

## New Jersey Guidance on Surveying Buildings/Structures for Evidence of Bat Occupancy

For reporting bat presence/absence to the U.S. Fish and Wildlife Service's New Jersey Field Office (Service) and NJDEP Fish and Wildlife's (NJFW) Endangered and Nongame Species Program (ENSP)

### Why Survey for Bats?

Human-made buildings/structures offer thousands of potential artificial bat roosts per state, supporting an inestimable number of bats. Construction, maintenance, and demolition activities at these structures may destroy roost features or disturb the bats, especially during sensitive times of the year. Surveying structures for bat occupancy ahead of time allows the appropriate avoidance and minimization measures to be incorporated into the project, reducing on-site conflicts while conserving bats. All of New Jersey's native nongame wildlife are protected under the NJ Endangered and Nongame Species Conservation Act (N.J.S.A. 23:2A-1-13), making it illegal to "take" them (meaning to harass, hunt, capture, kill, or attempt to harass, hunt, capture or kill). Two species of bat in New Jersey—Indiana bat (*Myotis sodalis*) and northern long-eared bat (*Myotis septentrionalis*)—are protected under the federal Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*), and an additional three species—tricolored bat (*Perimyotis subflavus*), little brown bat (*Myotis lucifugus*) and eastern small-footed bat (*Myotis leibii*)—are on New Jersey's Endangered Species List (N.J.A.C. 7:25-4.13).

### Visual Inspections of Buildings

Building/structure surveys (*i.e.*, inspections) should be conducted or supervised by personnel that are qualified to work with bats (*e.g.*, New Jersey Recognized Qualified Indiana Bat/Northern Long-eared Bat Surveyor<sup>1</sup>, professional bat exclusion company<sup>2</sup>) and/or have received training on identifying suitable bat roosts in structures. Surveys should be conducted from May 1 through October 31 but may be conducted outside this window with permission from the Service/ENSP. The inspection should include an internal and external survey of potential roosting locations and entry/exit points. During the inspection, the surveyor should seek indicators of bat presence, such as staining around potential entry/exit points, bat guano, discoloration or wear marks on attic/ceiling beams, high-pitched squeaking or chirping, or bats roosting or flying in the structure. Surveyors must employ appropriate safety measures and avoid touching any bats (unless permitted by the NJFW). Individuals assessing buildings/structures for evidence of bat occupancy must use the "New Jersey Building/Structure Inspection Form" and retain a copy of the form and any supplementary documentation (*e.g.*, survey photographs) in their project file. Negative survey results are considered valid for two years.

### Supplementary Data Collection (Emergence Surveys and Guano Sampling)

When a building/structure cannot be thoroughly inspected (*e.g.*, safety concerns, access limitations), a bat emergence survey may be performed between May 15 and August 15 to supplement the visual inspection. Refer to the "Guidance for Conducting Bat Emergence Surveys at Structures in New Jersey" and the "Bat Emergence Survey Form for New Jersey Structures" documents.

When evidence of bat occupancy is observed during a visual inspection, but diagnostic images of the bats are not available to identify the species, the Service/ENSP may recommend collecting representative guano samples for genetic analysis and/or conducting a bat emergence survey with an acoustic detector to record echolocation calls. Contact the Service/ENSP for further guidance on determining if/what kind of supplementary data collection is appropriate for a particular project.

---

<sup>1</sup> <https://www.fws.gov/media/new-jersey-recognized-qualified-indiana-batnorthern-long-eared-bat-surveyor-list>

<sup>2</sup> <https://dep.nj.gov/wp-content/uploads/njfw/professional-bat-excluders.pdf>

