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Photographing the World's Bats: Adventure, Tribulation and Rewards
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by Merlin D. Tuttle

A twig snapped and I strained my senses, listening intently. Then leaves rustled and I reviewed my plan for escape. I sat alone and unarmed, surrounded by the pitch black of a moonless night deep in the jungle of Khao Yai National Park in Thailand.

My fears were justified. On arrival three days earlier, park rangers had forbidden me to enter the jungle at night without a contingent of armed guards. Not long before, a tiger had jumped through a park headquarters window killing a ranger, adding to existing concerns of terrorist movements reported in the area. On the previous evening I had obeyed orders, but the guards had been extremely apprehensive. In fact, they had refused to follow my Thai assistant, Surapon Duangkhae, and me into a dense stand of wild banana plants, claiming that 15-foot king cobras as big around as a man's leg would certainly get us.

Now, as I sat in the dark, with my bat nets stretched across a well-traveled elephant trail, I wondered what could have gone wrong. Hours earlier I had sent Surapon to pick up the guards, neglecting to consider that if anything happened, I might end up alone in the jungle, miles from help. The night before, we had spotted a tiger less than a quarter mile away along the same trail. Now the idea of meeting one created vivid images, making me even more nervous.

In full sunlight, I had hiked a half mile into the jungle and set my three 40-foot mist nets, assuming that protection would soon arrive. Dusk, then full darkness, came and still no one returned. Figuring that the odds of being eaten were about the same regardless of whether I spent the night hiking for help or netting bats, I sat by my nets waiting.

My anxieties were not lessened by the knowledge that Asian elephants traveled quietly at night and didn't like surprise encounters with scientists who spread nets across their trails. Time passed slowly, and all sounds became increasingly threatening. Suddenly a large nightjar bird crashed into my net only inches away. Heart pounding, I managed to turn my headlamp on seconds later. The bird hung unhurt in the net, but began screaming the moment I tried to release it.

Knowing that the bird's distress cries could lure any hungry tiger in the vicinity, and certain I was in big trouble, I quickly released the bird and again considered my options for escape. Even my best chance□ jumping off an adjacent 75-foot cliff□ was not reassuring. I figured that about eight feet out, I could grab the stalk of a large bamboo plant and slide down out of reach of any approaching tiger. I was standing with my light on, poised to jump if necessary, when I finally heard Surapon and a single armed guard coming up the path.

Apparently the guards from the previous night had mutinied, not wanting to take any further chances with a crazy bat man who had insisted on making even his protectors sit, lights out in the dark, along jungle trails. Desperate, Surapon had finally convinced one guard to at least come with him to rescue me. But I'm not certain I'll ever be forgiven for

making him stay for an additional hour of bat netting!

This story illustrates only one of many obstacles I have faced while photographing some 300 of the world's 950-plus bat species. It all started back in 1978 when the National Geographic Society asked me to write the chapter on bats for their book, *Wild Animals of North* America. I agreed to write the chapter, but was appalled to see the photographs they had selected to accompany it.

I had never considered the impact of the bat pictures typical at that time; most showed them snarling in self-defense. Because of their shy nature and nocturnal habits, bats are exceptionally difficult to portray photographically as they really are in the wild. When first captured, they either try to fly away, bare their teeth in a threat display, or hunker down, eyes closed, expecting the worst. Impatient photographers typically held a bat by its wings, blew in its face, and snapped a quick picture when the bat tried to defend itself with a snarl. When pictures of these bats were enlarged to page size for publication, their tiny bared teeth could have passed for those of saber-toothed tigers, reinforcing the belief that bats were vicious and fearsome.

National Geographic editors were extremely responsive to my complaint, yet the problem of how to obtain natural photographs of bats remained. With only a few months available, they sent one of their top staff photographers, Bates Littlehales, with me to Tennessee. Six weeks later, he had obtained just six of the 31 photographs needed, despite our best efforts.

