

## Bats in New Jersey

New Jersey is home to nine bat species. From spring to fall, many of these bats find homes in



dead or dying trees, where they roost snugly under sheets of loose, flaking bark. Male bats generally roost alone. Females, though, often form large maternity colonies, sharing the best available roosts for giving birth and raising their young (called "pups").

Endangered Indiana bats (*Myotis sodalis*) have been found

to use a variety of tree species (elms, oaks, maples, sycamores, etc). Living shagbark hickories are also great bat habitat, with their already-"shaggy" bark.

Ideal roost locations are near a wetland or water body that provides a reliable insect prey base and a place to drink. Maternity roosts should also receive around eight hours of sunlight each day to keep the developing bat pups warm.

### MAKING YOUR LAND MORE INVITING TO BATS

Bats are some of the most beneficial animals to people. All of New Jersey's bats are insectivores. Each night, bats eat more than half their body weight in insects like mosquitoes, moths, flies, and beetles. Bug-eating bats save people billions of dollars annually on pest controls like toxic pesticides. In turn, guano (bat poo) is a terrific garden fertilizer!

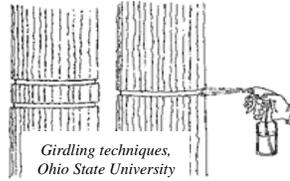
### Bat awareness and conservation are more critical now than ever before

Bats face many threats, including loss of forests and roost trees, disturbance to winter dens, and outright persecution. In 2006, White-nose Syndrome (WNS) began taking its toll as well. WNS causes hibernating bats to awaken too often, and thus to burn through the energy needed to survive winter. The bats often starve or freeze. Nearly 100% of hibernating bats have died in the caves and mines hit by WNS. We can help NJ bats by providing ample habitat for their recovery (also helping the few species that WNS *doesn't* affect).

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## Here are some things you can do to improve bat habitat on your property...

**Selective tree girdling:** Girdling creates standing dead trees whose breaking, flaking bark provides space for bats to roost under. Studies have found that the average dbh (diameter at breast height) of Indiana bat maternity roost trees is 45 cm (about 18"), so trees of approximately that size should be targeted. Girdling can be done by chain-sawing two horizontal cuts – about 6" wide, 1" or deeper, and 2-4" apart – around the entire tree trunk, or cutting one groove and applying an herbicide.



Remember that bat roosts need sunlight, so pick trees that get strong afternoon sun (S/SW-facing is best). Do not girdle shagbark hickories – they're valuable already!

### Removal of competing trees:

Where appropriate, felling smaller trees can open a potential roost tree to more sunlight, making it more attractive to maternity colonies. Alternatively, girdling multiple trees in a "patch" can reduce canopy shading without felling trees.



If you have no good candidate trees on your property for girdling, or are reluctant to kill trees, you can create some valuable bat habitat artificially.

**Artificial roost enhancements:** Dead trees don't stand forever, and their flaking bark is even more temporary. For instant and longer-lasting bat roosts, just mimic the loose bark that bats prefer...wrap tree trunks with sheet metal and other materials, nail up shingles, or install standard bat boxes. As for those old window shutters stashed away in the attic...why not give them a new purpose by tacking them onto a tree? All the bats need are quiet, dry, tight little spaces to squeeze into, where they're safe from the elements and where other animals can't reach them.

You can do the same to dead trees whose bark has dropped off, kind of like "putting the bark back up."

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A few types of artificial roosts that we have built are:

- ❖ Cedar shingles/shakes
- ❖ Sheet metal wrap
- ❖ Asphalt paper wrap



**Materials list** (pictured above from left to right): cedar shingles or shakes, asphalt paper, a hammer, 2.5" aluminum nails\*, scissors, sledgehammer, gloves, sheet metal or flashing, and vinyl window screening (not pictured). You'll also need a ladder tall enough to reach 15-20 feet high.

\* It is important to use aluminum nails. In the event that your "enhanced" tree is later cut down, aluminum nails are easily cut by a chainsaw, preventing the user from injury.

**Cedar shingles/shakes:** This shagbark hickory-inspired concept employs the same technique you'd use to put siding on a shed or shingles on a roof.

### You can use shakes, shingles, or other thin materials to create this flaking-bark effect

Start with the bottom layer (12+ feet off the ground), nailing the shingles onto the tree trunk all the way



around (or at least halfway around, on the sunny side). Leave about a 1/2" space between each piece.

Overlap another layer above the first, staggering the shingles to create a mosaic of overhangs and pockets for roosting.

Continue adding layers until your enhancement spans 3-4 feet vertically.

**Tip:** Hammer a nail through each shingle prior to climbing the ladder; it makes attaching the shingles to the tree much easier.

