



Friends of Ironwood Forest

Fall 2022

Talking About Rattlesnakes

by Mike Cardwell

A big attraction of Ironwood Forest National Monument is its abundant and varied wildlife. The many habitat types, from valley floors and arroyos to rugged peaks, are home to an incredible assortment of flora and fauna. But one of the more abundant creatures is also misunderstood by most and feared by many.

I'm talking about rattlesnakes.

Arizona is home to about sixteen species of rattlesnakes, and IFNM likely hosts at least five of them. Sidewinders and Mohave rattlesnakes hang out on the valley floors, while blacktail and tiger rattlesnakes avoid the valleys, preferring to occupy rocky hills and mountains.

And the abundant western diamond-backs can be encountered in the flats as



Sidewinder, photos by the author



Tiger rattlesnake

well as in the rocky foothills of mountains like old Ragged Top. An additional rattlesnake that loves rocky hillsides, the southwestern speckled rattlesnake, is abundant just north and west of the monument and might well inhabit the edge of IFNM, as well.

I have spent a lifetime studying rattlesnakes, and for more than two decades now, I have used radiotelemetry to peer into the private lives of wild rattlesnakes—including rattlers in IFNM.

While rattling rattlesnakes are frequently described as being “angry” and some folks tell tales about being attacked and chased, biologists who study rattlesnakes find them to be cryptic, shy, and retiring. I am often asked whether rattlesnakes are evolving to rattle less,



Blacktail rattlesnake

the idea being that because people kill the ones that rattle, those that don't rattle survive to pass on genes for not rattling.

The truth is that it's not just people who kill rattling rattlesnakes. Larger predators like coyotes, bobcats, hawks, and owls all routinely kill and eat adult rattlesnakes, so confrontations with these predators often don't end well for the rattlesnakes.

We routinely find rattlesnakes, especially coiled ones, remaining motionless, quiet, and reluctant to strike, even when approached within inches. Only when they think they've been discovered did they react. And if there is thick vegetation or a convenient rodent burrow close by, they usually prefer to flee rather than stand their ground. So, natural selection has always favored shy rattlesnakes because the bold ones are more likely to become dinner for larger predators.

A rattlesnake encounter should be exciting and fun, not frightening. That depends, of course, on watching where you put your hands and feet and leaving rattlesnakes alone when you find them. Always use a flashlight at night and wear boots and long pants if hiking in vegetation where you cannot see what you're stepping on.

When you encounter a rattlesnake, stay at least twice the length of the snake away from it. That's well out of strike range but close enough to get a good look and even some nice photos.

Defensive strikes are usually quick jabs that reach about a third of the snake's length, but they sometimes reach out nearly their entire

length when hunting ground squirrels and kangaroo rats. The difference is vulnerability. They can best protect themselves when tightly coiled, while extending themselves—even briefly—is the opening a coyote or red-tailed hawk needs to make a meal of the snake.

How do you recognize a rattlesnake? Look at the tail. No rattlesnake has a tapered pointed tail like our many harmless snakes. Baby rattlesnakes appear in late summer and are the size of pencils with a single hard button on the tail, like the eraser on a pencil. Hollow rattle segments of older rattlesnakes routinely break off, but the segment attached to the tail contains live tissue and doesn't come off. Even the extraordinarily rare rattlesnake that has lost its entire rattle to a predator has a short blunt stump for a tail. Other characteristics, such as triangular heads, elliptical pupils, and heat-sensitive facial pits, are either too small to see from a safe distance or are shared with some harmless species. Again, look at the tail!

Probably the most common rattlesnake myth is the idea that baby rattlesnakes are more dangerous than adults. The reasoning is usually that the babies have not learned to control how much venom they inject. But think about it. The babies are tiny, and everything is miniature, including the glands that make and store the venom. When collecting venom samples for various research projects, we routinely get samples from adults that fill a third of the small centrifuge tubes we use (about a milliliter, for you technical folks), while babies produce a tiny



Western diamondback

droplet or two that is invisible in the tube once it is dried.

Venom laboratories that produce and sell snake venom don't want little snakes; they want big ones, because venom yield increases exponentially with snake length. And, yes, there is good evidence that venom produced by babies of many species is a bit more lethal than adult venom. But the difference only matters if you're a one-ounce lizard. In a human snake-bite case, the enormous difference in quantity renders any difference in toxicity insignificant.

