

California Bat Conservation Fund Procedures for Bat Rehabilitation

GENERAL DISCUSSION: Bat rehabilitation is problematic because bats, along with skunks and foxes, are considered a rabies vector species. In actuality, rabies is considered rare in free-flying bats. Results of large-scale studies have shown that generally less than 1% of apparently healthy bats are infected with rabies (Brass, 1994a). In California, studies have indicated that approximately 1 in every 1,000 bats will test positive for rabies (Hill & Brown, 1984). These numbers may fluctuate according to species, location and season. (Brass, 1994b) However, these numbers jump dramatically when bats are found on the ground. From 4% to 10% of grounded bats (biased sample) may be found to test positive for rabies. (Brass, 1994c)

Rabid bats will almost always display paralytic rather than furious rabies. In paralytic rabies, bats usually lose the ability to hang or fly and become very lethargic and apparently unaware of their surroundings. They may still bite in self defense, but only if handled. Furious rabies is manifested in markedly aggressive behavior, with the animal snapping, biting and chasing anything that might come into its line of vision. As the disease progresses, rabid bats become unable to fly or hang normally, separate themselves from their colony and fall to the ground. It is at this point when bats become most dangerous to people who, with good intentions, discover the bat, pick it up and expose themselves to rabies.

Since laws have been enacted requiring dogs to be vaccinated, human deaths from rabies has become extremely rare in the United States. Dogs carry 99% of rabies on a world wide basis (Brass, 1994d). Exposure to rabies in the U.S. now usually involves wildlife or unvaccinated domestic cats that are allowed to run free. Because of this potential for rabies exposure, it is best if wildlife centers make every effort to minimize the public's contact with bats by picking up bats in distress immediately and informing callers of the potential risk of handling bats.

NATURAL HISTORY: Bats are the second largest order (Chiroptera) of mammals in the world with approximately 1,100 species. Bats are quite diverse and can be found on every continent except the Arctarctic. There are 45 species of bats in the United States, all microchiropteran (small). There are 24 species of bats in California, with all but one being insectivorous. The sole exception is the nectar feeding Mexican long-tongued bat (*Choeronycteris mexicana*) found in the most southern regions near the Mexican border. Fourteen species of bats in California are now listed as "species of special concern."

Because of the great diversity in bats, rehabilitators often find themselves caring for animals that seem to have little in common except for their ability to fly, their need to hang upside down, and their insectivorous diet. Consequently, prior to undertaking the rehabilitation of any bat, an apprenticeship and/or networking relationship with an experienced bat rehabilitator is crucial for the novice bat rehabilitator. This protocol is not intended to be a manual for bat rehabilitation, but rather a general guide. It is highly recommended that all novice bat rehabilitators attend at least one Department of Fish

and Game approved workshop/training session to learn car procedures. The California Bat Conservation Fund offers these workshops.

DEVELOPMENT OF PROCEDURES: Until recently, very few wildlife rescue centers would accept bats for rehabilitation. When we started the California Bat Conservation Fund's bat rehabilitation center 15 years ago, only one wildlife center in the Bay Area would accept bats for rehabilitation. This general lack of interest was reflected nationwide. Therefore, our procedures were developed mostly by trial and error, working with bat biologists and a veterinarian.

Much has changed in the last few years. The explosion of public interest in bats, fueled by educational programs to inform the general public of the enormous importance of bats to healthy ecosystems, has led to a desire to help these animals. Today, it is not uncommon for bats to be brought into wildlife centers by people who expect the animals to receive the same level of care as any native wildlife in need of attention. And, just as the public's interest in bats has grown in recent years, so has the amount of information available about bats. Today, as one scrolls through the internet, one finds many websites dedicated to bats and their rehabilitation.

