Bat World Sanctuary Protocol for Releasing Insectivorous Bats to the Wild

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All bats deserve the freedom to live their lives in the wild like nature intended. However, after receiving rehabilitation, bats must demonstrate perfect flight ability before being released. Bats that do not demonstrate perfect flight will not survive in the wild because they depend on flight for feeding, avoiding predators, and finding shelter. Most wing injuries involving bone damage will render a bat non-releasable. Severe tooth loss, back or leg injuries involving bones, and some complications associated with pregnancy may also render a bat non-releasable.

Releasing Hand-Raised Orphans

Previous research suggests that young bats need time to acquire the skills necessary to successfully capture flying insects (*Davis and Hitchcock, 1965*). The author has found that adult-sized young continue to nurse during this time, which likely provides additional sustenance as the youngster is learning to forage. It is also been suggested that young may learn foraging techniques by spending a considerable amount of time foraging with their mothers when they are young (*Brigham and Brigham, 1989*). However, this suggestion has been met with skepticism by bat rehabilitators who have established that hand-raised pups appear to have the innate ability to capture insects without being taught, provided they are allowed to develop proficient flight skills before release.

The author has recaptured several tattooed hand-raised Brazilian free-tailed (*T. brasiliensis*) juveniles over the past two decades. One was recaptured 11 days following release and three bats were recaptured three, five and seven days after release. In 2006, a tattooed female was found approximately 400 miles away five years after release. Microscopic examination of a fecal sample from a pup recaptured two days after release revealed insect parts (*Lollar, 2008*). In July of 2010 an adult lactating female was found on the rafters of Bat World's wild sanctuary. This bat was also a hand-raised orphan who was released sometime between 2000 and 2007. In August of 2015 a tattooed adult female *T. brasiliensis* was found grounded at a park in Mineral Wells, Texas. The bat was identified as an orphan rescued, hand-raised and released by Bat World Sanctuary 13 years prior. This recovery demonstrates that orphaned free-tailed bats are fully capable of survival as well as annual migrations to Mexico involving tens of thousands of miles.

In other reports, the recapture of a hand-raised evening bat (*N. humeralis*) was reported 16 days following release (*Laura Finn, pers. comm*.), and the recapture of a hand-raised pallid bat (*A. pallidus*) was reported approximately seven months after release (*Christine Scott, pers. comm*.). Orphaned red bats (*L. borealis*) and yellow bats (*L. intermedius*) have learned to forage on their own and also exhibited predator avoidance behavior by darting into small trees when an owl flew over their flight cage (*French, pers. comm*.). Microscopic examination of feces of red bat orphans (*L. borealis*) indicates that orphans begin feeding preferentially on available prey when placed in large outdoor flight cages (*French and Whitaker, 2000*). Kelly, et al, demonstrated that hand-reared pipistrelle bats are capable of independent survival (at least in the short-term), although it was unclear whether the bats were able to choose appropriate roosting sites or integrate into existing colonies (*Kelly, 2008*). On June 17th, 2003 an orphaned big brown pup (*E. fuscus*) weighing 2.9 grams was rescued with eight other orphaned big browns. This female was released on August 24th, 2003 and recaptured one month later

on Sept. 24th, 2003. The bat was in excellent physical condition with a recorded weight of 17.0 grams (*Barbosa, 2003*). Most significant, however, involved a report of a small colony of seven year-old big brown bats (*E. fuscus*) which had remained in captivity since infancy. These bats had never been exposed to moths but were fully flighted.

At age seven, the bats were moved into an outdoor flight cage, and a bucket light trap containing live moths was emptied into their cage. Although the bats were provided with their normal ration of mealworms from dishes, they began to prey on the flying insects the very same night as evidenced by insect wing parts on the flight cage floor the next morning. The following evening flying insects were again introduced into the flight cage, and the next morning the flight cage floor was again littered in insect wings. A number of these wings were subsequently identified as belonging to the following families: 12 *Arcttidae* wings; 25 *Nocturidae* wings; 5 *Nymphalidae* wings; 1 *Torticidae* wing; and 5 *Saturnidae* wings. Four unknown wings were also found. These bats remained in the outdoor flight cage for approximately one month where they continued to feed on flying insects, and were eventually released into a maternity colony of *E. fuscus* (*Barbosa, 2005*). These reports demonstrate that hand-raised pups can survive after release, despite the fact that they did not have any opportunity to spend a considerable amount of time foraging with their mothers beforehand.