## New Jersey Guidance on Surveying Buildings/Structures for Evidence of Bat Occupancy

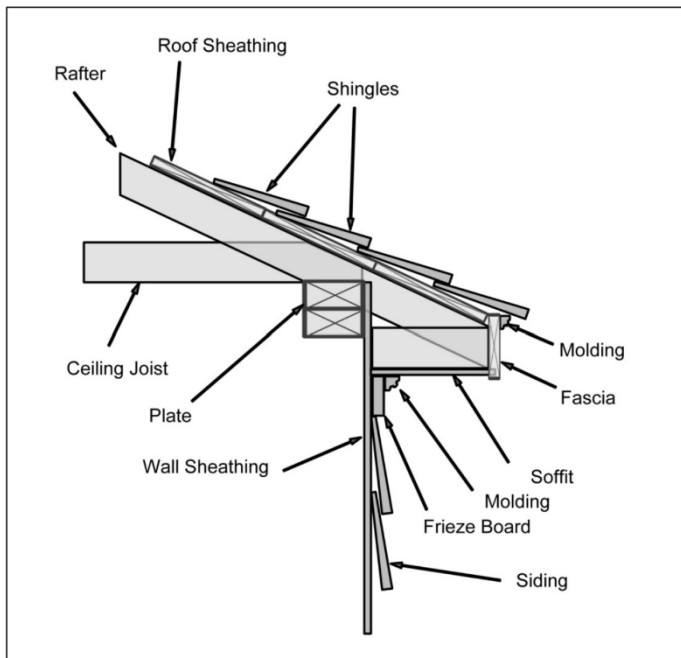
For reporting bat presence/absence to the U.S. Fish and Wildlife Service's New Jersey Field Office (Service) and NJDEP Fish and Wildlife's (NJFW) Endangered and Nongame Species Program (ENSP)

### Recommended Equipment

- High-power light (>600 lumens)
- Binoculars
- Camera with zoom/telephoto lens (*e.g.*, variable focal length reaching 300+ mm)
- Camera set-up for viewing high or tight spaces (*e.g.*, camera on a telescoping pole, borescope)
- Mirror with telescoping handle for seeing into tight or awkward spaces
- Safety equipment (*e.g.*, hard hat, dust mask/respirator, gloves, appropriate footwear, boot covers)
- Survey form and writing implement
- Additional equipment (*e.g.*, ladders) may be necessary depending on structure characteristics.

### Where to Look

- All vertical crevices (note: the most ideal for bats are those  $\frac{1}{2}$ – $1\frac{1}{4}$ " wide and >4" deep)
- Horizontal surfaces below potential entry/exit points that could catch guano
- Siding, shutters
- Roofing and roof ridge, chimney seams
- Dormers (especially where they meet roof line)
- Roof soffit, fascia
- Moldings, frieze boards
- Gutters and space behind
- Attic vents and interior screens
- Attic interior (rafters, joists, floor)
- Basement, crawl space
- Outbuildings or accessory structures



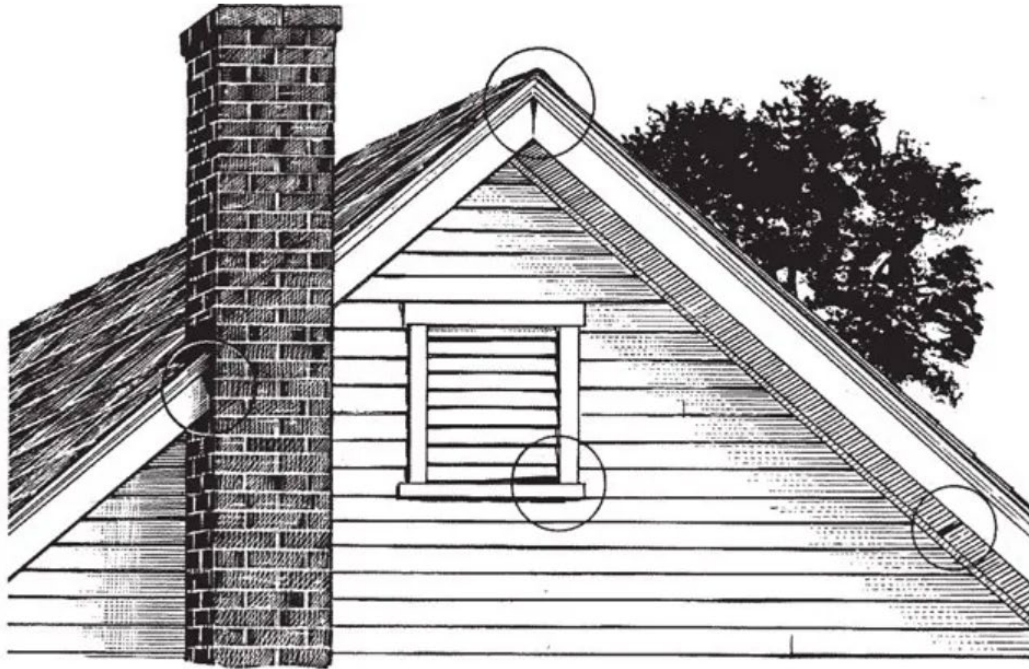
**Figure 1.** Illustration of basic home architecture terms (Image source: Wikipedia)



