wings will catch the slightest breeze and might blow them off their flower, butterflies like clumps of small flowers with lots of places for them to hold on.

Can you help these pollinators find their flower?



Liz Slauson

Professor of Botany
Scottsdale Community College



Liz Slauson holds a M.S. in Horticulture and a Ph.D. in Botany from Arizona State University. She began her plant career in 1988 as an intern at the Desert Botanical Garden caring for the Australian plant collection. She was a staff member at the Desert Botanical Garden for 15 years serving as the Director of the Center for Plant Conservation Program, Curator of Collections and the Director of Research. She currently is a Professor of Botany at Scottsdale Community College. She has conducted extensive field work in Arizona, New Mexico, Texas, and Baja California. Her research has focused on rare and endangered plants, and the distribution, pollination biology, ethnobotany, and evolution of agaves. Recently, her research has focused on the effects of fire on survival and reproductive biology of agaves, and the flora along the Arizona Trail. She has served on the Texas Rare Plant Recovery Team, as a board member of the Arizona Native Plant Society, and is currently a Scientific Advisory Board member for the Malapai Borderlands Group.

What is your research focus and why are you passionate about this field of study?

“The area of research I am most interested in is agaves, particularly their ecology and evolution. Much of my work has focused on rare agaves, their pollination biology and the effects of fire on agaves. I am very interested in agaves, not only because I find them to be interesting and beautiful plants, but because they are often keystone species in many of the ecosystems they inhabit, providing food, shelter, or some other benefit to many other organisms during some part of their lifecycle. Thus, the understanding of agaves and their conservation is of great importance in preserving healthy and functioning natural areas.”

When did you first become interested in science and nature?

“I have been interested in nature since I was a small child, preferring to spend most of my free time playing in and investigating the hardwood forests, fields, and lakes of northern Indiana and southern Michigan. My grandmother was probably responsible for spurring my love of plants-I loved to spend time with her as she taught me about the plants in her vegetable and flower gardens. As far as science, my first career was actually in nursing. But I was always interested in and curious about plants, and I eventually went back to school to study botany and horticulture, my first passion.”

From your point of view, why is the McDowell Sonoran Preserve important?

“As a child, I was lucky in that I could walk out my door to enjoy and learn about nature, but that is not the case for many people who live in the Phoenix area today. The McDowell Sonoran Preserve, and really all preserves, are important because they give all people the ability to actually experience natural habitats and learn about them. The more opportunities people have to spend time and learn about the desert (or any natural habitat), the more they begin to

value natural habitats and their conservation. There is nothing like seeing the desert in bloom or observing an animal in the wild that helps fuel an appreciation and desire to preserve native habitats. I also feel that as people see native plants and the animals they support in natural environments, the more they want to grow these beautiful plants and encourage native wildlife in their own yards.”

There is a concern that human factors are negatively impacting the environment so pervasively that even the smallest creatures, like bees, are in danger. How is your work addressing this concern?

“My work and the work of several other agave scientists has shown that bees are certainly important pollinators of many agave species, and obviously the decline and collapse of bee populations would impact reproduction of some agave species, and thus, all the other species that depend upon those agaves. So here we have an example of how the loss of one species can have a very detrimental effect on other species. Of course, the loss of bees won't just affect agaves. Bees are important pollinators of many crop plants that feed humans!”

How do you think local residents-both kids and adults-can make a difference in saving the natural environment or, specifically, the Sonoran Desert?

“I think education is the key. Educate yourself and your children about the natural world. If you show your kids you value natural areas, they will emulate that value. We should promote and involve kids and adults in programs that expose them to and educate them about plants, animals and their conservation. Get out and hike or go to a preserve (like the McDowell Sonoran Preserve), a botanical garden, a zoo. Start a garden with your kids or involve them in planting native plants in your landscape-then watch the animals that come to use those plants. Perhaps get involved in an environmental project with your kids. Teach your kids to respect natural areas and to “leave no trace.” Support the preservation of natural areas with your vote or your money! Be as green as you can be and involve your kids in helping to reduce your family's carbon footprint. And prevent “plant blindness”-the inability to recognize or see the importance of plants! Teach your kids to look at plants for both their beauty and neat adaptations. Remind them of all the products we derive from plants from medicines to fuels to clothing to the antioxidants in fruits and vegetables. Remember plants produce the oxygen we breathe, are great carbon sinks (they absorb CO₂), and are the basis of the food chain. The more we educate our kids and ourselves about plants and the natural environment, it becomes a ‘no-brainer’ to want to preserve them.”

