

A SIMPLIFIED TYPE OF FUNNEL TRAP FOR REPTILES

By Henry S. Fitch

Although trapping is an unusual method of capturing reptiles, funnel traps have been used effectively in certain instances. Employed in "pest control" they have served to capture large numbers of prairie rattlesnakes emerging from hibernation dens in South Dakota (Gloyd, 1947), and of bullsnakes on a Nebraska wildlife refuge (Imler, 1945). Dargan and Stickel (1949) have used funnel traps in population studies of several species of snakes occurring at the Patuxent Wildlife Refuge, in Maryland. Dr. Angus M. Woodbury, studying rattlesnakes at a hibernation den in Tooele County, Utah, and Dr. Walter E. Howard, studying snakes at the San Joaquin Experimental Range in California have likewise employed this method successfully.

In 1949 and 1950, at the University of Kansas Natural History Reservation, funnel traps different from those hitherto described in the literature, with the advantage of greater simplicity and ease of construction, have been used as an aid in population studies of reptiles. The model used consists of a piece of hardware cloth wire, one-fourth inch or one-eighth inch mesh, rolled into a cylinder and held in this shape by having the edges turned back and pounded together. An entrance funnel of the same material is fitted firmly into each end. First, each end of the cylinder is turned inward at right angles, for half an inch or so, forming a skirt. The elasticity of the hardware cloth tends to hold the funnel in place when it has been forced into the cylinder as far as it will go. Shingle nails woven through the meshes of the funnel and the end of the cylinder to maintain firm contact between them provided reinforcement which was found to be especially desirable in traps liable to be disturbed by predators. Striped skunks, spotted skunks, opossums, raccoons, and probably domestic cats occasionally broke open the funnel traps to prey upon the trapped animals. Effectiveness of the traps is increased by attaching a valve-type, transparent, cellulose acetate door inside each funnel opening. This permits use of a larger entrance through the funnel. The door pivots on its upper edge, which is perforated and threaded with a fine wire attached to the end of the funnel. A trapped animal can be removed easily by pulling the funnel from one end of the trap and shaking the animal into a cloth bag.

These traps are used without drift fences, but are placed where natural objects such as sunken logs, walls, or rock outcrops serve the same purpose, guiding the animal into the mouth of the funnel. Reptiles often tend to follow travelways along such shelter instead of crossing open spaces.

The relatively small amount of material required for each funnel trap, and the ease of construction permit their use in large numbers. Several can be made with the material that would be required for one drift fence a few feet long. The traps have been used in different sizes; for small lizards, 7 inches long and 3 inches in diameter, and for snakes and larger lizards, 15 inches long and 6 inches in diameter, or even larger. Success in trapping depends on the abundance of the animals to be caught, on careful placement of the traps in favorable situations, and, of course, on the activity of the animals. Usually few catches are made with any one trap, and it is necessary to have an adequately large number of them working to obtain reptiles in quantity. More than 100 of these traps were set out on the Natural History Reservation during the summer of 1949, and several dozen more were added during the summer of 1950.

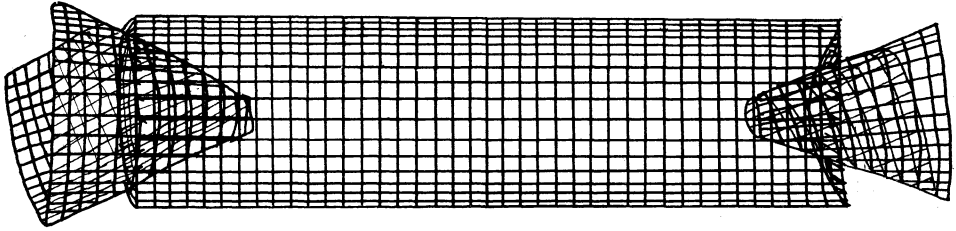


Figure 1. Side view of reptile trap, a wire cylinder with an entrance funnel at each end.

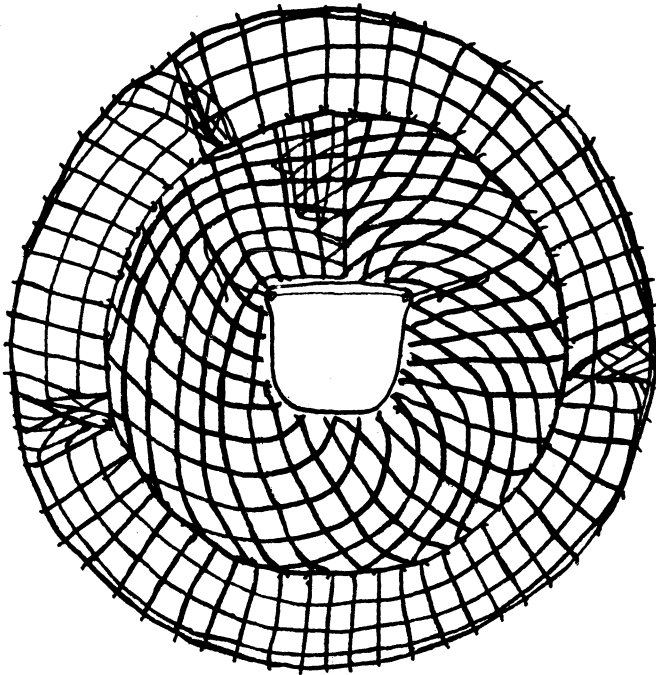


Figure 2. Funnel viewed from inside trap, showing transparent, valve-type door suspended over entrance by a fine wire.

