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CONTROL METHODS FOR SNAKES

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Of the various types of wildlife that home owners find undesirable, snakes are probably the leading offenders. Because of much false teaching, many persons have a great dread of even non-venomous snakes; hence control often is practiced when not needed. Nevertheless, very few people are willing to accept the presence of snakes in their gardens or their yards, especially if there is a concern for children playing in the area. For this reason snake control is often desirable about homes and suburban housing areas. Other situations where controls might be justified are recreation areas, farms, bird sanctuaries, duck nesting marshes, and fish hatcheries.

The first step in control is to find out what kind of a snake is creating the trouble and to learn something of its habits. Secondly, it is important to estimate the cost of the method to be used and to decide whether or not the expense and effort are justified. There is no single method of eliminating snakes from a given area, and since each person's predicament is different, it is practical to suggest here several ways of eliminating snakes. The following control methods are divided into seven categories. The first five groups are over-all general means of control, the sixth category is devoted to repellents, and the last group deals with miscellaneous methods, any one of which might apply to a particular set of circumstances.

SNAKEPROOFING OF HOUSES AND YARDS

Snakes may occasionally enter houses either by accident or in search of mice or shelter. Entrance of snakes into houses can be eliminated by sealing all openings around the foundation. In some instances this may be costly and difficult, but it may be the only way. Cellar doors, windows, and screens must fit tightly. Walls and floors should be searched for crevices, since snakes can pass through extremely small openings. Fireplaces and chimneys should be inspected for openings, and spaces around pipes going through the outside wall should be plugged. Galvanized screen of 1/4-inch mesh or smaller should be fastened over drains and ventilators leading to the outside.

Fences also have been used around houses to keep snakes away from buildings and out of yards. This method may be expensive, but if the yard is to be used as a playground by children, the cost may be justified, if only to ease the worries of the parents. A good fence can be made from heavy, galvanized, 1/4-inch mesh hardware-cloth screen, 36 inches wide. The lower edge is buried three to six inches in the ground. It is best if the fence slants outward from bottom to top at a 30° angle; although for snakes that seldom climb, such as rattlesnakes, a vertical fence 18 inches high is adequate. Supporting stakes should be inside the fence. Tightly fitting gates must be kept closed. This is best done by using strong springs or heavy weights which will immediately reclose a gate after it is used,

The fence should be constantly inspected to be sure animals have not opened holes under it, or miscellaneous items have not been piled against the outside. Vegetation just outside of the fence should be cut, or kept under control with herbicides, inasmuch as unattended vegetation next to the fence may assist snakes in climbing over the barrier.

REMOVAL OF FOOD AND COVER

Snakes can be discouraged from remaining in an area if food and cover *are* removed. Poison campaigns to reduce rodent populations tend to decrease the food supply of most snakes. Much precaution should be employed if poisons are used in the vicinity of poultry or other farm animals. Rodent populations can also be reduced by maintaining food and grain storages so that they are inaccessible to mice. Reduction of rodent-sheltering locations (rock piles, woodpiles, tall grass, weeds and brush) not only reduces the rodent population but also limits the snake-harboring localities. All debris under porches and about foundations should be removed, as they are possible locations for snakes to hide. It should be remembered that even a drastic removal of nearly all the rodents from an area would not bring about an immediate reduction of the snakes, because of the latter's ability to go long periods of time without food. The remaining rodents, with their high reproductive potential, would soon build up in numbers sufficient to save the snakes from starvation unless the rodent control operations were maintained.

Under laboratory conditions, snakes that were fed rodents which had been poisoned with a maximum amount of various rodenticides (sodium fluoroacetate, strychnine alkaloid, thallium sulphate, warfarin and endrin) did not die from secondary poisoning.

CONTROL BY SEARCHING AND KILLING

One of the most obvious and practical ways to control snakes is to club or shoot them when they are found (Eadie and Hamilton, 1961). Searching and killing can reduce snake numbers in a given area, but this program must be persistent due to the fact that all snakes are not active above ground at the same time. In certain parts of the country, where dens of rattlesnakes or copperheads can be located, it is often possible to club large numbers of them in the spring when they first emerge in a sluggish condition to lie in the sun.

