
RATTLESNAKES

Integrated Pest Management In and Around the Home

The rattlesnake is California's only native venomous snake. Nine species are found in various areas of the state from below sea level to about 11,000 feet. Their size may vary, and adults of some species may reach 6 feet in length. Rattlesnakes are an important part of the ecosystem, feeding on rodents, birds, and other small animals.

Rattlesnakes have a distinctive, triangular-shaped head, which can be helpful in their identification (Figure 1); and as their name implies, most have a rattle on the tail end. The harmless gopher snake (*Pituophis catenifer*) appears similar to rattlesnakes and can alter its posture to mimic the triangular head shape (Figure 2) but will always lack a rattle. The rattle lies at the end of the tail and is composed of interlocking horny segments of shed skin (Figure 3). Young rattlesnakes are born with a small rattle or button (Figure 4). A new segment is formed each time the skin is shed, which may occur several times a year. The size of the rattle is only a rough indicator of age because the terminal segments often break off on older snakes. Because rattles can shorten or be broken off completely, the lack of a rattle does not mean the snake is not a rattlesnake.

The most widespread rattlesnake in California is the western rattlesnake (*Crotalus oreganus*), found from the northern part of the state as far south as Santa Barbara County and from sea level to 7,000 feet. Two closely related species (*C. helleri* and *C. lutosus*) are found in coastal Southern California and in the northern Sierra Nevada, respectively. The sidewinder (*C. cerastes*) is the smallest rattlesnake and is so named because of its peculiar method of sideways locomotion. The sidewinder is sometimes called the horned



Figure 1. A western rattlesnake (*Crotalus oreganus*) has a triangular head, elliptical pupils in the eyes, and is often heavy-bodied with a rattle at the end of its tail. Its head is usually noticeably larger than its neck.



Figure 3. A closeup photo of the tail of a Mojave rattlesnake (*Crotalus scutulatus*) showing the interlocking segments of the rattle that are added each time the animal sheds as it grows.

rattler because of the hornlike scales above its eyes. It is most commonly found in sandy desert areas from below sea level to 6,000 feet. The Mohave rattlesnake (*C. scutulatus*) ranges across the desert and foothills of southeastern California from sea level to higher elevations. The southwestern speckled rattlesnake (*C. mitchellii*) ranges from Baja California northward across much of the Colorado, Mojave, and Sonoran Deserts, overlapping with the red dia-



Figure 2. A harmless gopher snake (*Pituophis catenifer*) will sometimes mimic a rattlesnake by vibrating its pointed tail and shaping its head into a triangle. However, gopher snakes never have a rattle on their tails, are usually thinner throughout the body, have a glossy body, have round pupils in their eyes, and their heads are only slightly larger than their necks.



Figure 4. Like all rattlesnakes, this young speckled rattlesnake (*Crotalus mitchellii*) is born with only a button on its tail in place of its rattle. Its rattle will grow in length each time the animal sheds as it grows.

mond rattlesnake (*C. ruber*) in western parts of its range and the sidewinder farther east. The Panamint rattlesnake (*C. stephensi*) is closely related but has a more northerly distribution in the inland desert regions of Southern California. The red diamond rattlesnake is found in Baja California and in southwestern California south of Los Angeles. The western diamond-backed rattlesnake (*C. atrox*) is seldom seen in California but occurs in the extreme

PEST NOTES

University of California
Agriculture and Natural Resources

Statewide Integrated Pest Management Program

Publication 74119

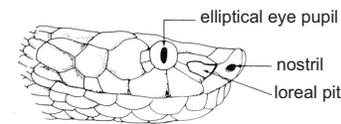
December 2014

southeastern part of the state in desert regions.

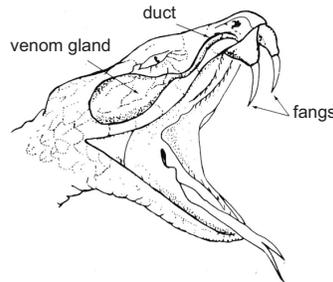
BIOLOGY AND BEHAVIOR

Most rattlesnakes forage for prey in or near brushy or tall grass areas, rock outcrops, rodent burrows, around and under surface objects, and sometimes in the open. Adults eat live prey, primarily rodents; the young consume mostly lizards and young rodents. To catch their prey, rattlesnakes wait until a prey animal is nearby. The snake strikes with two large fangs that inject venom (Figure 5). This subdues and usually kills the prey, which is then swallowed whole. Rattlesnakes feed on carrion less frequently.

