

Proposed position paper for the American Society of Ichthyologists and Herpetologists. Prepared by Henry R. Mushinsky and Alan H. Savitzky with contributions from Edmund Brodie, Jr., William Brown, Jonathan Campbell, Kevin Enge, Lee Fitzgerald, Harry Greene, Patrick Gregory, John Jensen, Paul Moler, Charlie Painter, Andy Price, and Walter Timmerman.

**Position of  
The American Society of Ichthyologists and Herpetologists  
Concerning  
Rattlesnake Conservation and Roundups**

The American Society of Ichthyologists and Herpetologists, an international society of about 2,000 professional scientists who specialize in the biology and conservation of fishes, amphibians, and reptiles, strongly opposes traditional rattlesnake roundups. Such roundups promote overexploitation of natural populations of wildlife, unnecessary killing and inhumane treatment of individual animals, degradation of habitat, and promotion of outdated attitudes toward important elements of America's natural heritage. Found nowhere but in the Americas, and especially diverse in the United States, the more than thirty species of rattlesnakes comprise a distinctive component of North America's biodiversity, and one that is increasingly imperiled.

SUPPORTING INFORMATION AND DOCUMENTATION

**EXECUTIVE SUMMARY.** Rattlesnakes are highly specialized predators that use venom to immobilize and speed digestion of their prey. As top carnivores, they help control rodent populations. Although feared by humans, they are responsible for very few deaths in the United States compared with other accidental sources of mortality. For rattlesnakes to persist, each species must overcome unregulated hunting, harvesting for roundups, and significant loss of habitat to agriculture and urbanization. Roundups began around 1940 and today attract thousands of spectators who observe rattlesnakes being treated inhumanely, in a manner unlike any other vertebrate animal. About 15% of the 125,000 rattlesnakes harvested yearly are intentionally killed at roundups. Many other species ecologically associated with rattlesnakes are harmed because gasoline is used often to force snakes from dens. Enlightened communities have opted to preserve the revenue generated from roundups by successfully transforming roundups into alternative festivals. Our forefathers viewed the rattlesnake as a symbol of strength and independence, a perception

that deserves to be encouraged once again. The American Society of Ichthyologists and Herpetologists supports an end to traditional rattlesnake roundups.

BIOLOGICAL ATTRIBUTES OF RATTLESNAKES. Herpetologists consider rattlesnakes to be among the most highly specialized snakes. Members of a lineage known as pitvipers, rattlesnakes possess the group's characteristic pair of pit organs on either side of the face, between the eyes and nostrils. These remarkable structures are highly sensitive infrared detectors, which enable rattlesnakes to sense their warm-bodied prey, even at night. Rattlesnakes have a pair of hollow fangs in the upper jaw that are folded back when not in use, but rotate into an erect position to deliver venom during a strike. Although used occasionally in defense, the primary biological role of the venom is to immobilize prey and facilitate digestion. Most rattlesnakes prey on rodents and occasionally other small mammals such as rabbits and ground squirrels; some smaller species feed primarily on lizards or frogs. Ecologically, adult rattlesnakes are top carnivores.

Although the threat of snakebite continues to elicit fear in humans, bites by venomous snakes today represent a minimal hazard to human health. According to the Centers for Disease Control, about 15 persons die from the bite of a venomous snake each year in the United States, while, on average, 12 die from dog bites and 82 die from lightning strike.

All living rattlesnakes belong to the genera *Crotalus* and *Sistrurus*, fossils of which date back about five million years. The greatest diversity of living species occurs in the southwestern United States and northern Mexico, but four species range as far north as New England and Canada. Although traditionally viewed as behaviorally simple animals, recent research has disclosed that rattlesnakes have a sense of self-identity, exhibit parental care of their young, recognize spatial arrangement of objects in the environment, and at times live in social groups.