Sometimes a snake that is known to be in a house hides so effectively that it cannot be found. A trick that might work to locate the snake is to place wet cloths at the various locations where it is thought the snake might be, and then cover the wet cloths with dry ones. Once snakes find this type of a moist shelter they will usually crawl under it.

TRAPS AS A CONTROL METHOD

There is no one successful trap for capturing snakes, since snakes have no fixed pathways to follow and are not easily attracted to baits. If the location of a hibernating den (as in a rock pile)

is known, trapping can be accomplished by closing most of the exits with cement, boards, or rocks, and leaving only one exit leading through a narrow tunnel into a large wooden box, where the snakes will accumulate as they emerge. The trap should be about 40 inches long, 32 inches wide, and 16 inches high, and have a removable hardware cloth top (Stickel, 1953)- The wooden chute with a diameter of *k* or 5 inches, should open a few inches above the floor of the trap so that snakes do not block the entrance by piling up against it.

Another trap that was successfully used on a duck-nesting area was a drift-fence funnel trap (Imler, 1945). In order to turn the snakes and lead them to the trap, hardware-cloth fences were erected through the marshy vegetation. The fences varied from 150 to 320 feet in length and projected 8 to 15 inches above the ground level, depending on the type of vegetation surrounding the fence. The traps (two per fence) were placed 30 to 60 feet from the ends. They were constructed of 1/3-inch mesh hardware-cloth, 72 inches long, *2k* inches wide, and 11 inches high, and had an inward-sloping funnel entrance at both ends. A lid on the top of the cage permitted removal of the captured animals. The objections to this trap are that it catches a large variety of different animals, including birds; because of this fact, the trap must be checked daily or the birds will die.

A simpler type trap consists of pits, three or more feet deep, with vertical sides, and with live frogs or mice in them as decoys. Sometimes overhanging sides are added to prevent snakes from escaping

from the pit. Caution should be taken that stock or humans do not trip in these pits.

Among the more unusual methods of capturing certain snakes is the technique of tying a small frog by one leg to a stake in a suitable surrounding. The snake swallows the frog and if it does not regurgitate the bait, is held captive for many days until digestion dissolves the swallowed bait.

USE OF CHEMICALS

Poisoned Water. If conditions are such that there are limited locations for available drinking water, this method can be successful. A mixture of one part 40% nicotine sulphate (sold commonly as a trade-named insecticide) to about 250 parts water is used (Stickel, 1953). A shallow metal tray is filled with the solution and placed in a suitable location. Extreme care should be taken to prevent birds and mammals from drinking the liquid. Small stakes should be driven into the ground around the tray and a screen tacked to the stakes, leaving about a one-inch space between the top of the pan and the screen. A research test has shown that putrid milk serves as an attractant to snakes; with the addition of 10% nicotine sulphate to the milk a snake was killed in the laboratory (Cowles and Phelan, 1958)- It seems likely that a lesser amount of nicotine sulphate may be sufficient.

Strychnine in Eggs. There are some snakes that feed upon eggs and may form the habit of entering poultry houses and barns in search

of eggs or young birds. These snakes may sometimes be controlled by the use of poisoned eggs. These eggs are prepared by making a small hole in the shell of a fresh egg and placing inside two or three medium-size crystals of strychnine. A piece of paper is then pasted over the hole and allowed to dry. Poisoned eggs should be clearly marked, and not used indiscriminately, as they are a hazard to house pets and farm animals. The eggs, if not taken in a few days, should be retrieved and destroyed, as they soon become unattractive as bait.