In the case of any rattlesnake bite, what should you do for the victim? Answer: call 911 or drive to the nearest hospital emergency department—immediately! The amount of venom injected varies considerably, but every rattlesnake bite is a medical emergency. Waiting to see how bad it gets is a very bad idea.

Over past decades, many first aid techniques have been advocated by responsible authorities, including tourniquets, cutting and sucking, suction without cutting, ice and ice water immersion, electrical shock, compression wraps, and others. But physicians who treat a lot of rattlesnake bites now agree that there is nothing we can do in the field to change the outcome of the bite. First aid measures waste time, and some can cause additional harm.

The only effective treatment for a rattlesnake bite is antivenom, and the sooner it is started, the better. Antivenom cannot repair damage. It can only neutralize venom that has not yet found its target tissue.

On average, only about five or six people die each year in the United States from venomous snakebites, out of about 8,000 or so bites. The bigger problem is tissue damage around the bite site, which can result in severe scarring, impaired use of fingers or other joints, and even occasional amputations. That's why snakebite docs are fond of saying, "Time is tissue!"

Indeed, delayed medical care is often correlated with worse outcomes. The one useful thing that can be done for a bite to the hand or forearm while waiting for paramedics or driving to hospital is to remove rings, if possible, before swelling begins.

But rather than being afraid, be informed! Rattlesnakes are part of living and playing in southern Arizona. They want nothing to do with us, but we must be alert and smart about where we reach and step. The occasional rattlesnake encounter should be fun and exciting; take some cool pictures from a safe distance and then leave the snake alone. They are fascinating and important members of the natural community in Ironwood Forest National Monument.



Mohave rattlesnake with kangaroo rat prey

Mike Cardwell holds an MS degree in Ecology, Evolution and Conservation. He is an adjunct researcher at San Diego State University and a consulting biologist for the Arizona Poison & Drug Information Center at University of Arizona. He is co-editor of The Biology of Rattlesnakes, a 600-page, peer-reviewed compilation of research from 90 authors (2008, Loma Linda Univ. Press). He served on the expert panel that revised the medical treatment guidelines for North American pit viper bites (2015, Wilderness Medical Society). He authored the Mohave Rattlesnake chapter in Rattlesnakes of Arizona (2016, Eco Publishing). His first non-technical book, The Mohave Rattlesnake and How It Became an Urban Legend, was published in 2020. Mike lives in Tucson with his wife Denise.



From the President

by Tom Hannagan

I want to thank every one of you who have continued to support the Friends group through the difficult times we've all seen the past couple of years. Your energy and good will are major factors in our ability to protect our local treasure called the Ironwood Forest National Monument.

In the recent issues of this newsletter we've discussed the critical role of wildlife connectivity. The species found in nature do not recognize our various artificial boundaries. The health and vitality of the diverse animal life in the Monument depends on their ability to move not only within its protected boundary but also to and from neighboring land.

The Friends are actively working with a number of other organizations and agencies to attack the decidedly unfriendly and often obsolete fencing that inhibits wildlife movement. These partners include the Coalition for Sonoran Desert Protection, the Arizona Wildlife Federation, Saguaro National Park, Pima County, the City of Tucson, the Arizona Game and Fish Department, Friends of Buenos Aires, and several others.

By teaming up with these other entities, FIF is able to accomplish much. Jointly, we participated in four fence removal outings last winter, removing a total of thirteen miles of 4-wire barbed fence. We are now planning for six fence removal events this coming fall/winter season, including one on our celebration of National Public Lands Day December 10, 2022.

Speaking of field efforts, we are also resuming our volunteer workdays at the Monument, working with the BLM, on the first Wednesday of each month through April 2023. We look forward to again addressing a variety of needs following essentially a 2-year hiatus. The FIF volunteers have been itching to get out again, and there is room for any of you to join in these efforts. It's a great way to experience the Monument up close and help BLM to accomplish needed work.

FIF has recently taken a major step forward in advocacy by joining the Center for Biological Diversity in filing a legal complaint that the

federal government has conducted an inappropriate Phase I environmental study related to the Interstate-11 initiative.

We have acted and will continue to act against the effort by ADOT and the Federal Highway Administration to consider a path through the open desert in the Avra Valley, very close to IFNM, for a new I-11. Such a path for a new interstate would bisect the wildlife connectivity between IFNM and Saguaro National Park and the Tucson Mountains. The EIS phase I study by ADOT and the FHA neglected to consider the impact on IFNM, along with other oversights required by law.

