

NEWS FROM THE PIT

Arizona Poison and Drug Information Center



No Entry, No Snake-Rattlesnake Fencing as Physical Prevention

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In the previous article, we discussed passive methods of snake deterrence. Those actions, while effective, inexpensive, and relatively easy to do, can't guarantee the end of all residential rattlesnake conflict. Even a property devoid of attractive elements may remain at the mercy of the surrounding area. A nearby pile of erosion control rock or the neighbor's lantana jungle may always bring rattlesnake conflict by proximity and line of travel. These situations are typically beyond the homeowner's control, leaving some limitations on passive methods alone.

This is where active prevention methods take over. These do not rely on assumptive behavior of the snake but are meant to provide more absolute control over an area by creating physical barriers. These may be smooth block walls, tightly sealed garage doors, and other construction elements installed specifically to separate wildlife from a protected area.

An increasingly popular method of physical barrier, designed specifically for rattlesnake exclusion, is a rattlesnake fence. In this article, we will cover important factors of rattlesnake fencing and outline challenges which may hinder its effect on public safety.

NEWSLETTER HIGHLIGHTS

Proper use of rattlesnake fencing to prevent rattlesnake encounters at residential locations

Image 1: Rattlesnake climbing through view fence without snake fencing, as photographed by a rattlesnake relocater in Phoenix.

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First, a note about terminology. The dozen or so other names for this method, including snake fence, snake proofing, snake barrier, and others, may be misleading without additional discussion. Harmless species, such as the Sonoran Gophersnake (*Pituophis catinefer ssp.*) and kingsnake (*Lampropeltis sp.*), are more able climbers than the heavy-bodied rattlesnakes and are able to get into areas that a rattlesnake is unable to. Similarly, tiny snakes such as the Western Groundsnake (*Sonora semiannulata*) or Desert Nightsnake (*Hypsiglena chlorophaea*) are smaller as adults than even newborn rattlesnakes, rendering preventative measures useless. However, the difference between preventing rattlesnakes and these harmless species is that of preventing potential danger rather than just avoiding undesirable animals. Aside from the fact that creating an effective barrier that would prevent entry of all species of Arizona snakes would be impossible, it is simply not necessary. For the purpose of this article and common references of the topic, it should be assumed that the standards and methods described are specifically for rattlesnake exclusion. While entry by non-target species may be greatly reduced, there should not be any expectation of absolute prevention.

What is a snake fence?

An outer perimeter already protects most homes that are candidates for snake fence installation. In Arizona, these are typically one of a few forms: concrete block, iron view fence, or a combination of these elements. A snake fence is not a free-standing construct, but a series of modifications and additions made to these existing structures. These enhancements create distance, close gaps, and remove climbable surface and texture to a tolerance beyond the physical capabilities of rattlesnakes.

The materials used for snake fencing should match the durability and aesthetic properties of the hosting structures. Recommended materials include plate steel and steel mesh, aluminum, and concrete. Affixing methods should similarly be considered long-lasting or permanent, able to withstand years in the brutal Arizona sun, and resistant to rust. It should also be strong enough to resist damage and typical wear and tear without compromising effectiveness. For instance, plastic and rubber should be avoided, because they break down relatively quickly in the desert sun. Instead, screws or other metal fixtures should be used.