THREATS TO RATTLESNAKES. 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. Geographic location and body size are two factors that can influence how rattlesnakes are affected by human activities. Relatively small species that live

in mountainous regions of the southwestern United States and Mexico have limited distributions, and narrow habitat requirements, making them particularly vulnerable to habitat alteration and human disturbances. Relatively large species, especially those in the northern states, may take as long as ten years to become sexually mature and then reproduce only once every third year. Furthermore, many rattlesnakes require large expanses of habitat to complete their annual movements, sometimes traveling many kilometers in a year. With increasing urbanization and habitat fragmentation, humans are reducing the habitat available for rattlesnakes and increasing the likelihood of encounters with them. The pattern of creating small, isolated populations of rattlesnakes that are in close contact with people may be tipping the balance against the long-term persistence of some species. As long ago as 1992, biologists concluded that 50% of all pit vipers might be threatened with extinction. Nonetheless, the U.S. Fish and Wildlife Service lists only three species of rattlesnakes as federally threatened or endangered. Several states have regulations to protect particular species or isolated populations of rattlesnakes. As agencies develop plans for the conservation of rattlesnakes, they will need to tailor them to the specific challenges confronting each species.

Five rattlesnake species are hunted in eight states. The Western Diamondback Rattlesnake (*Crotalus atrox*) is hunted in Texas, Oklahoma, and New Mexico; Eastern Diamondback Rattlesnake (*C. adamanteus*) in Alabama, Florida, and Georgia; Prairie Rattlesnake (*C. viridis*) in Kansas, Texas, Oklahoma, and New Mexico; Timber Rattlesnake, (*C. horridus*) in Pennsylvania, Georgia, Alabama, West Virginia, and Florida; and occasionally the Black-tailed Rattlesnake (*C. molossus*) in New Mexico and Texas.

In earlier times the perceived hazard of snakebite inspired organized efforts to control rattlesnake populations and government bounties for killing rattlesnakes date back to 1719. In the northeastern states, hunters gathered at large, communal dens to kill snakes as they congregated for hibernation. Similar hunts, both in spring and fall, occurred in other regions of the United States. Records from a single county in central Florida indicate that between 1935 and 1938 about 7500 rattlesnakes and 2000 coral snakes (an unrelated venomous snake) were collected for bounty. Bounties also were placed on rattlesnakes in Iowa, New York, Minnesota, and Wisconsin during the mid-1900s. Some states, such as South Dakota, hired professional hunters to destroy rattlesnakes. Over time this practice of killing rattlesnakes spread to southwestern states.

RATTLESNAKE ROUNDUPS. Organized “rattlesnake catching drives,” the precursors of modern roundups, date to 1939 and 1949 in two communities in Oklahoma, where they evolved into publicity events for local chambers of commerce. These drives were conducted in the spring of the year, to coincide with the emergence of rattlesnakes from their dens. Early events involved several thousand spectators, who watched as the hunters sold their catches by the pound to the organizing groups. The funds were provided by local ranch owners, who contributed a few cents per acre as a reward for clearing their land of rattlesnakes, which they considered to be dangerous to cattle. An estimated 1500-3000 snakes per year were captured and destroyed in each drive, despite evidence from a 1950’s statewide survey of Texas veterinarians, indicating that loss of cattle to snakebite was negligible. Special awards were given to individuals who captured the largest snake or were bitten during the drive.

In 1958, an Oklahoma event billed as the “world’s largest” was promoted by the local Board of Development; it was later turned over to the Jaycees. After the first hunt, uncounted thousands of captured rattlesnakes were decapitated and deposited in the city dump. The event has since become a focal point for the community, involving presentation of trophies and monetary prizes to the rattlesnake hunters and attracting tens of thousands of spectators who attend rattlesnake dances, craft shows, and cooking contests. By the late 1980s roundups were producing profits used to fund charitable projects, suggesting that roundup organizers had good intentions for their efforts. Today, some roundups are organized by private individuals for profit.

