



Shape the Future

# Canyon Chatter

Friends of Madera Canyon

July 2024





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Note. You can navigate this document using the Links to Content (above) and the small logos in the lower right corner of each page. Click on the small logos and it will return you the Links to Content.

*Erratum.* On the cover of last month’s Chatter (June, 2024) there was a photo labeled *Penstemon palmeri*. Palmer’s Penstemon is not native to the canyon, nor the Santa Ritas. It is generally a more northern species. The flower in the image was a common cultivar of the Snap Dragon.

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On the cover: Face to face with a Tiger Rattlesnake. The holes in the scales on the lower part of the face are infrared heat sensing pits. The black colored scales above them are the nostrils. JCM

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# From the President

## Stewardship in Summer

July 2024

**Dan White**

Some of you, like me, are in the Green Valley area this month, rooting on each potential monsoon squall and welcoming the relief from the heat an afternoon shower brings. Others are spread around the country, enjoying time with family and friends in other places. Still others of you are in and out on trips and back using the time to learn about new places.

The summer solstice has, of course, passed. We are on the inevitable seasonal path toward shorter days and changing environments.

The work of FoMC continues through the summer months. Later this month, the Board of Directors will review its performance against the Strategic Plan adopted in 2023. The Canyon Preservation and Maintenance Committee has volunteers checking occasionally on the condition of trails. The Visitor Information Center folks continue to greet visitors, fewer in number though they may be. The Clean-up Crew, our “Ashers and Trashers” continue their Monday morning activities. We’re working on new grants and plans for new projects in support of the visitor experience in Madera Canyon.

These actions help to define “stewardship.” That word has been part of the Mission Statement for the Friends from the start. Your membership is also a form of stewardship because the size of our organization makes us a significant voice in the community, advocates for Madera Canyon as well as the wonders of nature beyond the Canyon.

So, thanks again for being a part of our shared stewardship endeavor.

## How to Join Friends of Madera Canyon

Below are links to join as a new member, renew a membership or make a donation. The links will take you to a secure server to use a credit card or an automated payment. Do you have any questions? Let us know. If you prefer to help by writing a check, please make your check payable to Friends of Madera Canyon - mail to:

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## Summer Hiking in MaderaCanyon and the Santa Rita Mountains

David Linn

Hello hikers,

It is officially summer, and it feels like it. It is also officially monsoon season.

Summer hiking in the Canyon and in the Santa Ritas is a wonderful activity. The crowds are gone, and the elevation is high enough to keep things relatively cool. This year water is still flowing in portions of Madera Creek and the vegetation remains fairly green with occasional flowers. And, this is before any of the monsoon thunderstorms have hit. When the storms do come incredible things happen. The whole Canyon seems to come to life. Flowers pop, birds sing and water rushes. The air is cooler and with more humidity the sun does not feel so intense.

So, get out there and enjoy.

A few words of caution, though. It is still hot with temperatures predictably in the 90°s. You know what that means: hydrate, hydrate, hydrate. Always carry at least a couple of liters. And wear your hat to block the sun and help keep yourself cool. Also, plan to hike early in the morning, it is much cooler. Additionally, you are more likely to avoid the intense mountain storms that strike later after the day has warmed up. Being in one of these storms is no fun especially if you are high in the mountains. Lightning strikes are frequent as well as dangerous.

But don't let these cautions scare you off from the trails. Plan, equip, and hike!







## The Birding Report

### The Aztec Thrush -- *Ridgwayia pinicola*

#### Bob Pitcher

By the time this appears, spring migration in Madera Canyon will be over, and the summer breeding season in full swing. No season is really a dull one for birding here, but summer is slower than spring or fall. Yet some of the rarest birds seen in the Canyon are reported primarily in the summertime. One of these is the Aztec Thrush.

Aztec Thrushes are exceedingly rare in the United States. They seem also to be “rare and local” in the mountains of Sonora, to the south of the the border, but regular there. Some sources consider the spe-

cies endangered in Mexico, to which they are endemic. Aztecs are fruit-eaters, and presumably wander north of the border when fruit crops are good in the Arizona mountains. Here, they seem to favor cherries, and have been found in Arizona almost entirely in late summer. There have been only two winter sightings in the U.S., one in Arizona, one in Texas.