It is important to note that, although a great deal of knowledge has been gained about bats in recent years, bat rehabilitation is still in a relatively early stage of development. Unfortunately, this creates an arena in which there are still many opinions about what is the best procedure for individual animals. To this end, the following guidelines have been gathered and compiled into this format at the request of the California Department of Fish and Game's Central Coast Region. These are procedures that the California Bat Conservation Fund has developed over several years through trial and error and with the assistance of Dr. Scott Sims, a veterinarian, and Drs. Elizabeth D. Pierson and William E. Rainey, both bat biologists with the University of California at Berkeley. One procedure that cannot be under emphasized is the need for all rehabilitators handling bats to have their rabies vaccinations up to date. NO rehabilitators without this protection should handle a bat at any time.

REQUIREMENTS FOR BAT REHABILITATION: Wildlife rehabilitation facilities shall assign one bat team leader and assistants who are vaccinated for rabies to care for all bats accepted into the facility. These shall be the ONLY people handling bats. All care people handling bats *must* have their rabies immunizations and be current on their rabies boosters. Bats should not be handled or cared for by rehabilitators out of this group, but should stay with their initial care person and their assistants until they are released or transferred. Bats may be transferred from one location to another by an unvaccinated rehabilitator, but it must be understood that the bat will be placed in an escape proof cage for transport and under no circumstances be taken out of this cage or handled during transport. If a rehabilitation facility has no veterinarian available that is adept at pinning wing fractures, transfers should be made immediately to a facility that has a veterinarian willing to surgically pin the wing, or perform any surgery or major procedure. External Splinting or gluing of the wing will result in a non-releasable bat except for the very rare "greenstick" fracture.

Any bat found on the ground must be handled as a potential rabies contact. Handlers should be alert for any CNS symptoms in a bat, although rabies may show symptoms other than CNS problems. Bats that show symptoms of rabies shall be euthanized immediately. Under NO circumstances shall wildlife rehabilitators or phone volunteers offer health advice to individuals who are concerned regarding potential exposure to rabies. Individuals who are concerned about contracting rabies should be advised to consult their physician.

Bat rehabilitators shall use either gloves or a wrapping cloth when handling bats. A terrified bat will try to bite. Letting the bat chew on a piece of cloth will often keep the animal distracted while it is being handled. Another technique that works well is to cover the bat's head with a soft cloth during handling. Utilizing this method will help keep the bat calm and also help prevent the handler from being bitten.

Adult bats brought in with injuries may be released as soon as they have recovered and are capable of sustained flight (5-15 minutes in the air without the need to land, depending upon species). Any facility that accepts bats for rehabilitation shall have one or more flight cages or an escape proof room available for exercising bats several times a week.

SCREENING CALLS: It is imperative that all information regarding the finder of the bat be recorded. The name, phone number and address of the finder should be documented and maintained with the bat's records, along with the exact location where the bat was found. Callers should be informed of the risks of handling bats with their bare hands. Bats that have bitten people or pets or had any contact with children shall not be accepted for rehabilitation. Refer the finder to the Dept. of Health Services or the local Animal Control agency in their area to test the bat for rabies. Any bat that has bitten a person must be destroyed immediately and sent in for rabies testing. No exceptions can be made.

RESPONDING TO CALLS: A bat rescue kit should be made up and kept within reach at all times. Most rescue calls will come in after dark. A bat rescue kit should consist of: A small escape proof cage equipped with bedding for transport, 1cc syringes loaded with Ringer's (for rehydration in the field; most bats that are in need of rescue are in *immediate* need for SQ rehydration), gloves, a net with extendable pole, and flannel cloths for picking up and wrapping bats to lessen stress. Additionally, feather dusters work well to tease bats out of inaccessible crevices or cracks found in many ceilings where nets will not fit. If the bat is capable of flying, interview people nearby to determine that there was no contact, examine the bat for rehydration, offering it water orally even if it does not seem dehydrated, and release it outside where it can fly to shelter immediately in nearby trees. If the bat is injured or seems sick, place it, pick up cloth and all, into the transport cage and secure the lid. The bat's life depends on your professional handling. As bats that have bitten people must be euthanized, make every effort to keep from being bitten yourself.