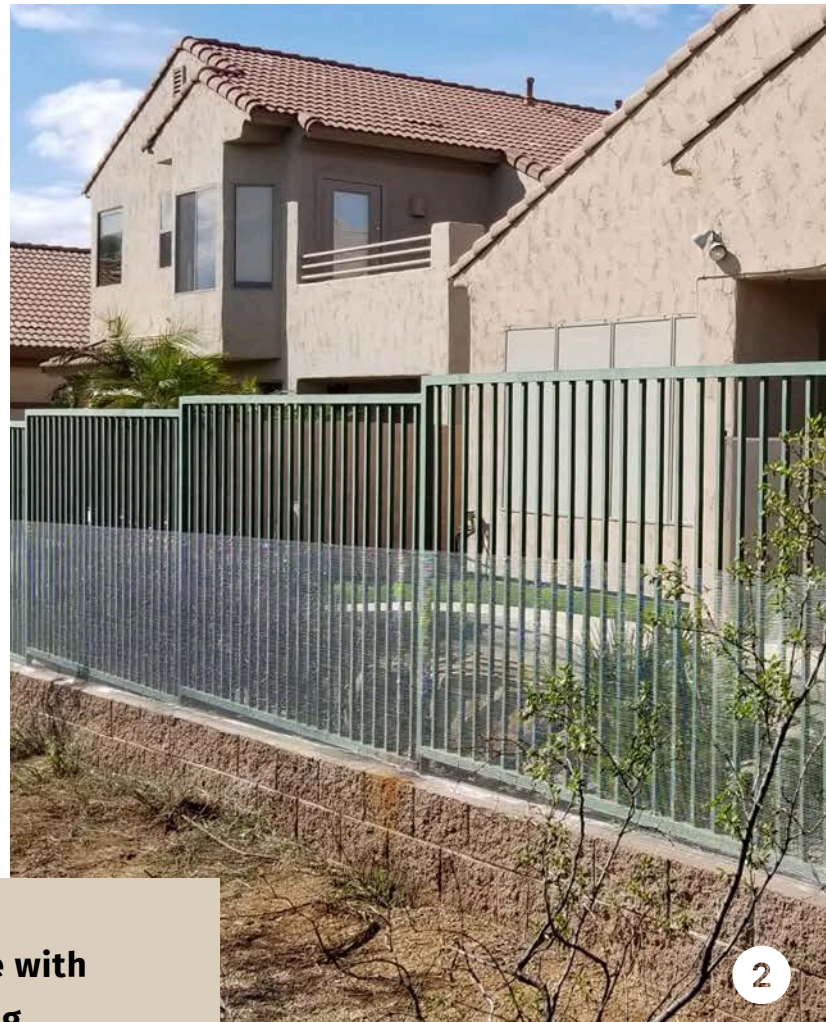


Image 2: The typical Phoenix-area home with properly installed rattlesnake fencing.

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Who needs a snake fence?

A home located in the middle of the city probably has no need for snake fencing. There is sometimes a perception, especially to new residents, that rattlesnakes are under every rock ready to attack. Fortunately, that is far from the truth. Residential rattlesnake encounters tend to occur near native deserts. However, sometimes residential properties and natural deserts may be interlaced.

Rattlesnakes differ from other animals that many consider pests in that they pose a real, potentially life-threatening danger to people and pets. Termites, cockroaches, and other items on the “pest control” list are not something anyone wants in their home. However, if a roach is spotted in the kitchen, there is no potential for a life-threatening encounter. When considering whether snake fencing should be an option, decision should be based on the potential for real danger.

The walls, gates, and fences that are standard in modern developments are not designed to effectively exclude wildlife. Every neighborhood is like this to some degree, with few taking it into consideration. Think of snake fence installation as a last measure to make your property safe, in addition to passive methods.

Who should install snake fencing?

Snake fence installation is an increasingly popular service offered by wildlife services organizations and fence installers. Homeowners, too, can install their own snake fencing with simple tools and materials available at any hardware store. While methods may differ, a snake fence will be effective as long as the standard tolerances are met without compromise.

A professional snake fence installation entity should carry general liability and workers compensation insurance. The activity is also regulated by the Arizona Registrar of Contractors under classes CR-24 (Ornamental Metals) and CR-14 (Fencing). We recommend inquiring with a potential provider for these credentials.

Whether self or professionally installed, city and county construction codes may apply, as well as homeowners' association rules, and other factors of material, measure, and looks. If the property has any restriction to design and build of walls and gates, the snake fence is considered an addition to those structures and subject to the same regulations. In some instances, these rules may prevent its installation. As the solution becomes more popular at Arizona homes, however, more and more homeowners' associations and cities have considerations and rules about it. To learn which rules may apply to snake fence installation at your property, check with the same entities as you would with any residential construction project. These may include the HOA, city government, and county or state permitting offices.



Image 3: Properly installed rattlesnake fencing separating open natural areas from residential activity.

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What makes an effective snake fence and why?

Rattlesnakes are heavy-bodied snakes, built mostly for a life on the ground. They can and do climb, but are not as capable as some other types of snakes. They are also relatively predictable in size per species, being somewhat similar in minimum size when born.