The first Aztec Thrush found in this country was discovered in Big Bend National Park in 1977. One was found in Huachuca Canyon in Cochise County, Arizona, the next year, on May 30, 1978, and photographed. That bird was last seen there fifteen days later, and this seems to be the pattern: an Aztec, usually a single bird, is found and stays several days, then vanishes again.



Aztec Thrush, *Ridgwayia pinicola*.  
Photography by Brennan Mulrooney





In 1996, a high of 24 Aztecs were seen at various places in Arizona, and sources from about that time say that Aztecs have become “almost annual” in the state. The Great Madera Canyon Aztec Invasion began on July 24, 2006, when a flock of nine was found up the Carrie Nation Trail in the Canyon. At least some of the flock stayed until August 7.

Then an Aztec was in the Canyon from August 4 to at least August 13, 2011, again on the Carrie Nation Trail, and many pictures were taken of it. I haven’t found any subsequent records of an Aztec Thrush in the Canyon. One was found at Aliso Springs, on the other side of the Santa Ritas, in 2016, when birders were there to see the even rarer Pine Flycatcher. And that’s been it for Aztecs anywhere in this country. I can’t find any report of an Aztec anywhere in Arizona or elsewhere in the U.S. in the last eight years.

Per *ebird*, Aztecs seem only to have been reported in Arizona from the Santa Ritas, the Huachucas, and Cave Creek on the east side of the Chiricahuas. And there have been four records of Aztecs from Big Bend in Texas.

What does an Aztec Thrush look like? The bird is about the size and shape of a Robin, with a shorter tail. It is mottled black and white, which would be highly distinctive if the bird were seen in the open. Commonly it’s not, however, but in shaded foliage, where patterns of light and shadow render its overall pattern an effective camouflage. A Spotted Towhee, especially a juvenile, half-hidden among the leaves, could be mistaken for an Aztec.







## Canyon Nature

### [A Guide to Fireflies of the Southwest, Ann Walker, 2024.](#)

Ann Walker of New Mexico's BioPark Society has produced a very useful guide to fireflies. Most of us grew up with fireflies. Catching them and putting them in a jar for a living light was a summer activity that I used to look forward to as a child in the Midwest. Despite the common name, they are not flies, but beetles. Walker's guide was published in February of this year and is available online as a free PDF.

The guide introduces the diversity of fireflies found in the Southwest, including the USA states of Colorado, Utah, New Mexico, Arizona, and southern California, and the Mexican states of Sonora, Chihuahua, and Baja California. It was written for anyone who wants to better understand fireflies, though some sections of the guide are better suited for more serious students. Casual readers can ignore the scientific references, dichotomous keys, and morphological jargon. In the face of accelerating biodiversity loss driven by human activity, we are running out of time to understand the baseline condition of the firefly population in the Southwest. The time may already have passed. Many populations have already been lost to misuse of water resources, drought, wildfire, and overgrazing. We must move fast to understand what remains intact, so we can take steps to prevent further losses. Programs like Firefly Atlas and the Western Firefly Project are making progress in filling some of the gaps in our understanding of southwestern fireflies. These programs rely on the help of hundreds of committed, diligent community scientists. This guide is designed to act as a tool for those wishing to better contribute to these programs. While guides to fireflies of the eastern (Faust 2017) and Western (Buschman 2018) United States do exist, this guide focuses on the species from the Southwest region.

Chapters divide the species into three groups based on their courtship behavior: flashing fireflies, glow-worms, and diurnal dark fireflies. Each chapter contains detailed information on each genus, with a genus-specific key to help the more serious students differentiate between related species. Accounts are then provided for each species, with photos and detailed information on distribution, habitats and ecology, and conservation status.







# Cicadas

Doug Moore

What is that noise, that loud trilling buzz emanating from the trailside vegetation or tree canopy in the canyon? It is the calling of cicadas, one of the defining sounds of hot summer weather leading into the monsoon in the Sky Islands.