Talk about success, we have been distributing the new, user-friendly map of IFNM. In fact, the first printing literally "flew off the shelves." We will have a second printing for you, with a few updates, and send out a notice when our inventory of maps is again replenished.

Education remains an important mission of the Friends. We are now working with two undergraduate student groups from the University of Arizona.

The Liverman Scholars are focused on the combination of public communications and environmental research. They are reviewing our website and have hiked with us in IFNM.

Members of the UA Fish and Wildlife Society are studying conservation and wildlife management. This group will join us for one of our multi-day, on-site connectivity projects.

All of the above have benefitted from your financial support. We are grateful for your contributions that support our efforts in education, outreach, and advocacy.



Desert Fence Busters



Photo by Trica Oshant Hawkins

We have an official name now! The Desert Fence Busters met for the first time this season to remove unneeded barbed wire in the Anway/Tucker Road vicinity.

Twenty-one volunteers removed approxi-

Way to go, Busters!

mately two miles of fencing and abundant scrap metal on Saturday, October 21.

Look for upcoming opportunities to join with us to remove treacherous fencing that inhibits and endangers wildlife movement.

New BLM Field Manager Named

Friends of Ironwood Forest is pleased to share the following memo from the Tucson Office of our BLM partners. We welcome Colleen Dingman as the new Field Manager and look forward to collaborating with her and her staff.

—Dave Barker, board member

From Robert Walter, BLM Resource Specialist:

I am pleased to announce the selection of Colleen Dingman as our new Tucson Field Manager. Many of you already know her from her time here as acting ADM and most currently as acting Field Manager. Her experience and leadership has been a welcome addition in both roles and will help us ensure little disruption as she moves into the permanent role.

In addition to her technical natural resource background, Colleen Dingman has extensive experience working closely with agency executives managing highly complex projects across multiple states and jurisdictions. She has experience in multiple leadership roles in multiple states; in doing so she has touched nearly all aspects of organizational management.

She is extremely collaborative, engaging both agency staff and partners to address administrative and natural resource management challenges. She has shown herself to be a very effective communicator, ensuring no surprises to upper leadership, and is highly effective at engaging a diverse staff, improving morale, and accomplishing targets in a highly complex and challenging Field Office.

Remembering Special Friends of IFNM



Gary Borax

I'm saddened to let you know that our dear friend, founder and leader of the Dove Mountain Volunteers, Gary Borax, has passed away.

Gary would identify projects and then organize and lead a bunch of folks out to hike and get some work done, much of it not easy. Gary's enthusiasm was catching and brought so very many of us together to socialize and work on a common cause. Then we would head out to spend a little time together and grab some grub (maybe a burrito) at a favorite eatery.

Gary was an extraordinary hike leader and evolved his hike schedules to include "work hikes" doing trail maintenance, trimming vegetation, pulling or spraying buffelgrass, cleaning up dump sites, installing and resetting wash barriers, erosion control, horizontal and vertical (one of his favorites) mulching of disturbed areas, and much more. And it was always a treat if a little bushwhacking was involved.

Gary loved working in the Tortolita Mountains, on the grounds of The Highlands, in the Ironwood Forest, and many other areas to help mitigate the encroachment of invasive species and protect and restore natural areas.

Gary would mobilize the Dove Mountain Volunteers and get us out to many sites that needed help in support of multiple organizations, including the AZ Native Plant Society, BLM, AZ Game and Fish, the Town of Marana, Pima County, the Highlands, and more.

Gary was welcoming and always loved having a crowd of folks come out and enjoy working together and socializing on these projects.

Gary is missed. May his memory be eternal.

Tribute by Jim Avramis

Dr. Cecil Robert Schwalbe

The Sonoran Desert lost a true friend with the passing of Dr. Cecil Robert Schwalbe. After serving in the Army during the Viet Nam War, Cecil returned to his home state of Texas and earned a degree in mechanical engineering from Rice University.

When he decided he really didn't want to be an engineer, Cecil went to the University of Washington. He then received a master's degree in environmental science and engineering. Next he moved on to Arizona to earn degrees in ecology and environmental science. He taught at U of A for many years.

Cecil served as Arizona's first state herpetologist and dedicated his professional life to the research and conservation of amphibians and reptiles.

Cecil and his herps "stole the show" at our Meet the Monument events. He will be missed by all who were fortunate enough to know him.



Photo by John de Dion

Requiem for a Tree

By Bill Thornton

The chain saw crew arrived early. With ruthless efficiency, what took decades to grow was reduced to a pile of “green waste” in a matter of minutes.