Essentially, there are three principles that must be achieved through the entire perimeter in order to consider a snake fence effective:

- Minimum height of at least 36" from the nearest climbable surface or texture. This is based on experiments with several rattlesnake species to test climbing height against smooth material in various formats and implementations. In all instances, rattlesnakes were able to climb just over half body length. With a reasonable buffer added to the half-size of what would be considered a maximum size of an adult Western Diamondback Rattlesnake, 36" should be considered a minimum height.
- Maximum gap size of 1/4" or smaller. Experimentation with small rattlesnakes' ability to get through small spaces was done with neonate Sonoran Sidewinders (*Crotalus cerastes cercobombus*), being the smallest rattlesnake species in the area. Just hours old and able to coil entirely on a space about as large as a quarter, all were able to climb through 1/2" mesh, but stopped by 1/4".
- The functional elements of a snake fence must be in place entirely. It should never be installed to only a portion of the perimeter. Just as it prevents entry, a rattlesnake within is unable to escape. This means that a perimeter that is sealed entirely but a one-inch gap under a side gate is, effectively, a rattlesnake trap. In situations where it is not possible or reasonable to install snake fencing around an entire perimeter, it is recommended that it is not installed at all. In my experience, properties which have allowed partial installation of snake fencing may have a considerably higher rate of encounter than those at which a rattlesnake is able to continue its way out of the property. It is common to find snake fencing installed only on an outer wall nearest to a natural area, while gates and other aspects are ignored. This should always be avoided.
- Any portion of the fence that comes into contact with soil or rock must be trenched into the ground and buried to an appropriate depth. There is no standard depth that will be suitable for all conditions, though a general guideline would be to go deeper for softer soil or areas prone to erosion or flooding.

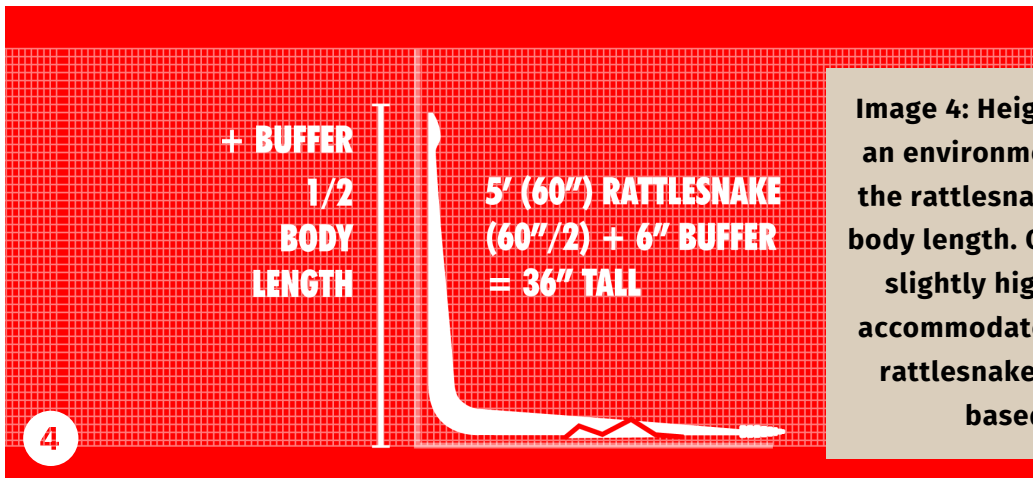


Image 4: Height standards are based on testing in an environment with smooth surfaces, observing the rattlesnake's ability to climb to about half its body length. On uneven ground, this height may be slightly higher, adding a reasonable buffer to accommodate for the unknown. This assumes a 5' rattlesnake is the largest possible in the area, based on confirmed size records.

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These figures should be adhered to regardless of materials, installation methods, or aesthetics. With these standards in place, there may be a variance in build and installation quality. These may affect things like price, build quality and longevity, maintenance times, and overall efficacy. While use of these methods does not mean a rattlesnake fence will be initially ineffective, these methods should raise some doubts:

- Plastic zip ties can snap in as soon as a few months in the Arizona sun, leaving gaps in the fence and creating a snake trap out of your yard. They can also slip down fencing over time, warping the mesh and creating gaps, wavy-mesh, and other problems.
- Metal wire ties can quickly rust, degrade, and eventually break, causing gaps and unattractive waves in the mesh. They can damage the fence, accelerating rust and corroding iron bars.
- Any non-rigid materials will eventually warp or lose strength, creating gaps. These include any rubber, brush-style sweeps, plastic, and to a lesser degree fiberglass and high strength plastics.

