FEATURE ARTICLES

A SURVEY OF OKLAHOMA'S RATTLESNAKE ROUNDUPS

by

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Abstract

In Oklahoma, rattlesnake roundups have developed into sporting events that attract thousands of people and generate hundreds of thousands of dollars for sponsoring nonprofit agencies. Five Oklahoma towns, Apache, Mangum, Okeene, Waurika and Waynoka, sponsor annual roundups. The western diamondback rattlesnake, *Crotalus atrox*, is the species targeted. The annual harvest in the state amounts to perhaps 10,000 diamondbacks. Early maturity (third year), large annual litters, and dispersed population are traits that have permitted the diamondback to survive the heavy hunting pressure of the roundups. Currently, there are incipient signs of over-hunting. There is need for a regulatory group under the state's Department of Conservation to formulate and enforce rules preventing over-hunting and cruelty on a statewide basis. A large, live diamondback might bring as much as $20 to its captor, and disassembled parts might bring several times that amount to the roundup sponsors. Although prices fluctuate, they have tended to rise. The roundups have become a firmly established tradition, but are opposed by conservation-minded individuals and organizations on grounds of cruelty, disruption of ecosystems, and risk to participants. Cruelty is involved in crowding the snakes into crates where they are kept for long periods with but little air and no water. Snakes are subject to dehydration and need to drink. Spraying dens with gasoline to flush out snakes with the toxic fumes, and sewing snakes' mouths shut so that people can safely be photographed handling them are also very cruel practices. An original goal of the roundups was to exterminate rattlesnakes, but sponsoring agencies have come to regard them as an exploitable resource and have begun to propose and enforce conservation measures, including bag limits and lower size limits.

Introduction

Rattlesnake "roundups" are held in many parts of the United States and have involved several different species, especially the western and eastern diamondbacks (*Crotalus atrox* and *C. adamanteus*), the timber rattlesnake (*C. horridus*) and the prairie rattlesnake (*C. viridis*). Currently some 50 roundups are held annually (up to 30 in Texas, five in Oklahoma, four in Georgia, one in New Mexico, one in Alabama, one in Kansas, and about 12 in Pennsylvania (Williams 1990). The timber rattlesnake is the species hunted in Pennsylvania, where the state requires hunters to purchase a special permit and imposes a bag limit of two snakes per hunter per day. Nevertheless, this species is being decimated by over-hunting, much of it illegal. Poaching is rampant. At 75 percent of the known dens, the snakes have been exterminated or reduced below the level considered viable. Taking reproductive females from their summer aggregations is a major cause for collapse of local populations (Brown 1992).

In Texas alone, the harvest has been alleged to reach half a million western diamondbacks annually (Williams 1990) but this estimate seems excessively high. The Sweetwater, Texas, roundup, alleged to be the world's largest, draws an average of 25,000 visitors and harvests 5,000 to 8,000 western diamondbacks, with a total weight of 10,000 to 13,000 pounds (Cox and Meinzer 1991). The original motive for rattlesnake roundups was to extermi-
nate the snakes, and their elimination or drastic reduction locally often was accomplished, but over time the recreational aspects of snake hunting have taken precedence over the desire to exterminate. A traditional point of view—that snakes are evil and must be killed—is changing, and a substantial segment of the public recognizes that these reptiles play important roles in ecosystems, prey to a large extent on small mammals that may be agricultural pests. Increasing numbers of people have come to admire snakes and to consider them a part of the nation's wildlife heritage that should be preserved. The pro-snake faction includes a militant minority that lobbies for legislation, stages demonstrations to protest roundups, and deplores cruelty in catching, confining, and butchering the snakes. This group also uses an ecological argument, pointing out the disruption of food webs involved in the mass removal of snakes from ecosystems.

Persons who organize rattlesnake roundups or participate in them represent a third point of view. They regard the snakes as an exploitable resource, enjoy the sport of hunting them, and recognize their potential value in fundraising for individuals and communities. Although such persons may not actually like snakes, they wish to maintain a perennial supply of them, and consequently the diamondback's perceived status is changing more and more to that of a game animal.

