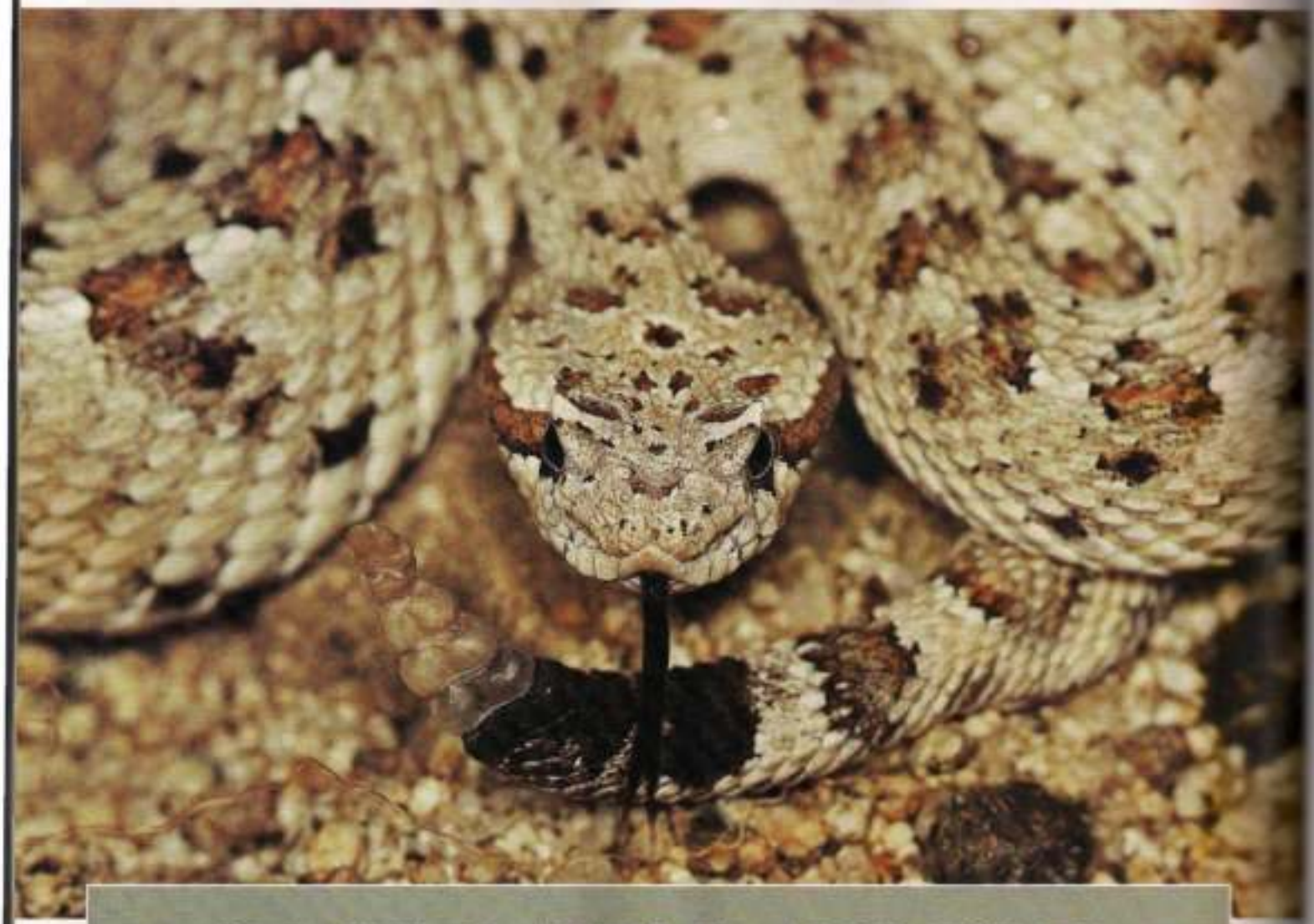


SNAKE, RATTLE, AND ROLL

Rattlesnake conservationists work tirelessly to emphasize the often maligned reptile's importance to the ecosystem.

By Stephanie Stephens

An enduring symbol of independence and strength in America, the rattlesnake remains one of the most misunderstood and feared of all species. For eons, the human response to rattlers has been "kill or be killed." And Hollywood hasn't helped: The rattlesnake scenes in films like *True Grit*, *Two Mules for Sister Sara*, and *Raiders of the Lost Ark* continue to ratchet up the fear factor. But that perception is beginning to change as ranchers, who have long shared their land with and protected their livestock against this ostensible foe, begin to pursue a new rattlesnake reality in the West.

