

Rattlesnakes in California orchards

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Rattlesnakes are occasionally found in orchards in California, generally leading to unwanted encounters. However, it is important to remember that the desire to avoid any kind of a negative interaction is mutual. As such, rattlesnakes will generally avoid human confrontation when possible. Rattlesnakes are an important part of the ecosystem, feeding on rodents, birds, and other small animals. Snake season in Southern California runs from April through October, but the warmer the weather, the more the reptiles are likely to be out and about. Rattlesnakes are California's only native venomous snake, with some adults reaching up to 6 feet long. According to the California Poison Control Center notes, rattlesnakes account for more than 800 bites each year, with one to two deaths. About 25 percent of the bites are "dry," meaning no venom was injected, but the bites still require medical treatment. There are nine species that live in various areas of the state and their size can vary.

According to the *University of California Integrated Pest Management Guidelines (2014)*, the most widespread rattlesnake in California is the northern Pacific rattlesnake (*Crotalus oreganus*, Photo 1), found from the northern part of the state to 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 northeastern portions of the state that are associated with the Great Basin region, 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 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 diamond 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 southeastern part of the state in desert regions.

Of the nine species of rattlesnakes in this region, the Western diamondback rattlesnake is probably the most dangerous because of its size and aggressive nature. This snake is considered a generalist, which means that it isn't too picky about its habitat. It can be found living in deserts, grassy plains, forests, rocky hillsides



Photo 1. Northern Pacific rattlesnakes have large bodies and large triangular heads. This snake is often heard before it is seen. (Photo: Sonia Rios)

and areas along the coast. It lives in elevations from below sea level up to 6500 feet. State experts say the diamondback can be found primarily in Imperial, Riverside and San Bernardino counties (Photo 3). Most trees crops that are found in this county that are at risk for hosting these snakes are avocados, citrus and dates. This puts subtropical growers the most at risk for being bit.

Rattlesnakes can pose a threat to workers conducting routine agriculture cultural practices such as irrigating, fertilizing, and harvesting. In the deserts of Riverside and Imperial counties where the laborious date palms are grown, rattlesnakes can be problematic if orchard vegetation is left uncontrolled (Photo 2). The snakes are also attracted to water, so irrigators have an increased likelihood of coming into contact with the snakes.

Biology and Behavior

Rattlesnakes are thick-bodied snakes with keeled (ridged) scales in a variety of colors and patterns. The National Wildlife Federation reported that rattlesnakes typically live for 10 to 25 years. Most species are patterned with dark diamonds, rhombuses or hexagons on a lighter background. Rattlesnakes are ovoviviparous, which means that eggs incubate inside the mother's body. Babies are born live, encased in a thin membrane that they puncture after being born.

They 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. These pits are temperature-sensitive structures that assist the snake in finding prey, even in complete darkness (Alving and Kardong, 1996). 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. (Kardong and Bels, 1998). The California Department of Fish and Wildlife recommends being alert and also having a sense of where a rattlesnake could be at a particular time of day. After a cold night, the snakes will try to raise their body temperatures by laying out in the sun around mid-morning. To prevent overheating during the day, they may be more active at dusk, dawn and nighttime hours. Though they are not nocturnal, in the hot summer months they may be more active at night.

Management

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.

Habitat Modification

Most rattlesnakes seek cover in crevices of rocks, under surface objects, beneath dense vegetation and in rodent burrows, so eliminating potential shelter is critical. Adults eat live prey, primarily rodents; the young consume mostly lizards and young rodents. Controlling the vermin population in your orchard is an important

Photo 2. In the deserts of Riverside and Imperial Counties, if orchard vegetation is left uncontrolled this can create an ideal habitat for rattlesnakes. (Photo: Sonia Rios)



factor as the rodent burrows can become a snake's new home. After rodent control, fill in existing burrows with rocks, soil, and sod and pack down firmly (Baldwin and Meinerz 2015). Weed management in orchards is critical during the warmer months. The vegetation can provide habitat for snakes. In addition, after pruning or removing old trees from the orchard, proper disposal of the wood is important. Stacking or saving the wood in piles creates safe harborage for the rattlesnakes.

Exclusion

Buildings and associated structures for farming operations can vary in size and age. Chemical sheds, equipment garages, and machinery shops occasionally host snakes. In summer, rattlesnakes may be attracted to cool and/or damp places, such as beneath buildings. Sealing all cracks and other openings greater than ¼ inch can prevent them from entering. Gaps beneath doors are often large enough to permit snakes to enter, especially young ones. While expensive, snake-proof fencing can also be used. If wire mesh is used, it should be 1/4-inch mesh and extend 3 feet aboveground. Bury the bottom 3 or 4 inches and bend outward 3 or more inches of the base of the wire to discourage other animals from digging under the fence. Place the support stakes on the inside and install a gate that is tight-fitting at the sides and bottom. Make sure the gate includes a self-closing spring (Baldwin and Meinerz 2015).

Benefits

Rattlesnakes add to the diversity of our wildlife and are important members of our ecosystem (Todd et al. 2014). They can reduce the number of disease-carrying vermin. In general, they should be left alone, whenever possible, especially in wildland areas. Nonvenomous snakes, such as California kingsnakes (*Lampropeltis californiae*) and garter snakes (*Thamnophis* spp.), should also be left alone wherever found. ■

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Photo 3. (L) Western diamondback rattlesnake found in an avocado grove, photo by Gary Tanizaki; (R) Western diamondback, photo by Gary Nafis.

