

How Bats Slurp at Night

They drink in flight, and they're not just squeaking by.

By Alison Pearce Stevens, Ph.D.



A bat swoops down to a pool of water to take a drink.

As the sun set on a national park in Bulgaria, thousands of bats left the safety of their roost. Most flittered into the evening air in search of breakfast, but a few were caught in a net strung across the exit of the cave.

German scientists Stefan Greif and Dr. Björn Siemers gently removed the struggling bats. They placed some bats in cotton bags. They released the others into the night air.

The researchers took the captured bats to Tabachka Bat Research Station nearby. Inside, they placed the bats in holding

cages with plenty of water and food (mealworms). The next night, Mr. Greif and Dr. Siemers began an experiment to answer a simple question: how do bats find water in the dark?

On the Wing

In the wild, different species of bats hunt for food in different ways. Some zip through the open air searching for insects. Others hunt closer to the ground, listening for the scratching, scrabbling sounds of beetles. Some hunt for insects above a lake or pond, and others drink

nectar from night-blooming tropical flowers. Still others search for moths among the leafy branches.

But no matter how they hunt for food, when bats get thirsty, they visit a pond. Do they land at the edge of the pond to drink? No! Bats drink in flight, skimming along the surface of the water with an open mouth. And they do this in the dark.

How can bats tell the difference between water and other things, like the ground or the roof of a house? That's what Mr. Greif and Dr. Siemers wanted to find out.

Blind as a Bat?

You may have heard the saying “blind as a bat,” but bats aren't blind. They use their eyes, just as you do. But they can also sense their environment using a method called echolocation.

To use echolocation, a bat sends out loud, short, high-pitched calls. (Most bats make calls that are so high-pitched that the human ear cannot hear them.) These sounds echo off nearby objects. Depending on how long the calls take to bounce back, the bat can tell how far away things are. Even in darkness, the bat can “see” its surroundings, from the trunk of a big tree to the tiny insects it snaps up and eats.

Reflecting on Water

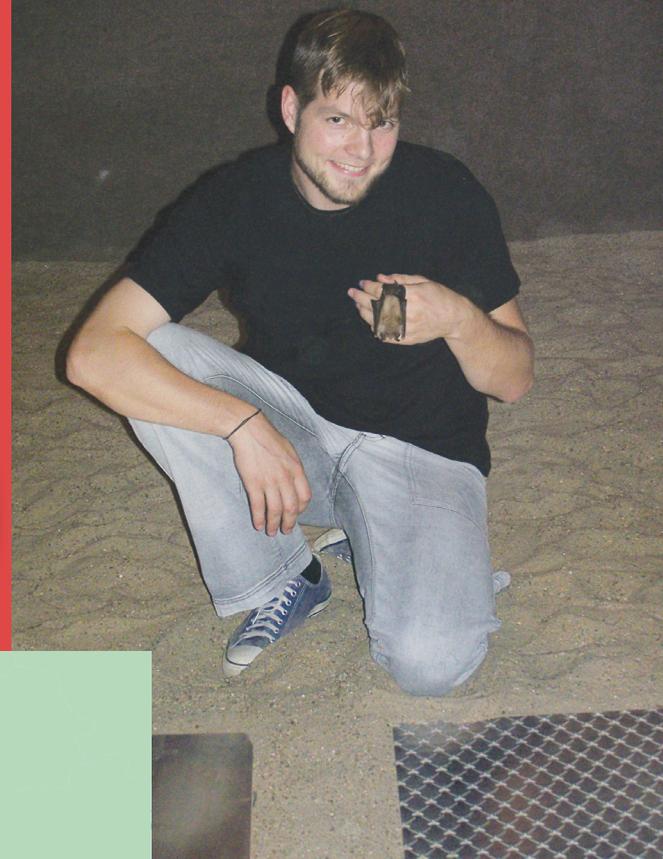
Do bats use echolocation to detect water? The scientists reasoned that they do. The surface of water is often smooth, like a mirror. It has an unusual effect on a bat's call. Rather than bounce back, the sound reflects away from the bat. Maybe bats use this change in their echoes to locate water.

To find out, the scientists set up an experiment to test whether bats would try to drink from any smooth surface. A study like this can't easily be done in the wild, which is why they caught the bats.

To begin the experiment, Mr. Greif put two large metal plates next to each other on the sand-covered floor of a room. One metal plate was smooth (like water), and the other was textured (unlike water). To watch the bats, Mr. Greif used night-vision lights and equipment.

Then Mr. Greif released one bat

Bat researchers Stefan Greif and Björn Siemers work at the Max Planck Institute for Ornithology in Germany. In Bulgaria, they studied bats from the Rusenski Lom Nature Park, which has many species of bats.



Yes, that's really a bat clinging to Stefan Greif's hand! (Never touch or try to handle a bat.) Here, Mr. Greif has laid metal plates on a sand-covered floor to set up an experiment.

into the room. He watched to see if the bat would swoop down and try to drink from one of the metal plates and, if so, which plate the bat chose.

The bat did try to drink, and it chose the smooth plate. Mr. Greif counted the number of times the bat “drank.” Then he switched the positions of the plates to see which plate the bat would choose. Again, the bat swooped down and tried to drink from the smooth plate. At the end, the bat was allowed to drink from a pool of water.

Mr. Greif repeated the test over two more days, first using smooth and textured wooden

plates instead of metal and then using plastic plates. Finally, the bat was returned to its home cave. The scientists caught new bats and repeated the tests, studying four different species of insect-eating bats.

At the end of the experiment, the researchers had an answer to their question. The bats had tried to drink only from the smooth plate, whether it was made of metal, wood, or plastic. But no bat ever tried to drink from the textured plate.

Do bats use the echo pattern from a smooth surface to find water? Yes! 🦇