**Figure 2.** Roofing with ridge vent (Image source: ABARoofing.net)

## New Jersey Guidance on Surveying Buildings/Structures for Evidence of Bat Occupancy

For reporting bat presence/absence to the U.S. Fish and Wildlife Service's New Jersey Field Office (Service) and NJDEP Fish and Wildlife's (NJFW) Endangered and Nongame Species Program (ENSP)



**Figure 3.** Bats can enter a building through small gaps at points where materials have warped, shrunk, or are not adequately sealed. Some common bat access points are illustrated here, including louvred attic vents with loose/missing screening, at the roof peak, where the chimney meets the eaves or siding, gaps in the soffit, and in areas where flashing or trim has pulled away from the siding. (Image source: [PennState Extension: A Homeowner's Guide to Northeastern Bats and Bat Problems](#))

### Evidence of Bat Occupancy

Physically entering a structure and observing bats roosting and/or bat droppings beneath roost areas is the most straightforward way to confirm bat use of buildings. Bats commonly roost in high places where it's warmest, on materials they can easily grip (like wood), and in crevices or other concealed spaces where they feel safe.



**Figure 4.** Here, five big brown bats (*Eptesicus fuscus*) are roosting on rafters at the peak of an attic ceiling.



## New Jersey Guidance on Surveying Buildings/Structures for Evidence of Bat Occupancy

For reporting bat presence/absence to the U.S. Fish and Wildlife Service's New Jersey Field Office (Service) and NJDEP Fish and Wildlife's (NJFW) Endangered and Nongame Species Program (ENSP)



**Figure 5** (left). Another example of big brown bats clustered on attic rafters and roof sheathing.

**Figure 6** (center). Accumulated guano on the attic floor beneath bats roosting along the peak line at the site shown in Fig. 5.

**Figure 7** (right). Significant wearing of the board just below a group of roosting bats, from bats landing on and climbing across it for many years. This amount of wear suggests that this attic roost has been used by a sizable long-term colony.



**Figure 8** (left). Big brown bats roosting on a corner beam in a church attic.

**Figure 9** (right). Guano accumulated at the far end of an attic indicates a favored roost area.



## New Jersey Guidance on Surveying Buildings/Structures for Evidence of Bat Occupancy

For reporting bat presence/absence to the U.S. Fish and Wildlife Service's New Jersey Field Office (Service) and NJDEP Fish and Wildlife's (NJFW) Endangered and Nongame Species Program (ENSP)



**Figures 10 and 11.** A colony of little brown bats (*Myotis lucifugus*) roosting in a gap between rafters in a machine shed. In Fig. 10, possible moisture and mineral buildup from the bats' urine is visible on the underside of the roost gap (white arrow), and droppings are perched on the horizontal beam below (orange arrow).



**Figure 12 (left).** Another example of a crevice between rafters – this time in a barn – being used as a roost by little brown bats. **Figures 13 (upper right) and Figure 14 (lower right).** Two bat pups were found grounded beneath this roost, as can happen to flightless young. One (Fig. 13) was still furless, just a few days old; the other was approx. 2-3 weeks old. Bat pups are fully developed and beginning to fly at just over 1 month old.



