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Dear Field Supervisor:

Attached are comments developed by staff with the National Council for Air and Stream Improvement (NCASI) for the Indiana bat (*Myotis sodalis*) summer survey protocols. Please do not hesitate to contact us if you can be of further help.

Regards,
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TECHNICAL REVIEW

Draft Revised Rangewide Indiana Bat Summer Survey Guidance January 2013

T. Bently Wigley

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On January 9, 2013, the U.S. Fish and Wildlife Service announced (78 FR 1879) that draft revised Indiana bat (*Myotis sodalis*) summer survey protocols were available for public review and comment. The guidelines describe methods that managers may use to determine presence or probable absence of Indiana bats during summer. The Indiana bat is federally listed as endangered and occurrences have been recorded in many midwestern and eastern states (see map and distribution by county at <http://www.natureserve.org/explorer/>). The standardized survey protocols, which may be accessed at <http://www.fws.gov/midwest/Endangered/mammals/inba/index.html>, were developed by a multi-agency team comprised of State and Federal agency experts on Indiana bats and bat survey methodology. The Service solicited peer review of the original version of the guidelines between February and March 2012 through regional bat working groups and revised the draft guidelines based on comments received and the results of pilot testing during the summer of 2012. In addition to soliciting comments on the revised draft survey guidelines, the Service is also requesting comment on their proposed approach and criteria for testing the accuracy and suitability of available acoustic identification software programs, and on the Service's contingency plan for the 2013 field season should no suitable software programs be identified.

The National Council for Air and Stream Improvement, Inc. (NCASI) is a non-profit organization that serves the forest products industry as a center of excellence for providing technical information and scientific research needed to achieve the industry's environmental goals and principles. NCASI (<http://www.ncasi.org>) has a long history of supporting research to help its member companies better manage forest and manufacturing operations to meet environmental objectives, including conservation of bat communities. As a result, over the last decade, NCASI has supported multiple research projects across the nation investigating habitat relationships of bats in managed forest landscapes and a synthesis of literature describing Indiana bat forest habitat relationships (Menzel et al. 2001). Because NCASI is interested in developing cost-effective measures for conserving bats, we offer the following comments for consideration by the Service.

Summary

The draft survey protocols have many features that should lead to improved information for management of Indiana bats. However, the draft guidance could be strengthened by describing how the Service intends to use the protocols, enhancing the description of suitable habitat, linking the need for a habitat assessment with proximity to known occurrences of the Indiana bat, and varying the sampling intensity for acoustic surveys with scale of the project. The Service also should recognize that surveys and telemetry studies will be beyond the capacity of most private landowners, may render some forest management operations uneconomical, and may be unnecessary. Indeed, it is unclear why surveys would be required for forest management operations that create conditions considered by the Service to be suitable habitat. As the Service tests accuracy and suitability of available acoustic identification software programs, we suggest using data with a quality comparable to that of data that will likely be gathered during actual surveys.

Technical Comments

The draft survey protocols have many features that should lead to improved information for management of Indiana bats. A key advantage of the guidance is the logical, stepwise process of determining Indiana bat presence and use of a given site. The first step is to assess whether any suitable Indiana bat summer habitat is present. If so, acoustic surveys would be conducted. If Indiana bats are detected in acoustic surveys, mist-net surveys would be conducted to help understand use of the project site. Radio-transmitters would be affixed to captured bats to collect base home range and foraging information, and to identify roost sites. Finally, roost sites would be monitored to count bats emerging. Acoustic surveys, therefore, play an important role in this four-step process and may provide greater assurance that Indiana bats are present or likely absent at a site. Acoustic surveys also should make surveys more cost-effective as they would potentially reduce the need for mist-netting and more intensive (and expensive) field work. Overall, a standardized protocol should also result in greater consistency among Service Field Offices and would allow property owners to determine what portion of a project site is actually used by Indiana bats. Despite these and other strengths of the draft protocol, we encourage the Service to consider several opportunities to enhance their guidance.

