

New Jersey Guidance on Surveying Transportation Structures for Bat Occupancy

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

Why Survey for Bats?

Our nation's bridges, culverts, and other transportation structures inadvertently provide thousands of potential artificial bat roosts per state, supporting an inestimable number of bats. Construction, maintenance, and operational activities at these structures may destroy roost features or cause direct disturbance to the bats, especially if done during sensitive times of the year. However, surveying structures for bat occupancy ahead of time allows the appropriate avoidance and minimization measures to be incorporated into the project plans, specifications or standard operating procedures as needed, reducing on-site conflicts while conserving bats. All of NJ'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 - the Indiana bat (*Myotis sodalis*) and the northern long-eared bat (*Myotis septentrionalis*) - also are afforded protection under the federal Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*).

Surveys in New Jersey

Surveys shall be conducted or supervised by personnel that have received training on identifying suitable bat roosts in transportation structure. Surveyors must employ appropriate safety measures and avoid touching any bats. Surveys should be conducted from May 1 - October 31, but may occur outside this window with permission from the Service/ ENSP. Individuals assessing bridges/structures for evidence of bat occupancy must use the New Jersey Bats in Bridges Survey Form and must 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.

Recommended Equipment

- High-power light (>600 lumens, *e.g.*, Gerber Myth spotlight, Fenix flashlights)
- Binoculars
- Camera with zoom/telephoto lens (*e.g.*, variable focal length reaching 300+ mm)
- Video/camera on an telescoping pole for viewing high up spaces (*e.g.*, GoPro on a Wonder Pole)
- Mirror with telescoping handle for seeing into tight or awkward spaces
- Safety equipment (*e.g.*, hard hat, safety vest, dust mask/respirator, gloves, appropriate footwear)
- Survey form and pencil

Scouting the field location in advance using Google Maps street view, if available, can help to identify a safe parking spot and to predict any accessibility hazards (*e.g.*, water, ravine, high traffic) or additional equipment you may need to conduct a thorough survey (*e.g.*, ladder, snooper truck).

Where to Look

- All vertical crevices (note: the most ideal for bats are those ½ - 1¼" wide and >4" deep if sealed at the top, or >12" deep if not sealed)
- Expansion joints and vertical spaces between end walls/bridge deck
- Pier caps or surfaces that may catch guano
- Other crevices in the structure
- Rough surfaces/spalls and vertical surfaces on I-beams
- Guiderails and gaps in concrete parapet
- Plugged drain pipes
- Bird nests (bats can hang on these!)

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Evidence of Bat Occupancy

Urine Staining: Urine stains appear as wet-looking areas when bats have recently used the structure as a roost. When dry, urine staining may have light-colored mineral deposits, but it can be difficult to tell apart from water staining. If staining has algae growing in it, it's more likely to be water staining.



Guano: Piles of guano accumulate on horizontal surfaces (e.g. ledge or ground) under colony roost locations, especially near the bats entrance/exit points. Unlike fibrous rodent droppings, bat guano pellets can be crushed easily and contain shiny bits of insects. When stormwater hits guano piles it can cause guano staining along vertical surfaces- this staining looks 'gritty', like coffee grounds. Guano piles and staining can be very dark and obvious for extremely large colonies, but is usually more subtle.



Visible or Audible Bats: Bats may be visible in crevices or hanging exposed on the structure. Listen carefully for high-pitched squeaking/chirping sounds - bats make social calls audible to humans.



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Evidence of Birds Nesting

Besides pigeons, the most likely birds to find nesting on transportation structures include eastern phoebes, cliff swallows, and barn swallows. While less common, state endangered peregrine falcons sometimes nest on tall bridges, which mimic their natural cliff-side nesting sites.



Cliff swallow nests



Eastern phoebe nest



Eastern phoebe eggs & hatchlings

Cliff swallow nests (above left) are cavity-type structures made of dried mud, with an entry hole in the front or side, and usually attached to a vertical surface with overhead shelter. Cliff swallows are colonial, so their nests are often found in groups along the underdecks of bridges. Eastern phoebe nests (above center and right) are made of moss, leaves and grasses, and are typically built atop ledges and other horizontal surfaces. This example is attached vertically, though, to a spalling concrete culvert wall. Barn swallow nests are similar to phoebe nests but are made of mud mixed with grass.

Telescoping Tools

Surveying with a camera – especially a digital video camera – atop a telescoping pole can help you visually access high-up places like pier caps and expansion joints without a snooper truck or ladder. This saves time, money and coordination and provides good documentation of the surveyed areas. Attach a flashlight to the pole or camera to illuminate the view.

Below is still-shot taken with a GoPro camera showing the surface of a pier cap.

At far right is an example of a telescoping rod with a camera attachment being used during a bridge bat survey in NJ.