While it's not especially natural to empathize with beady-eyed creatures that have been demonized throughout history and rounded up for mass killing, the idea that "the

only good snake is a dead snake" is an erroneous one, says Steven J. Beaupre, Ph.D., a biology professor at the University of Arkansas in Fayetteville. Snakes play an important role in sustaining the earth's fragile balance of nature, and, although often unjustly persecuted, they offer humans many benefits. For example, according to the National Institutes of Health, snakes are the prized research animals for some scientists seeking better treatments for such disorders as high blood pressure, heart disease, stroke, Alzheimer's disease, and cancer.

"Serious diseases lurk in nature, and healthy ecosystems provide protective effects. Rattlesnakes exactly fit the bill," Beaupre says. "They're critically important natural rodent-control agents and voracious small-animal predators that help keep rodent-born diseases like hantavirus and bubonic plague in check."

Beaupre also says Arkansas timber rattlesnakes may actually help control Lyme disease by consuming large numbers of white-footed mice that carry the bacterial infection. "Plus, any rancher who stores grain knows how devastating rodents can be to his supply," he notes.

In addition to rodents like ground squirrels, chipmunks, and mice, rattlesnakes eat birds, lizards, and insects that typically share their sunny, rocky, and arid locations. They're rarely found in densely populated areas, but there are exceptions. These include a May 2012 encounter at a Wal-Mart in Clarkston, Washington, during which a male customer was bitten by a rattlesnake he initially thought was a stick on his leg in the store's garden department.

The customer didn't have much time, but perhaps prior knowledge about the rattlesnake's appearance and habits could have helped him distinguish a reptile from a piece of wood. For starters, most rattlesnakes live mainly in the Southwest, especially Arizona, and have a distinctive triangular head, narrow neck, and stocky body. There are 32 known species of rattlesnakes and up to 70 subspecies, which are all part of the larger viper family—one of only two types of venomous snakes in this country.

But it is their subfamily of pit vipers that provides a clue as to how rattlesnakes hunt. In addition to being able to detect prey by scent and sound (which vibrates through their jaw), rattlesnakes utilize a sophisticated heat-sensing capability—a "pit organ" or "infrared eye" located between their slit-like eyes and nostrils—that allows them to "see" warm-bodied prey as a thermal image.

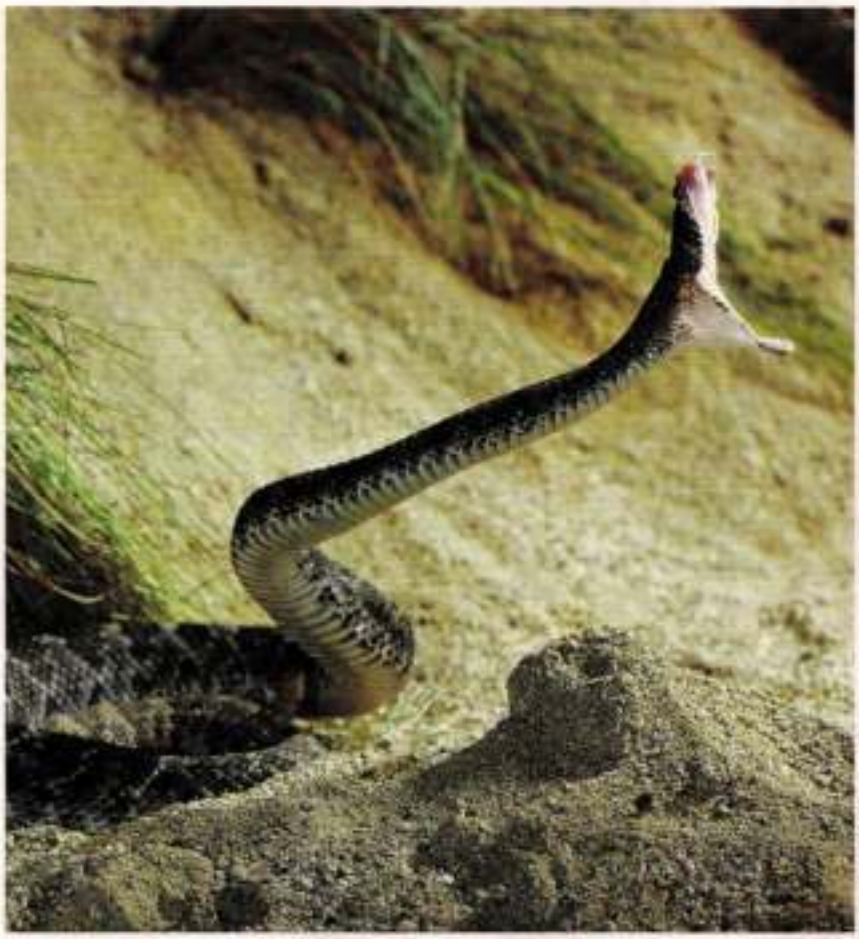
While information about snake biology and appearance is useful, experts at the Arizona-Sonora Desert Museum—which is located in an area with more species of rattlesnakes than any other in the world—caution that when you identify one, you should leave it alone. Trying to kill a rattlesnake only puts humans at greater risk.