Oklahoma's rattlesnake roundups, extending back more than 50 years, have become a part of the state's tradition, and the hunts have been highly successful in terms of perennial sustainability, large numbers of participants, and the economic rewards that they generate. The western diamondback (Crotalus atrox) is the species hunted, although occasionally prairie rattlesnakes, timber rattlesnakes, and various nonvenomous species are taken in relatively small numbers. Between us, we attended all five Oklahoma roundups in 1988, one in 1987 and two in 1989. Separate reports have been prepared based on the examination of 1,011 live diamondbacks and a smaller sample of their internal organs (Fliech and Pisani 1993, Pisani and Stephenson 1991, Stephenson and Pisani 1991). The present report is concerned with the history of the roundups, their organization, and their economic, ecological and sociological bearing.

Results

TIMING AND PERSONNEL OF SNAKE HUNTS

At each Oklahoma roundup rattlesnakes are accumulated in three stages. The formal roundups are three-day events (Friday through Sunday) during which aspiring snake hunters, some from distant places, are registered, charged a fee, equipped for the field, guided by local experts to areas where snake dens can be found, and supervised in the finding, capture, and bagging of the quarry. Before the roundup weekend, experienced local hunters, familiar with the terrain and with the places where snakes can be found, are active in the field whenever the weather is mild enough to trigger the snakes' emergence from hibernation. At Apache in 1988, we were told by one participant that about ten professional snake catchers furnish most of the rattlesnakes for the event, and that these individuals differ considerably in their degree of commitment and success. A second participant claimed that only three hunters (of whom he was one) brought in most of the snakes.

Many other snakes are those caught far from the roundup where they are used, and are purchased in large lots by wholesale dealers, and shipped in for the event. Certain residents of southwestern Kansas have brought large collections of prairie rattlesnakes to the Oklahoma roundups. This was illegal because in Kansas the possession limit was five (and a hunting license was required to take them). Because of the shorter and milder winters to the south, Texas diamondbacks emerge from hibernation earlier than those in Oklahoma, on average, and many are captured and shipped to Oklahoma for the roundups there. Likewise, in Oklahoma many rattlesnakes originally taken in southern roundups at Waurika, Apache, and Mangum are shipped north for the roundups at Waynoka and Okenee. Individual snakes may be used in several roundups held on successive weekends. The Fountain Reptile Manufacturing Company of Colorado Springs has been a major purchaser, and eventually, after being used for live display and butchered for meat, its diamondbacks are used for snake-skin products, such as belts, hat bands and boots. At the Waurika roundup in 1988 we were told that the sponsors had contracted for and received 800 pounds of C. atrox from Texas in order to assure having plenty on hand during the event. When we arrived for the roundup at Okenee on 7 April 1989, there were ten crates of diamondbacks on hand, each containing about 33 snakes and, we were told, with a combined weight of about 300 pounds. The weekend hunting was expected to yield some 500 pounds more. At Apache on 21 April 1989, as the roundup began, there were already rattlesnakes on hand amounting to approximately 500-600 pounds. Most of these had been brought in by a contractor and were of unknown provenance.

A spirit of rowdy fun and alcoholic bravado that formerly characterized the roundups has been largely suppressed. Illustrating horseplay, which was once common, Mickey (1965) described an incident at the Waynoka roundup nearly 30 years ago, as follows: "Harold Newman, Marion Manning and Rolois Harmon held on to a six-foot diamondback [1] and gave him a drink of snake medicine [whiskey]. . . . The first drink did nothing. The second drink put the rattler in high gear and he became unmanageable. He was tossed toward the author who fell backward into a cactus bed along with his camera... The rattler was re-

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trived thoroughly plastered and sleepy, while the author spent the next six hours removing cactus spines."

On recent roundups, using liquor and carrying firearms have been discouraged because of the high risk of accident. However, competitive bagging ("speed packing," see below) at the Waurika event is still a high-risk activity. Competitors choose to dispense with normal safety precautions in order to shave time from their performance, and bites are frequent. As a concession to safety, the snakes used are small ones much less liable to deliver a mortal bite than are full adults. One or more bites are sustained during a typical roundup. An ambulance and physician are kept on standby. Victims are rushed to the local hospital and treated with antivenin, and most recover without lasting debilitation. Some have survived multiple bites and proudly display scars and amputations.