Marty Gromulat, Program Manager



MSC is very excited to announce the hiring of its newest employee, Martin Gromulat. As Program Manager, Marty's responsibilities will include overseeing the volunteer program, leading education and advocacy programming, and managing land protection for the Conservancy.

A native New Yorker, Marty recently moved to Phoenix. After practicing law in New York for several years, he refocused his career on conservation. His conservation work experience includes acting as Legal Coordinator for the Pennsylvania Land Trust Association, and most recently, as Senior Policy Advisor for Pennsylvania's Department of Conservation and Natural Resources.

Already a volunteer with MSC, Marty is looking forward to working with MSC on a full-time basis. When asked about his future with MSC, Marty said "This is a wonderful opportunity, and I am very fortunate to be working with one of the pioneer conservancies in the country". "MSC developed the model for preserving large natural open space within an urban environment through its public/private partnership with the city of Scottsdale. I think that my experience and expertise in land conservation will be a benefit to the Conservancy as it prepares for the future, and I know that I will learn a great deal from the expert staff and volunteers who made MSC the model land conservancy that it is."

In addition to his work at MSC, Marty said he is also looking forward to exploring the McDowell Sonoran Preserve, by mountain bike and by foot with his girlfriend Sue and their two trusty Rhodesian Ridgebacks, Rudy and Maizey -on leash of course!

Contact Marty via email at Marty@mcdowellsonoran.org or by phone at 480-998-7971 x 105.

"We cannot win this battle to save species and environments without forging an emotional bond between ourselves and nature as well – for we will not fight to save what we do not love."

~ Stephen Jay Gould, American Paleontologist, Evolutionary Biologist, and Historian of Science.

WHY WE CARE...

by Tracey Epel & June Kleier, MSC Stewards and Owners of Take A Hike Arizona, LLC



June and I started out as neighbors and through a shared interest in the desert, we quickly became good friends. We are, like many, transplants from another region of the country. We did not grow up in a desert. Our hometown landscape was made up of oceans, lakes and mountains. So, moving to the desert was quite a change for us, our husbands and children. There was something about this desert, though, that immediately spoke to each of us. I remember the first time watching the sun set over the McDowell's. I immediately went home and wrote my grandmother a letter about "purple mountains majesty" and how I now knew what that meant. That was my first memory of the McDowell's.

Since then, June and I have hiked extensively in the McDowell's. Our frequent jaunts, with many challenging hikes thrown in, quickly created the strong friendship we enjoy. The mountains

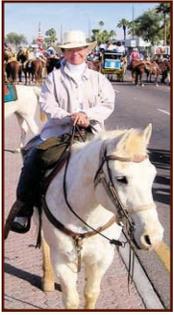
lent themselves to in-depth conversations about our life's purpose and our mutual admiration of, and respect for, the Sonoran Desert. The more we hiked throughout the McDowell's, the more we became concerned about protecting and preserving this pristine environment. As hiking enthusiasts, we encountered many visitors on the trails who did not understand how their actions impacted the ecosystem. We found many people off trail, with minimal water, and in the process of removing cactus or some other items from the Preserve. We decided to become more active in protecting our desert and the people visiting it. We became MSC Stewards, and created a guided hiking company that would promote preservation, conservation and education to our guests.

We especially enjoy the family hikes we do with our guests. These trips into the desert give us the opportunity to start educating youth about the importance of this beautiful area, and what they can do to ensure it is here for many generations to come. We always talk about MSC and the great benefit we all derive from this fantastic organization. We are always trying to recruit new stewards because we love our McDowell Mountains!