Making Snake Sense: What You Need To Know

Can we all get along? Harry W. Greene, reptile expert and Cornell University professor of ecology and evolutionary biology, shares some practical advice about how to coexist with rattlesnakes: "There's not a snake anywhere that wants to have anything to do with you."

- Rattlesnakes like temperatures between 80 and 90 degrees. They may hibernate in colder climes when the temperature drops from September through March, but in many warmer parts of the country they remain active year-round.
- Humans are most commonly bitten on the hands and lower body. To avoid a bite, be aware of your feet and where you're walking—such as in tall grass—and carry a walking stick. Avoid stepping over logs and sitting on boulders where snakes like to take shelter, and don't squat in the wilderness without looking first.
- If you hear a rattle or see a snake "rise up" in a defensive display, don't panic or do anything hasty. Look around and then back up slowly.
- You may not hear a rattle from a young snake, but that doesn't mean it won't strike—young snakes can often feel more threatened than adults.
- This should go without saying, but don't "hassle" or pick up snakes.
- Cowboy boots are historically known to afford good—but not always complete—protection, as do hiking boots, snake chaps, or gaiters.

If The Snake Bites



What should you do if you're bitten by a snake? Call 911. The bite is probably not a death sentence, but you should seek medical attention immediately. Most fatalities occur from an allergic reaction to venom, but shock and tissue damage are more common reactions—as is swelling and severe pain. Symptoms may occur quickly.

- Stay calm and quiet while immobilizing the affected limb, ideally at or below the level of your heart. If you must walk, wait 20 minutes for the toxin to localize instead of spreading.
- The Mayo Clinic warns not to cut the bite or try to remove the venom, and not to apply a tourniquet or ice. Cleanse the wound, don't flush with water, and cover with a clean, dry dressing.
- Don't take anything by mouth, including medications, unless directed by a doctor who is qualified to deal with this medical emergency.
- Don't worry about finding the snake, but try to remember its color and shape so you can accurately describe it and receive appropriate medical treatment. Symptoms will begin immediately, which a doctor will recognize and assess appropriately.
- Don't pick up the snake even if it is dead. A dead snake's head can continue to bite for several hours due to a reflex.

That's one good reason why shooing, not shooting, is the preferred protocol on Lily Starling's 400-acre walnut farm in California's Central Valley, where she relocates rattlesnakes to a den away from the houses. "Rattlesnakes keep the squirrels down," she says. "My grandfather, Bill Hamilton, a well-known zoologist at the University of California, Davis, as well as a farmer, started the practice, and the three generations living on the ranch continue it. We shoo them into an empty plastic garbage can, drive them out, and turn them loose in the dry creek bed."

On the Pacific Coast, with sheep, goats, chickens, and a turtle rescue living on her Malibu, California, ranchette, Susan Tellem says she never kills rattlers because they help control the mouse and rat populations. "Just buy yourself a snake hook and move the snake to another area or call a snake rustler."

"Live and let live" is also Brenda Avadian's approach in the Angeles National Forest. "Only when we have overnight guests with children or animals do we do a thorough check and chase 'em away," she says. "Otherwise, we remain cautious as we walk around our property. After all, we live in their territory."

Once Bitten, Twice Shy

Despite the best of intentions, sometimes a rattler encounter is unavoidable. "We do not bother them, but if they enter our living space, it's tit for tat—whoever strikes first wins the day," says conservationist Pablo Solomon, whose historic Moses Hughes Ranch is situated north of Austin, Texas. In his experience, rattlesnakes strike at any animal or person that they perceive as a threat. "Often that only means getting within striking range while walking, picking up a toy, moving something, stepping on your porch, loading a bale of hay, putting on a boot in which a small rattlesnake has wiggled into, opening a drawer in a barn into which a rattlesnake has followed a mouse, walking under a mesquite tree limb in which a rattlesnake has climbed to get out of the heat, stepping out of your pickup, picking tomatoes, or walking in the bluebonnets."