Littlehales' contribution, however, was far greater than was yet apparent. While working with me, he had generously shared his substantial knowledge of photography, and on departure, offered me his leftover film in case I could contribute some pictures of my own.

I shot the first 15 rolls making detailed tests of my newly purchased equipment and in testing possible lighting arrangements that might work on bats. The key was to combine photographic skill with a detailed knowledge of bats and a sensitivity for their best interests.

Soon after, I received a call from a concerned editor at the National Geographic Society who needed more bat photographs. Could I tell Littlehales where to photograph Mexican fishing bats? I explained that he might have considerable difficulty finding one, let alone getting it to pause for a picture, but offered to go along and help. Hours later, the editor called to inform me that in Littlehales' opinion I had learned enough photography to go alone if I was willing.

My assignment was to get pictures of a Mexican fishing bat eating a fish. This was to be my first trip on my own, so I experimented some more. I tried dialing flash power systems all the way down to minimum brightness to gain high speed and used an infrared beam as a triggering device to stop objects I pitched through for practice. The results suggested that high speed pictures of bats might be possible. However, they would have to fly through just the right spot, meaning the bats would have to cooperate.

I checked with colleagues and learned that fishing bats lived on islands in the Gulf of California, northwest of Guaymas. Looking forward to the trip, I had visions of a pleasant boat ride to a sandy beach where I would locate the bats in nearby rock crevices. In reality, no one locally knew of such bats; the islands were cliff-faced and protected by breakers that crashed unceasingly onto sharp, barnacle covered rocks; available rental boats came with unreliable motors; and one of the local industries was shark fishing.

I knew that back at National Geographic there would be critics questioning the wisdom of sending a novice on a several thousand dollar expedition, so I was plenty concerned when after two days I still hadn't caught a single bat. I had, however, learned where they were roosting on the cliff faces high above the breakers.

Accompanied by several assistants, I approached one of the islands in a rented boat. Not a particularly strong swimmer, it was with considerable trepidation that I jumped overboard, capture bags in hand. Between waves, I tried to land on the base of the cliff, but before I could climb out of the water, I was thrown against sharp barnacle covered rocks. Battered and bleeding, I finally gained a slippery handhold on the cliff and began the slow, arduous climb to reach a small sea cave some 40 feet up. Once at the cave, I was still 10 feet short of a large colony of chattering bats. There was no way to reach them. The retreat back down the cliff was even more treacherous than the climb up, since water from my swim had splashed on the guano covered rocks, rendering them as slick as oil.

When I finally did get back into deep water, I surfaced to see my crew frantically attempting to start the motor as our boat drifted farther and farther away from me. Still bleeding, I imagined sharks circling beneath!

Obviously, the boat did eventually pick me up. That night I spotted active bats with a night vision scope and netted seven of them over a beach on the mainland.

My newly caught bats refused to eat in captivity, let alone cooperate for pictures. My assistants and I carried them around, talking to them and gently petting them, for hours on end. The bats became completely docile, but remained uncooperative in front of the camera. I began to gain a taste of the kind of patience required to photograph bats.

Just as we were about to despair of success, I tried cutting minnows into tiny pieces, tucking one piece at a time under each bat's lips. For some time nothing happened, but then I noticed one of them licking a bit of it into his mouth. He would stop whenever I came near, but time after time, he would slowly lick another piece into his mouth when I went away. Then, to our great elation, he grabbed a whole minnow from my hand, eating it with gusto. The others continued to refuse even small pieces, but we perched them on each side of the feeding bat until, one by one, each succumbed to temptation. An hour later, all seven bats were eagerly eating from our hands and allowing themselves to be photographed with their meals.

When I returned from the trip and had the film developed, I was amazed to see the spectacular photographs that resulted. Even more impressive, when I showed the photographs to others, I soon saw that most peoples' negative attitudes about bats could be changed in minutes. They simply needed an opportunity to see bats as they really are. Bats that are not afraid can be just as curious, winsome, and even comical as any household pet. I didn't yet know that they also were highly intelligent, and that just like people and pets, some are smarter than others, each with a unique personality.

