

Meet Your Neighbor, the Western Diamondback Rattlesnake

Rusty Goetz



Western Diamondback Rattlesnake

Rattlesnake petroglyph from Three Rivers Petroglyph Site, NM. Picture by Curt Mekemson

Now that spring is here and summer is upon us, rattlesnakes have become far more active. It is important for us to become aware of their habitats, and the risks and benefits of living with these beautiful animals.

About sixty years ago Four Hills Village was built on the western foothills of the Manzano/Manzanita Mountains, along the southern flank of Tijeras Canyon, a natural source of permanent water (springs) and a major wildlife corridor. We sit within what is called the Upper Sonoran Climatic (or Bio) Zone, in the Juniper/Pinon - Juniper vegetation ecozones. That is to say we are in the transition zone between the high dry desert grasslands and the high cool conifer forests of the mountains. As a result of our location and the fact that subsequent neighborhood development has preserved many large interconnected open spaces with access to numerous water sources, we are host to an unusually wide range of wildlife and vegetation. Snakes are one of the many resident animal groups in FHV.

Snakes are thought to have evolved from some yet unidentified land-living lizard in the Late Jurassic Period (~150 million years ago) and have been in residence in New Mexico for far longer than humans. They have been vilified and revered. (See picture of rattlesnake petroglyph above), but mostly their role and value in the ecosystem has been misunderstood.

This note will concentrate on the Western Diamondback Rattlesnake, one of the six most common snakes in our area. Of our resident snakes, three are nonvenomous: the Bullsake (also called Gopher Snake), the Striped Whipsnake, and the Wandering Garter Snake. The other three are all rattlesnake subspecies: the Prairie Rattlesnake which prefers open or slightly wooded grasslands in the lower elevations; the Blacktail Rattlesnake, somewhat less common and prefers south facing exposures at the higher elevations, and the Western Diamondback Rattlesnake (also called Coontail Rattler) which occurs in high densities all along the western mountain foothills and in our area.

Before you get all jumpy about snakes in our neighborhood, take note that all of these snakes are basically nonaggressive, although they all take a very dim view of being played with, picked up, or stepped on. Also, they are not active all of the time. All snakes are cold-blooded and as such they cannot increase their body temperature when it is cold outside. They become torporous or they “brumate” (a great word for Scrabble that means a condition similar to hibernation) in cooler or cold weather. They are most active when the temperatures range between 77° and 90° F. The Western Diamondback Rattlesnake’s activity pattern changes seasonally. It is most active at dawn and dusk but

will hunt other times of the day. During the summer it will actively hunt at night and will bask on warm rocky outcrops by day. In the spring and fall it is more likely to be active during the day. The Western Diamondback brumates between October and early March. Brumation is carried out in a shelter such as a cave, rock crevice, or an animal burrow. Multiple snakes (even snakes of different species) may brumate together.

All of our local snakes are ambush predators whose diets are composed primarily rodents and other small mammals, rounded out with lizards, amphibians, smaller snakes, ground feeding birds, and the occasional fish or insect. They occupy a very important place in our ecology. Besides being major controllers of the rodent population, they also help protect us by consuming rodents/small mammals hosting Hantavirus-, Bubonic Plague-, and Lyme Disease-infected fleas and ticks. One surprising recent discovery is that snakes also help disperse seeds of grasses and other plants. The rodents they consume usually have their cheeks stuffed with seeds which can pass harmlessly through the snake's gut, and in some cases even germinate, before being deposited in the snake's feces.

The Western Diamondback Rattlesnake scientific name is "Crotalus atrox" and it's a member of the viper family. It is the second largest of the 40+ recognized species of rattlesnakes in North America -coming in with a length of 4 to 5 ft. (the largest know was 7 ft. long) and a weight of up to 6 pounds. Only the closely-related Eastern Diamond Rattlesnake is larger. The Western Diamondback is found throughout the high deserts of the southwestern US and in the northern high deserts of Mexico.

This handsome snake's body is heavy looking and is usually brown-grey but may also be dusky grey or pinkish-gray in color. Running along its back are up to 45 diamonds or hexagon-shapes blotches that are darker brown than the underlying skin color and have dark edges. These markings are bordered by sandy-yellow lines. The Western Diamondback has a broad triangular head and a set of back-sweeping white and/or dark diagonal lines can often be seen on each cheek. The belly of the snake is off-white in color and unmarked. The snake's tail is marked with 2 to 8 black and white rings much like a raccoon's tail (which is the origin of its alternate name, "Coontail Rattler"). The other two rattlesnakes common in the Sandia and Manzano foothills lack the black and white banding of the tail.