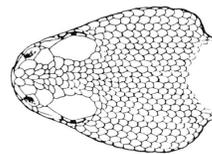
When inactive, most rattlesnakes seek cover in crevices of rocks, under surface objects, beneath dense vegetation, and in rodent burrows. In some areas, rattlesnakes hibernate for several months in the crevices of rock accumulations. Unlike many reptiles, rattlesnakes give birth to live young.



Pit viper head showing the elliptical pupil and location of the loreal pit.



Rattlesnake venom injection system.



Rattlesnake head. Note the triangular shape.

Figure 5. Distinguishing features of pit viper.

Newborn snakes require protection for 1-2 weeks and are likely to be born in abandoned rodent burrows, rock crevices, or in other secluded places.

Rattlesnakes are among the group of snakes called pit vipers because of the small pits on each side of the head between the eye and nostril (Figure 5). These pits are temperature-sensitive structures that assist the snake in finding prey, even in complete darkness. The tongue is also used to detect the scent of prey. Rattlesnakes have a specialized venom delivery system. Venom is produced in glands behind the eyes and then flows through ducts to the hollow fangs. Normally the fangs fold back against the roof of the mouth and when a snake strikes, the fangs pivot forward to inject venom (Figure 5). Rattlesnakes may occasionally bite without injecting venom, often called a 'dry' bite. However, even after its death, a rattlesnake can still inject venom for an hour or more by reflex action. Caution, therefore, is advised when handling what appears to be a dead snake.

What Should I Do for Initial First Aid?

Because most Californians live in rattlesnake country, a snakebite emergency plan should be developed before it is needed. If you are less than one hour from the nearest emergency room, initial treatment is relatively simple:

- Try to calm the victim.
- Gently wash the area with soap and water.
- Apply a cold, wet cloth over the bite.
- Transport victim to the nearest emergency facility for further treatment.
- Phone ahead to notify the emergency facility that a snakebite victim is being brought in.
 - If safe to do so, have someone photograph the snake so that identification can be made to aid in treatment.

What should NOT be done after a rattlesnake bite?

Several DON'Ts are very important to remember:

- DON'T apply a tourniquet.
- DON'T pack the bite area in ice.
- DON'T cut the wound with a knife or razor.
- DON'T use your mouth to suck out the venom.
- DON'T let the victim drink alcohol.
- DON'T apply electric shock.
- DON'T use a snakebite kit as these do not work and can cause more damage.

Call: 1-800-222-1222 any time, any place in California (California Poison Control System)

Snake Bites

In the United States, about 1,000 rattlesnake bites are reported annually, although typically fewer than 4 people die from these bites in a given year. Although seldom fatal, bites can be extremely painful and can lead to severe tissue loss and medical trauma. It is important to never handle rattlesnakes, not even dead ones.

Those who enjoy hiking should determine first whether rattlesnakes are found in that area and under what conditions they might be encountered; however, rattlesnakes may be very sparse or nonexistent across parts of their range. In addition, they can sometimes be transported into areas outside their normal range, either by humans or by natural mechanisms such as floods. If rattlesnakes are in the area, they will most likely be hidden in rock crevices, under logs, in heavy brush, or in other areas where they are protected, including tall grass; but they can also be found on roads, paths, and other areas where cover is limited. Be careful when moving brush, wood, logs, or

other debris. In rattlesnake country, be alert when kneeling down to work in the garden and watch where you step. Since rattlesnakes are often well camouflaged and wait quietly for prey, they can be difficult to see. In the wild, rattlesnakes should be left alone as they present little potential hazard. In fact, more than half of venomous snakebites in the United States occur as a result of a person bothering, handling, or harassing a snake, and approximately half of snakebite patients report ingesting alcohol prior to being bitten. Thus, it would seem that one of the key ways to avoid being bitten is to avoid harassing venomous snakes, especially if you are under the influence of alcohol. However, rattlesnakes can still present some risk even if they are not being pestered. For many people, having them around the home or garden is not acceptable. Fortunately, there are ways to minimize potential hazards.

LEGAL STATUS

The nine species of rattlesnakes found in California are not considered endangered or threatened. California Department of Fish and Wildlife Code classifies rattlesnakes as native reptiles. California residents can take most rattlesnake species on private lands in any legal manner without a license or permit, although a bag limit of two still applies. Additionally, the red diamond rattlesnake (*C. ruber*) is prohibited from being taken or killed by state wildlife regulation.

MANAGEMENT

Rattlesnakes add to the diversity of our wildlife and are important members of our ecosystem. They can reduce the number of disease carrying rodents and other pest species. In general, they should be left alone, whenever possible, especially in wildland areas. Nonven-

omous snakes should also be left alone wherever found.