The biological ramifications of decades of rattlesnake roundups are difficult to assess, but they have great potential to affect snake populations negatively, and it is difficult to predict when rattlesnake harvests will push local populations beyond the point of recovery. Analysis has proven challenging because of inconsistencies and variation in recording the numbers of hunters, area hunted, and numbers of species included in the total catch. For example, hunters may broaden the areas in which they hunt and bring rattlesnakes captured at considerable distances from the location of the roundup. Collecting rattlesnakes at communal dens during the spring or autumn months can quickly deplete a local population. All rattlesnakes give birth to live young, and pregnant females often are especially conspicuous and therefore vulnerable to collection. Such females must bask in exposed locations to raise the temperature of their developing embryos, and in some species pregnant females aggregate at special sites, increasing the likelihood that these especially critical members of the population will be subject to capture.

Although subject to error, the information collected during rattlesnake roundups provides a reasonable index of the annual hunting pressure on rattlesnakes as a result of organized events across the country. Information from five roundups in Oklahoma suggests that the take of Western Diamondback Rattlesnakes ranges from 6,000 to 10,000 individuals each year. At one large roundup alone, the average number of rattlesnakes captured annually between 1959 and 1991 was 5,469, with a mean total mass of 2855 kg (more than three tons). Over that period 91,365 kg (more than 100 tons) of rattlesnakes, or 174,996 individuals, were captured. Interestingly, peak years occurred about once per decade and were followed by a year in which relatively few individuals were captured. Based on 16 roundups in Texas, estimates range from 70,500 to 112,600 per year. Three roundups in Georgia and one in Alabama accounted for an estimated 1,000 -1,600 snakes per year. Analysis of harvest data from four roundups, collected between 1985 and 1993, indicated a non-significant but consistent decline in purchases of rattlesnakes at all four locations.

Clearly, roundups cause significant mortality in rattlesnakes, but they represent only part of the total human-caused mortality in these species. Researchers have estimated that, for both Western Diamondback and Eastern Diamondback Rattlesnakes, only about 15% of the total annual harvest originates from roundups. During the two-year period 1990-92, Florida snake-skin dealers reported purchasing 3,647 Eastern Diamondback and 366 Timber Rattlesnakes from Florida and 18,289 and 4,346, respectively, from outside the state. Florida snake-skin dealers purchased 40,056 Eastern Diamondbacks and 7,659 Timber Rattlesnakes from 1990-94, collected in Florida and five nearby southeastern states. Currently, the annual harvest of all rattlesnakes in the United States exceeds 125,000 per year.

In addition to the effects of roundups on snake populations, some of the methods used to collect snakes are detrimental to the environment and to non-target species. In Florida, hunters have ignited isolated patches of saw palmetto (*Serenoa repens*), collecting rattlesnakes as they moved to escape the fire. In southeastern states, Eastern Diamondback Rattlesnakes and many other species of wildlife seek shelter in the deep burrows of Gopher Tortoises (*Gopherus polyphemus*). Hunters introduce gasoline into tortoise burrows, collecting rattlesnakes as they are driven out. No doubt many non-target species of wildlife are killed by this unethical hunting practice. Research has demonstrated that gassing is harmful to rattlesnakes, tortoises, and other species that co-occur in dens or burrows. Gassing burrows is prohibited within the

range of the Gopher Tortoise, which is now protected in every state in which it resides. However, in southwestern states, beyond the range of the Gopher Tortoise, gasoline is sprayed into the deep recesses of rattlesnake dens, and snakes are collected as they attempt to escape.

ETHICAL CONSIDERATIONS. Apart from the negative aspects of rattlesnake roundups on the populations of both snakes and non-target species and their habitats, strong ethical reasons exist to oppose the practice of rattlesnake roundups. Traditional roundups often include large enclosures or pits in which snakes are maintained at high densities for extended periods and are subjected to continual provocation, encouraging them to rattle and strike. Inflated balloons are displayed before captive rattlesnakes to provoke a strike to burst the balloon for the entertainment of onlookers. Individuals are kicked, burned with cigarettes, have their rattles removed while still alive and funneled full of liquor. Rattlesnakes may be shipped from roundup to roundup in wooden crates without food or water, and some individuals are crushed to death or die of overheating and dehydration during transport. Snakes are handled roughly and are decapitated and butchered in large numbers in front of an audience, including small children, as entertainment. It is hard to imagine subjecting any other vertebrate animal to such thoughtless and inhumane treatment. Indeed, as scientists we are subject to requirements that our study animals be treated humanely, and it is reasonable to expect similar treatment by others.