There may be some instances where using wire ties is justified, like on a surface that's just too thin to attach screws to, or if the fence is built of solid steel or rebar, but that's about it. The snake fence installers should be able to answer your questions about this, though don't be fooled into thinking plastic is going to hold up to the desert sun for long.

The materials that make up the rattlesnake fence are only as good as the way it is fastened to the existing fence. This is one of the details that causes the most failures, so it's nothing to overlook.

Making it look as good as the rest of the property

When snake fencing is installed without considering aesthetics, it can look like braces put in by a blind dentist — metal hanging in rough, uneven edges, wire hanging and bent along the bottom of gates, and generally detracts from how the yard should look. Aesthetics need to be considered during the design process. When done properly, mesh, screws, plates and concrete blend in with the existing fencing to look like it was always part of the property. These improvements may also help satisfy HOA rules for aesthetic standards.

Some aesthetically driven upgrades that are often available:

- Steel can be painted to match the color of the rest of the fence or gate, or at least be close enough that the added materials do not stand in stark contrast or become an eyesore.
- More elaborate or stylish materials may be used in place of steel mesh for decorative courtyard gates, like expanded aluminum or plate metals. As long as the functional standards remain unchanged, these materials can be about anything.
- Mesh around the perimeter can use colored PVC-coated or painted metal to either match the surrounding color or become less visible.

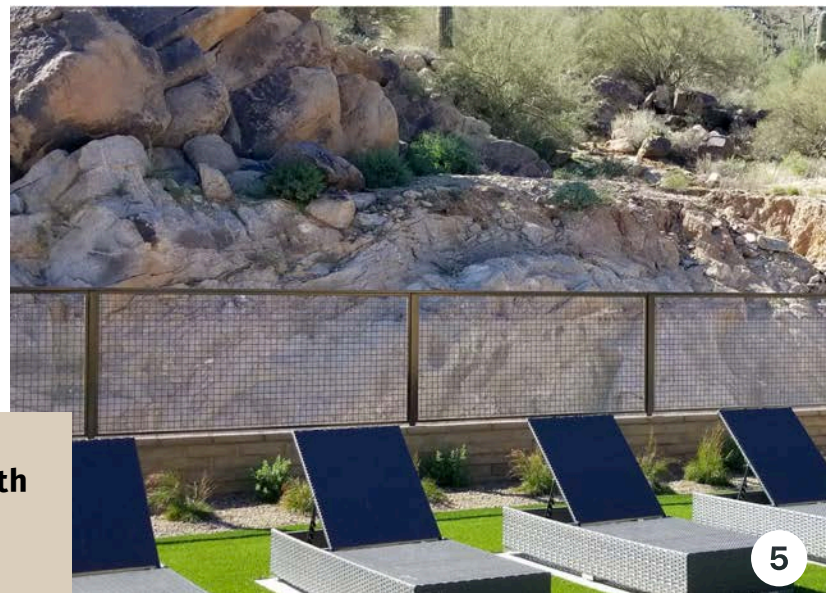


Image 5: Rattlesnake fence installed to work with existing aesthetics of the property.

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What about chemical or sonic snake repellents and other “snake oil”?

While chemical granules, mothballs, electric sonic emitters, and others are popular products at every local grocery store, there is no evidence that they are effective in any way.

Chemical snake repellents are inexpensive, but ineffective. Rattlesnakes simply don't care about them. In my experience removing thousands of rattlesnakes from homes in Arizona, there is absolutely no difference in snake activity at homes that pay for snake repellent and homes that don't. Many pest control companies that sell it know this, but sell it anyway because, as I've been told numerous times: “customers ask for it”. It's a scam; don't fall for it. In our opinion, the sale of a product known to be ineffective where potential life-threatening injury is possible is highly unethical. Currently, snake fencing combined with keeping a clean, rodent-free property is the most effective method to keep snakes out of a yard.

- Rattlesnakes can and do crawl over rope, horse hair or otherwise. They don't care.
- Rattlesnakes are not repelled by sprinkling coffee grounds around the property.
- Mothballs fall into the same category as item #1 – they just smell bad, and rattlesnakes aren't repelled by them. It is not uncommon for snake relocation professionals to find rattlesnakes sleeping or hunting among small piles of mothballs, entirely oblivious to their purported effect.