1. We suggest that the Service clearly describe in the guidance the intended use of the survey protocols.

The draft guidance indicates that it “is designed to provide standardized, rangewide guidelines and protocols and to determine whether Indiana bats (*Myotis sodalists*) are present or likely absent at a given site during the summer (May 15 to August 15).” Some language in the draft guidance suggests that the Service intends the protocols to be used in surveys conducted as part of Endangered Species Act Section 7 consultations. However, the draft guidance does not clearly describe whether this is indeed the intended use for the protocols, or whether the Service expects the protocols to be used in other contexts. We encourage the Service to clearly describe the intended use of the survey protocols.

2. The draft guidance could be strengthened by an improved description of suitable habitat.

The draft survey guidelines describe suitable habitat as follows:

“Suitable summer habitat for Indiana bats consists of the variety of forested/wooded habitats where they roost, forage, and travel as well as surrounding non-forested habitats (e.g., agricultural fields, emergent wetlands, old fields, pasture). This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags greater than 3 inches dbh⁴ (7.6 centimeter) that have exfoliating bark, cracks, crevices, and/or hollows), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet (305 meters) of other suitable habitat.”

In the definition of suitable habitat above, the minimum diameter of 3 inches dbh for roost trees is footnoted as follows:

“While any tree greater than 3 inches dbh (7.6 centimeters) with exfoliating bark, cracks, crevices, and/or hollows has the potential to be male Indiana bat summer roosting habitat, even-aged stands of 3-inch dbh and smaller trees are not defined as suitable roosting habitat for the purposes of this guidance. Suitable roosting habitat is defined as forest patches with trees of 5-inch dbh (12.7 centimeters) or larger, although trees as small as 3 inches within the forest patch(es) may also be included.”

While this description of suitable habitat may be useful for projects that are small and involve little rural land or forest cover, it provides almost no guidance for owners or managers of large parcels of forest or other rural land. This description, in fact, is so broad that it could describe almost any rural site east of the Great Plains. Furthermore, the description of suitable habitat fails to recognize that suitable habitat for this species differs in composition and configuration in different regions (e.g., Northeast, Appalachians, Ohio Valley/Midwest) (Menzel et al. 2001). We encourage the Service to provide a more detailed and, if possible, quantitative description of suitable habitat that addresses habitat characteristics at multiple spatial scales (e.g., individual tree, forest stand, landscape). The Service could also recommend in the draft guidance that users of the survey protocol collaborate with the appropriate Service Field Office to more clearly define suitable habitat for their locale.

2. We encourage the Service to link the need for a habitat assessment with proximity to known occurrences of the Indiana bat.

We suggest that the initial step in the survey (a habitat assessment) be required only within a clearly defined distance of a known occurrence of Indiana bats. Because it is a federally endangered species, occurrences of the Indiana bat are by definition rare and not distributed uniformly across its potential summer range. Thus, conducting habitat assessment when there is

no prior evidence of Indiana bat occurrence within a reasonable proximity will potentially lead to unnecessary costs for landowners and others, including the Service, and could result in false positives that result in additional unnecessary costs as well as constraints.

Currently, the revised guidelines recommend that managers consult the Indiana bat range map maintained by the Service (which can be accessed through this site: http://ecos.fws.gov/tess_public/pub/listedAnimals.jsp). The map, however, has a very coarse spatial resolution and the Service itself acknowledges at this website that the map is inadequate for ESA Section 7 consultation purposes. Thus, the draft guidance should be modified to recommend that users identify the distance of their project from known Indiana bat locations. One option may be to acquire an official species list through the Service's Information, Planning, and Conservation System (<http://ecos.fws.gov/ipac/>) or through the Service's Indiana bat website at <http://www.fws.gov/midwest/endangered/mammals/inba/index.html>. Another option may be to “coordinate with the USFWS Ecological Services Field Office (USFWS FO) and state natural resource agency for information on known occurrence locations” (Page 3 in the guidance). Distance of a project from known occurrences of Indiana bats could then be used to determine whether use of the survey protocols should be considered.

3. The sampling intensity for acoustic surveys should vary with project scale and may be unnecessary for actively managed forest landscapes.