**ECONOMICS OF THE ROUNDUPS**

Rattlesnake roundups have developed as commercial enterprises designed to attract a large clientele by offering excitement, arousing curiosity, and playing on the widespread public fear of snakes. Hunting and capturing live rattlesnakes provides the central theme, and a competitive element is introduced by offering awards for certain categories of snakes (largest, heaviest bag, recapture of specially marked specimens). Special attractions are the "snake pit", an enclosure open on top where viewers can look down on hundreds of live diamondbacks. And the butcher shop where a team can be observed at work decapitating, skinning and gutting snakes, and cutting up carcasses for human consumption. In the snake pit, daredevil performers may display feats such as crawling into a sleeping bag containing one or more live rattlesnakes. At the butcher shop, spectators may be invited to weld the use in decapitating snakes, or a knowledgeable lecturer may discuss and demonstrate aspects of snake anatomy and physiology. Numerous shops and booths along the main street offer a variety of curios and souvenirs, specializing in snake products such as boots, purses, belts, key cases, and hatbands. Popular souvenir items are freeze-dried snake carcasses mounted in striking position with mouth open and fangs erect. In 1988, such mounts of first-year snakes usually cost about $15. A comparable mount of an adult cost about $35, but most often only the head and neck of an adult snake were preserved. The booths and shops featuring such snake products also offered a wide variety of other non-snake items, including knives and other implements, ornaments and curios.

Organized contests of various sorts have added zest to the gatherings. Especially notable are the snake-sucking contests. Each contestant is provided with a sack and snake-stick and three small rattlesnakes, which can be urged into favorable positions before the starting signal. Then there is a race to bag all three and secure the bag with a knot in the fastest time. Two contestants were bitten at the 1988 Waurika roundup that we attended. Various other contests may include boat races, shooting matches, tomahawk and knife throwing, and, on a more sedate note, golf, and dancing. Each roundup hosts a carnival. Organized entertainment may include a reunion of veteran snake hunters, a dinner with talks and films featuring earlier roundups, and a Saturday night dance.

Hotels, motels, and restaurants are filled to capacity on roundup weekends, and almost every business establishment in the town profits from the great influx of visitors. At each roundup the annual harvest is typically from 1,500 to 3,000 diamondback rattlesnakes. However, there is much fluctuation in snake numbers from year to year. If the weather is cold and overcast, relatively few snakes will be above ground and searching will be less thorough, resulting in a meager harvest. Perhaps such "bad years" have saved local populations from extermination. Klauber (1956) describing the Okene and Waynoka hunts in the early 1950s, stated that the annual catch at each was 1,500 to 3,000 snakes, and that participants numbered several thousand. These figures suggest that there has been little change over a 25-year period. There is some evidence to the contrary. At Okene, we were told that the roundup formerly yielded many more snakes than it has yielded in recent years, with an annual harvest of as many as 12,000. Even with improved transportation and increased attendance, the take has evidently undergone some decline. Local people blame the reduction on deterioration and shrinkage of habitat rather than on over-hunting. Probably both habitat change and hunting pressure are involved. It is remarkable that each of the roundups has been able to maintain an annual harvest of thousands of snakes without collapse of the local population. Studies by Campbell et al. (1989) at Texas roundups and Warwick et al. (1991) in Oklahoma demonstrate that steadily increasing numbers of hunters, and more efficient transportation extending into relatively remote areas are helping to maintain the catch from year to year. These studies have indicated that the snakes are being reduced to very low levels or totally eliminated from many more accessible places where they formerly were abundant.

Specific traits that have favored the survival of the western diamondback rattlesnake in Oklahoma are: 1) early maturity (normally in the third year); 2) apparent annual reproduction of females; and 3) large litters, averaging about 12 (with exceptionally as many as 40) (Klauber 1956)). In 1988 we estimated that a typical four-foot (122 cm) diamondback purchased from the hunter for $7 would be worth at least $35 disassembled: $12 for the meat, $12 for the skin, $5 for the rattles, $15 for the mounted head, and $1 for the gall bladder (used medicinally by certain Asian peoples). Thus, an estimated 10,000 diamondbacks harvested annually in Oklahoma might have been valued at
$350,000 (in 1988). However, this is a fraction of the money generated by the roundups. Registration of participants and paid admissions to the snake pit, butcher shop and many other ancillary forms of entertainment (see below: "Provenance of Roundup Participants") raise the total amount of money taken. Sale of souvenirs and curios also provide income, while, finally, lodging and feeding thousands of visitors and filling their routine needs, swells the total. Undoubtedly, rattlesnake roundups benefit Oklahoma's economy by several million dollars annually.

The sponsoring organizations are nonprofit groups and income from the roundups benefit community projects. For instance, at Waynoka, beneficiaries have included Clapper Memorial Hospital, the Waynoka Nursing Home, Emergency Medical Technicians and Ambulance Service, KIDS, Inc., the city parks, and several church and school projects.