EVALUATION FOR RABIES SYMPTOMS: The bat should be evaluated immediately for any possible CNS symptoms that might indicate rabies. Rabies symptoms are varied, but usually involve an inability to hang normally or walk on all fours. A bat's inability to hang normally, or stand on all fours (using their wings as front legs, although red and hoary bats cannot "walk" on all fours at any time), clutching their hind legs to their abdomen, crying out, wings held over the head for long periods of time, dirt found in the mouth, persistent erections of the penis in male bats, and general paralysis with no interest in trying to hide underneath bedding are the most commonly observed symptoms of rabies in bats. The natural state of torpor, which is exhibited by the seemingly lethargic, slow movement of bats which are cold, is often confused with rabies symptoms. A cold, sleepy bat should be allowed to warm up and awaken before being evaluated for CNS symptoms. Hoary bats will typically adopt a defensive posture of lying on their backs when approached, hissing and screeching, while flailing with their wings. This is normal behavior for hoary, and often red bats, and should not be confused with CNS symptoms.

PHYSICAL EXAMINATION: Once it is determined that the bat is not displaying symptoms of rabies, an examination may proceed to determine if the bat has any broken bones, and/or open wounds or other injuries. Jeweler's magnifying glasses are invaluable during these examinations because of the very small size of most bats. Be sure to check the *entire* wing, down to the tips of the fingers, for breaks or tears in the wing membrane. Then check the bat for any injuries to the body, head, and teeth. Antibiotics should be started immediately for any injured bat. If the bat is cat-caught, it should be assumed that there will be punctures to the body as well as the wings, even though they may not be visible upon examination. Over half of all injuries in bats brought to our rehabilitation center involve compound fractures of the arm bones (radius and humerus) of the wings, and these can often be pinned successfully I.M. by a veterinarian experienced in this procedure. The bat should then be weighed with a gram scale, forearm measurements taken, and as is usually necessary, rehydrated with Lactated Ringer's Solution. Dehydration is almost always present in grounded or distressed bats, and can be determined by checking the wing membranes; a bat's wing membrane is normally silky and pliable. Wings that feel dry or "crispy" indicate extreme dehydration that will necessitate SQ rehydration with a 1cc syringe and 25 gauge or smaller hypodermic needle. Tuberculin or diabetic syringes work well for this purpose. When in doubt, rehydrate SQ. The bat's approximate age can also be determined at this time by checking the sharpness of its canines. Young bats have needle sharp teeth; older bats will have teeth that are progressively worn down and shortened or "pegged". Infant bats, with rare exceptions, will only be found from May through July in California.

CARE IN CAPTIVITY: Once the bat is rehydrated and allowed to quiet down, mealworms may be offered if the bat is a juvenile or adult. Infant bats should be offered a puppy formula weakened to 1/4 strength, gradually increasing the formula to full strength over the next three or four feedings. When feeding a juvenile or adult bat, a mealworm's head may be pinched off and the guts "tooth pasted" (squeezed) into the bat's mouth, which will normally be open in a defensive posture when the bat is first handled. Once the bat realizes that the mealworms are food, they should be

encouraged to chew the entire mealworm. Some species of bats learn to eat from a shallow dish left on the bottom of their cage very quickly. Other bats may never learn. It is suggested that forceps be used to offer mealworms so that bats do not associate feeding with human hands and become dependent upon being hand fed. Do not feed a bat mealworms before being taken to the vet for pinning; their stomach should be empty before anesthesia is administered. After the first feeding the bat should be introduced to a small holding cage with soft non-terry type material on the bottom and draped over the sides of the cage in a way that allows the bat to crawl underneath the material to hide. A shallow dish of water and a dish of mealworms may be left close to or underneath the cloth where the bat chooses to hang, and a heating pad set on low should be set on the side and over the top to encourage the bat to hang normally. The cage should be placed in a quiet, dark room where no potential predators are housed or reside (i.e., owls, other raptors, rats, domestic cats or dogs) so that the bat can rest with a minimum of stress.

