Guidance for Conducting Bat Emergence Surveys at Structures in New Jersey

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

Bat Emergence Surveys at Structures

Bridges, culverts, and other structures (hereafter called structures) within the range of Indiana bats (*Myotis sodalis*) and/or Northern long-eared bats (*Myotis septentrionalis*) in New Jersey shall be surveyed for bat occupancy prior to conducting construction, maintenance, or operational activities which could disturb or directly harm bats. Bat emergence surveys are a supplementary tool to assess bat occupancy at structures where a comprehensive visual inspection could not be completed, or where a visual inspection of a structure found evidence of bat occupancy and additional data is needed to confirm the species of bat and number of individuals that use structure.

Surveys in New Jersey

Emergence surveys shall be conducted or supervised by personnel that have received training or have previous experience conducting bat emergence surveys. Emergence surveys should be conducted from May 15 – August 15 but, in certain circumstances, may occur outside this window with permission from the Service and/or ENSP.

Surveyors must employ appropriate safety measures during the survey and avoid touching any bats. Individuals assessing bridges/structures for evidence of bat occupancy must use the Bat Emergence Survey Form for New Jersey Structures and must retain a copy of the form and any supplementary documentation (*e.g.,* survey photographs) in their project file.

A negative bat emergence survey result is considered valid for two years, except where evidence of bat occupancy was previously documented during a visual inspection of the structure. In such instances where a bat emergence survey does not detect bats despite evidence of bat occupancy on the structure, the Service or the ENSP may request that the emergence survey be repeated. A positive bat emergence survey result is considered valid (*e.g.*, seasonal bat presence is assumed) indefinitely, unless otherwise coordinated with the Service and ENSP.

Recommended Equipment

- Survey form and pencil for each observer
- Device with a clock (*e.g.,* watch, cell phone, etc.) for each observer
- Camera
- Safety equipment (*e.g.*, traffic control, high visibility vest, appropriate footwear, insect repellent)
- Flashlight or headlamp (though lighting must be minimized during survey)
- Acoustic/ultrasonic bat detectors [optional, but highly recommended]
- Infra-red, night vision, or thermal-imaging spotting scope/video camera [optional]
- Boats or other specialty equipment may be necessary to conduct emergence surveys at structures with challenging access.

Know Before You Go

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 an emergence survey (*e.g.,* boats, traffic control).

Emergence Survey Protocols

Surveyors should use the "New Jersey Survey Form for Bat Emergence Surveys at Structures", or similar, to document the results of emergence surveys. Tallies of emerging bats should be recorded every few minutes or as natural breaks in bat activity allow.

Timing: A bat emergence surveys should begin one half hour before sunset and continue until at least one hour after sunset or until it is otherwise too dark to see emerging bats. Surveys may need to start a little earlier or later than one half hour before official sunset times (*i.e.*, before "dusk") in some settings such as deep/dark forested valleys or ridge tops, respectively. Sunset tables for the location of survey can be found at: https://sunrise-sunset.org.

Weather: Bat activity is affected by weather; therefore, emergence surveys should not be conducted when the following conditions exist: (a) temperatures that fall below 50°F (10°C); (b) precipitation, including rain and/or fog, that exceeds 30 minutes or continues intermittently during the survey period; and (c) sustained wind speeds greater than 9 miles/hour (4 meters/second; 3 on Beaufort scale).

Number of Observers: An emergence survey requires enough observers to ensure that the entire structure falls within the collective view of the observers, such that no bats could emerge from the structure without being seen by at least one observer. Each observer can cover a portion of the structure that they can clearly see *without having to pivot their field of view*. The total number of observers needed for an emergence survey will depend on the size of the structure, site conditions, and presence of obstructions that could impede/obstruct the view of observers (*e.g.*, trees, adjacent structures). An emergence survey at small structure could be accomplished with as few as two observers, while a larger structure may require many more.

If suitable or suspected roosting features (*e.g.*, expansion joints, cracks, crevices, plugged drain pipes, etc.) were identified during a visual inspection of the structure prior to the emergence survey, it may be appropriate to assign additional observers to focus on these areas during the emergence survey.

Positioning of Observers: The observers must be positioned so that emerging bats will be silhouetted against the sky as they exit the roost. If a roost cannot be adequately silhouetted (*e.g.*, due to site conditions or limitations on where observers can be placed), then coordinate with the Service or ENSP to discuss alternative survey methods.

Surveyors must be close enough to the roost to observe all exiting bats but not close enough to influence emergence. That is, do not stand directly beneath the roost, do not make noise or carry on a conversation, and minimize use of lights (use a small flashlight or similar to record data, if necessary). Do not shine a light on the roost as this may prevent or delay bats from emerging.

Example Emergence Survey Maps