Supplemental feedings of mealworms or Bat World's soft food diet (twice daily) is recommended for orphaned bats while in a pre-release flight cage. Juvenile bats must maintain appropriate weights before being released. Additionally, these bats must exhibit significant flight abilities before release in order to successfully forage and avoid predators in the wild.

Releasing Adult Bats

Bats that have been in captivity for more than a few days should be given daily flight exercise before being released. As a rule of thumb, the bat should be given one night of flight exercise in a flight cage for every week it has spent in captivity. Alternately, a bat can be exercised in a room, with careful monitoring. The bat should be given 10 to 20 minutes of flight exercise per day in captivity. Wait at least 10 minutes after feeding before flight exercise.

In the evening, hold the bat in a gloved hand over your head while inside a flight cage. Release your fingers so that it is not confined in your grip, but merely sitting in the palm of your hand. It will typically stretch its wings once or twice before taking flight. If the bat has sufficiently recovered from injuries, and it has a proper flight area, it will generally attempt to maintain flight for a period of time. Bats must be able to sustain flight for 10 to 20 minutes, and must land and roost appropriately on the ceiling or upper portion of the cage. A bat that seems to fly well but consistently lands on the floor is not ready for release.

Bats are creatures of habit and have a strong affinity for day and night roosting sites, as well as established feeding grounds. It is always best when possible to release a rehabilitated bat in the area from which it originated, and even back into its original colony if this information is available. Solitary bats, of course, such as red bats (*L. borealis*), may simply be released in the area from which they came. When this information is not available, attempt to release in areas that provide known roosting and feeding requirements for the species. For example, red bats *(L. borealis*) roost in tree foliage, particularly along fence rows surrounding agricultural crops. These bats should not be released in bat houses or other structures used by crevice-dwelling species. Big brown bats (*E. fuscus*), on the other hand, are crevice-dwellers and need to be released in areas with known colonies of this species where natural (or man-made) crevices exist.

On numerous occasions the author has witnessed wild free-tail bats (*T. brasiliensis*) coming to investigate other bats being released, including red bats (*L. borealis)*. The bats often swoop by in very close proximity to a bat being held overhead for release. During one instance, two dozen *T. brasiliensis* had been rescued from a building and overwintered together in a flight cage. The bats were released the following spring. As the bats were capable of flight, they were released in small groups of two to four, held overhead in the hand. As each small group was set free, they began to circle back, swooping close to the next group of bats being held overhead. The amount of bats circling in the air continued to increase as more bats were set free. This behavior continued until there were no bats left to release.

When the location of roosts or colonies of the species is not known, bats (including solitary tree bats) should simply be released in areas that provide appropriate habitat for the species. For crevice species, it is preferable that bat houses be placed in these areas and the bat placed inside for release. Bat houses will provide temporary shelter and protection from predators, and give a bat the opportunity to leave if it chooses, or to remain inside if it does not. Bats found inside the house on the following day should be checked to see if they fed the preceding night, which can be determined by palpating the abdomen. The author has found that bats located inside a bat house on the following day typically did not feed the previous evening. This is a clear indication that the animal is not ready for release. It should be retrieved and release attempted again at a later date. If a bat house is not available, simply hold the bat in your hand above your head in a natural roosting posture and wait for it to fly off on its own. If it does not fly off on its own, do not force it to do so (i.e., do not toss it into the air), but rather attempt release again at a later date.

Always release bats at nightfall (never at dusk when predators can easily locate the bat) and always take a spotlight along for hand releases to retrieve the bat if necessary. Extend the hand over the head for release. Use a ladder, if necessary, to provide bats a 7’ to 8’ drop. Never release a bat by placing it on a tree trunk or the side of a building as it may eaten by predators before it is able to fly away. Female tree bats with pups are the only exception to this rule. They should be carefully placed in the branches of a tree (with a clear drop below) in the early afternoon. Place the mother in the branches, not on the trunk, about 10 feet off the ground so that she is hanging by her toes. There should be several branches with foliage surrounding her to help support her and the pups, while concealing them from possible predators. Do not hang the mother from a single branch. It is best to place her in a forked branch within a clump of leaves so she has better support and is somewhat hidden from view. If not disturbed before being placed in the tree, she will hang quietly with the pups until dark. Females that become stressed during this move will fly off and may not return for the young. Although the female may hang the pups in the tree after dark and then fly off to feed, she may return for one or more of the pups before dawn. The tree should be checked again in the early morning to determine if any pups were abandoned. A red bat will frequently abandon one or more of the young. These pups should be retrieved and hand-raised if mothers do not return for them by the following morning.