**OKLAHOMA'S FIVE ROUNDPUPS**

The oldest Oklahoma roundups, Okeene's, began in 1939, Waynoka's began in 1945, Mangum's in 1955, Waurika's in 1961, and Apache's in 1981. Some ranchers regard rattlesnakes on the range as a constant hazard to humans and domestic animals, and would like to see them eliminated, but extermination of the snakes has ceased to be a major objective of the roundups. Excitement of the hunt, curiosity, and fascination with snakes are the three major incentives for participants, according to answers to a questionnaire we administered in 1988 (discussed below in detail). Forty-six percent of questionnaire respondents came to the roundups exclusively as spectators, while 41 percent were participants (13 percent did not respond to the question).

Each roundup draws on an area of several hundred square miles to collect snakes, but much of the hunting is within 25 miles (40 km) of the sponsoring town. The Okeene hunt is mainly between the Cimarron and Canadian rivers and it overlaps the area of the Waynoka hunt. The latter hunt area has been mapped as a parallelogram about 37 miles (59.5 km) long and six (9.6 km) or more miles wide, bounded on the northeast by the Cimarron River from Edith in the north to Fonda in the south (Mickey 1963). The Waurika and Mangum hunts take place principally along the bluffs of the Red River, Waurika's farther east and Mangum's farther west, but broadly overlapping, and both drawing on areas on the south (Texas) side as well as on the north (Oklahoma) side. The Apache hunt overlaps both Waurika's and Mangum's in the Red River bluffs, but also includes the Wichita Mountains. See Figure 1 for graphic representation of the areas of these hunts.

At Waurika and Okeene, the local chambers of commerce have been primary sponsors: the Apache Rattlesnake Association, Inc., sponsors the Apache roundup, and the Mangum event is sponsored by the Shortgrass Rattlesnake Association of that town. The several sponsoring agencies have somewhat different orientations and histo-

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**Figure 1. Map of Oklahoma showing location of rattlesnake roundups and areas of collection for the individual roundups. A=Apache, M=Mangum, N=Waynoka, O=Okeene, W=Waurika.**

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rieties which have resulted in differences in the local events. The Waynoka roundup began as a social gathering of local ranchers on spring weekends, with snake killing as a form of recreation. The Waynoka Saddle Club became the sponsor of the event, which attracted increasing numbers of participants and spectators each year until more than 5,000 people gathered at the ranch which hosted the event. Many were armed with shotguns, and, at first, shooting snakes was customary. Later guns were banned because of the hazard to participants and because the snakes were found to be marketable alive. When the rumors became too large to be hosted by local ranches, headquarters were shifted to the nearby town, with cooperation from the Chamber of Commerce (Mickey 1983).

The Okeenee roundup features a “... den of death with professional handlers working among hundreds of deadly live diamondback rattlesnakes.” Prize money is offered for the largest snakes brought in ($200 first prize, $125 second, $75 third, $50 fourth, $30 fifth), and a bounty is paid on “branded” snakes brought in alive. Added attractions are “The World’s Largest Traveling Reptile Show,” and the butcher shop where fresh “rattlesnake steaks” can be purchased. Tongs, bags and other snake hunting equipment can be rented or purchased. Ancillary attractions include a golf tournament, and carnival rides. Stipulations for the hunts are that there shall be no gassing of dens, that no snakes shorter than 30 inches (76 cm) be taken, and that a bag limit of six snakes per hunter per day shall apply.

At the Mangum “Rattlesnake Derby” the main attractions, each with a separate admission fee, include the “snake pit” with hundreds of snakes on display, the butcher shop, and bus tours for those not caring to hunt (the tours visit typical den areas where experienced hunters demonstrate the finding and handling of rattlesnakes in the field), and the actual snake hunts (registration $5 per person). During informal conversation with hunters at Waurika, GRP (in response to a question) was told that crowds are definitely not taken to active dens but to “salled”, den-like areas. The major reason is to conceal the best hunting spots from the masses. Registered hunters are eligible for awards that include prizes up to $200 for the most snakes; the most pounds, (first prize $150); the longest snake (first prize $200); and recapture of a specially marked snake ($25). Ancillary events include a carnival, skydivers, daily concerts, and a Saturday night dance.