Most crevice dwelling bats learn quickly to walk down to the bottom of the cage or to a shelf and eat out of a shallow dish. Water can also be offered in shallow dishes. Baby food jar lids or shallow plastic lids make acceptable dishes. Cracking mealworms just behind the head will disable them so that they cannot escape from a shallow dish. After a bat becomes used to eating out of a shallow dish they can then be offered deeper dishes that do not allow mealworms to escape and cracking the mealworm's neck may be discontinued at that time. An occasional bat, and a sizable percentage of Mexican free-tail bats, will not learn to eat on their own and must be hand-fed for their entire stay in captivity. Many pallid bats will become ill on a constant mealworm diet and should be fed domestic crickets. All insects being fed to bats must be kept in a nutritious, mold-free medium (wheat bran, grain, cereals, etc.) and should be dusted with a powdered vitamin/mineral supplement, such as Vionate TM before being offered to the bats. Most bats can be offered free choice of insects, but some bats, especially pallid bats, may become obese if offered an unlimited supply of food. All bats in captivity should be weighed regularly to see if their food should be limited or more should be offered. Bats normally gain up to 1/2 again their normal weight in the fall to prepare for hibernation and should not have their food limited for this natural seasonal response.

RAISING INFANT BATS: Conventional wisdom has always decreed that bats hand-raised from infancy cannot be released. However, recent studies have shown that hand-raised colonial bats are capable of surviving in the wild if released back into their own or conspecific colonies in a careful, well thought out manner. More studies are now under way to study the survivability rates of hand-raised bats. It is becoming increasingly apparent that orphaned, colonial bats are suitable candidates for release as soon as they become adept at flight. No evidence is yet available, pro or con, regarding the survivability of solitary species that are hand-raised and then released.

Infant bats weighing less than one gram for smaller species (i.e., myotis species), or 3-4 grams for larger species (i.e., big brown, pallids), need to be fed every two hours, day and night. Infant bats weighing between 1 and 3 grams for smaller species, and 5-6 grams for larger species, should be fed every three hours. Infant bats will need to be fed during the night until they are approximately 3 week of age. They can then be

introduced to mealworms and weaned from formula gradually over a period of two weeks. Check with your local bat specialist for formula suggestions. Do NOT use Esbilac TM puppy formula as it may cause severe metabolic bone disease in infant bats. Infant bats should be kept in a somewhat warmer environment than an adult bat, but care must be taken to not overheat them. Always have a space in their container where they can roost to avoid excessive heat. Check them every hour or so, and if they are found hanging from the screening on the top of the container, it is probably too warm. Experiment with heating pad placement until you become adept at keeping a comfortable temperature available at all times. It is very important for infant bats to be raised with other infants, preferably their own species. Transferring infants to a rehabilitator who can raise it with others of its own species is preferable to raising it alone.

If infants are found on the ground below known colonies, every effort should be made to return the infant bats to their roost once the rehabilitator has determined that the fallen infants are not injured or seriously dehydrated. CBCF has found that hanging fiberglass screening in a way that allows the baby bats to climb back up into their roost works well for free-tails and myotis bats. Every effort should also be made to alleviate the cause of the infants falling from their roost, i.e., extreme heat, disturbance, or other causes that can possibly be mitigated. Mother bats will quickly accept their returned offspring, but few bats can actually pick their babies up and gain enough altitude to return to the maternal roost. The infants can also be placed in a shallow pan with a cloth to sit on and placed high enough that mother bats can fly straight back into the roost with them. We have facilitated many mother/child reunions with this method. If infants cannot be returned to their colonies, they must be taken to a wildlife rehabilitation center and raised until they can fly. At that time, they should be returned to their own or a conspecific colony.

