

## Reducing Rattlesnake-Human Conflicts

Arizona is home to 11 species of rattlesnakes. As rapidly growing Arizona communities move into formerly undeveloped landscapes, encounters between people and rattlesnakes increase. As a result, the management of nuisance snakes, or snakes found in areas where people do not want them, is increasingly important. Since 1994, the U.S. Geological Survey (USGS) has conducted research on the behavior and ecology of nuisance rattlesnake in Arizona national park units. A decade of research provides important insights into rattlesnake behavior that can be used by national parks and communities to reduce rattlesnake-human conflicts.

### Research Findings

The initial research effort examined the effects and effectiveness of relocating, or capturing and moving, nuisance snakes to different and sometimes distant locations at Montezuma Castle National Monument, Arizona. Snakes implanted with radio transmitters were tracked by USGS scientists and volunteers for more than two years. Relocated animals had higher mortality rates and different movement patterns and behavior than animals that were not relocated. In addition, more than half of the relocated snakes eventually returned to their original home locations.

Subsequent research in Arizona national parks found that many rattlesnakes used hibernation sites, including natural and built features, near visitor areas. In addition, many of these same snakes had summer ranges completely within or near visitor and housing areas. Despite the occurrence of the animals in developed areas, USGS biologists found that park staff and visitors seldom saw tracked rattlesnakes, including snakes that were occasionally located less than 5 m (16 ft) from heavily used trails.

Rattlesnakes may focus their activities in developed areas during the summer, the time when they are actively foraging, because these areas contain increased numbers of prey species and water, particularly during drought years. Increased abundance of prey species, including birds and rodents, may result from the presence of garbage, the feeding and watering of birds, and the creation of habitat in the form of lumber and brush piles, thick vegetation, and loose soil.

USGS research indicates that relocation is not an effective management tool for dealing with nuisance rattlesnakes and that removing individual nuisance snakes from sites that are rich in prey will not make these sites less attractive to other snakes.



**Figure 1.** Adult western diamondback rattlesnake (*Crotalus atrox*). Arizona is home to 11 species of rattlesnakes. Since 1994, the U.S. Geological Survey (USGS) has conducted research on the behavior and ecology of nuisance rattlesnakes in Arizona national park units.



**Figure 2.** A USGS biologist works with volunteers to measure a rattlesnake at Montezuma Castle National Monument, Arizona.



**Figure 3.** A National Park Service ranger captures and prepares to move a rattlesnake from a trail at Montezuma Castle National Monument, Arizona. Research in Arizona national parks indicates that it may be possible to reduce rattlesnake-human conflicts in developed areas by making these areas less attractive to the small mammals and birds that rattlesnakes feed on during the foraging season.

## Research Implications

In the human imagination, rattlesnakes loom as a dangerous and aggressive threat to people. In truth, USGS research and several other studies indicate that rattlesnakes seldom reveal their presence to people, even if approached closely. Rattlesnakes use procrystis, or motionlessness combined with blending with the background environment, as their primary means of avoiding predators, including humans. It is also possible that rattlesnakes foraging for food near developed areas may be habituated to the presence of people and less likely to display defensive behavior. Similarly, rattlesnakes are unlikely to strike unless inadvertently stepped on or handled. For these reasons, the presence of snakes near visitor facilities does not constitute a public safety concern in and of itself.

Based on findings from the past decade, USGS rattlesnake research in Arizona offers some potentially more effective solutions for dealing with nuisance rattlesnakes than long-distance relocation. Reducing rattlesnake-human conflicts in developed areas can potentially result from making these areas less attractive to the small mammals and birds that rattlesnakes feed on during the summer foraging season. Controlling or

removing garbage, bird feeding stations, and standing or dripping water will make a site less attractive to prey animals and their predators, including rattlesnakes. Other tactics for discouraging rodents include the removal of scrap piles, stacking wood and lumber off the ground, removing dense vegetation, and sealing off rodent access points to buildings.

If a snake does need to be removed for safety reasons, then the best solution is to move the snake a short distance, less than 50 m (164 ft), to the nearest cover. A relocated snake should always be moved away from heavily used roads into habitat that is similar to that from which it was moved.

By removing attractants and treating rattlesnakes with respect, people can reduce or eliminate many concerns posed by this fascinating desert dweller.

## More Information

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Arizona rattlesnake research is conducted by the Southwest Biological Science Center (SBSC) [<http://sbcs.wr.usgs.gov>], which is one of the 17 science centers that are a part of the U.S. Geological Survey’s Biological Resources Discipline. To address the research needs of the large and biologically varied Southwestern United States, SBSC research is conducted by scientists working at four research stations, including Canyonlands Research Station (Moab, Utah), Colorado Plateau Research Station (Flagstaff, Arizona), Grand Canyon Monitoring and Research Center (Flagstaff, Arizona), and Sonoran Desert Research Station (Tucson, Arizona). The mission of the Biological Resources Discipline is to work with others to provide the scientific understanding and technologies needed to support the sound management and conservation of the Nation’s biological resources.