COMMUNITY ALTERNATIVES TO ROUNDUPS. Former rattlesnake roundups have been transformed successfully into other types of community festivals designed to raise funds for charitable organizations. An enlightened community in Florida, responding in part to efforts by the Gopher Tortoise Council, changed its rattlesnake roundup to a rattlesnake festival. In San Antonio, Florida, organizers use well-maintained rattlesnakes and nonvenomous species for an environmental education program. The organization called RAGE, Rattlesnake And Gopher Enthusiasts, sponsors the festival, which features “turtle” races (using mechanical Gopher Tortoises), arts and crafts, music, and a petting farm featuring common livestock. Funds raised by the festival are used to support local nonprofit organizations. In response to declining populations of Eastern Diamondback Rattlesnakes and the harmful collecting technique of gassing Gopher Tortoise burrows, organizers of the Fitzgerald Georgia Rattlesnake Roundup changed the focus of the festival and now celebrate The Wild Chicken Festival. At these festivals in Georgia and Florida, participants learn factual information about rattlesnakes and other

wildlife and most leave with an understanding that snakes are beneficial for rodent control.

BENEFITS OF RATTLESNAKES TO HUMANS. In addition to the ethical issues, practical reasons exist to value and conserve rattlesnakes. Researchers are beginning to unlock the secrets of snake venoms. Substances derived from venoms are ingredients in numerous medications, such as those used to treat stroke victims and to prevent the growth of cancerous tumors. More than a dozen diagnostic tests and drugs are derived from snake venoms. Because the muscles that power the noise-making rattle are so highly resistant to fatigue and resemble human heart muscle, they have proven to be a valuable model system in biomedical research. Ecologically, rattlesnakes excel at pest control and are especially proficient at hunting rodents. Because of the large number of rattlesnakes harvested for roundups each year, hundreds of thousands of rodents that would have been consumed by them remained free to wreak havoc on the human enterprise. In recent years, increases in rodent populations have led to the spread of dangerous diseases, such as Hantavirus, and one can only speculate whether efforts to control rattlesnake populations have exacerbated this problem.

CONCLUSIONS. Rattlesnakes are treated differently than most other commercially harvested vertebrate species. For example, the harvesting of sharks, animals that also elicit fear by humans, is highly regulated to promote their conservation. Unfortunately, the cornerstones of wildlife conservation -- controlling commercial use and regulating the take of wildlife -- have not been applied broadly to rattlesnakes. Thus, rattlesnakes are widely hunted and sold for profit, both dead and alive, without adequate regulation or monitoring by wildlife agencies.

The more than thirty species of rattlesnake comprise a unique component of North America's biodiversity, and one that is increasingly imperiled. By virtue of their novelty to European colonists and their perceived nobility, rattlesnakes hold an honored place in the early history of the United States. They appeared on numerous battle flags during the Revolutionary and Civil Wars, including the first Union Jack, which was raised over a Revolutionary warship by the young Lt. John Paul Jones. Our forefathers viewed the rattlesnake as a symbol of strength and independence, a perception that deserves to be encouraged once more.

Just a few decades ago top predators such as hawks and wolves were regarded as “vermin” and were subjected to bounty hunts and wanton killing. Today, however, these magnificent species are valued elements of our natural heritage, the intriguing subjects of documentary films and ecotourism. The American Society of Ichthyologists and Herpetologists supports an end to traditional rattlesnake roundups and encourages local communities to replace such anachronistic events with festivals that celebrate the role of rattlesnakes in nature and recognizes their significance as an historic symbol of our nation’s strength and independence.

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