Because of the danger rattlesnakes pose to people, pets, and domestic animals, it can be necessary to exclude or remove them from around homes and gardens.

DETECTION

It is difficult to detect rattlesnakes because they are not easy to see or to find in their hiding places. Be alert to the potential for their presence during the times of year when rattlesnakes are generally active in your region. If rattlesnakes become exceptionally numerous in an area, sightings by neighbors may alert you to expect a problem. Snake populations may fluctuate from year to year; this is thought to be related in part to the availability of prey. Some animals, such as peacocks, turkeys, and dogs, can be good sentinels for detecting rattlesnakes. If your dog behaves in an unusual manner, such as excessively barking or whining, it would be wise to investigate for the presence of a snake. A veterinarian should immediately attend to dogs or domestic animals bitten by a rattlesnake. If you have a snake-proof fence, be sure to check its integrity prior to the time when snakes become active in the late winter or early spring. Remember that keeping the rodent population in and around your yard under control is an excellent way to discourage snakes of all kinds.

Habitat Modification

One of the best ways to discourage rattlesnakes from inhabiting gardens and homes is to remove suitable hiding places. Heavy brush, tall grass, rocks, logs, rotten stumps, lumber piles, and other places of cover should be cleaned up. Keep weeds mowed close to the ground or remove them completely. Since snakes are often attracted to areas in search of prey, eliminating rodent populations, especially ground squirrels, meadow voles, deer mice, rats, and house mice, is an important step in making an area less attractive for snakes. Rattlesnakes cannot dig burrows but will use those dug by

What Can be Done to Prevent a Bite?

Hands, feet, and ankles are the most common sites for rattlesnake bites. Using some common sense rules can prevent most snake bites.

- Never go barefoot or wear sandals when walking in areas where you cannot clearly see where you are placing your feet. Always wear hiking boots.
- Always stay on paths. Avoid tall grass, weeds, and heavy underbrush where snakes may be present.
- Always look for concealed snakes before picking up rocks, sticks, or firewood.
- Always check carefully around stumps or logs before sitting.
- When climbing, always look before putting your hands in a new location. Snakes can climb walls, trees, and rocks and are frequently found at high altitudes.
- Never grab what appear to be sticks or branches while swimming; rattlesnakes are excellent swimmers.
- Baby rattlesnakes are venomous! They can and do bite. Leave them alone.
- Never hike alone. Always have a buddy to help in case of an emergency. Learn basic lifesaving skills.
- Never handle freshly killed snakes. You may still be bitten.
- Never tease a snake to see how far it can strike. You can be several feet from the snake and still be within striking distance.
- Don't keep rattlesnakes as pets. Many rattlesnake bites occur when people tease or play with their "pet" rattlesnake.
- Teach children to respect snakes and to leave them alone. Curious children who pick up snakes are frequently bitten.
- Always give snakes the right of way!

rodents. After controlling rodents, fill in all burrows with soil or sod and pack down firmly.

Exclusion

Rattlesnakes may seek refuge beneath buildings. If there is a gap or opening, they will enter and inhabit a building, just as house mice do. Sealing all cracks and other openings greater than 1/4inch can prevent them from entering. Gaps beneath garage doors are often large enough to permit snakes to enter, especially young ones. In summer, rattlesnakes may be attracted to cool and/or damp places, such as beneath buildings and in basements. Access doors on crawl spaces should be inspected carefully for breaks or gaps. Use caution if you must crawl under a house or other building. Hot tub or swimming pool pump enclosures may provide cover if they are not well sealed. The dampness associated with ornamental water fountains, pools, and fishponds may also make the surrounding area attractive to snakes.

Fences

Snakes can be excluded from an area by installing a snake-proof fence. While expensive, fences are often necessary for children's play areas. Be sure to make gates tight fitting and keep vegetation and debris from collecting around the fence. Snakes can climb accumulated vegetation and gain access to the top of the fence. Check the fence frequently to be sure it has not been damaged in any way.

Repellents

Over the years various home remedies have been suggested to repel snakes, such as placing a horsehair rope around your sleeping bag, sprinkling sulfur dust, or scattering mothballs around the area to be protected. Unfortunately, none of these remedies work. Despite what you may hear, there are no plants that repel snakes. Currently, several commercially available chemical snake repellents are on the market, but none of them have been proven to work well enough to warrant recommendation.

