

Trees: The Habitat Ohio's Bats Cannot Live Without

*Ten ways Ohio's insect-eating bats depend on trees,
ranked from most to least critical, with bat and tree species associated with each.*

On a warm June evening in an Ohio woodlot, a female Indiana bat slips into a gap no wider than your finger, the space between a shagbark hickory's peeling bark and the trunk beneath it. Packed in with her are dozens of other mothers and their pups, in a nursery nobody built, warmed by nothing but an afternoon of sun on dead wood. Within a few days she will move the whole colony to a different tree, and then to another after that.

All eleven of Ohio's native bat species eat insects, and every one of them is tied to trees, not as scenery, but as infrastructure. A tree is the delivery room, the roof, the thermostat, the pantry, the sheltered road, and for one species the winter blanket. The ten benefits below are ranked from most to least critical to survival and reproduction. The ranking is an evidence-based synthesis rather than an official agency list, and for most bats the decisive factor is a tree's structure and position on the landscape, not its name.

1. Maternity roosts beneath loose bark

Bats: Indiana bat, northern long-eared bat, evening bat, silver-haired bat, big brown bat, **Trees:** Shagbark hickory, silver maple, American elm, green ash, large oaks

Pregnant females gather beneath the sloughing bark of large living and dead trees to give birth and nurse young that cannot yet fly. Shagbark hickory is the classic Ohio example, its naturally peeling plates form ready-made nurseries, but a roost-tree synthesis cited by the U.S. Fish & Wildlife Service found ash, elm, hickory, maple, poplar, and oak together accounted for roughly 87% of recorded Indiana bat roost trees. Fell one occupied tree in June and an entire season of reproduction can go with it.

2. Day shelter in cavities, cracks, and snags

Bats: Northern long-eared bat, little brown bat, big brown bat, tri-colored bat, **Trees:** Standing dead trees of any species; American beech, sugar maple, black locust, northern red oak

Bats spend roughly half of every day inactive and vulnerable. Woodpecker holes, hollows, frost cracks, and peeling bark keep resting bats out of rain, wind, and heat, and out of sight of predators. Federal guidance defines a suitable roost tree by these features rather than by species, which is why a defective, half-dead tree is often worth far more to wildlife than a perfect one.

3. Foliage roosts and camouflage

Bats: Eastern red bat, hoary bat, **Trees:** American beech, oaks, sycamore, elm, boxelder, tulip poplar

Ohio's solitary tree bats never enter a cavity. They hang alone inside dense leaf clusters, where rusty or frost-tipped fur passes convincingly for a dead leaf or a seed pod, the difference between invisible and eaten when owls, crows, and blue jays are hunting. Beech, which holds dry leaves deep into winter, matters especially to red bats before other trees leaf out.

4. A dependable insect prey base

Bats: All eleven Ohio species, **Trees:** White and northern red oak, hickories, sugar maple, tulip poplar, willows, eastern cottonwood

Leaves, bark, flowers, dead wood, and tree fungi feed the moths, beetles, flies, and caddisflies that bats feed on. Oaks are the standouts, supporting far higher caterpillar and moth densities than most other genera. A mix of native species spreads insect emergence across the whole season, so no single cold snap or off year closes the kitchen.

5. Roost microclimates that raise pups and save energy

Bats: Indiana bat, northern long-eared bat, eastern red bat, evening bat, **Trees:** Large-diameter (9"+ DBH), sun-exposed hickory, maple, elm, ash, and oak

Trunk diameter, decay, canopy position, and solar exposure give a colony a menu of temperatures. Warm roosts speed gestation and let pups fly before hibernation season; cooler ones allow energy-saving torpor when the weather turns. Big, tall, sun-struck trees are the limiting ingredient, and the slowest of all to replace.

6. Wooded travel corridors and flight space

Bats: All Ohio species, **Trees:** Fencerows, riparian buffers, woodlots, and connected forest edge

Tree lines and stream buffers let bats cross farmland and subdivisions under cover, out of the wind, with continuous structure to echolocate against. Varied forest structure also divides the hunting into arenas: northern long-eared bats glean prey off leaves in the understory while hoary and big brown bats work the open air above the canopy.

