

Building a better life for bats

HOW A HOUSING PROJECT CAN HELP.

Story by Laura Lane and photos by Becky Hunter

The bad news for Wisconsin bats came last spring when DNR biologists found the deadly white-nose syndrome (WNS) in Grant County. WNS is a fungal disease that kills insect-eating bats when they are hibernating in caves and mines. Over 6 million bats and counting have been killed by WNS and it's spreading across the central United States.

The microscopic fungus spores thrive in cold temperatures and attack bats when their immune systems have shut down during hibernation. The disease passes from bat to bat, and the fungus particles may also attach to people's clothing or shoes and can be transported to different areas.

The benefits of bats

Bats play a critical role in keeping insect populations in balance. Insectivorous bats will eat mosquitoes, moths, beetles, flies, termites and spiders. They also eat agricultural pests such as corn borers, cutworm moths, potato beetles and grasshoppers.

"They eat massive quantities of insects. One single big brown bat that is nursing will eat 110 percent of its body weight in insects every night," says Dee-Ann Reeder, associate professor of biology at Bucknell University. "It would be like me eating 500 hamburgers every night."

While bats are often overlooked, they are among the most economically important, non-domesticated animals in North America, according to a recent study in the journal *Science*. Pest-control services provided by insect-eating bats in the United States likely save the U.S. agricultural industry at least \$3 billion a year, the study reported.

"In the context of white-nose syndrome, every single bat we have left is precious," Reeder says.

Safe havens for bats

While scientists across the country race

to discover ways to save bats from the deadly fungus, there are things you can do to help bats. One of the best ways is to leave them alone.

"It's really important not to disturb bats that are hibernating," Reeder says.

Building a bat house is also a great way to give bats a safe place to roost in the summer. Mother bats give birth in bat

houses and can raise their pups there.

"When built and placed correctly, bat houses offer safe, warm habitat for maternity colonies," says Heather Kaarakka, a conservation biologist with DNR's Bureau of Natural Heritage Conservation. "Mother bats leave the roost nightly to feed while the pups remain in the roost, and bat houses act as shelter for the pups that are not able to fly yet."

Wisconsin's four bat species that might roost in bat houses include: little brown bats, big brown bats, eastern pipistrelle bats and northern long-eared bats. The little brown and big brown bats are the most likely of the four species to take up residence in bat houses. A bat nursery house can provide shelter for 100 to 300 little brown bats.

Building a bat nursery house

The DNR's *Building a Bat House Handbook* recommends using naturally decay-resistant materials such as rough-sawn black locust, white oak, cedar or old barn wood to build your bat house. Also make sure the wood is not treated because the chemicals can be toxic to bats.

Painting the bat house dark brown or black helps the house heat up and stay warm through the night.



This spring, DNR's Heather Kaarakka helped Girl Scouts from Troop 2330 assemble, caulk and stain two bat houses. The troop donated one bat house to the Friends of Indian Lake and the other bat house to Prairie Elementary School in Waunakee.

BUILD YOUR OWN BAT HOUSE

"Bats like it warm, because it helps the baby bats mature," Kaarakka says.

Avoid Kilz brand primer or paint as bats tend to avoid it, she adds.

As you follow the step-by-step instructions, remember to seal all the joints with caulk, because it protects the wood from decay and also prevents the house from becoming too drafty.

Mounting your bat house

Kaarakka says bat houses should be mounted 10 to 15 feet in the air on a pole or a building (not a tree as it provides too much shade), be located within one quarter mile of water and be protected from wind, but still exposed to southern or eastern sun.


"The first thing a bat thinks about when it emerges in the evening is getting a drink of water. The closer the bat house is to water, the more likely bats are to use it because it reduces commuting costs," Kaarakka says. "Little brown bats especially, also like to forage over water consuming small, soft-bodied aquatic insects like midges and mosquitoes."