At the tip of tail is the snake's rattle which is made of stack of pale brown, hardened hollow scales. A new segment is added to the rattle every time the snake sheds its skin. However, despite what you may have heard, you cannot count the number of rattle bands to calculate the snake's age. These hollow scales are made of keratin, the same material as we have in our fingernails, and just like our fingernails, they break from time to time. A very old snake may have lost all of its rattle and young rattlesnakes don't have rattles. Most, but not all, rattlesnakes will rapidly vibrate their tail when threatened. This causes the keratin segments to knock against each other, producing a snare drum-like sound that is amplified by the hollow scales (and used in hundreds of western movie soundtracks to scare us).

Western Diamondback Rattlesnakes are pit vipers, meaning they have organs behind their nostrils and between their eyes that can sense very tiny changes in temperature. Tracking subtle changes in temperature is a primary method used in hunting small mammals. Also, unlike many snakes, the Western Diamondback has very good vision. When hunting, one quick bite delivers enough venom to kill or incapacitate its small prey. Occasionally, the snake loses its teeth when it strikes. This is only a temporary hindrance as lost teeth can be replaced multiple times a year. The snake swallows its prey whole. Typically, it feeds once every two to three weeks but it can survive up to two years without eating by slowing its metabolism dramatically and living off stored fat reserves.

The Western Diamondback can live 15-20 years or more. They reach sexual maturity at 3 years of age.

Except for mating and brumation, the Western Diamondback tends to be solitary. Mating takes place in the spring. During this time the male rattlesnakes engage in ritualized fighting. The combatants coil their bodies around each other holding their heads high off the ground and slug it out in what is called “combat dancing”.

The female Western Diamondback Rattlesnake is ovoviviparous. This means she has a reproductive system in which her young develop in eggs within her body over the course of 6 to 7 months. The young then “hatch” from eggs within her body prior to being born in apparent “live” birth. A typical brood consists of 8 to 12 young, but cases of broods of up to 25 are known. Born in the late summer or early fall, the baby snakes are about a foot long and disperse within a few hours of birth to fend for themselves. Their mortality rate is very high. Primary predators of the Western Diamond Rattlesnake include; hawks, eagles, owls, coyotes, grey foxes, bobcats, roadrunners, other snakes, lawnmowers, automobiles, and people who want to make boots, belts, and cans of exotic stew meat for tourists.

Snake Bite Truths

Each year over 45,000 snake bites on humans are reported in the United States. Of these about 8,000 are from venomous snakes and out of this total there are 5-12 human deaths per year attributed to snake bite. A significant number of the snake bites occur when people provoke the snake by trying to handle, capture, or kill it. The Western Diamondback is considered the most aggressive rattlesnake species and is responsible for the highest annual number of snake bites (but not fatalities) in the U.S. This is due to the (relatively) low potency of its venom. The Eastern Diamondback’s venom is far more powerful and it is responsible for more fatalities. The venom from the majority of rattlesnakes is primarily composed of hemotoxic elements. This means it will damage tissue and affect your circulatory system by destroying skin tissues and blood cells and cause you to hemorrhage internally. It is important to remember that a snake’s bite reflex can still be triggered several hours after the animal’s death and that even a newly born baby rattlesnake can give a venomous bite.

Rattlesnakes, like all vipers, have a pair of hollow retractable fangs positioned at the front of their mouths. The snake’s venom, which is produced by glands behind their eyes, is injected into the snake’s prey via these fangs. Although the Western Diamondback’s venom is less toxic than that of many other rattlesnakes it can be delivered in higher quantities per bite. If left untreated, the bite of the Western Diamondback venom is potentially fatal to humans (especially to those weighing less than 100 pounds). However, because the snake rarely delivers a full venom strike (around 25-30% of all snake bites are dry-meaning they inject no venom) and because the antivenom is readily available, the bites are rarely fatal. In fact, more damage to humans is done by fear causing heart attacks and by improperly applied tourniquets, than the actual deaths from the venom.

If you are bitten, or think you have been bitten, the first and foremost thing to do is to move away from the snake, as they can strike again. Do not waste time and energy trying to capture or kill the snake. First, the snake has already had a really bad day, and second, this activity will increase your heartrate and blood circulation, further speeding the toxin throughout your body. Do try to remember its size, color, and markings to help medical staff select the correct antivenom. You will start to feel symptoms immediately and they will worsen over time. Do seek medical help as soon as possible. Call for an ambulance if you are able to, preferably within 30 minutes. Do stay calm and remember that unlike in the movies and on TV, rattlesnake bites very, very rarely kill humans and that even if left untreated, the overall effects of the venom usually take days to develop in a human.