The Apache “Rattlesnake Festival” follows the usual pattern in having a snake pit and a butcher shop. It offers prizes of $175, $75, and $50 for the longest snakes; $125, $75, and $25 for the most pounds collected, and $100 for a marked snake recaptured. Competitive Indian dances are held with prizes of up to $200. Canoe races, tomahawk and knife-throwing contests and black powder shooting contests are featured, along with a flea market.

THE ESCALATING PRICE OF RATTLE SNAKE PRODUCTS

In 1953 snake catchers at Okeenee were paid 50c per pound for live snakes (Klauber 1956), but in 1960 the price had fallen to 10c per pound (Mickey 1963). Since then the price has tended to rise, but with fluctuations depending on demand versus supply and the general state of the economy. By 1987, the price had reached $4 per pound. In 1988, $3.50 per pound was the standard at all five roundups. In 1989, the price again underwent a sharp increase. Early in the season at Waurika some hunters received as much as $10 or $12 per pound for their snakes. At Okeenee, the price declined to $7.50 per pound and two weeks later at Apache, it seemed to stabilize at $7.50.

The alleged cause of the 1989 increase was adoption of an improved method of tanning skins. This resulted in increased demand and competitive bidding among leading boot manufacturers (Justin, Nocona, Tony Lama). The 1989 price rise resulted in much increased hunting pressure. At each roundup, a dealer contracted for the entire lot of snakes brought in, and because of the enhanced value of skins, the price per pound of live snakes exceeded the price of dressed meat. In 1990 hunters received $8 or $9 per pound, but in 1991, the price had slipped back to $6 per pound at Apache. $5 at Mangum and Waurika, and $4.50 at Waynoka.

With increased demand for the snakes and their products, resulting in more intense hunting pressure, there is danger that in the near future the harvest will exceed the snakes’ rate of natural replacement. As numbers of snakes decline, the demand for them is liable to escalate and rising prices will provide incentive for unremitting hunting pressure, which might eliminate the species from most of the areas where it still occurs.

This unwanted outcome can be avoided only by management practices that have proven effective for game animals in general. Such measures include: 1) creating reserves—areas of prime habitat where rattlesnakes are protected from exploitation; 2) imposing size limits (e.g., 2 foot [61 cm] length to protect first-year young, or 3-foot [91 cm] to also protect some second-year young), bag limits, season limits, and declaring a closed season when snake numbers are found to be declining. Special fees might be charged for a snake-hunting license. Monitoring of the hunts is needed to detect either a reduction in numbers of snakes or a shift toward younger age classes, both of which are indicative of stressed populations.

CRUELTY AT THE ROUNDUPS

Most of the snakes displayed and butchered at the roundups are captured days or even weeks beforehand by local hunters, are purchased by the local committee, and are transferred to wooden crates. Each crate usually contains about 30 rattlesnakes. Often one or more are found
dead, sometimes in an advanced stage of decay, when the snakes are finally removed from a crate to be displayed or butchered. Obviously, the crated snakes are subjected to various stresses. In some instances, death may result from suffocation of the semi-torpid snakes pinned beneath several layers of larger ones, but more often convection is the cause. Many bites are exchanged by the occupants of each crate, which are stressed by capture and rough handling to the extent that they are inclined to strike at any moving object. Although the snakes have a high degree of resistance to the venom of their own species, massive doses of venom (or even puncture wounds) in vital organs can cause mortality. When snakes are skinned in the butcher shops, many show evidence of one or more recent bites, with hemorrhage and histolysis, subcutaneously, intramuscularly, or intraperitoneally. Affected sections of the body are discarded, resulting in a considerable loss of salable meat.

The crated snakes lack access to water, and rattlesnakes need to drink. Their food needs are minimal so long as they are kept cool, but in warm spring weather there is weight loss and mortality. It is difficult to avoid stress and mortality in the crated snakes, crowded together in a confined space for long periods. However, damage and suffering can be minimized by storage in cool places, reducing the number in each box, and providing occasional water. Decreased damage or mortality would increase profits to sponsors, a pragmatic reason for humane practices.

The most cruel practice observed at the roundups was the sewing shut of mouths to prevent snakes from biting. Selected large diamondbacks were immobilized by refrigeration, then subjected to the operation. At some roundups, several such “fixed” snakes were kept at photography booths and customers could be photographed handling them for a fee of $5.