Cicadas are large insects with prominent eyes set wide apart, short antennae, and long membranous wings. They are really easy to hear, they can be incredibly loud! But, it is not as common to actually see these chunky, clear-winged bugs- they blend into the habitat amazingly well as they live their short, loud adult lives.

The many species of cicadas exist underground as nymphs most of their lives feeding on plant roots. During the summer matured nymphs crawl partway up handy tree trunks, split open their skins, and emerge as short-lived adults to mate and lay eggs before dying. Most commonly, we only see the dry, pale amber shucks left stuck behind.

Male cicadas are the “musicians”, producing loud trills by rapidly vibrating two plates on their undersides. Each species has its own specific call, so that females can recognize and find their appropriate mates. When perched in a tree or bush, cicadas tend to remain stationary. Males are quite wary and when approached go silent before you can accurately zero in on the sound. These characteristics can make cicadas maddeningly difficult to find out in habitat! Despite being hard to see, sometimes a big hatch of males will let loose together in a tree producing a mind-numbing roar that is



Apache Cicada one of our largest species.  
Photography by DM

truly impressive. You may not see any individuals among the leaves, but there is absolutely no doubt that lots of them are present and accounted for!

There are several dozen species of cicadas in Arizona in a variety of sizes from small to “jum-







Adult cicada emerging from larval exoskeleton.  
Photography by DM



A small cicada species. Photography by DM.

bo". Sometimes it is possible to tell when more than one species has emerged by listening closely to the different trills the males are emitting. Our local cicadas are related to the "periodic" cicadas of the eastern U.S. that emerge periodically en masse every 13 or 17 years, but our species tend to have much shorter life cycles.

Cicadas are important food sources for a variety of animals, particularly insect-eating birds like flycatchers. Climbing omnivorous mammals, like ring-tail and raccoon relish the big, juicy bugs also. Large predatory wasps called Cicada Killers also specialize in hunting them. They catch then paralyze the insects with a sting and feed them to their larvae in underground nests.

When you are out hiking this summer you shouldn't have any trouble listening for cicadas. They are hard to miss!



A Cicada Killer wasp.  
Photography DM





# The Editors' Desk

## **Report shows Copper Mine to have a negative impact on the Economy**

Save the Scenic Santa Ritas, a Tucson-based conservation group opposed to mining in the Santa Rita Mountains commissioned the Missoula, MT-based Power Consulting Inc. to report on HudBay's Copper World Project and the economic impact it will have on the local economy.

"The Power report documents that the marginal economic benefits from the Copper World mine are not worth destroying the Santa Rita Mountains, depleting our groundwater, generating millions of tons of toxic mining waste while exporting most if not all the raw copper overseas, providing little to no benefit to the U.S. renewable energy economy," says Dr. Rob Peters, executive director of Save the Scenic Santa Ritas. Additional key findings in the Power report include:

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Economic Report: Copper World Mine would provide relatively little economic benefit to the regional economy while undermining vital economic sectors, depleting groundwater, and destroying a vibrant ecosystem.

An economic analysis of the proposed Copper World Mine concludes the project will provide negligible economic benefits to the regional and state economies while undermining vital economic sectors, depleting regional groundwater supplies, and obliterating an ecologically vibrant

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mountain range. state economies while undermining vital economic sectors, depleting regional groundwater supplies, and obliterating an ecologically vibrant mountain range.

“The Copper World project would contribute minimal economic gain to the greater Tucson economy while destroying the northern half of the Santa Rita Mountains and threatening human health and water supplies,” according to the executive summary of the report prepared by Missoula, MT-based Power Consulting Inc.

“The proposed mine has the potential to negatively affect important industries that depend on Pima County’s natural environment and groundwater, notably tourism, outdoor recreation, the housing industry, and agriculture,” the executive summary states.

“The harm to these industries could easily offset whatever economic benefits the mine would contribute in the form of jobs and tax payments.” Toronto-based Hudbay Minerals Inc. is seeking state permits to construct the Copper World mine, which includes a series of open-pit copper mines and waste dumps that will straddle the northern half of the Santa Rita Mountains about 35 miles southeast of Tucson.