If you have been bitten by a rattlesnake, you may notice 1 or 2 puncture marks made by their large fangs (nonvenomous snake bites usually have multiple punctures arrayed in a “V” or horseshoe shape). You

will probably experience some pain, tingling, or burning in the area of the bite. This may be accompanied by some swelling, bruising, or discoloration at the site. Other common symptoms include:

- Numbness in the face or limbs
- Lightheadedness
- Weakness
- Nausea or vomiting
- Sweating
- Salivating
- Blurred vision
- Difficulty breathing

There are many common misconceptions about the treatment of rattlesnake bites. Here is how to minimize your risk (according to Healthline, 2020).

- Don't raise the bitten area above the level of your heart. If you do this, your blood containing rattlesnake venom will reach your heart more quickly.
- Stay as still as possible, as movement will increase your blood flow and the venom will circulate faster.
- Remove any tight clothing or jewelry before you start to swell.
- Let the wound bleed, as this may allow some of the venom to be released.
- Don't wash the wound, as your medical team may be able to use some of the venom from your skin to more quickly identify the correct antivenom.
- Place a clean bandage on the wound.
- Try to remain calm, as anxiety and panic can increase your heart rate which will cause the venom to spread.
- If you begin to experience signs of shock, try to lie down on your back, raise your feet slightly and stay warm.
- Don't cut the wound, as this doesn't help and could cause an infection (and as one doctor told me when I was being checked out to carry antivenom where I worked, "you are not a doctor and you don't know where your veins and arteries are located". - R.G.)
- Don't try to suck the venom from the wound, as you then introduce the venom to your mouth as well as introduce the bacteria from your mouth to the wound.
- Don't use a tourniquet or apply ice or water.

A word about dogs, rattlesnakes and the Albuquerque Open Space rules.

If your dog lives, plays, or accompanies you on hikes where rattlesnakes live, it will come as no surprise that these snakes are a serious danger to our dogs (and cats). Each year about 300,000 dogs and cats are bitten by venomous snakes. Already this year there have at least two cases of dogs having been snake bitten in our Manzano/Four Hills Open Space. Because most dogs are smaller animals with high heart rates, rattlesnake venom will hit them very quickly and very hard. This danger is one of the several reasons the City of Albuquerque requires all dogs to be on a leash while in the Open Spaces.

You may have heard of, or have had your dog inoculated with, a rattlesnake vaccine developed by Red Rock Biologics. But are you aware that there is considerable discussion within the veterinary community about its effectiveness? This rattlesnake vaccine was developed to protect against the Western Diamondback Rattlesnake by generating protective antibodies against its venom. According to Red Rock Biologics, it is not effective against other snakes and dogs should be inoculated at least 30 days before any exposure to rattlesnakes, with booster shots given every 6 months thereafter. The primary question being debated is how good is this vaccine actually? Even included in Red Rock Biologics own information is "safety and efficacy are not proven".

The vaccine efficacy issue has two parts: 1) No hard evidence has been presented on the consistent behavior of the vaccine. This could be due to the wide variety of dog body types and the wide varieties in the amount of snake venom injected, depths of bite, and the bite location on the dog's body; 2) The purpose of the vaccine is to reduce the time from re-exposure to venom toxins (a snake bite following inoculation) to produce antibodies (called memory T-cells). The part that is illogical to a large number of veterinarians is that, with a snake bite on a small animal, you don't have a few days for the production of antibodies. Red Rock Biologics have not demonstrated that the vaccine will stimulate enough antibodies – and quickly enough to neutralize the venom. "If you do decide to use the vaccine, it's important not to develop a false sense of security. Owners need to understand that this vaccine will not eliminate the need to take the dog for care should he be bitten. It may buy some time to get him to the veterinarian; then again, it may not. Don't assume the vaccine will provide any amount of cushion". (The Rattlesnake Vaccine for Dogs: Both sides of the Story by Dr. Laci Shaible, 2020)

So, if you have the inclination to let your dog off its leash in the Open Spaces or other wild areas of New Mexico, remember, that as your dog's Person, you have the responsibility to look out for their instinctual behavior. Most city dogs (particularly younger dogs) don't have "snake training", but they do have an insatiable curiosity to checkout basking snakes and will take off with the boundless enthusiasm/lack of judgement of 2-year-old human hyped on sugar to chase the very same prey as those hunted by rattlesnakes. The ultimate discussion over prey rights and trespassing can be deadly.

Summary

Rattlesnakes are common in our area. Long an icon of many cultures in the American Southwest, the rattlesnake and the Western Diamondback in particular, plays an important role in controlling the rodent population and preventing several nasty diseases from spreading widely. Left on their own they are reclusive not highly aggressive but, when provoked, will attack quickly and effectively with a venomous strike. Fortunately for humans the bite is rarely lethal because venom is slower acting than that of many snakes and it is easily counteracted by a widely available antivenom serum. Full recovery is common.