PERMANENT BATS: A few wildlife rehabilitation facilities have permits to keep non-releasable bats for educational programs. Occasionally, a bat will be accepted at a wildlife center that cannot be released back into the wild, often because of a break in the wrist joint or elbow that will not regain sufficient rotation to allow flight. Evaluation of the bat by a veterinarian to determine its inability to fly must be obtained, along with permission from the California Dept. of Fish & Game, and the bat shall be kept in quarantine (isolation) for six months before being used for programs. During this time, the bat's temperament should be evaluated to determine if it is a suitable candidate for a life of being bought out into (for a bat) a noisy, bright environment, and handled. Some bats become quite comfortable once they begin to trust their handler, and adapt very readily to the noise and lights they will be subjected to in educational programs. Some bats are simply incapable of adjusting to even limited handling and being out "in the open" and suffer a great deal of stress whenever they are taken from the safety of their cage. Bats that cannot adapt are not considered suitable educational candidates and can sometimes be transferred to a museum for a nocturnal display where it can join other bats in a much less stressful setting. If a wildlife rehabilitation facility has not permits to have bats for educational purposes, but feels they have a non-releasable bat which would make a good candidate for an educational program, they should inquire to

see if one of the rehabilitators who conduct educational programs can transfer the bat to their facility.

Permanent bats must NEVER have any contact with wild bats, both while they are in quarantine, and later when they are placed into an education program. Once a permanent bat has gone through the six months quarantine it can be placed with other bats used for educational programs, but must be kept from any contact with wild bats or other animals. As bats can live up to 30 years, many of CBCF's educational bats have been with us for 13 years or longer. Our bats used for educational programs are allowed to roost together if they are normally found together in the wild. But many bats will not normally roost with other species, and in most species, females will not tolerate males except during breeding season or hibernation. In big brown bats, for instance, females are highly social while males prefer to be solitary or live with one other male. Our rule is: If bats don't roost together in the wild, we do not place them together in captivity. Bats should also not be allowed to breed in captivity. Non-releasable females often lack the ability to exercise sufficiently for safe delivery of an infant that can weigh as much as 1/3 of the mother's weight at birth. Separating males from females during breeding seasons has worked well at CBCF. In addition, permits are needed for breeding wildlife and these permits are normally only given to zoos and research facilities.

CAGING: Caging for bats that are injured, especially fractures, should be small enough to inhibit movement as much as possible. Crevice dwelling bats prefer to hide underneath soft, non-terry cloth material draped over the sides and bottom of their cage. Foliage roosting bats (Hoary bats and Red bats) normally hang from the petiole of a leaf in filtered sunlight during the day, and so should be allowed to hang from the appropriately sized twig, real or artificial, fastened to the top of a cage that is placed in partial filtered sunlight for at least a few hours each day. Newborn bats do well in large cool-whip containers, modified with screen replacing the middle of the lid, so that they cannot wander off and become lost as they might in a larger cage. A range of temperatures should be offered by placing a heating pad sent on low and top and down one side of the cage, allowing the bats to enter torpor by choosing a lower temperature. Foliage roosting adult bats do not normally need heating pads and will actively avoid them. The exception to this are injured bats, which should be kept in a warm cage (approx. 80o Fahrenheit) during the entire time they are recuperating, as a torpid bat's tissues will not heal. The cages should be escape proof and capable of being sterilized after use. We find that Rubbermaid Tuff Totes TM in various sizes, available at hardware and drug stores, make excellent cages for injured bats and for transport. They are escape proof and can be easily sterilized and stacked when not in use. The one caveat is that care must be taken to insure that the bat's toes are not accidentally caught by the lid when it is snapped on. The middle of the lid should be removed and replaced with chew proof netting for ventilation. Hot glue guns are used to affix the netting to the top and sides of these cages.

Bats that are capable of flight should be housed in a flight cage large enough for the bat to attain speed while flying. The flight cage should have appropriate roosting areas, either material draped over a heating pad for crevice dwelling bats, or foliage arranged

at the top for Lasiurine (foliage roosting) bats. All cages must be escape proof. Small bats can squeeze through a hole or crack that is 3/8 inch wide by 1 1/2 inch long. The new energy saving fluorescent light bulbs stay cool and allow enough light for handlers to care for the bats without getting so hot that the bats might accidentally burn themselves brushing against the light.