So what happens if the snake strikes first? Rattlesnake bite severity is determined by the type of rattlesnake as well as the potency and amount of venom it injects, says Cameron Young, founder and executive director of the nonprofit Center for Snake Conservation in Louisville, Colorado. The most frequent "illegitimate bites" are to men between the ages of 18 and 30, he says, who have been drinking alcohol and are trying to "play" with rattlesnakes, or kill them. On the other hand, approximately 20 percent of bites are "legitimate," meaning they occur when a human is accidentally bitten while in the snake's ecosystem.

In the United States, 8,000 snakebites occur annually, of which 70 percent are caused by rattlesnakes. But deaths are rare. No more than 12 fatalities from any type of snake venom were reported in a single year between 1960 and 1990, and oftentimes these were due to the fact that the bite victim did not seek proper medical care.

In a threatening situation, a bite is a last resort since a rattlesnake's first line of defense is not to be noticed at all, Beaupre says. The animal usually blends seamlessly with the surroundings and is fairly confident about camouflage.

A rattlesnake that is noticed and threatened doesn't wait around. "A second line of defense is to bluff—to rattle and puff up to cause an attacker to think twice," Beaupre explains. If that fails, there's the backup plan. "It appears the snake is thinking, 'My rattle isn't working, these large animals—cows, horses, or people—don't see me and I'd better move away fast,'" says Young. "Livestock know how to avoid rattlesnakes—I've seen cows just go right around them."

When escape isn't possible and intimidation doesn't work, this carnivorous creature that travels at a mere 2–3 mph gets serious about a strike. "It's faster than you and I can see, and then the snake is back in 'recoil' position before you know it," Young says.

If the strike culminates in fang penetration, it may or may not include the release of venom. But when the rattlesnake does lash out with intent—to bite, immobilize, and ultimately digest small prey—this precise predator doesn't miss the target and carefully controls the amount of venom released.

"Venom is for killing prey, not defending," explains Young. "When they occur, bites to humans can be serious because the snake unloads so much venom to that 'large animal'—again because it feels its life is at risk."

The myth that snakes chase people to bite them is just that, he says. "It makes no ecological or evolutionary sense for a snake to bite something bigger than it can eat."

Don't Tread On Me (Please)

Cornell University ecology and evolutionary biology professor Harry W. Greene doesn't deny that having livestock bitten occasionally isn't trivial, but the overall impact of rattlesnakes on ranching is probably exaggerated. Case in point: In the early 1950s, Laurence Klauber conducted research for his landmark 1956 book, *Rattlesnakes: Their Habits, Life Histories, and Influence on Mankind*, by sending postcard questionnaires to county agriculture agents in all Texas counties asking if snakebites to livestock were a serious problem. The overwhelming response was "no."

Hoping that "yes" is the answer to whether rattlesnakes will occupy a significant, long-term place in the ecosystem, Young believes the onus is on humans, not snakes.

The American Society of Ichthyologists and Herpetologists, a science organization dedicated to the study of fish, amphibians, and reptiles, agrees. Its members laid out requirements for rattlesnake conservation in a position paper that reads: "To persist, each species of rattlesnake must overcome unregulated hunting, harvesting for roundups, and significant loss of habitat in response to agriculture and urbanization. Their life history traits are shaped by evolutionary history and current conditions, and each species responds differently to the destructive pressures exerted by human activities."

Basically, the story is the same for rattlesnakes as it is for coyotes, deer, skunks, raccoons, and other wildlife. Humans take precedence and encroach on their territory, with deadly results for the animal.

"Roads and snakes don't mix very well," Young says, for warm pavement is often a fatal attraction for these cold-blooded animals. Increased urban and residential development is decreasing the habitat available to rattlesnakes, which, in turn, raises the chance of a potentially dangerous encounter with humans.

The promise of coexistence lies in knowledge, as Senegalese environmentalist Baba Dioum once eloquently said: "In the end, we will conserve only what we love, we will love only what we understand, and we will understand only what we are taught."

For Beaupre, Young, and Greene, understanding can't come soon enough for an animal that already claims nearly 10 million years on earth.

Meanwhile, back on his Texas ranch, Solomon keeps it real. "While all life is precious, sometimes you just have to follow the rules that Mother Nature lays down—look out for the safety of your family first."

For more information about rattlesnakes, visit the Arizona-Sonora Desert Museum website at www.desertmuseum.org.