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**Sheet metal wrap:** Use gloves when handling sheet metal! In our example we used a roll of 20"-tall metal roof flashing and cut it into 3 strips (regular scissors worked well), each long enough to wrap around the tree that we selected. Wrapping the metal all the way around the tree will allow the bats to shift in response to sun and temp... metal in full sun can get hot!



Fold the cut edges over and pound them flat to prevent injury to the bats. Before attaching the sheets to the tree, lay them on the ground and use a sledgehammer to pound grooves (placing rocks underneath the metal during this process helps with the desired effect). These irregularities will provide movement corridors and roosting cavities for the bats. *Note:* Leave the top edge of the top sheet flat so that it wraps fairly tightly to the tree trunk, preventing rain from getting inside. All the other sheets should be pounded to allow bats to move laterally and vertically.

Ideally with two people on different ladders, raise the first (bottom) sheet into position around the tree trunk – again, about 12+ feet high up. Nail one side to the tree to free your hands, and pull the other side around until it's tight...you only want to leave about 1" openings at the top and bottom for bats to access. Nail the second side. Add just a few nails around the diameter of the tree for support.

Every foot or so around the tree, nail a piece of screening so it overhangs the sheet metal. This serves as a grippable "landing strip" for bats, since the sheet metal itself is slippery. Only attach screening in one piece all the way around the tree if it is very loosely attached, whereby bats can safely exit from below it.



Afix a second sheet above the first one in the same manner. Allow ~2 inches of overlap between sheets. Add another layer of screening, then the third metal sheet. Nail the top edge securely to rain-proof it.

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**Asphalt paper wrap:** This is the quickest and easiest roost to construct. Asphalt paper is also easily grippable and dark colored for good heat retention. Simply cut the paper with sheers into a large enough strip (or strips) to wrap around your tree and to cover about 3-4 vertical feet of the trunk.



Add extra interior nooks and crevices by first nailing pieces of wood around the trunk where the wrap will cover.

Wrap the asphalt paper around the tree trunk and nail it on in much the same manner as the sheet metal wrap. Parts of the wrap will looser, some snigger...that's ok! Really loose sections can be folded or gathered and nailed – this actually creates nice little roosting fissures.

We also added a layer of textured sheet metal flashing 1 foot below the asphalt wrap to discourage predators like raccoons & snakes while offering the bats another roosting option.

### Be **CREATIVE!**

Try more than one technique on your property. Experiment with your own designs and materials.

Maybe even use some old scraps or renovation project leftovers. Just keep in mind:

- ✓ Height placement on tree: ~12+ feet
- ✓ Vertical extent of enhancements: ~3-4 feet
- ✓ Location: Should have good sun exposure
- ✓ Protection from predators: Metal flashing below your artificial roost is a good idea
- ✓ Landing surface: Bats need to be able to grab on to something. Vinyl screening can provide a grippable surface on sheet metal designs
- ✓ Choose materials that are sturdy, weather resistant, and that don't contain harmful chemicals

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Feel free to contact our staff for further assistance...  
Email: [MacKenzie.Hall@ConserveWildlifeNJ.org](mailto:MacKenzie.Hall@ConserveWildlifeNJ.org)  
Or call: 908-782-4614 x 104

We would like to thank Crystal Springs Golf Resort in Hamburg, NJ, for participating in this project and for allowing us to experiment with their trees!

### General forest management recommendations for bats:

From the US Fish and Wildlife Service, NJ Field Office

1. Maintain at least 60% canopy closure after timber harvest within forested stands.
2. Retain standing snags, except where they pose a serious human safety hazard due to their location near a building, yard, road, or power line. A live tree with less than 10% canopy should be considered a snag. Snags with no remaining bark and no visible cracks, splits, or hollows may be felled, as well as any snags leaning more than 45° from vertical. When possible, delay removal of hazard trees until bats are hibernating (October 1 to March 31).
3. Do not harvest or manipulate shagbark hickory trees (*Carya ovata*) unless there are more than 16 shagbark hickories per acre. If present, maintain at least 16 live shagbark hickory greater than 11" dbh per acre.
4. Maintain at least 16 live, high-value roost trees per acre on average with at least 3 live trees >20" dbh and 6 live trees >11" dbh. Other retained trees should be among the largest or highest roost value trees present within the stand.
5. Do not harvest trees or conduct timber stand improvement within 300 feet of a stream bank or wetland, or within 500 feet of a known bat hibernaculum.
6. Do not fell trees >3" dbh while Indiana bats may be present, generally April 1 – September 30.
7. Avoid prescribed burns from April 1 to September 30 in forest stands containing potential Indiana bat live roost trees and / or snags.
8. Avoid prescribed burns year-round within 1,000 feet of a known bat hibernaculum.

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