Fumigation of Burrows. Poison gas can be used on snakes that take refuge in rodent burrows. With a long-handled spoon, two ounces of calcium cyanide should be placed as far down the burrow as possible. The opening should then be sealed with a stone or piece of sod so that when soil is added it will not cover the chemical. The moisture in the tunnel combines with the cyanide to liberate hydrocyanic acid gas. Under ordinary conditions, a snake will be killed within 30 minutes. Extensive gassing of miscellaneous burrows should not be done unless definitely needed, for many forms of wildlife are likely to be killed. This gas also can be used effectively in fumigating buildings for snakes, provided that the structures can be tightly sealed. Such buildings should be vacated a day or more. It should be remembered that calcium cyanide is a deadly poison, and should therefore not be removed from the original container until you are outdoors and ready for its use.

Gassing of Dens. Gassing of dens in which groups of snakes are hibernating or taking shelter is another method of controlling snakes, but it is difficult and often not too successful. The reason for a lack of success may be due to several factors, one of them being that snakes have a low rate of metabolism, especially when hibernating. This characteristic renders them unusually resistant to the effects of poison gas (Fitch, 1960). Gassing should therefore be done in the fall soon after snakes enter the dens or in the spring shortly before they leave them. It is also necessary to maintain an adequate amount of the gas in the den for a considerable period of time in order to kill the snakes.

Another difficulty lies in the fact that there is no way of judging the extent of the den cavity. A person can try to allow for this by using enough gas to fill any likely amount of space; but still he would not know whether the cavity extended up or down, and therefore whether to use a light or heavy gas. Stickel (1953) has suggested the possibility of using a mixture of both light and heavy gases. Lastly, it is important to seal all the openings to the den in order that the gas will be retained long enough to have its lethal effects on the snakes.

Gases that have been used with success include tetrachloroethane, methyl bromide, carbon bisulfide and formaldehyde. Mustard gas is also good when circumstances allow its use. Some reports claim that phosgene, chlorine, and tear chemicals have not given good results.

Poisonous gases are extremely dangerous to humans and can cause death or severe injury. They should be handled only by control experts, or individuals who are trained and equipped to handle them safely.

Use of Insecticide Sprays. Experimental sprayings of marsh and woodland areas for the control of insects have killed many reptiles. Such chemicals as DDT, aldrin, dieldrin, toxaphene, and heptachlorane are highly toxic to snakes, but their use should be severely restricted because they are non-selective and may cause mortality of harmless and beneficial forms of wildlife. Some control of snakes, though, can be achieved with the use of high concentrations of these chemicals from a hand sprayer (Anon., 1961). Repeated applications should be made along rock ledges and rock piles, with special attention to the holes, fissures, and crevices where snakes might den.

USE OF REPELLENTS

There long has been a need for a good snake repellent. The use of a 50% DDT powder will help to keep snakes out of buildings and basements. The powder should be dusted around the edges of the walls, into cracks, and onto ledges. Snakes that move over a treated area may be repelled by the irritating effect of the chemical or even killed if they remain in the area. The DDT will also kill many of the mice that run over it. In the laboratory, snakes have died after feeding upon live mice that were heavily dusted with DDT. This chemical should not be used near food or where the chemical or its dust can be reached by children or pets.

A commercial snake repellent, which contains a mixture of the highly toxic chemicals, dieldrin, toxaphene, and heptachlor, is available on the market. This product, when applied at the rate of one pound per 420 square feet, is stated to keep snakes from houses, garages, gardens, and campsites. Snakes that do enter the area and stay in contact with the chemical for a sufficient duration are likely to die. Small snakes are reported to die after contact of only a minute or two.

Another chemical that may serve to repel snakes is thio-alcohol n-butyl mercaptan, a commercially available substance closely simulating the odor of skunk (Cowles and Phelan, 1958). Experiments have shown that charcoal soaked with this liquid creates a fear reaction in snakes, but no field tests have been carried out. Charcoal is used because it is absorbant, inexpensive, and durable.

MISCELLANEOUS CONTROL METHODS

Use of Domestic Animals. Geese, ducks, and chickens will kill and eat harmless and venomous snakes of sizes they can manage. Turkeys can be used to help locate snakes; these birds will gather about an unusual object, and their gobbling will quickly attract attention (Cummings, 1961). Cats and dogs occasionally learn to kill snakes, especially small ones. Hogs have a reputation for exterminating snakes; the thick layer of fat beneath their skin supposedly makes them physiologically immune to the effects of snake venom. There is no proof that hogs actually eat many venomous snakes, but their rooting

can upset a snake's habitat by destroying hiding places.