Of all the places that we have hiked in the world, there is something about the McDowell's that speaks to the inner self and just makes you want to do the right thing - which to us, is helping to protect and preserve it for years to come.

Equestrian Patrol Unit

By Sue Livingston, MSC Board Member and Equestrian Patrol Chair



It's been a long road, but finally the time is right. MSC is forming an equestrian unit to join the Hike and Bike Stewards who patrol the Preserve. So far, we have 12 trained MSC Stewards in the equestrian patrol. These trained Stewards patrol on horseback, covering more terrain in less time. One advantage of patrolling on horseback is the capability of carrying more emergency equipment. All horses will tote a basic complement of items, including a first aid kit and a minimum of 4 extra bottles of water. Riding horseback through the Preserve allows

us to go longer distances, and have the ability to cross terrain not as easily traversed by foot or bike.

The MSC Equestrian Patrol reflects Scottsdale's heritage, and provides a direct link with horse owners and ranchers that live around the Preserve. For centuries, Arizona residents have understood the benefit of riding horseback through our Sonoran desert and mountain terrain.

Our first group ride took place on December 19, 2008. Five Equestrian Stewards met at the Alma School entrance to Brown's Ranch. After unloading the horses from their trailers and tacking up, we took off on our inaugural ride. The main purpose behind this first group ride was to evaluate the suitability of the horses and skills of the riders, as well as to familiarize ourselves with the trails. We rode through Brown's Ranch and returned via the power line trail. It was a successful two-hour ride. The horses all behaved well, and the riders got to know each other better. We plan to continue these rides from the different trailheads around the Preserve. As the group grows and becomes more familiar with all of the trails, we will begin to patrol with more structured coverage of the Preserve.

The Equestrian Patrol is funded by generous support from the Drinkwater family and the Scottsdale Charros. For more information, or to join this team, please contact the MSC offices at (480) 998-7971.

The good we secure for ourselves is precarious and uncertain until it is secured for all of us and incorporated into our common life.

—Jane Addams

Wildflowers!...continued from cover

The second thing we know is that we had good soaking rains this year, very much like what happened prior to spring 2008. That's a good sign for at least a decent bloom since there are a lot of wildflower seeds in the upper soil layer from last year and from the great spring 2005 bloom.

No matter how great or poor the bloom turns out to be, MSC once again will provide detailed information to the public about what's blooming where in the Preserve. Last year we mounted our most extensive effort to date, getting wildflower reports from many patrolling Stewards that we identified (thanks to botanists Steve Jones, Wendy Hodgson, Kathy Rice, and Ruthie Carl) and augmented with pictures (thanks to Ruthie Carl and steward/photographer extraordinaire Marianne Jensen). The resulting list of wildflowers with pictures and locations were posted on the MSC website throughout the spring, with several notable organizations like Arizona Game & Fish and the Scottsdale Convention and Visitors Bureau putting links on their websites to our wildflower postings.



Photo: Marianne Jensen

For this spring, we're going to introduce a more convenient format that builds on all the work of last year. It will list wildflowers and other flowering plants by bloom color, show in a matrix where they're blooming (trailheads and trails), and have links to access color photographs and other information about each plant. As before, we plan to update the matrix weekly based on reports from the field.

See something interesting? Let us know! Email us at wildflowers@mcdowellsonoran.org telling us what you saw and where, and then watch the MSC website for identification of the wildflower.

MSC Steward Challenge

McDowell Sonoran Conservancy volunteers are trained to become Preserve Stewards. Learning basic information about the history and rules of the Preserve, the Preserve trail system, the MSC mission, our relationship with the city of Scottsdale, as well as information on desert flora and fauna, geology and cultural history of the area, ensures MSC Stewards are well prepared for the responsibilities they choose in their volunteer work.

For the first time, summer training was added this year to respond to increased interest. Since July 2008, we have trained three new classes of Stewards, adding an additional 68 volunteers to our workforce. This brings the total number of active, trained Stewards to more than 320 volunteers.

MSC Stewards contributed more than 25,000 hours of service in the 2007/2008 fiscal year, and based on service hours reported to date we anticipate even greater numbers this fiscal year. This contribution saves the city of Scottsdale significant payroll expense, allowing precious tax dollars to be spent on other city services.