- House prices in Corona de Tucson, the community closest to the mine, could drop more than \$100 million due to the combined effects of air pollution and lost scenic vistas.

- Copper World is unlikely to be essential for U.S. copper needs because copper is not in short supply and is not considered a critical mineral by the United States Geological Survey, the agency responsible for classifying minerals as critical or not. It is mined and processed in many countries, including free trade agreements with the U.S.

- Hudbay plans to pump 6,000 to 13,000 acre-feet of groundwater annually, roughly enough to supply 20,000 to 40,000 households. This water will be extracted from the same aquifer used by nearby communities, including Sahuarita, Quail Creek, and Green Valley. This will substantially decrease the water available to farmers and residential housing, with concomitant impacts on the local economy.

- Hudbay claims it will pay \$12.35 million per year in property taxes, which would be slightly less than 1% of Pima County’s total intake of property taxes. Hudbay states it will pay \$8.4 million yearly in state taxes, representing 0.03% of Arizona’s 2022 tax revenues of \$27.8 billion.

- Hudbay projects that 430 miners will be directly employed at Copper World and that 3,000 secondary jobs will be created. However, studies on other mining communities, including those near the proposed Resolution Copper Mine in Superior, indicate that Hudbay’s 430 mining jobs would likely create significantly fewer than the 3,000 secondary jobs claimed.



Making roads and excavating hillsides, disrupts the ecological integrity of an area making it less desirable habitat for the native flora and fauna. JCM





- Even assuming Hudbay's projection of 3,430 total jobs is correct, employment from the proposed mine will only add tenths of 1% to the local economy.
- The historical volatility and periodic lows in copper prices call into doubt Hudbay's assertions that its activities will continuously employ 430 miners and create 3,000 secondary jobs.
- The high biological diversity of the Santa Rita Mountains, including jaguar, ocelot, and a high concentration of bird species, attracts people to Pima County and helps support the outdoor recreation industry that annually generates \$1.4 billion and employs more than 14,000 people. If the mine were to cause even a slight percentage decrease in outdoor recreation by destroying the Santa Ritas, this could translate into a substantial hit to the local economy.
- Environmental and cultural amenities attract people to Pima County, with more than 6,000 people moving here yearly, many bringing retirement savings and other investments that power the local economy. If environmental degradation caused by the mine during its 20-year life persuades only 2.7% of these new residents not to come, this would offset all the 3,340 direct and secondary jobs Hudbay claims it would provide. "This report provides the public and decision-makers essential information in countering Hudbay's unsupported assertions that southern Arizona desperately needs a handful of mining jobs that will permanently degrade the environment and decrease future economic vitality," Peters said. "Southern Arizona is far better off saying no to this disastrous project."

Read the Executive Summary and Full Report here: [www.copperworlddeconomics.com](http://www.copperworlddeconomics.com)



# Venomous Reptiles in the Canyon

John C Murphy

The Centers for Disease Control and Prevention's (CDC) website on venomous snakes, states that it has been estimated that 7,000–8,000 people per year receive bites from venomous snakes in the United States, and about five of those people die. So, if you are bitten your chances of dying is about 0.06246%. Very good odds.

The Natural History Museum of Los Angeles County published an article titled, "Misplaced Fears: Rattlesnakes Are Not as Dangerous as Ladders, Trees, Dogs, or Large TVs". The article cites data from the CDC noting that more people die from falling from ladders, mammal bites, falling from trees, venomous hornet stings from wasps and bees, dog bites, lightning strikes, venomous spiders, and large TVs falling on people than from venomous snakes (Pauly 2021). All venomous snakes in the United States of America are included in this statistic. A 1988 USC Medical Center study resulted in a profile of the average American snakebite victim. It found that 44% of snakebites were accidental, more than half resulted from the victim handling a snake, 28% of the victims were intoxicated, and 90% of the victims were male, most of whom were in their 20s. Many of the victims were trying to feed captive snakes.