Biological Control. Natural predators in a local area where snakes are a problem should be encouraged, for they will help destroy individual snakes. Skunks, weasels, and raccoons feed occasionally upon snakes. The roadrunner and most hawks take venomous snakes at times (Bogert, 1948). King snakes are known to readily eat other snakes, including rattlesnakes.

Bounty System as a Control. The bounty system for controlling snakes has been tested widely. Usually no decrease is noticed, and the system is greatly abused. Gravid females sometimes are kept in captivity for later collection of bounty for the young. Dead snakes found on the roads are also brought in for the bounty. Snakes from far away locations are also brought back into the area for payment. Due to such factors, this system has not been successful (Fitch, I960).

Rattlesnake Control Officer. Some localities hire officers to control snake populations, specifically rattlesnakes. These men become experts on mass extermination of snakes, using all available methods. By gassing and trapping dens, they often eliminate large numbers of snakes.

Blasting of Dens. Sometimes good results are obtained by dynamiting dens of hibernating snakes, but this method is not always practical. Often the number of snakes killed in not worth the effort involved. It also has been suggested that blasting of dens may improve the habitat for snakes by making deeper and more extensive

cavities. Furthermore, in many areas the hiding places for snakes are abundant, and the snakes are dispersed over a large area instead of being gathered in a few dens.

SUMMARY

Before attempting to control snakes, the operator should be able to identify the species and know something of its habits, so he can best judge the type of control needed.

In order to exclude snakes from houses, a thorough check should be made for openings around fireplaces, chimneys, cellar doors, windows, screens, and where pipes and wires go through the outside wall. To exclude snakes from yards and gardens, special fences can be constructed.

One of the most effective ways of limiting snake numbers is to reduce their food supply (rodents) and cover. The removal of cover not only limits the snakes[1] hiding places but also helps reduce the habitat needed by mice. Another means of regulating snakes within a given area is to have campaigns to search out and kill them by clubbing or shooting. One trap that has been used where many snakes hibernate in a den is a box set outside the den with a tunnel leading from the den to the box. Another trap requires a "drift fence" which leads snakes into a funnel trap. The simplest type of a trap is to dig a three to four foot hole with vertical sides and place several live mice in it for bait.

In locations where water is scarce, a diluted solution of nicotine sulphate is a good poison. Strychnine in eggs works for snakes that raid poultry houses. Calcium cyanide is a good chemical for killing snakes taking refuge in burrows, while there are several gases that sometimes work in fumigating dens. The use of certain insecticide sprays used in a hand sprayer also has possible uses. In many instances before resorting to the use of a poison on snakes, the control operator should consider the use of a repellent.

Other categories of snake control deal with the use of domestic animals and the use of natural wild predators. Certain localities have tried hiring snake control officers. The bounty system for snakes has not been successful.

LITERATURE CITED

Anonymous. 1961. Control of birds and other vertebrates. Pest Control 29(9): 35.

Bogert, C. M. 1948. The problem of snake control. Natural History 57: 185-8.

Cowles, R. B., and R. L. Phelan. 1958. Olfaction in rattlesnakes. Copeia 1958(2): 77-83.

Cummings, M. W. 1961. Rattlesnake control in residential areas. One-Sheet Answers, OSA#110, Univ. of Calif. Ag. Ext. Serv.

Eadie, R. W., and W. J. Hamilton, Jr. 1961. Control of small animals in homes and gardens. Cornell Univ. Exten. Bull. 729.

Fitch, Henry S. I960. Autecology of the copperhead. Univ. Kansas Publ. Mus. Nat. Hist. 13(4): 85-288.

Imler, R. H. 19^5- Bullsnakes and their control on a Nebraska wildlife refuge. J. Wlldl. Mgmt. 9: 265-273.

Stickel, W. H. 1953. Control of snakes. U.S.D.I., Wildlife Leaflet No. 345, 8 p.