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United States Department of the Interior
Fish and Wildlife Service

Wildlife Leaflet 333

Washington 25, D. C.

January 1951

✓ CONTROL OF BATS^{1/}

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When bats invade homes and occupied buildings to establish their roosts they often become nuisances and make necessary some measure of control. The Fish and Wildlife Service receives many requests for information regarding control measures under these circumstances. Since bats are harmless animals and may even be ranked as beneficial through their control of insects, they should not be destroyed; milder measures should be tried, directed toward dispossessing them from the buildings they have invaded and permanently excluding them. This leaflet gives directions for such control.

A few facts about the habits of bats should be stated as background information. They are nocturnal animals, leaving their roosting places at dusk to fly about in pursuit of the night-flying insects that provide the bulk of their food. By day they roost in dark, sheltered places. A few species are solitary, but most congregate in groups or in colonies, the largest of which may number a million animals or more. Bats are mammals--not birds, as so many people believe. Their "wings" are formed by thin leathery or membranous skin that stretches between the greatly elongated bones of the front legs and "fingers". They are the only mammals thus equipped to fly. The ones found in this country are small, averaging 3 to 5 inches in body length; the wingspread averages between 10 and 15 inches. They do not attack humans, nor do they get themselves tangled in peoples' hair.

Some bats migrate with the change in seasons, following a steady source of food supply. Others remain in their roosts if well protected, hibernating only during the colder months. Originally bats roosted in natural shelters, such as caves and hollow

1/This leaflet supersedes Wildlife Leaflet 260, issued September 1944.

trees. Many still do, but others have found attics, spaces between building walls, and unused areas in upper stories much to their liking. This habit constitutes the major objection to their presence. From the droppings and urine deposited about the roost comes a highly objectionable odor that is characteristic of bat roosting places. This odor persists for a long time after the roost is broken up and may serve to attract new colonies if preventive measures are not taken. The noises created by crawling bats are also disturbing to the householder. While they cause no actual damage to structures, their presence in a dwelling is usually undesirable. Exclusion or elimination is then necessary.

CONTROL METHODS

Repellents: Frequently control can be accomplished by the use of repellents. Bats dislike the odor of naphthalene and paradichlorobenzene, two chemicals commonly used as moth and insect repellents. When the roost is located in attics or other closed spaces that can be reached easily, either of these materials can be used to drive them out. Three to five pounds of naphthalene flakes will usually be sufficient to treat the average attic. Simply sprinkle the material liberally over the entire area. So objectionable is this odor to bats that they will usually leave the roost within a short time after it is introduced, even in broad daylight. Both of the chemicals dissipate rapidly on contact with air, however, and applications may have to be repeated if no other control is practiced. Bats are quite persistent, and it is often difficult to dislodge them from old established roosts. Then too, new individuals may be attracted by the odors left by departed guests. For these reasons, bat-proofing should be considered a necessary adjunct to the use of repellents.

Bat-Proofing Buildings: Bats may enter buildings through large or even small openings, such as unprotected louvres or vents, broken windows, or other open spaces, or through old worn sidings, around eaves, or cornices. The smaller species of bats can crawl through an opening as narrow as $3/8$ of an inch. It is necessary, therefore, to eliminate all possible entrances.

The larger openings should be covered with sheet metal or with $1/4$ -inch mesh hardware cloth if ventilation is necessary. It is essential that no openings larger than $1/4$ -inch are left. In the case of narrow cracks, they are best plugged with oakum, tow, or similar packing material, and sealed with caulking compound. This will provide useful weather protection as well. Inspect carefully all old siding and baseboards to make certain that alternate entrances have not been overlooked.

If the roost is not completely dislodged, it is necessary to ensure that all bats are out of the buildings before proofing work is completed. Normally, during the warmer months when bats are active, all occupants leave the roost within 15 to 20 minutes after the first one starts out. If they have been disturbed, however, the normal routine may be upset considerably, and one or two of the most-used openings should temporarily be left open. In the evening after the last bat has left the roost for feeding, close the remaining openings. If a number of entrances have been used, wait two or three days before attempting to close the last one, thus allowing all the occupants to learn to enter through this last opening. It can then be easily located and closed. If any entrances have been overlooked, the bats will soon find them, so it is necessary to watch the building closely at dusk for several evenings.

Fumigation: In cases where the use of repellents and proofing will not suffice, it may be necessary to destroy the bats. Best results can be obtained by fumigation with gas. Calcium cyanide is the material most generally used for this purpose. Operations involving space fumigation are dangerous and must never be attempted by inexperienced persons. Only trained professionals, qualified to handle the materials, should be entrusted with the task.

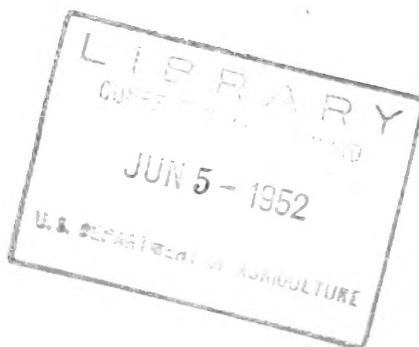
The use of poisoned bait is impractical since bats feed primarily upon flying insects they catch in the air.

Bat destruction by the above method, while accomplishing the immediate objective, has several disadvantages, as carcasses not recovered decompose with a resultant displeasing odor. Further, it gives no degree of permanency, for as soon as the space has been cleared of gas it is ready for new occupants if no bat-proofing has been done. For the reasons mentioned, proofing, where practical, is recommended as the most satisfactory and permanent means of bat control.

For those interested in details about bats, their habits and characteristics, a selected group of references is listed on Page 4.

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