FLIGHT CAGE SIZES AND CONSTRUCTION: Flight cage sizes may vary depending upon the size and species of bat. Bats with low wing loading aspects have a slow, fluttery flight better suited to hunting in cluttered habitats. These bats can fly quite well in a flight cage of 6' X 6' X 8'. Bats with long, narrow wings, i.e., the free-tail bats, hoary bats, and some myotis bats, have a high wing loading aspect and must have a larger flight cage to attain the speed necessary for flight. These bats often migrate long distances and need to spend much of their time aloft in the wild. Bat rehabilitators should be familiar enough with bats to be able to identify which species will need larger cages. We have used flight cages of 9.5' X 4.5' X 8' to successfully teach free-tails to fly well, but ideally a 20' X 8' X 8' cage should be used whenever possible. Bat flight cages should be constructed of untreated wood frames with plastic netting. The plastic netting should have no more than 1/4 or 1/8 inch openings. Bats can damage their wings by accidentally slipping a wing through larger openings. (Netting may be purchased from Internet Inc. 1 (800) 328-9456). Hardware cloth is not recommended. Fiberglass screening is acceptable for temporary caging for some species of bats, but tears easily and can be chewed through in a few minutes by the larger bats, allowing them to escape. Juvenile bats should be started out in a cage no more than 3' X 4' X 4' for flying until they are capable of landing safely (usually in about 1 week). Starting juvenile bats out in these smaller cages will avoid most first-flight type injuries.

RELEASE: Bats should be released back into the area where they were found as soon as they are capable of sustained flight, demonstrate the ability to gain altitude during flight, land well, and the weather permits. Bats should not be released when storms are forecast or temperatures drop to near freezing. Small, solitary bats such as *Myotis californicus*, or bats that have had serious injuries, should be over-wintered until spring arrives and insect populations are up. If the bat is a juvenile and the maternal colony's location is unknown, the juvenile bat should be released into a nearby conspecific colony. Communicate with bat biologists in your area to determine where these colonies may be found. Colonies often migrate unexpectedly due to shifting insect populations, changes in the weather, or disturbances. It is important to determine that the colony is actually present BEFORE releasing juveniles into that location. Solitary bats can be released at dusk into the general area where they were found. All bats should be released at dusk so that their flight can be followed visually and the bat picked up quickly if it drops to the ground. Cold, torpid bats are incapable of flight. Make sure the bat has adequate time to warm up before release. CBCF uses heating pads with adapters for automobile cigarette lighters; this insures that the bat will be warmed and ready for release by the time you reach your destination.

Solitary bats can be released as soon as they can fly as they will immediately resume their migration. Stormy weather should be avoided on the release day, and pregnant

hoary and red bats should be taken to the central valley for release as they do not normally give birth in coastal or the cooler mountainous areas.

Phone Protocol for Wildlife Center Volunteers

Most Wildlife Centers are the main source of education on bats for the public. But many phone volunteers are not prepared to answer questions on bats. We have prepared a guide for the most frequently asked questions. This guide may be referred to by all volunteers who take phone calls from the public.

I just found a bat on the ground. What should I do?

Do NOT pick up or touch the bat with your bare hands. Any bat found on the ground is very likely to be sick, and may have rabies. Place a small box or container (preferably non-metallic) over or near the bat and use a piece of paper or the lid of the box to gently scoop the bat into the box, again being careful not to touch it with your bare hands. Close the container securely and bring the bat to the wildlife center immediately. As most bats are dying of thirst by the time they are found, the bat will need to be brought into a wildlife rescue center as quickly as possible.

There is a bat flying in my house. How do we get it out without hurting it?