7. Riparian feeding hotspots

Bats: Little brown bat, Indiana bat, tri-colored bat, silver-haired bat, evening bat, **Trees:** American sycamore, eastern cottonwood, silver maple, black willow, river birch

Wooded stream and pond margins concentrate emerging aquatic insects and open a sheltered lane where bats can drink and hunt efficiently. Riparian tree cover is consistently among the most productive foraging habitat in Ohio, and among the first things lost when a buffer is cleared.

8. Roost-switching networks

Bats: Indiana bat, northern long-eared bat, evening bat, hoary bat, **Trees:** Clusters of live and dead hickory, oak, maple, elm, and ash within one stand

A colony is not loyal to a single tree. Indiana bat maternity groups may use more than twenty in one season, shifting to escape parasites, predators, storms, and bark loss while holding the same social group together. That resilience only works where spare trees stand nearby; one perfect roost is a single point of failure.

9. Migration stopovers and winter refuge

Bats: Hoary bat, eastern red bat, silver-haired bat, **Trees:** Large canopy trees and snags along wooded corridors; oaks that build deep, persistent leaf litter

Migratory tree bats need places to rest and refuel during long spring and autumn movements, and unlike the cave hibernators they may spend the cold months right here, tucked into hanging dead leaves in mild weather, and burrowed down into leaf litter when temperatures approach freezing. An unraked woodlot floor is winter habitat.

10. The favor returned: bats defend the forest

Bats: Community-wide effect across all Ohio species, **Trees:** Mixed deciduous forest, with oak stands showing the strongest measured effect

The relationship runs both ways. In exclusion experiments that kept bats away from young trees, insect density and leaf damage rose sharply, direct evidence that bats suppress the defoliators attacking the very trees that shelter and feed them. Healthy woods make bats, and bats keep woods healthy.

What trees are worth to Ohio's bats

Add it up and a tree is not a perch; it is the entire apparatus of a bat's life. It is the nursery and the thermostat that together decide whether a pup can fly before winter, the roof over half of every day, the crop that grows the insects, the sheltered road between bed and dinner, the spare rooms that keep a colony from being wiped out by one storm, and, for the eastern red bat, the blanket. Every one of Ohio's eleven bat species is state-listed, and all of them are losing ground to white-nose syndrome, wind-energy mortality, and habitat loss, pressures no individual landowner can fix. Trees are the exception. The condition of the woodlot behind the house is a variable Ohioans actually control, and it is the most direct contribution most of us can make to bat recovery. Keep the loose-barked, hollow, cracked, oversized, imperfect trees. Let some dead ones stand where they are safe to stand. Keep the woody cover connected and leave the leaves.

Before you cut, three cautions

- ▶ **Healthy-looking trees can be roosts.** Loose bark, cavities, and clusters of dead leaves on living trees are all occupied habitat, not defects to be tidied away.
- ▶ **Safety comes first.** Do not retain snags where they could fall on people or structures. A qualified arborist can balance hazard reduction against habitat value.
- ▶ **Protected species have legal standing.** Consult current ODNR and U.S. Fish & Wildlife Service guidance before removing trees near known bat habitat; seasonal cutting restrictions may apply.

References

1. Ohio Department of Natural Resources, Division of Wildlife. [Ohio Bat Conservation Plan \(2018\)](#), and Ohio bat species profiles. [ohiodnr.gov](#)
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3. U.S. Fish & Wildlife Service. [Northern Long-eared Bat \(*Myotis septentrionalis*\) species profile](#) and Appendix IV, Potential Northern Long-eared Bat Roost Trees.
4. U.S. Fish & Wildlife Service. [Northern Long-eared Bat and Tricolored Bat Voluntary Environmental Review Process](#) guidance (2024).
5. Monarchino, Behan, and Johnson (2020). "Summer day-roost selection by eastern red bats varies between areas with different land-use histories." [PLOS ONE 15\(8\): e0237103](#).
6. Krynak (2010). "[Bat habitat use and roost-tree selection for northern long-eared myotis in north-central Ohio](#)."
7. Cable et al. (2022). "Larger trees may support larger Indiana bat maternity colonies in a dynamic landscape." *The Journal of Wildlife Management*. [doi:10.1002/jwmg.22254](#)
8. Beilke and O'Keefe (2023). "Bats reduce insect density and defoliation in temperate forests: an exclusion experiment." *Ecology*. [doi:10.1002/ecy.3903](#)

Prepared by Discover Bats Ohio

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