Some of my biggest photographic breakthroughs involved training bats. My first experience was with frog-eating bats in my research laboratory at the Smithsonian Tropical Research Institute in Panama. It was there that I discovered the greatest impediment to progress often was my own inability to believe the extent to which bats could learn.

Over a period of many months, I realized that even adult frog-eating bats could be trained

in as little as two hours from the time of capture to come to my hand with a verbal call. Perhaps even more remarkable, they also could be trained to respond to simple hand signals alone.

When the BBC came to Panama to film me and my colleague, Mike Ryan, studying the impact of frog-eating bats on frog courtship behavior,* it only took five days to train a cast of four wild bats. By the time filming began, they came on call and went wherever I pointed on visual command□ essential for success in filming. Frogs were placed in a table-top pond that exactly replicated a pond in the forest. Even after I had already pointed to a particular frog, the bats were trained to wait until they heard the high speed movie camera begin, and then they caught only the individual frogs I had pointed to. Individuals were trained to come from predictable directions□ one always straight in, another only from the left, and a third only from the right.

Three of the bats were especially intelligent and receptive to training, but one was a "slow learner." Ironically, she proved invaluable several times simply because she wasn't smart enough to out-flank us. One time was when we wanted the bats to go to an unusual perch. We covered the flight cage ceiling and sides with plastic sheeting to prevent them from landing anywhere but the desired new perch. Nevertheless, the three smart bats immediately discovered how to land on the small bits of masking tape used to hold the plastic up. The slow one couldn't figure it out and landed on the only other possible place□ right where we wanted her. When the other bats saw that her perch was okay, they joined her.

Training involves rewards for appropriate behavior□ in this case, small pieces of fish. Trained bats didn't always require a reward since, even in the wild, the intended meal sometimes escapes. The bats were tolerant, but still seemed to have their own predictable understanding of fair wages.

If deprived of a reward beyond five or six performances, they would go into what, for humans, would be called pouting behavior. Once offended, it could take up to half an hour or more to get a bat back to work. A "pouting" individual might refuse to take even its favorite food, no matter how hungry. After a waiting period, it would accept food offered from a hand. Reluctantly, it would then fly a foot or two on call several times to receive a reward before being willing to hunt again on command alone.

At the end of each evening's work, the bats were allowed to feast on the frogs killed during filming. None were wasted. In fact, far fewer were eaten than if the bats had been free to hunt in the wild, since their diet had been supplemented by bait minnows.

The BBC film crew arrived very nervous about working in a lab with free-flying bats, but when they left, they "knew" bats could do almost anything and were in love with them. Their response typifies the reaction of virtually every one of us who has had the opportunity of working with these amazing animals and also explains one of many reasons why I am willing to work so hard on their behalf.

Some people are disappointed to learn that most bats in my pictures are tamed in captivity and often trained as well, but without such efforts the world of bats would forever remain shrouded in mystery and misunderstanding for all but a few privileged scientists.

Those who think photography of captive bats is easy may be interested to learn that even with trained bats on an artificial set, I often take a hundred or more pictures to get just one

suitable for publication. One basic reason is that the average bat is faster than most cameras. Bats can move at from 10 to 30 feet per second in flight, but cameras typically take a twentieth of a second just for the shutter to open. That delay isn't noticeable in most photography, but it makes a world of difference in stopping a bat who may already have flown six inches to as much as a foot and a half before the camera is even ready to take the picture!

On an average photographic field trip, I carry approximately 350 pounds of equipment, literally a portable studio, complete with up to 15 flashes, a dozen flash stands and tripods, several cameras and a wide assortment of lenses. My life's investment can be found in my equipment and the resulting 60,000 bat photographs.