Open all doors and windows to the outside in the room where the bat is located. Close all doors to the rest of the house to keep the bat from flying deeper into the house. Turn out the lights in the room and LEAVE the room for a few hours. The bat will usually smell the fresh air and find its way outside. Occasionally a bat will not leave and must be coaxed out. One method is to gently throw a large sheet over the bat while it is flying and very carefully shake it out once outside. If a bat is hanging on a wall, a small, preferably non-metallic container may be carefully placed over the bat and a piece of paper or cardboard can then be gently slid between the container and the wall so that the bat will fall into the container. The container can then be taken outside and left on its side in a safe, shaded area so that the bat can walk out and fly away. If the bat cannot fly or appears to be injured, it should be taken to a wildlife center immediately.

Can I get rabies from a bat?

Bat can contract rabies, although the numbers are much lower than people have been led to believe. Anywhere from 1 in 1,000 to 1 in 200 bats in the wild (depending upon species and geographical location) will contract rabies. Bats do not have "outbreaks" of rabies, and no research has ever shown evidence of rabies "epidemics" in bats. (Dr. Denny Constantine, pers. comment. 1996) Bats are not asymptomatic carriers of rabies, remaining healthy but spreading the disease. If a bat gets rabies they will fall and die within a few days of showing symptoms. The rabies virus will be present in the infected bat's saliva and may be transferred to another animal or human by a bite. Simply not picking up a bat will lower your chances of getting rabies from a bat to statistically zero.

Do bats attack people?

Bats do not attack people or get "stuck" in their hair. Bat researchers, who often must work very closely with bats, are never attacked by them, no matter what the provocation. But bats, like any wild animal, will bite in self-defense if they are picked up or handled. The smaller bats will often fly close to your face because they are hunting the mosquitoes that are attracted to human breath. The mosquitoes, on the other hand, ARE attacking and biting you.

How do we get rid of a colony of bats in our house?

As their natural habitat becomes destroyed, bats often move into the attics, eaves or walls of houses and other structures. Unless the numbers of bats are very large, most homeowners are unaware that bats are using their house as a day or night roost. Bats can be humanely evicted during the early spring and late fall; they must NEVER be evicted during nursery season (early May through September), as the babies will be unable to fly away with their mothers. Humane evictions consist of hanging nets over the exit holes, making a type of one way "doggie door" that is left up for a week or so until it is certain that all bats have left. The entry/exit holes can then be permanently sealed. Using poisons on bats is illegal in California and most other states as this practice has been shown to be extremely dangerous to humans and has actually made some houses uninhabitable. "America's Neighborhood Bats", by Merlin Tuttle, University of Texas Press, soft cover (about \$9.00) has an excellent chapter on humanely excluding bats and instructions for placing nets. The nets should be placed over the exit holes and nailed or fastened on the top and sides, but left open at the bottom with the bottom edge hanging approximately 18 inches below the exit hole. Fiberglass screening, available at any hardware store, is an acceptable material for netting. Bats sometimes congregate in the ceiling or on walls of porches at night. This called a "night roost" and is made up of bats that are out hunting insects. These bats can be discouraged from roosting in unacceptable locations by placing a small fan directed toward the bats and leaving it on a high setting for several nights.

Aren't bats just rodents?

Bats are not related to rodents. They are actually more closely related to us than they are to rodents. Bats do not chew wood or insulation. They live up to 30 years or more and reproduce very slowly; most bats have only one offspring per year. Bats are not considered vermin, and are crucial to a healthy environment. They are considered keystone species in many ecosystems, meaning that many ecosystems would crash if bats were removed. In California, bats are very important for mosquito and insect crop pest control.

Can I keep a bat as a pet?

It is illegal in California and other states to keep wild animals as pets, even for a few days. Bats do not do well in captivity and will die quickly if they do not get the proper

diet and care. Another important consideration is that any bat that is easy to catch may be sick with rabies. For your safety as well as the bats', bring it to a wildlife rescue center immediately.

References

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First written in 1993. This bat rehabilitation manual is part of the MOU of all bat rehabbers in California. Spelling, typographical errors were corrected by Mary Cummins of Animal Advocates.