Biological Control

Several predators feed on rattlesnakes, including the kingsnake, which swallows them whole. Unfortunately, the number of rattlesnakes eaten by predators is insignificant in reducing the problem you might encounter around your home or garden. For this reason, relocating kingsnakes to your property is not recommended.

Other Control Methods

Remember, if left alone, a snake is likely to move on to another area. Also recall that most rattlesnake bites occur when inexperienced people try to pick up, pester, move, or kill a rattlesnake. If you would prefer the snake be removed, it is best to call a professional pest or wildlife control operator who specializes in snake removal. Your local county agricultural commissioner or UC Cooperative Extension office may be able to direct you to professionals who remove rattlesnakes. A final course of action may be to kill the rattlesnake. However, this option is not generally recommended since rattlesnakes only bite in self defense and attempting to kill them can, and sometimes does, result in a person getting bitten. Even a dead rattlesnake can have a bite reflex and is capable of delivering venom. Rattlesnakes are natural and important predators and automatic killing of them is not recommended any more than is the automatic killing of coyotes, mountain lions, or bears, all of which can very rarely harm people.

REFERENCES

- Walter, F. G., U. Stolz, F. Shirazi, J. McNally. 2009. Epidemiology of severe and fatal rattlesnake bites. Philadelphia: American Association of Poison Control Centers' Annual Reports. Clin. Toxicol. 47:663-669.
- Salmon, T. P., D. A. Whisson, and R. E. Marsh. 2006. *Wildlife Pest Control Around Gardens and Homes*. 2nd ed. Oakland: Univ. Calif. Agric. Nat. Res. Publ. 21385.

AUTHORS: Brian Todd, Dept. of Wildlife, Fish and Conservation Biology, UC Davis. Revised based on a previous version authored by T.P. Salmon, D.A. Whisson and R.E. Marsh.

ILLUSTRATIONS: Fig. 1. A. G. Clause, Univ. of Georgia; Fig. 2. T. Young; Fig. 3. J. M. Peaden, U.C. Davis; Fig. 4. William Flaxington ©2009; Fig. 5. Reproduced from *Wildlife Pest Control Around Gardens and Homes*, 2nd ed. UC ANR Publ. 21385.

TECHNICAL EDITOR: K. Windbiel-Rojas
EDITOR: K. Beverlin

This and other Pest Notes are available at www.ipm.ucanr.edu.

For more information, contact the University of California Cooperative Extension office in your county. See your telephone directory for addresses and phone numbers, or visit http://ucanr.edu/County_Offices/.

University of California scientists and other qualified professionals have anonymously peer reviewed this publication for technical accuracy. The ANR Associate Editor for Pest Management managed this process.

To simplify information, trade names of products have been used. No endorsement of named products is intended, nor is criticism implied of similar products that are not mentioned.

This material is partially based upon work supported by the Extension Service, U.S. Department of Agriculture, under special project Section 3(d), Integrated Pest Management.

Produced by:
Statewide Integrated Pest Management Program
University of California
2801 Second St.
Davis, CA 95618-7774



WARNING ON THE USE OF CHEMICALS

Pesticides are poisonous. Always read and carefully follow all precautions and safety recommendations given on the container label. Store all chemicals in the original, labeled containers in a locked cabinet or shed, away from food or feeds, and out of the reach of children, unauthorized persons, pets, and livestock.

Pesticides applied in your home and landscape can move and contaminate creeks, rivers, and oceans. Confine chemicals to the property being treated. Avoid drift onto neighboring properties, especially gardens containing fruits or vegetables ready to be picked.

Do not place containers containing pesticide in the trash or pour pesticides down the sink or toilet. Either use the pesticide according to the label, or take unwanted pesticides to a Household Hazardous Waste Collection site. Contact your county agricultural commissioner for additional information on safe container disposal and for the location of the Household Hazardous Waste Collection site nearest you. Dispose of empty containers by following label directions. Never reuse or burn the containers or dispose of them in such a manner that they may contaminate water supplies or natural waterways.

ANR NONDISCRIMINATION AND AFFIRMATIVE ACTION POLICY STATEMENT

It is the policy of the University of California (UC) and the UC Division of Agriculture & Natural Resources not to engage in discrimination against or harassment of any person in any of its programs or activities (Complete nondiscrimination policy statement can be found at <http://ucanr.edu/sites/anrstaff/files/183099.pdf>).

Inquiries regarding ANR's nondiscrimination policies may be directed to Linda Marie Manton, Affirmative Action Contact, University of California, Agriculture and Natural Resources, 2801 Second Street, Davis, CA 95618, (530) 750-1318.