Each species presents a unique challenge. On the night that I was left with the tigers in Thailand I was looking for a species of nectar bat that I still have not found. When I do, it will be photographed close to its native habitat, so that authentic plants and other materials are available for the photo set. I take pride in creating sets so natural that no one could ever tell that the bat wasn't photographed in the wild. After all, I'm trying to show people what bats are really like.

Just to obtain a bunch of figs used to show an epauleted bat taking one in Kenya** necessitated climbing a hundred feet up into the jungle canopy. Only one bunch could be found and lowered to the ground undamaged, yet the second bat that touched it caused nearly all the ripe figs to fall off. Luckily, I was well prepared for the first picture!

In Guam I had to climb nearly as high to obtain kapok flowers, always at night, because the buds wouldn't open if the branch was cut early. The trees were brittle and the flowers dangerously near the top. Foliage with flowers had to be hauled halfway across the island to my studio set, yet my subject, a Marianas fruit bat with its four-foot wingspan, could and sometimes did, bruise the petals in a single visit, meaning another long drive and treacherous climb.

BCI member, Gary Wiles, who steadied the long extension ladder for me to reach the first branch, undoubtedly remembers my making surprise contact with large gecko lizards during climbs in the dark. The lizards would retreat to the back side of a branch to avoid my approaching light, so until my hand came down on one, I was unaware of its presence. My immediate response was to think SNAKE, and during an already precarious climb, such errors can be less than amusing.

Climbing tall jungle trees at night to build a set is hardly for the faint of heart, but consider the options. Some pictures can be taken only in the wild, as was the case in photographing epauleted bat courtship. To do so required a month of scouting for just the right location, not only where bats were courting, but where dense foliage didn't obscure my view. Then I spent nearly a week learning the behavior of one male and how to literally herd this wild bat to one of his perches where he could be viewed.

Using a 400 millimeter telephoto lens, I had to prefocus on his perch from a tripod on top of a land rover. Even so, the courting male was 25 feet farther up, too far for my flashes. This meant hoisting several flashes at the ends of 15-foot poles and expecting my field assistants to keep them steady and correctly aimed for hours on end. The tree in which the bat perched swayed in the wind, so I could not be sure my framing and focusing were correct even when the courting male finally arrived. Females attracted to his calling stayed only for seconds per visit, returning only a few times each night. Even my most loyal

assistants nearly mutinied, exhausted and certain that we would not succeed. One who consistently fell asleep while waiting all night, night after night, finally announced that he would stand up so he could stay awake. Minutes later he went crashing to the ground, asleep on his feet! After endless exhausting hours, only one photograph out of 600 was acceptable. If all pictures were so difficult to obtain, I'm sure that most bats would remain a mystery, even with me in pursuit!

Coming into close contact with bats in the course of studio photography has its own irreplaceable rewards. My bats are harmlessly netted, gently handled and released as quickly as possible. Often it's more difficult to say "goodbye" than to get acquainted. I'd like to think that many of my favorite bat friends are still alive and happy out in some deep dark jungle night. Most people will only ever see bats and their behavior through pictures, but if everyone could know these gentle and intelligent animals as I have, arguments of their economic or ecological values would never again be needed. Through photography, we are gradually bridging the gap.

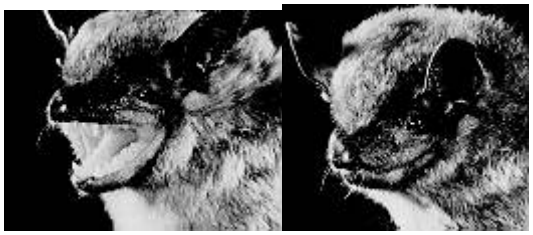
(Bio)
Merlin Tuttle is the Founder and Science Director of Bat Conservation International.