At the butcher shops, snakes are killed by decapitation, but some animal-rights advocates maintain that this is an extremely cruel method, resulting in a painful and lingering death. A head, separated from the body, continues to manifest life by such reactions as opening at the approach of an object, biting at an object within reach, twiching the neck stub, contracting the pupil of the eye, and advancing and opening the end of the trachea. Biting may occur as long as 40 minutes after beheading (Klauber 1956). Depending on the temperature, as much as an hour may elapse before the separated head loses its ability to respond to external stimuli. Such a head shows evidence of stress. Upon dropping from the chopping block, a head will try with great vigor and animation to bite anything within reach, including the sawdust substrate. No practical alternatives to decapitation have been suggested. Since cold is an effective anesthetic for reptiles, the cruelty involved in decapitation might be mitigated by chilling the snakes in ice water before butchering or dropping heads into ice water immediately after. This procedure would also render them more easily handled.

The practice of flushing snakes out from their denning retreats by spraying with gasoline, using a hand pump and a long tube inserted into the den, has been popular in the past as an efficient means of collecting. The irritating fumes cause the snakes to surface where they can be captured. However, “gassing” is now generally condemned in Oklahoma. One objection is that animals too cold and sluggish to emerge are killed underground by the toxic fumes, and this applies to nonvenomous snakes and other vertebrates associated that share dens with the diamondbacks. Even the rattlesnakes that are flushed out and captured may have suffered irreparable lung and neurological damage (Williams 1990). It is claimed (and accepted by many event sponsors in Oklahoma) that “gassed” snakes are unfit for human food, having absorbed dangerous amounts of potentially carcinogenic hydrocarbons (Cox and Meinerz 1991). Although “gassing” is officially disapproved, some irresponsible hunters may still resort to it to increase their catch. We were told that Waynoka sponsors no longer accept snakes bearing a noticeable gasoline smell.

**PROVENANCE OF ROUN Dup PARTICIPANTS**

We distributed questionnaires (N=2144) at the Whirka, Waynoka, and Okeene roundups in 1988 and these provided a profile of attendees. Most were out-of-town visitors from within a 200-mile (320 km) radius, were male, earned $10,000-$30,000 annually, and spent less than $50 at the roundup, of which one-third was for souvenirs. Many persons attend more than one roundup in a season or return to the same roundup in successive years. Thirty-six percent of respondents came for only one day, 32 percent for two days, and 26 percent for three days, with somewhat different trends in the several roundups. The majority of those attending came as spectators rather than as active participants in the hunts. A high proportion of those attending came in family groups. There were many children in attendance.

At the Apache roundup on 22 April 1989, vehicle license plates were checked to try to determine where participants had come from. Of 311 license plates, 87% (270) were from Oklahoma, 6% (20) were from Texas, and 2% (5) were from Kansas. There were two cars from Alabama and just one each from Arizona, Arkansas, California, Colorado, Florida, Hawaii, Kentucky, Maine, Michigan, Missouri, Nebraska, Ohio, Pennsylvania and Tennessee. Some of the out-of-state license plates were probably those of soldiers temporarily stationed at nearby Fort Sill. There were Oklahoma cars from at least 28 counties: Caddo-65, Comanche-47, Oklahoma-25, Stephens-13, Grady-8, Jackson-6, Cotton-5, Craig-3, Okfuskee-3, King-
lisher, Sequoyah, and Tulsa 2, and there was one each from Beckham, Cleveland, Creek, Custer, Greer, Harmon, Kiowa, Latimer, Logan, Marshall, McClain, Murray, Muskogee, Okmulgee, Pittsburgh, Pottawatomie, Washita, and Woodward counties.

RECOMMENDATIONS

For long term management in Texas, a representative of the state’s Parks and Wildlife Department has written to all roundup sponsors requesting that they “(1) not accept snakes captured by using gasoline, (2) minimize the number of snakes used in roundups, (3) emphasize the importance of snakes in the biological community rather than treating them as carnival creatures, and improve handling and housing standards for the reptiles, (4) seek assistance from herpetologists and other professionals when planning roundups to improve the handling and care of snakes and develop educational materials, and (5) provide accurate and biologically sound information, rather than personal viewpoints that can be misleading” (Cox and Meinzner 1991). These same recommendations are equally appropriate for Oklahoma roundups.