## New Jersey Guidance on Surveying Buildings/Structures for Evidence of Bat Occupancy

For reporting bat presence/absence to the U.S. Fish and Wildlife Service's New Jersey Field Office (Service) and NJDEP Fish and Wildlife's (NJFW) Endangered and Nongame Species Program (ENSP)



**Figures 15 (left) and 16 (right).** When just a few droppings are found, the “crush test” can be used to tell bat guano from small rodent droppings by applying pressure to a sample. Bat guano breaks down easily into fine, shiny particles of undigested prey (insect) parts (Fig. 16), whereas rodent droppings are generally hard and fibrous and do not readily break apart.



MacKenzie Hall, NJFW



MacKenzie Hall, NJFW

**Figures 17 (upper left), 18 (right) and 19 (lower left).** The amount of guano present can give an indication of the bat colony size and/or length of time they've been using a structure. In these examples, Fig. 17 shows a sprinkling of bat droppings indicating a few bats, or possibly just one, using this attic; Fig. 18 shows moderate piles (white arrows) of guano in an attic used by approx. 50 bats for several years; Fig. 19 shows a deep layer of guano across the entire floor of a barn loft historically used by more than 1,000 little brown bats.



## New Jersey Guidance on Surveying Buildings/Structures for Evidence of Bat Occupancy

For reporting bat presence/absence to the U.S. Fish and Wildlife Service's New Jersey Field Office (Service) and NJDEP Fish and Wildlife's (NJFW) Endangered and Nongame Species Program (ENSP)



**Figure 20** (left). Bats often enter attic spaces through louvred vents with missing or loose screening.

**Figure 21** (right). Bats may also roost behind the louvres by gripping the screen, like the colony seen here near the top of photo. In this example, guano can also be seen accumulating at the base of the screened vent.



**Figure 22** (left). Less commonly, bats may roost between window panes. In this example, a maternity colony of big brown bats roost every summer between the gridded window and partially raised storm window (allowing the bats to come and go). They hang from the window screen, which is easy for the bats to grip.

**Figure 23** (right). The dirty appearance of this shutter is from the guano of bats roosting in the narrow space behind it.





## New Jersey Guidance on Surveying Buildings/Structures for Evidence of Bat Occupancy

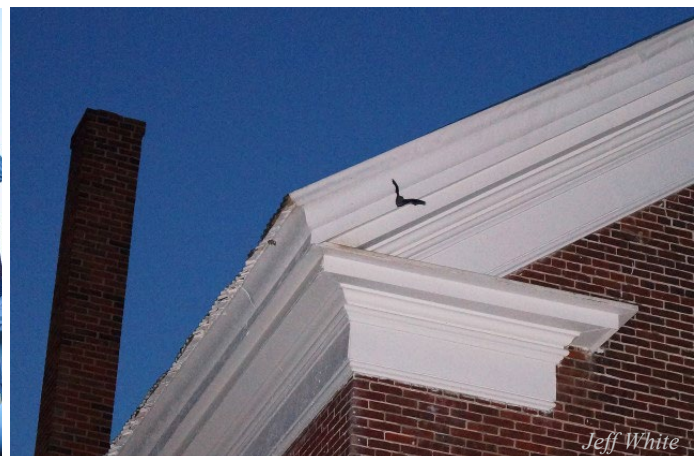
For reporting bat presence/absence to the U.S. Fish and Wildlife Service's New Jersey Field Office (Service) and NJDEP Fish and Wildlife's (NJFW) Endangered and Nongame Species Program (ENSP)



**Figure 24.** On the exterior of a structure (orange arrow), brownish staining is sometimes visible at the bats' entry/exit point, from their body oils rubbing against the surface as they leave and re-enter the roost nightly during the warm months.



**Figure 25.** A bat photographed emerging at dusk from the eave of a church. Staining is visible around the entry/exit point where the eave meets the chimney. The eave had rotted at this junction, and the flashing used to cover it is warped from bats coming and going over the years.



**Figure 26** (left) and **27** (right). Keep in mind that potential bat access points may not be obvious or even visible from the ground. In this example, an emergence survey reveals bats exiting through a gap in the trim board above the second story of a church. Inside, this is the far corner of the attic floor.