(Footnote 1)
**National Geographic*, January 1982

(Footnote 2)
***National Geographic*, April 1986

Merlin Tuttle and BCI Trustee, Verne Read, are protected by armed government guards as they search for bat caves in Thailand

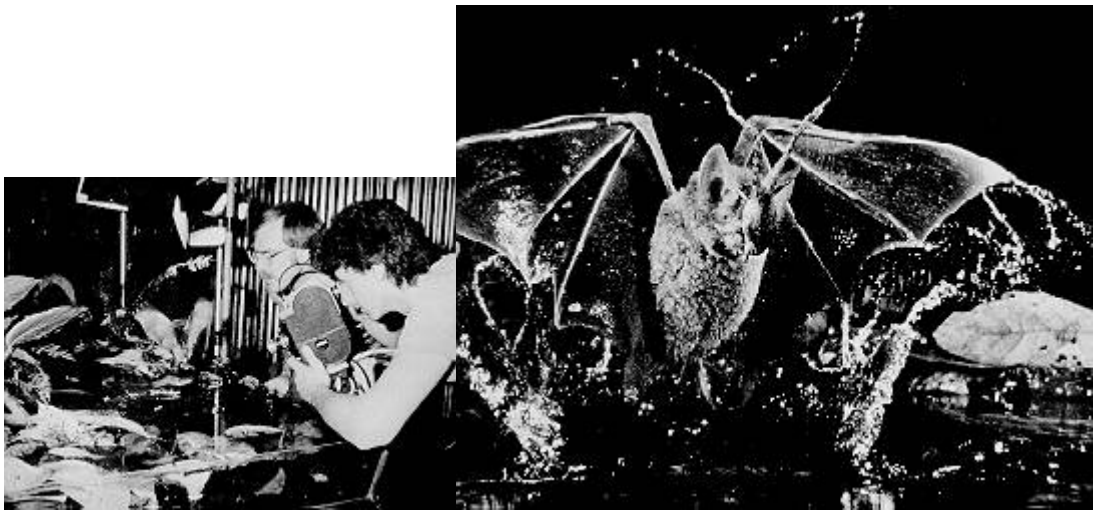
Above: The result of Tuttle's first professional assignment for National Geographic was this photo of a Mexican fishing bat (Pizonyx vivesi) carrying a minnow.



Left: The difference between these two photographs of Big brown bat (Eptesicus Fuscus) illustrates the affect photography can have on a viewer's perception of bats.
PHOTOS BY MERLIN D. TUTTLE

Photographing the world's bats has its uncomfortable moments. In Panama, Tuttle risks an encounter with a poisonous snake instead of bats when he squeezes through a hole in a tree. What he fins is this small group of curious big-eared bats (Micronycteris megalotis) and a single short-tailed bat (Carollia perspicillata). PHOTO BY MERLIN D. TUTTLE

First you have to catch them Tuttle carefully removes a Frog-eating bat (Trachops cirrhosus) from his mist net (above). The bat was attracted to the net by the mating calls of a frog, a favorite prey, broadcast from a small tape recorder. The following year, as Tuttle prepares for a BBC filming of his work, his cast of trained bats is called to his hand, rewarded by small bits of fish (above right). The next step was training the bats to hunt on visual command (below right), coming on cue to capture prey only where he had pointed. PHOTOS BY MERLIN D. TUTTLE



As the BBC cameras roll (below), a trained bat captures a frog from a tabletop pond that exactly duplicates those found in nearby jungle. The bat watched Tuttle point to the frog, but did not leave its perch until cued by the sound of the camera. What the viewer saw was similar to the shot at right. To get it, Tuttle used the same set, positioning his camera so

that the wide-angle lens was at water level, just inches from the action. PHOTOS BY MERLIN D. TUTTLE

Photographing bats calls for patience and persistence. To get this picture of Gambian epauleted bats (Epomophorus gambianus), Tuttle sat ready with a camera for more than 18 hours, waiting for the baby to lick its mother's face. Even then, the tongue moved so fast that it was back in the bat's mouth before the shutter could even open. After careful observation, Tuttle snapped the picture in anticipation. PHOTO BY MERLIN D. TUTTLE

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