Image 6: Don't waste your money on chemicals--rattlesnakes could not care less. This is an unposed photograph of a rattlesnake taking shelter under unopened bags of snake repellent within a yard heavily-treated with the chemical

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What works and does not work: rattlesnake proofing fact and fiction

Rattlesnakes have some climbing ability, but they can't climb straight walls or metal. Rattlesnakes do sometimes hang out in trees or low branches of bushes or climb through cracks in rocks ... but these rough and well-edged surfaces are a very different situation than the modern block wall or wire mesh. If rattlesnakes don't have a "foot"-hold, they simply cannot climb a smooth surface. There will always be people who claim to have seen it first-hand, but these are either exaggerations or the misidentification of more capable climbers, like gophersnakes, coachwhips, and kingsnakes.

It is incredibly unlikely that rattlesnakes will climb up adjacent trees to drop into the yard. While it's something that could happen, rattlesnakes would not want to do this. Their bodies are heavy, and a drop from even a small height can cause severe injury or death. While landscaping along edges may be a climbing hazard, large trees with branches overhanging the protected area should not be a concern.

As stated elsewhere in this article, it must be made very clear to anyone looking to have rattlesnake fencing installed that it will not prevent the entry of all species of snakes. Regardless of method and frequency of this message, it can still be a surprise to many who are surprised by a harmless gophersnake in a perfectly protected backyard.

Maintenance matters, even with rattlesnake fencing installed

Even with the best rattlesnake fence installation completely protecting an area, landscaping and pest control considerations persist. Even when materials, like steel and concrete, are made to last as long as the house, factors like erosion and wild animals require at least some attention to make sure the area remains secure. However, this can be performed by the homeowner in most cases on rare occasions, usually with little effort.

Landscaping can be a challenge for many properties, especially those which back up against natural areas or adjacent properties beyond the control of the homeowner. If vegetation is allowed to grow along the outer edge of the fence line, it can provide a climb risk where snakes can easily get up and over. To prevent this, it is recommended that all vegetation on the outward side of the fence be entirely clear to a space of 36", or whatever distance is reasonable. If this space is under the control of a homeowner's association or similar entity, this can often be resolved by contacting the organization to request its clearance, or permission to clear it on their behalf. To differentiate the request from the more typical landscaping related inquiries they may receive, it can be effective to cite the potential issue and risk to safety if it is not addressed.

While a properly installed rattlesnake fence is trenched into the ground and situated in such a way that rodents and other animals would have great difficulty digging under it, this is always something to watch out for. All it takes is one motivated rodent to open a one-inch gap under mesh and the yard becomes a giant snake trap. To prevent this, remain watchful and aware of rodent activity. If one location seems to be more problematic than others, use a garden hose to fill and collapse holes, and fill or cover with gravel where appropriate to prevent future digging. The fact is, however, that in the areas where rattlesnake encounters are common, other wildlife will always exist and ongoing rodent prevention will always be required.

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Making nice with the neighbors, and the neighborhood

Perhaps the greatest and most time-consuming challenge for many homeowners who wish to protect their properties from rattlesnake encounters are rules and restrictions enforced by homeowners' associations. In most communities where rattlesnake protection is needed, there are specific stipulations around aesthetic and structural properties of fencing, gates, and any outward-facing elements.

This in itself is not an issue, but each HOA typically creates its own set of rules based on aesthetics and adherence to standards that often defeat the fence's functional aspect. For example, the fence may be required to be only 18" tall or use materials that degrade in the sun or fail quickly, like zip ties or rubber sweeps. While these may seem reasonable requests, they often negate the purpose entirely.

A common example: many HOAs, in their initial set of snake fencing rules, require 1/2" gap size mesh. The belief is that less wire is less visible. The larger gap size, though, would allow small rattlesnakes to enter the yard. However, the 1/2" gap size mesh typically is made of a heavier gauge, ironically being more visible than the 1/4" gap, thinner mesh. Similarly, mesh, which is required to be painted to match approved colors, will result in a thicker, more visible surface.

The practice of effective rattlesnake fencing with well-developed standards is still relatively new and has little in the way of official industry-wide standards that these communities can draw on to create rules. When homeowners present a reasonable argument for the functional requirements of rattlesnake fencing, most communities are open to revising rules. The last thing an HOA wants is to get a request from a homeowner to protect their property from rattlesnakes, deny it in writing, and then take on potential liability if a bite occurs.