Along with other forms of wildlife, rattlesnakes play important roles in Oklahoma’s natural communities, and the traditional attitude that they should be treated as pests and exterminated, is changing. This trend should be encouraged. Legislation is needed to ensure that diamondback rattlesnakes will neither be exterminated nor reduced to insignificant levels. The economic benefits of these snakes to local communities cannot be ignored. The roundups do constitute a potential threat to snake populations but it is noteworthy that after half a century of exploitation there is still an ample supply of snakes to support several roundups. Whenever and wherever the harvest exceeds the annual increment, the population will decline, and when it has begun, such a decline will be difficult to check. Life history study is needed to establish reliable population trends and to facilitate effective management.

The state’s present five roundups overlap broadly and draw upon the areas where diamondbacks are most numerous. Any additional roundups would add to the stress already existing, so new hunts ought to be avoided. Because the existing roundups have become a part of Oklahoma tradition, and have generated millions of dollars in income for the sponsoring communities, they cannot be readily eliminated. However, their most undesirable aspects probably can be eliminated or controlled, and will work to the benefit of sponsors. As stated above, sponsors generally do not wish to eradicate the snakes. Local support for controls is essential. At each roundup the sponsoring group has undertaken to discipline its event and to introduce conservation measures. For instance, the use of gasoline to drive snakes from their shelters has been condemned by all. In its printed pamphlet, the Waynoka group deplores cruelty to snakes that occurs at other roundups, and rejects using shot of mouths. Okoene imposes a bag limit of six snakes per day and specifies a minimum length of 30 inches (76 cm). Such measures and more like them are needed, and ought to apply uniformly to all the roundups. At the conclusion of our 1988 study, we proposed a Crotalus atratus management plan for Oklahoma (Appendix 1) and submitted it to the Oklahoma Department of Wildlife Conservation Non-game Wildlife Program.

We recommended the creation of a rattlesnake roundup regulatory committee consisting of a delegate from each roundup community, herpetologists representing the Oklahoma Herpetological Society, representatives of Oklahoma’s Department of Wildlife Conservation, and qualified environmentalists. This group should arrange a meeting one or more times annually, and should formulate guidelines that would apply to all the roundups. The group’s goal should be to promote conservation, safety, and the elimination of cruelty. Suitable habitat monitoring should also be undertaken. The committee should arrange to monitor each roundup, to determine the numbers, provenance, and sizes of the snakes taken, with the object of detecting signs of over-hunting and taking appropriate remedial action. The advisory-regulatory group should be empowered to declare a moratorium on any of the roundups when necessary, and to declare specified areas off-limits for hunting, as deemed necessary, until their snake populations increased to desired levels, and to impose bag limits and size limits. Through such management practices, the committee could ensure that the harvest would not exceed an exploitable surplus, and the supply of snakes can be assured to continue indefinitely for as long as suitable habitat remained.

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Literature Cited


Appendix 1

Proposed Management Considerations for Crotalus atrox in Oklahoma

Objectives

The objectives of the following proposals are to:

1- respond to increasing demand from certain sections of the public for regulation of activities involving the harvest of this species in Oklahoma.

2- allow for the existing traditional seasonal harvest of this species by various groups, while simultaneously promoting measures designed to maintain a harvestable supply of animals.

3- safeguard the denning and breeding habitat of this species, the better to sustain a harvestable population of animals.

Narrative

The protection of various species capable of inflicting damage on humans, their pets, and livestock is never an easy task to promote. Much of the success or failure of such an undertaking hinges upon conveying to the public at large the realization that most of these animals in fact do no harm at all. The model is analogous to the public's perception of gun control versus crime control—the reality is that the vast majority of snakes possessing a venom injection mechanism (like the vast majority of persons who freely purchase and use firearms) cause no harm to humans, pets or livestock. The model is not, of course, perfect, but it does carry home the message in a state with a high percentage of firearms owners. The initiation of any new management program must, to be successful, attempt to accommodate existing custom to the extent that such will not interfere with objectives of the program. In this case, we have built the proposed program around existing custom, as recent study indicates that such custom does not appear detrimental to the species. The proposed program responds to concerns for habitat and species conservation. Its success depends, in large part, upon cooperation from organizers of rattlesnake roundups and concerned members of the conservation community. An important part of the program involves education of the general public about the beneficial and generally inoffensive nature of Crotalus atrox.

Recommendations

The following recommendations are intended for implementation on 1 January 1989, except where later implementation is stated in text. They shall be retrospective to 1 September 1988. The recommendations are not presented in any particular order of desirability.