Because predators such as owls can attack bats when they emerge, place your house 10 to 15 feet away from trees, but keep it sheltered from winds. Trim back tall shrubs and bushes below the base of your bat house.

"If there is a colony within a mile or so, the bat house may get used within a couple of months, especially in the late summer and fall as juvenile bats are exploring and learning to forage," Kaarakka says. "If there is no established roost in the area, it can sometimes take several years for bats to find and inhabit the bat house."

Monitoring your bat house

Once bats take up residence in your bat house, do not shine lights up into the house. If the bats are disturbed, they will abandon the roost and the pups might die. The best way to monitor whether bats are using your bat house is to look for guano under the house or sit outside in the evening and watch for bats to emerge.

Once your bat house is inhabited, join the DNR's roost monitoring project and share what types of bats are in your bat house, how many bats you have and the best methods you've found for encouraging bats to roost in your house. 

Laura Lane writes from Madison, Wis.

Here are the materials you will need:

- One-half sheet (4' x 4') ½" cdx (outdoor grade) plywood
- One-half sheet (4' x 4') ¾" cdx (outdoor grade) plywood
- Two pieces 1" x 6" (¾" x 5 ½" finished) x 8' pine or cedar
- One lb. 1 ⅝" coated deck or exterior grade screws
- 20-25 1 ¼" coated deck or exterior grade screws
- One quart non-toxic, black, water-based stain, exterior grade
- One quart non-toxic, water-based primer, exterior grade
- Two quarts non-toxic, flat water based paint or stain, exterior grade
- One tube of non-toxic, paintable exterior grade caulk (latex caulk is the easiest to use)
- Tools you will need include a drill, drill bit, table saw, paint brush, caulk gun, utility knife and tape measure.



Watch a video on how to build a bat house on the DNR's YouTube channel at youtu.be/IS8Yc2Cy_w.

Follow these instructions from the DNR's *Building a Bat House Handbook* (found online at dnr.wi.gov/topic/WildlifeHabitat/documents/BuildBatHouse.pdf) to build your bat nursery house:

- 1 Measure and mark all wood as per the cutting diagrams found on pages 14-16 of the handbook. Cut out all the parts.
- 2 Bats need something to hang on to, so it's important to score or groove the interior and landing surfaces. Score the inside back wall (E), and partitions (G) with a utility knife or a sharp object. Space grooves ½" apart, cutting ½₃₂" to ½₁₆" deep.
- 3 Apply two coats of black, water-based stain to the interior surfaces. Do not use paint, as it will fill in the grooves.
- 4 Screw back (E) to sides (two Ds), caulking whenever wood meets wood. Drill pilot holes so the wood does not crack.
- 5 Drill pilot holes, caulk and use screws to attach 5" & 10" (I, J) spacers to inside corners per drawings.
- 6 Place a partition on, to within ½" of the roof. Place 20" spacers (H) on partition (G), screw and caulk to first spacers (through partition). Be careful not to block the vents. Bats can overheat, so the vents allow for cooler areas of the box where bats can choose their preferred temperatures.
- 7 Repeat step 4 for remaining partitions (G) and spacers (H).
- 8 Caulk first and then screw front piece (B, C) to sides (Ds). Be sure top angles match (sand if necessary). Leave a ½" vent space between the top and bottom front pieces. A bar clamp may be useful if sides have flared out during construction.
- 9 Attach roof supports (K) to the top inside of front (B) and back (E) pieces. Be careful that screws do not protrude into roosting chambers.
- 10 Caulk around all top surfaces, sanding first if necessary to ensure a good tight fit.
- 11 Screw roof (A) to side (D) and roof supports (K). Caulk all outside seams to properly seal the roosting chamber.
- 12 Cut a line on the underside of the roof to act as a drip edge.
- 13 Attach mounts to the back of the box, making sure there is ½-¾" between the box and mounts.
- 14 Prime the exterior of the house. Paint the exterior with two coats. Be sure to use stain on the landing surface on the back wall (E) and not paint as paint will fill in the grooves.