In addition to the time they gave, more than 61% of all MSC Stewards and 100% of Steward leadership, staff and the MSC Board of Directors, made a financial contribution this year to become a part of our Circle of Friends. Gifts we have received since 2000 from Stewards total more than \$430,000, evidence

that our Stewards provide a considerable amount of financial support, as well as their time. Master Steward Tom Karn, Class 2, is leading the Steward annual giving campaign--the Steward Challenge. "If those closest to the organization, who know the organization the best support it," he explains, "this helps provide the evidence to encourage contributions from other individual donors and corporations."

Thanks to annual contributions from Stewards-- a very clear message in support of the full range of MSC programs that educate the public on the importance of land preservation--we are able to continue our programs even in this tough economic environment.

Join us! To register for an upcoming volunteer training, please go online and complete a volunteer application at www.mcdowellsonoran.org/get_involved.html

No time to volunteer? Consider supporting MSC Stewards through a financial contribution. Use the form below to support volunteer training and continuing education, MSC patrol and pathfinder programs, and Preserve stewardship.

Nobody made a greater mistake than he who did nothing because he could do only a little.

—Edmond Burke

Become A Friend of McDowell Sonoran Conservancy

As a community member who values the outdoors, and specifically the Sonoran Desert, you understand the importance of preserving and maintaining open space now to ensure its availability in the future. This shared appreciation of the desert is why we are inviting you to join us today... either through our website at www.mcdowellsonoran.org or by returning this membership form.

MSC
16435 N. Scottsdale Rd., Suite 110
Scottsdale, AZ 85254

| | |
|---------|--|
| Name | |
| Phone | |
| Email | |
| Address | |
| | |
| | |

Please accept my gift of:

- \$1,500
 \$1,000
 \$500
 \$250
 \$100
 \$50
 Other _____

- I have enclosed a check
 Please charge my credit card

Credit Card # _____

Exp. Date _____

Sign and Date _____

MSC Preservation Partner Profile



The Boeing Company

The Boeing Company, located locally in Mesa, recently provided generous funding to the McDowell Sonoran Conservancy in support of our conservation education programming, making an immediate positive impact on the organization. This support enabled MSC to enhance our youth hike program, offering field trip hikes with charter schools, youth groups and school districts, to get kids in the Preserve so they can experience nature first-hand. This and other education programs enable MSC to help create "nature leaders" needed for a healthy community and educate adults, families and youth about the importance of conservation.

"Boeing also supports organizations through their annual Community Service Days. We participate in various activities such as sorting donated supplies, assisting with events, and facility cleanup and improvements such as painting, washing windows and landscaping," states Mary Baldwin, Global Corporate Citizenship Manager. MSC is looking forward to working with a volunteer team of Boeing employees in the Gateway Access area in April, to help get the trails in great shape for the May opening.

Boeing is the world's leading aerospace company, and the largest manufacturer of commercial jetliners and military aircraft combined. Additionally, Boeing designs and manufactures rotorcraft, electronic and defense systems, missiles, satellites, launch vehicles and advanced information and communication systems. As a major service provider to NASA, Boeing operates the Space Shuttle and International Space Station. The company also provides numerous

military and commercial airline support services. Headquartered in Chicago, Boeing employs more than 160,000 people across the United States and in 70 countries.

In Mesa, Boeing employs about 4,500 people and is a global leader in development and production of military rotorcraft systems, including the AH-64D Apache Longbow helicopter, for the U.S. Army and a growing number of nations around the world. The site is also a major supplier of components and electrical assemblies for Boeing military and commercial aircraft.

Recognizing the interdependence between business and community, Boeing strives to excel in global corporate citizenship by partnering with nonprofit organizations like McDowell Sonoran Conservancy to promote environmental preservation. In 2007, the company granted approximately \$3.7 million to nonprofit organizations across the globe to support innovative environmental programs that protect vital natural assets, restore or improve critical habitats and train citizens to protect and preserve the environment.

These activities, and many others, that Boeing supports each year underscore the company's emphasis on environmental preservation and conservation through community involvement.