1. Rattlesnake roundups, or other events at which more than 25 rattlesnakes of any species are displayed and/or offered for sale, are restricted to those traditional Spring events sponsored by the cities of Waurika, Waynoka, Okeene, and Mangum, as held during 1988.

2. The scheduling of the aforementioned events is restricted to their traditional Spring timetable, revolving around the Easter holiday. That schedule followed in 1988 may be taken as representative.

3. Crotalus atrox is to be recognized as a game animal in the State of Oklahoma. The harvest season is to be fixed in accordance with number 2 above, and after
discussion with sponsors of existing rattlesnake roundups. Daily per capita bag, possession, and minimum size limits shall be similarly derived and fixed for the general public, with exemptions provided for the sponsors of the roundups in recognition of the need to collect and accumulate quantities of animals prior to each event. Registered participants in the hunts should purchase a restricted State collecting permit (valid for the days of a specific hunt), with the fee for same embedded in their event registration fee. It thus would be relatively simple to collect this fee and transfer it to the State. The fee charged should be less than that charged for a regular collecting permit, in recognition of its reduced usefulness. Proceeds from such fee should accrue to the Non-game Wildlife program for use in administering these recommendations.

4. Transfer of surplus animals from hunt to hunt is discouraged. Since most snakes for any given roundup are collected from reasonably limited areas, and in order to reduce pressures on these local populations, it is recommended that surplus snakes be released into suitable local habitat by hunters and/or Department personnel at the conclusion of each event. It is acknowledged that this will slightly diminish the available revenue from a roundup, but the modest loss will be offset by reduced population damage and by harvestable animals the following year. Additionally, there should be public relations value to sponsors involving the release of unused animals. Perhaps income generated by the collecting and commercial selling permits recommended in this plan could be used by the Non-game Wildlife Department to partially reimburse hunt sponsors for unused animals to be returned to habitat.

5. Hunt sponsors should, whenever possible, identify (by boxing separately) and butcher snakes accumulated from surpluses of roundups in other states. This recommendation is intended to reduce the genetic variation of stock selected for release. (Note added: it will also reduce holding time for boxed snakes.)

6. The introduction of any petroleum product into the environment for the purpose of driving snakes from their dens or other refuges should be made unlawful by the legislature. Recommended sanctions are a fine of $1,000 or imprisonment for 60 days per offense. It should be noted that introduction of petroleum products into the environment for any reason, even accidental, is a federal offense under existing environmental statutes and EPA regulations. As many dens of *Crotalus atrox* occur adjacent to and in the valley walls of major rivers, these may be additionally covered by federal laws protecting waterways.

7. If destruction of known rattlesnake dens is necessary for lawful economic purposes (quarrying, etc.), such destruction should be performed, or at least initiated, during the months of May through July to allow maximum time for resident populations of animals to adapt to the habitat alteration. Creation of substitute hibernation habitat by the planned location and form of rubble deposits and/or explosive deep fracturing of unquarryable strata should be encouraged via tax incentives based upon actual incurred costs for businesses so engaged.

8. In view of the proposal to recognize *Crotalus atrox* as a game animal, individuals engaged in the commercial sale of snakes or snake products (including those represented as prepared from non-Oklahoma snakes) should be licensed by the State, the revenues from such licensing to accrue to the Non-game Wildlife Program for use in administering these recommendations.

9. Though considerable data on the biology of *Crotalus atrox* during the Spring portion of its life cycle is being evaluated, the habits of this economically important species through much of the year remain a mystery. A detailed, sound management plan can only be prepared when the autecology of this species is better known and understood. Research on this species should therefore be encouraged and supported, with priority given to proposals from Oklahoma researchers.

10. Conservation-oriented organizations or individuals should be encouraged to develop educational programs designed to inform the public about the generally inoffensive nature (if unprovoked) and ecological role of rattlesnakes, as well as the importance of not destroying natural habitat. Such organizations should be encouraged to apply for Non-game funds for direct costs associated with operating such educational programs. Perhaps a small amount of such money could be reserved each year for competitive award to the best such proposal. If unused, the money should revert to other needs. Any such programs should be sensitive to the legal right of persons to participate in any taking of animals which does not cause severe habitat destruction or significantly diminish the sustainable harvest of these animals.

Prior to final implementation of these proposals, the Non-game Wildlife Program shall convene a workshop consisting of representatives from roundup sponsor organizations, invited representatives of conservation oriented Oklahoma organizations, and invited specialists in rattlesnake biology to refine the recommendations advanced above.