Working with neighbors can be a challenge at times, too, in situations where a shared fence line is part of the protected perimeter. This can be further complicated if the homeowner has landscaping or decorative elements that would prevent the normal installation of rattlesnake fencing. In such situations, it can be effective to discuss it with the neighbor and suggest a combined solution or offer to pay for a portion of their installation.

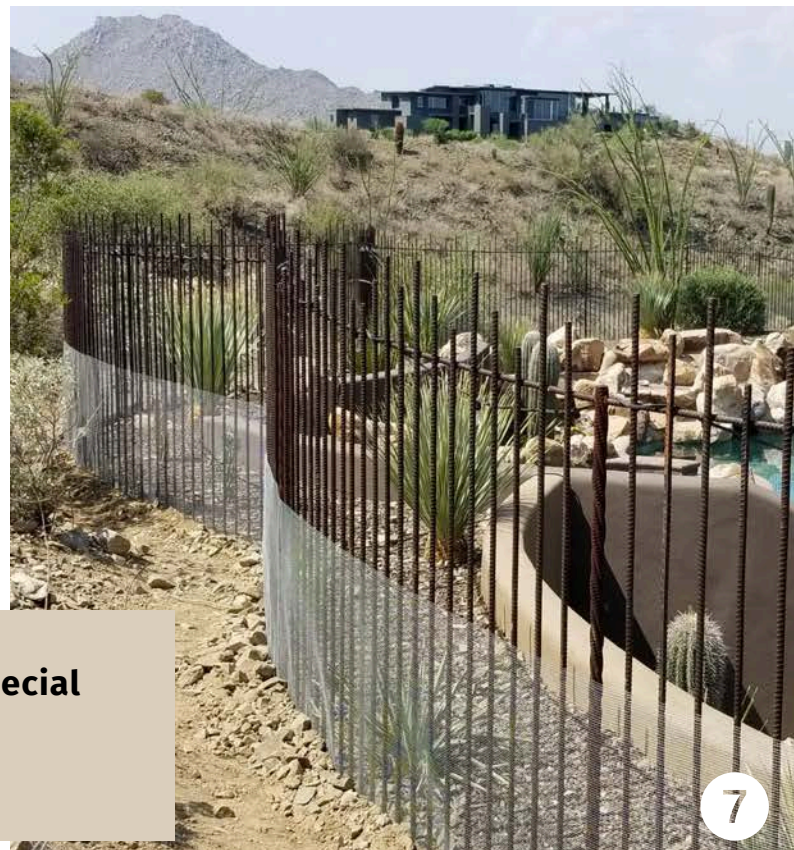


Image 7: Rattlesnake fencing applied with special standards required by an HOA.

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Rattlesnake fencing is not the entire solution, but an important aspect of public safety.

Rattlesnake fencing will not entirely prevent a homeowner from the reality of living near wild spaces. Outside of the protected area, rattlesnakes can still visit, and the occasional snake on the roadway on the way to get the mail can't be avoided. Potential encounters with wildlife should be part of the decision-making process when deciding on a home purchase. Rattlesnakes are no different and may be just as much a part of the landscape as the boulders and saguaros.

Regardless of ethical and ideological reasoning, it is not feasible to entirely remove rattlesnakes from an area adjacent to natural habitat. Unexpected encounters with venomous snakes may always be a possibility in these zones, and residents are better off finding ways to safely live with the situation. The fantasy of old-school thought, where individual rattlesnakes are eliminated with an expectation that this process of local extirpation will someday be completed, obscures more productive, preventative action. The act of reducing potentially dangerous encounters is more easily controlled at a property level than a regional wild-urban conflict boundary. The difference between a rattlesnake living its life in an adjacent wash and avoiding detection and one found sleeping on the back patio may only be a few yards, but from a safety perspective, on another planet. That distance, regardless of the figures and materials, is ultimately what rattlesnake fencing should be.

While rattlesnake fencing has been available for many years in some form, more precise techniques as an aspect of greater sustainable integration with the surrounding environment are still in the early stages. Its advancement could be both a great impact towards reduction of residential venomous snake bites in Arizona. Rattlesnake Solutions and Arizona Poison and Drug Information Center are committed to preventing snake bites by providing the most current and accurate information available.