Hiking in Madera Canyon and other locations within the Santa Ritas you and your dog are exposed to eight species of venomous snakes and one venomous lizard. Seven of the snakes are rattlesnakes, one is a coral snake. While there are no human deaths from a bite by a Sonoran Coral Snake, they should be treated with respect and not handled. Four bites from this species were reported between 1955-1965, one reported in 1991, and 12 bites reported between 2001 and 2005 (see Jones 2022). As for the one venomous lizard, the Gila Monster, *Heloderma suspectum*, people and pets may be bitten by them if they try to handle them - fatalities from Gila Monsters are known.

In addition to the coral snake Madera Canyon and the Santa Ritas have seven species of rattlesnakes (Western Diamondbacks, Mojave Rattlesnakes, Blacktail Rattlesnakes, Tiger Rattlesnakes, Rock Rattlesnakes, Ridgenose Rattlesnakes, Twin-spotted Rattlesnakes). Thus, the Canyon

*Rattlesnakes Are  
Not as Dangerous  
as Ladders, Trees,  
Dogs, or Large  
TVs*







A recently hatched Gila Monster, *Heloderma suspectum*, that was found while hiking on July 24. The banded pattern seen in this specimen is found in very young animals. As Gila Monsters age the bands tend to disappear and break into spots. JCM

has eight species of snakes with fangs located in the front of their mouths, and the fangs have a venom canal that will carry venom under high pressure. To be sure, snakes are more afraid of you than you are of them. No snake native to Arizona can consume a person, thus it is in the snake's interest to avoid encounters with people. Humans will go out of their way to kill snakes; this is not good for the snake or the human. Frequently I will stop and move snakes off roads out of the path of traffic. Several times, after moving to Arizona, I had cars swerve out of their lane into mine and come as close to me as possible in an attempt to run over the snake. Bitten by any of these eight snakes or the lizard, your most effective first aid kit and treatment are your car keys and an immediate trip to the hospital. In the 21st century there is no cutting of tissue near the bite site, or sucking the venom out of the wound with a dirty human mouth.

There is the saying, "the time to antivenom equals tissue". This refers to the fact that rattlesnakes have hydrolytic enzymes in their venom. These enzymes destroy tissue and the longer the time is to get the antivenom the more likely it is that a larger volume of tissue will be destroyed. This may result in loss of skin, muscle, nerve damage, and disfigurement.

The good news is that defensive bite by rattlesnakes are often dry bites, i.e. there is no venom injected. The fangs may puncture the skin but because the snake was hasty they may not have aligned all of the ducts and orifices that transport the venom. Dry bites may occur in 30% of defensive bites.







Western Diamondback Rattlesnake, *Crotalus atrox*, inhabits desert scrub at elevations from below sea level to 5000 feet (about 2400 m) above sea level (ASL). This is the most encountered snake in the Madera Canyon, Santa Rita area. JCM



The Mojave Rattlesnake, *Crotalus scutulatus*, inhabits deserts and grasslands at elevations from sea level to around 8300 feet (2500 meters) (ASL). This is one of the most encountered snakes in the Madera Canyon, Santa Rita Area. JCM







Blacktail Rattlesnakes, *Crotalus molossus*, inhabits deserts to subalpine coniferous forests at elevations of 6070 to 10,500 ft (1850-3203 meters) (ASL) (JCM). Hardy and Greene (2002) recorded 3,271 contacts with 49 telemetered Blacktails, ranging from a few days to almost nine years. Whereas females that had mated the previous summer typically settled at individual sites for gestation and birth, 15-150 m from their respective winter sites, non-reproductive females moved to individual hunting ranges of previous years upon spring emergence, approximately 200-1000 m from their winter sites. Most fertile females inhabited an area of approximately 1.5 square meters from spring emergence until delivery, roughly four months. Six birth sites were excavated beneath large rocks, two were in outcrops of rock, and one was in a mammal burrow that had been abandoned (probably made by Rock Squirrels).