Besides reptiles, the traps caught various other small animals, especially large insects such as grasshoppers, predatory carabid beetles (*Pasimachus*), and camel crickets (*Ceuthophilus*); also wolf spiders (*Lycosa rabida* and *Lycosa carolinensis*); small mammals including white-footed mice (*Peromyscus leucopus*), harvest mice (*Reithrodontomys megalotis*), prairie voles (*Microtus ochrogaster*), pine mice (*Pitymys nemoralis*), short-tailed shrews (*Blarina brevicauda*), a weasel (*Mustela frenata*); toads and frogs (*Bufo terrestris* and *B. woodhousii*, *Hyla versicolor*, *Pseudacris nigrita*, *Acris crepitans*, *Rana pipiens*, *Microhyla olivacea*); and on two occasions wrens, and once a Lincoln's sparrow. Mortality was high among the amphibians from desiccation and the shrews from starvation and some of the rodents caught were dead or in weakened condition when removed from the traps. The reptiles caught were generally in good condition. Most of the traps were placed in woods where they were well shaded, and others in more open situations were protected from direct sunlight by placing rocks and boards over them. Trap lines were tended daily or every second or third day during the season when reptiles were active.

No bait was used, but in some cases the reptiles probably were lured into the traps to secure prey trapped earlier—insects attracting the lizards, and small mammals and amphibians attracting certain snakes. Even more effective lure for reptiles of certain kinds was provided by a trapped individual of the same species. In fall, copperheads, blueracers and garter snakes were caught in numbers along the rock ledges, and often two or more were found together in the same trap, suggesting the possible effectiveness of scent lures. In spring two or more males of the same kind of skink (*Eumeces fasciatus*, or *E. obsoletus*) were often caught together in the same trap. In these instances the first individual caught probably provided visual stimulus arousing the pugnacious interest of other males and luring them inside. When two or more male skinks were trapped together, they usually bore wounds of recent combat, and sometimes one was so badly injured that it did not survive.

Variation in activity according to moisture, temperature and season, is illustrated by the fluctuating catch for each of the common species. Narrow-mouthed toads have been caught in numbers on warm rainy nights, and rarely at other times. Blueracers and copperheads, trapped only occasionally during the spring and summer, are caught in much larger numbers in early fall when they concentrate along the rock ledges preparing to hibernate.

Population densities can be calculated or estimated by the numbers of a species taken on a given area, allowing for movement and mortality. The ratio of marked animals to others, after a period of trapping, provides an index to the total number present. The figure obtained will be accurate only to the extent that the sample is representative of the population. Samples obtained by trapping may be biased if varied terrain prevents uniform distribution of traps over the study area. Similarly, a sample obtained by hand collecting may be biased, if individuals living in certain parts of the area have shelter, such as immovable boulders or deep rock crevices, protecting them so effectively that their capture is made difficult or impossible. A much more satisfactory sample therefore may be obtained by a combination of hand collecting and trapping. Trapping may provide a more or less random sample of those previously caught by hand, and vice versa.

On trips to the area where traps were set, the catch was usually augmented by an intensive search for reptiles, involving turning flat rocks, and stalking individuals seen in the open. Also, some reptiles were caught by hand on other parts of the Reservation when opportunities arose in the course of routine field work. The following list of total number of captures made by hand and by funnel traps for each species, indicates relative success of the two methods.

	<i>Taken with funnel traps</i>	<i>Taken by hand</i>
<i>Eumeces fasciatus</i>	366	332
<i>Eumeces obsoletus</i>	325	104
<i>Agkistrodon contortrix</i>	158	54
<i>Coluber constrictor</i>	145	21
<i>Cnemidophorus sexlineatus</i>	91	15
<i>Elaphe obsoleta</i>	31	28
<i>Thamnophis sirtalis</i>	28	5
<i>Crotalus horridus</i>	2	12
<i>Pituophis catenifer</i>	6	3
<i>Natrix sipedon</i>	3	3
<i>Ophisaurus ventralis</i>	2	3
<i>Lampropeltis doliaata</i>	1	0
<i>Lampropeltis calligaster</i>	1	0

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Univ. of Kansas, Lawrence, Kansas

THE HABITS OF YOUNG SMOOTH GREEN SNAKES (OPHEODRYS VERNALIS) IN CAPTIVITY.—On August 5, 1950, a fourteen inch female smooth green snake collected in Medford, Middlesex County, Massachusetts in a dried up swamp under a log was found coiled around six elongated eggs with the seventh in the process of being laid. These measured three-quarters of an inch in length. They were placed in a terrarium and covered with damp pieces of newspaper. They grew rapidly in size.

On August 30 a young snake was found to be emerging, but upon disturbance it drew its tiny body into the egg, not to be seen until the next day, when two were found to be crawling around in search of food. The average length was six inches. When the third one emerged it was covered with a transparent amniotic tissue which was soon discarded. Still later in the day, four more had appeared.

For the first few weeks the young snakes would not eat, subsisting on remaining yolk material absorbed from the egg. Feeding was finally preceded by molting in each case. Before the actual molting they were a gray-green in color, but later their color resembled the parent far more. After molts they readily accepted small earthworms, crickets and grasshoppers.

The one and only death was caused by strangulation as a cricket covered the glottis. All of the small snakes ate readily, and grew rapidly. At the time of their release in October the largest measured eight inches in length.—Charles R. Le Buff Jr., 12 Evelyn Ave., Medford, Mass.