The draft guidance recommends that, for non-linear projects, one acoustic sampling site be established per 30 acres of suitable habitat. While this level of sampling intensity may be appropriate for small, discrete projects where suitable habitat is being permanently converted to another land use (e.g., a construction project), it is problematic for large land bases where ongoing forest management only temporarily alters Indiana bat habitat. For example, it would be costly for a national forest or a private landowner to conduct acoustic surveys at this level of intensity across an entire forest, across a single management district, or even in multiple forest stands where harvests are scheduled in a given year. Therefore, we recommend that the Service consider reducing sampling intensity of acoustic surveys as scale of the project increases.

It is unclear why surveys would be required at all for forest management operations that create conditions considered by the Service to be suitable habitat and logical locations to detect Indiana bats. The description of suitable habitat in the revised guidelines clearly notes that Indiana bats use non-forested areas and habitats with limited tree cover. Furthermore, based on information in Britzke et al. (2010), the revised guidelines suggest placing acoustic detectors in “forest-canopy openings that are no more than 164 feet (50 meters) wide” and in “recently logged forest where some potential roost trees remain.” Thus, recently harvested forests are recognized as being potentially suitable habitat for the Indiana bat.

Managed forest landscapes typically are dynamic mosaics of different forest age classes and structures where suitable habitat is always available, although its configuration may vary over time as forest management activities and natural processes occur. Conducting surveys in actively managed forest landscapes will potentially create unreasonable delays in land management activities, may make active forest management uneconomical, and may be

unnecessary. Another option would be to explicitly exempt actively managed forest landscapes from surveys.

4. When testing the accuracy and suitability of available acoustic identification software programs, we suggest that the Service use data with a quality comparable to data that will likely be gathered during actual surveys.

Many researchers and managers have used ultrasonic detectors to assess bat species presence and activity, and the Service’s draft guidance recommends use of acoustic surveys to determine presence and probable absence of Indiana bats. The draft guidance recognizes that automated analysis of echolocation data will be required to handle the large datasets likely to be generated through the required acoustic surveys. Britzke et al. (2011) recently estimated accuracy rates of 3 parametric and 4 nonparametric classification functions for acoustic identification and found that the “2 most flexible classification functions also were the most accurate: neural networks (overall classification accuracy = 0.94) and mixture discriminant analysis incorporating an adaptive regression model (overall classification accuracy = 0.93).” Britzke et al. (2011) report that both techniques provided accuracy rates of $\geq 90\%$ for the two federally endangered species, the Indiana bat and gray bat (*Myotis grisescens*).

However, acoustic identification of *Myotis* species can be challenging and many bat researchers have expressed concerns (such as at recent meetings of regional bat working groups) that software designed to conduct automated analysis of echolocation data may have been trained and tested using recordings of the highest quality. Therefore, when echolocation data such as those that will be gathered during acoustic surveys conducted under the auspices of the Service’s draft guidance are used with the software, accuracy will likely be lower. We encourage the Service to test the accuracy and suitability of acoustic identification software programs using data with a quality comparable to that of data that will be gathered during surveys.

5. Additional information about recommended methods for radio-tracking bats would strengthen the protocol.

The protocols for radio-tracking Indiana bats appear to largely focus on finding roost trees but suggest that information about foraging habitat use may be requested by the Service in some situations. Our experience indicates that simultaneous bearings by multiple observers are required to delineate home range/foraging area for moving, radio-tagged bats. The protocols also note that, when radio-tracking bats, triangulation may be required to identify roost sites when they occur on other ownerships. However, the draft guidance does not describe criteria for use when triangulating locations (e.g., minimum number of azimuths, a desired range of angles between azimuths, minimum times between azimuths). Providing such criteria would strengthen the protocols and increase confidence in the quality of data being provided to the Service.

6. The Service should recognize that some aspects of the survey guidance will be beyond the capacity of many private landowners.

Most forest land in the eastern United States is in private ownership and controlled by individuals and families who own relatively small parcels. Corporations own significant forest

area in the eastern U.S. as well. Even if the survey protocol is intended primarily for use in consultations where a federal nexus exists, project areas are likely to include or occur adjacent to private lands and, thus, have implications for private landowners. Private landowners of all types, corporate, individuals, and families, typically have limited resources for conducting surveys and many will be unable to implement the protocols.

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