Tiger Rattlesnakes, *Crotalus tigrinus*, inhabits Upper Sonoran Deserts to Madrean Woodland at elevations from sea level to 4800 feet (1463 meters) (ASL) (JCM). Repp (2022) found Tiger Rattlesnakes in the Tucson area regularly gave birth one to two months before Blacktail and Western Diamondback rattlesnakes. It's unclear exactly how they manage to do this, but suggests indicators of the tiger reproductive process seem to be expedited. He noticed "the look" of pregnancy in some females as early as September. He proposes that Tiger Rattlesnakes may be in advanced egg production, ovulation, or pregnant when they go into hibernation.







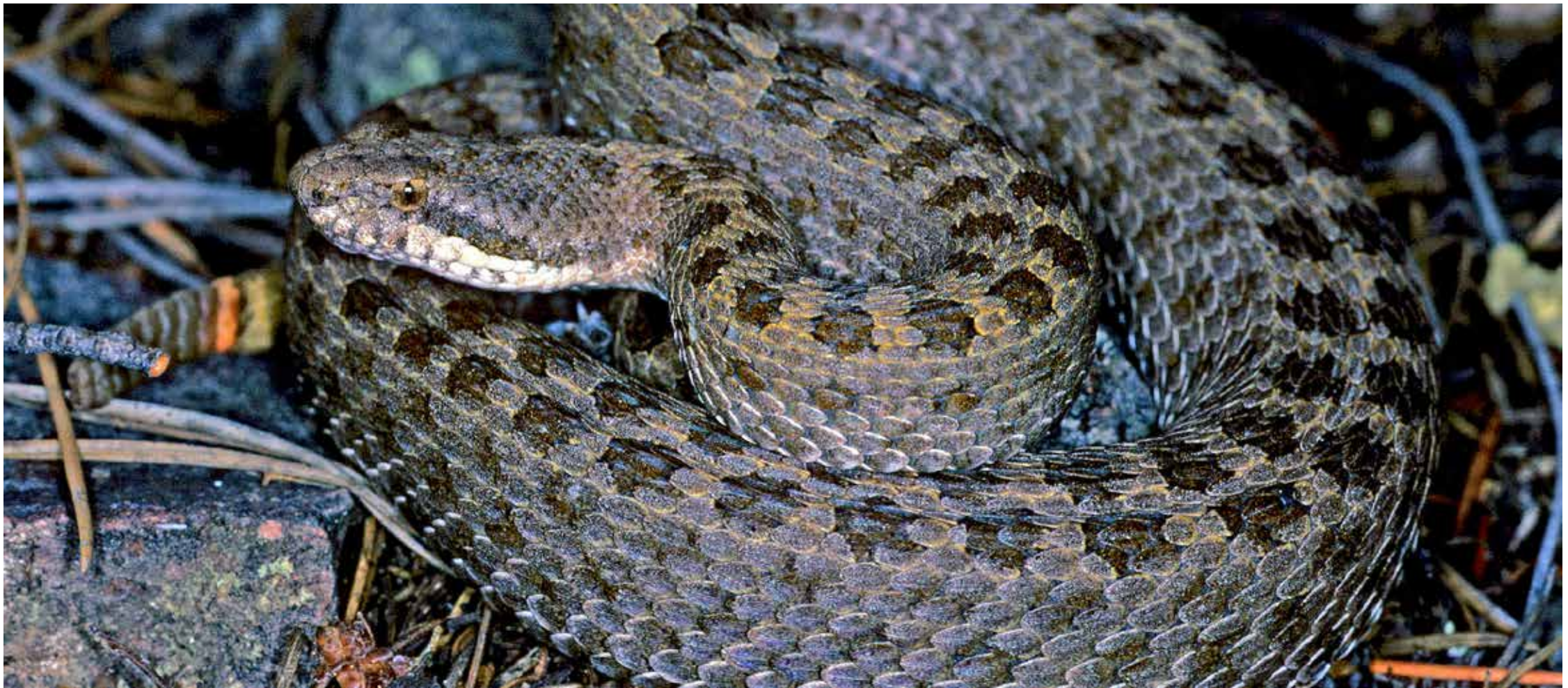
Rock Rattlesnakes, *Crotalus lepidus*, inhabits Madrean Evergreen Forests and Rocky Mountain Montane Forests and associated with talus slopes at 4,000 feet (1200 m) to 8,500 feet (2,590 m) (ASL) (JCM). The diet of the Banded Rock Rattlesnake was described by Holycross et al. (2002). Most records Approximately 91% of the records were from the northern Sierra Madre Archipelago. The diet consisted of 55.4% lizards, 28.3% centipedes, 13.8% mammals, 1.9% birds, and 0.6% snakes. Lizards of the genus *Sceloporus* comprised 92.4% of lizards. Extrapolation suggests that *Sceloporus jarrovi* represents 82.3% of lizard records. Diet was independent of geographic distribution, sex, sample source, and age class. However, predator snout-vent length differed significantly among prey types; snakes that ate birds were the longest, followed by those that ate mammals, lizards, and centipedes.