A sad but not unexpected event for this lifelong “tree hugger.” To make way for the long overdue replacement of an aged water line, the tree, a 20-foot mesquite, had to be removed from the utility easement behind our home.

So, you may ask, what’s the big deal? It’s only one tree. How much difference can it make? More than you might think.

A mature hardwood tree can absorb 48 pounds of atmospheric carbon each year, and a ton or more by the time it reaches 40 years of age. The same tree can release about 260 pounds of oxygen into the atmosphere each year, enough for two people.

But trees can do a lot more. Properly selected and placed, trees can save up to 20% on utility costs. That’s about \$22 per month for the “average” Arizona residence that uses 1,061 kilowatt hours of electricity each month.

Renewables are making a significant and growing contribution, but fossil fuels, mostly coal, still provide most of Southern Arizona’s electricity. With allowance for renewable energy, our “average” home still consumes about 4.5 tons of coal each year. A 20% reduction saves about 1,800 pounds of coal and keeps more than 5,100 pounds of carbon dioxide out of the atmosphere each year.

Besides saving on utility bills, trees help retain soil moisture, reduce water consumption for irrigation, provide homes for nesting birds, and can add 15% to the value of your property.

That’s the good news. Now for the bad.

Too many trees are dying in Tucson. The loss of tree cover is at least partially responsible for earning Tucson the dubious distinction of being the third fastest warming city in the nation. Is that a list we want to be on?

But there’s more good news. Awareness of the problem is growing, and a lot of good people are working to restore our tree canopy for a cooler more livable city. Trees for Tucson offers trees at reasonable prices and can help you select the right trees for your needs. Desert Survivors is an excellent resource for low water-use trees and other landscape plants.

If you possibly can, please plant a tree. It’s one of the best investments you can make in a sustainable future. Each tree makes a difference and the more the better. Don’t have a yard to plant in? There are many ways you can still contribute. The Trees for Tucson website will show you how.

So, goodbye old friend. You are gone but not forgotten. For every day of your abbreviated life, you made your little piece of the world a better place, without receiving one drop of water not provided by nature. We will honor your memory by planting at least two trees.



Mesquite in bloom, photo by Julie Roederer

Editor’s note: FIF board member Bill Thornton is a regular contributor to this newsletter and a frequent correspondent for the Arizona Daily Star. This article first appeared in that newspaper. Although it is not directly about IFNM, it certainly is relevant to our appreciation of trees, wherever they grow.

The Ironwood Gallery

Send us your favorite photographs of IFNM.



Ragged Top continues to be a favorite subject for our talented photographers.

This photograph of IFNM's signature mountain was taken by Lauren Trench, a U of A journalism graduate student currently working on a documentary involving protected aspects of IFNM.

Community Supporters

Bach's Cactus Nursery
BKW Farms, Inc.
Dragoon Brewery
Rusty Lizard Press

Our Mission

Friends of Ironwood Forest is a local non-profit organization that works for the permanent protection of the biological, geological, archaeological, and historical resources and values for which Ironwood Forest National Monument was established.

FIF provides critical volunteer labor for projects on the monument, works with the Bureau of Land Management and many other partners, and strives to increase community awareness through education, public outreach, and advocacy.



FIF Partners

Alliance of Arizona Nonprofits
Archaeology Southwest
Arizona Desert Big Horn Sheep Society
Arizona Game and Fish Dept.
Arizona Native Plant Society
Arizona Wildlife Federation
Bureau of Land Management
Center for Biological Diversity
City of Tucson
Coalition for Sonoran Desert Protection
Conservation Lands Foundation
Friends of Buenos Aires National Wildlife Refuge
Mule Deer Foundation
National Park Service, Saguaro NP
National Parks Conservation Assn.
Old Pueblo Archaeology Center
Pima County
Public Lands Foundation
Sky Island Alliance
The Rock Band
The Wilderness Society
Tohono O'odham Community College
Tohono O'odham Nation
Tortolita Alliance
Town of Marana
Town of Marana Chamber of Commerce
Tucson Audubon Society
Tucson Cactus and Succulent Society
University of Arizona

Your Financial Contributions at Work

We rely on the financial support of people like you to help us with our mission to protect the natural and cultural resources of Ironwood Forest National Monument. We also work to increase awareness of the monument and improve visitor experience there.

Please consider donating to support our work. We couldn't do this without you. You can donate online at <https://ironwoodforest.org/donate>