

Love bats? Think twice about that bat box, experts say

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Ever thought about buying or building a bat box to help bats? Think carefully about the design and where you put it, University of Illinois researchers say.

Here's why: Bats and their pups can overheat and die in poorly designed or placed bat boxes, and in a warming climate, it could happen more often.

Illinois bat ecologists Joy O'Keefe and Reed Crawford recently synthesized the available data on bat boxes, also known as bat houses or artificial roosts, to raise awareness of the issue and motivate change in bat box design, marketing, and consumer education. Their recommendations are published in *Conservation Science and Practice*.

"Conservation practitioners and homeowners are well-intentioned; they want to help [bats](#). Inevitably, the first thing they do is go online and buy a bat house," says Crawford, a doctoral student in the Program in Ecology, Evolution, and Conservation Biology at Illinois. "But unfortunately, a lot of bat houses on the market are small and painted dark colors, and they get hot really quickly. They're likely to hurt bats if they're installed in the wrong spot.

"We're trying to highlight that there's a lot of misleading information out there. We want to steer people away from putting up bat boxes as a first course of action, to instead consider the risks and ask if there is anything we can do that's going to be more beneficial for bats."

Crawford has read just about every study that's ever been done on bat boxes, and he and O'Keefe have conducted their fair share of studies, as well. They and other members of the bat research community have identified a critical temperature threshold—104 degrees Fahrenheit or 40 Celsius—above which most bat species are significantly heat-stressed.

Although very few studies have documented temperatures inside the countless bat boxes currently in use across the world, researchers have recorded temperatures as high as 142 degrees Fahrenheit in artificial roosts. And they've observed bats in natural roosts moving to avoid temperatures above 97 degrees.

In many bat boxes, bats can't move around to avoid hot spots. The most

common design is a small, flat-panel box with vertical slats creating one to four chambers. The boxes are often painted or stained dark colors, and that can be a big part of the problem.

"We know darker boxes can be, on average, 41-43 degrees hotter than white boxes and are more likely to overheat. Yet we see companies marketing black boxes as preferable to bats and suitable for most U.S. climates," Crawford says. "But one hot summer day in a really tiny black bat house is probably going to kill anything that's in there. So it's very dangerous."

O'Keefe, an assistant professor and wildlife extension specialist in the Department of Natural Resources and Environmental Sciences at Illinois, adds, "Even our colleagues in cooler climates have seen a number of bat deaths in dark-colored boxes. That's why we advocate for not painting boxes in dark colors."

But she points out that bat deaths have also occurred in unpainted, light-wood boxes in warm climates. "Clearly, more intervention is needed than just the color of the box."

Bats do like to be warm and protected when they're sleeping and raising their young. But when they're seeking out natural roosts in the wild, they choose spots that allow them some flexibility to move when it gets too hot.

That's why Crawford and O'Keefe say if you're going to invest in a bat box, large designs are better. For example, tall, four-sided boxes allow bats to move up and down in space and around to the back side when the front is being blasted by sun.

Researchers are also investigating novel materials and design elements that are better temperature buffers than the usual plywood, including

wood-cement (a molded mixture of wood shavings and cement), insulating water chambers, and chimneys.

But regardless of design and color, placement has implications that go beyond overheating.

"Obviously, you're going to want to avoid hanging a small, dark bat house where it's going to get direct sun all day, especially in warmer, southern climates," Crawford says. "But we're just starting to learn about how artificial roosts might represent ecological traps for bats. They could be preferentially selecting the bat box because of where it is and passing over natural habitats that would keep them safer from predators and parasites, as well as dangerously warm temperatures."

O'Keefe adds, "Bat houses can also draw bats to areas that are inappropriate. That's one of the reasons I've moved away from advising people to put out bat boxes as a first step in bat conservation. People need to think about what they're drawing bats to. Do they have to cross any difficult boundaries, like busy roads, to get there?"

"I encourage homeowners to think about doing something else that could benefit bats instead, like planting [native trees](#) or wildflowers to attract insect prey, providing clean water sources, or leaving standing dead trees wherever it is safe to do so, as these are natural roosting habitat for bat box users."

More information: Reed D. Crawford et al, Avoiding a conservation pitfall: Considering the risks of unsuitably hot bat boxes, *Conservation Science and Practice* (2021). [DOI: 10.1111/csp2.412](https://doi.org/10.1111/csp2.412)

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