This great partnership with Boeing will help MSC ensure the McDowell Sonoran Preserve is a place to be enjoyed by this and all future generations. Thank you to Boeing and all of our Preservation Partners!

MSC Preservation Partner Profile

Environmental Fund for Arizona

The McDowell Sonoran Conservancy is a member agency of the Environmental Fund for Arizona (EFA), a coalition of Arizona's conservation and environmental non-profit groups. MSC receives thousands of dollars of support each year through EFA campaigns.

According to Solange Whitehead, EFA Executive Director, EFA serves as a bridge between the many citizens that care about Arizona and the agencies working on behalf of every Arizonan. She explains, "The coalition of environmental groups that are a part of EFA are tackling every conservation and environmental issue facing Arizona today including preserving our spectacular wild places, keeping our skies blue and our rivers flowing, reintroducing native crops that tolerate heat and arid climates, creating sensible energy policies, rehabilitating our wildlife when injured or orphaned, and connecting our children with nature through sponsored field trips, classroom presentations, and hands-on work programs".

More than ever before, the public is becoming aware of the environmental challenges we face as a society. Employers and employees are concerned about environmental causes and issues that affect them and their families, as well as the drain on natural resources that will impact future generations.

EFA is committed to making environmental support as easy as possible by giving working people the ability to donate through workplace payroll contribution campaigns. Founded by its member charities and led by Solange Whitehead, EFA is an opportunity for environmentally-conscious employees and employers to support environmental groups through a charitable giving

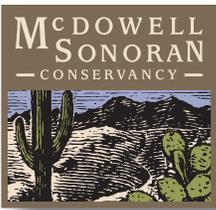
drive. EFA participates in campaigns at public and private sector workplaces. These include the Arizona State Employee Charitable Campaign (SECC), the Combined Federal Campaigns, the Maricopa County Community Colleges District, campaigns in the cities of Mesa, Scottsdale, Chandler and Tucson, and corporate campaigns at companies like American Express and Wells Fargo.

Introducing an environmental choice to a workplace giving campaign typically encourages employees who did not participate in the past to get involved. Employees have a choice in the giving campaign to make just one gift to EFA, and their support will be distributed among all the causes EFA represents, or donors can choose to direct their gift to one or more charities under the EFA umbrella-like MSC!

Nearly 80% of Americans favor companies with a pro-environment image, and almost 75% said they're more likely to support companies and products associated with an environmental group [Source: The Power of Two: Conservation and Corporate Environmental Responsibility, Roper Starch Worldwide/The Nature Conservancy]

If you are interested in having your employer participate in an EFA payroll deduction campaign or you would like to create an opportunity to give "green" in your workplace, please contact Linda Raish at (480) 998-7971, extension 101.

Thank you to those who support MSC through the Environmental Fund of Arizona!



McDowell Sonoran Land Conservancy
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Creating a Wildflower Report

We are relying on the reports that we get from our volunteers and supporters to keep our wildflower website current throughout the Spring (see cover article for a description of the Wildflower Watch). Submitting a complete report is helpful. Here are the three parts to a great wildflower report:

- 1) Your Contact Information
- 2) The Data:
 - a. The location of the plant
 - b. A brief description of its surroundings
- 3) Three Photographs. Don't worry if they are fantastic. These are references, not works of art!
 - a. A close-up of the flower
 - b. A section of stem with leaves
 - c. The entire plant with something to illustrate the plant's size

Example: Desert Wishbone Bush

- 1) Ruthie Carll, ruthie@mcdowellsonoran.org
- 2) Horseshoe Trail, 100 yards from trailhead (GPS data would be better!)
It was in a flat open area in full sun.
- 3) Three Photographs:



- a) Flower showing the pink throat and curly anthers
- b) Leaf and stem showing alternate leaf pattern
- c) The entire plant with a size reference



The best resource for identifying plants in the Preserve was created by Steward, Marianne Jensen. This easy to use, well-designed book, **A Flora Photo ID Guide of the McDowell Sonoran Preserve** is available at the MSC office or through the website.