Ridgenose Rattlesnakes, *Crotalus willardi*, inhabits Madrean Evergreen Woodland and Rocky Mountain Woodlands at elevations of 4000 - 9000 feet (1200-2793 meters) (ASL) (JCM). While the venom of this snake is thought to be mild, Holzman et al. 2018 reported a bite that required antivenom. Symptoms included progression of swelling, tenderness to palpitation, increased blood supply to the skin and diminished range of motion.







Twin-spotted Rattlesnakes, *Crotalus pricei*, inhabit high elevations in Rocky Mountain Montane Forests and Rocky Mountain Subalpine Coniferous Forests and are associated with talus slopes at elevations of 4,000 to 10,500 feet (1220-3200 meters) (ASL) (JCM). This species, along with the Ridge-nosed Rattlesnake, the Rock Rattlesnake, and the Gila Monster are protected in Arizona by having no open season.

Prival et al. (2002) collected, measured, and labeled 127 *C. pricei* in the Chiricahua Mountains of Arizona between 2530 and 2900 meters above sea level between 1997 and 2000. Sixteen were tracked using radiotelemetry in the research region between 1997 and 1998. Lizards made up 74% of the prey, however it also consumed birds, mammals, and a conspecific. Parturition took place in late July and early August, with a concentration of mating taking place in August and early September. There were 3.94 (range = 1-6) embryos on average, while female reproduction seemed to occur either biennially or less frequently. At 4-5 years old, female *C. pricei* were mature. Males traveled more than six times farther each week during the 1998 monsoon season (July to September) than they did during the 1997 monsoon season, according to radiotelemetry, which showed that mobility patterns differed from year to year. Males may be driven from talus toward colder microclimates, where resources are less concentrated than on talus, in drought years like 1998.

Protected species are neither considered threatened nor endangered in Arizona. Rather, under Arizona Game and Fish Commission orders 41 and 43, species that are protected are simply designated as having No Open Season. Within this section, harass, injure, pursue, hunt, shoot, wound, kill, trap, capture, or gather are all considered forms of taking.

A Scientific Collecting License (SCL), issued by the Arizona Game and Fish Department, is required for the taking or handling of species designated as having No Open Season, with the exception of species protected by the U.S. Endangered Species Act.

It requires a federal permit to harvest or handle any species that are protected by the U.S. Endangered Species Act and are designated as having No Open Season. Thus, *Crotalus pricei* is protected under







Sonoran Coral Snake, *Micruroides euryxanthus*, inhabits deserts, mesquite grasslands, tropical deciduous forests, thorn forests, and lower pine-oak woodlands. It is often associated with river bottoms and arroyos. The venom produces local effects at the site of the bite, but it has neurotoxic venom. Symptoms may appear hours after the bite. However, fatalities are unknown. Babb and Brennan (2018) observed the Sonoran Coral Snake entering harvester ant (*Pogonomyrmex* sp.) nests. All observations occurred within a few hundred meters of each other in the same dry wash traversing a bajada in Arizona Upland Subdivision Sonoran Desert. This coral snake preys primarily on small snakes, including threadsnakes (*Rena* spp.). Approximately a third of the threadsnake diet is comprised of ant larvae and pupae.

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# The Last Page



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