

APPENDIX B

Letter from Evans Associates

August 24, 2015

August 24, 2015

David Wylock, Chairman
Town of Dover Planning Board
Dover Town Hall
126 East Duncan Hill Road
Dover Plains, New York 12522


Evans Associates
Environmental Consulting, Incorporated

**RE: Olivet Management, LLC
Redevelopment of the former Harlem Valley Psychiatric Center / Dover
Knolls Project Site**

Dear Chairman Wylock and Members of the Planning Board:

At the request of Kathleen Schibanoff, I have reviewed the Biological Assessment Report that our office prepared in 2013 for the Dover Knolls Project to determine if the report is still valid for the site. The Biological Assessment Report was submitted to the U.S. Fish & Wildlife Service (US FWS) for review in May of 2013, and a response letter was received on August 28, 2013 offering comments and recommendations for the Dover Knolls Project. Shortly after receipt of the US FWS letter, ownership of the property changed to Olivet Management LLC, and the permit applications to NYS DEC and ACOE were withdrawn.

Since the 2013 letter from US FWS, the northern long-eared bat (*Myotis septentrionalis*) was added as a threatened species under the Endangered Species Act on May 4, 2015. The purpose of this letter is to provide your Board with information and recommendations regarding protection of this species, as well as information on the eastern small-footed bat (*Myotis leibii*), which is also mentioned in the August 2013 US FWS letter, and is currently listed as a Species of Special Concern in New York State.

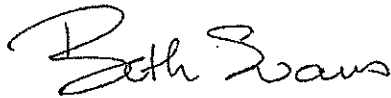
In July of 2008 a summer mist net woodland bat survey was conducted on the subject property as part of the site analysis for the former Dover Knolls Project. A total of one hundred and twelve (112) bats were captured during the 2008 survey, including two (2) Indiana bats (*Myotis soldalis*), nine (9) northern long-eared bats, and one (1) eastern small-footed bat. Based on this survey, it is assumed that suitable summer habitat is present on the site for these species, and a variety of conservation measures were proposed in the Biological Assessment Report to avoid or minimize impacts to these bat species. The recommended conservation measures guidance from Appendix D of the US FWS *Northern Long-eared Bat Interim Conference and Planning Guidance* document, published January 6, 2014, is attached for your reference, and is consistent with the recommendations made in the Biological Assessment Report for the Indiana bat.

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Chairman David Wylok
Dover Planning Board
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Based on this review and update, it is our professional opinion that the information contained in the March 2013 Biological Assessment Report is still valid for this site, and that implementation of the mitigation measures outlined in the report will serve to protect all endangered, threatened, or special concern species found on the property. Should you have any questions regarding this assessment, please do not hesitate to contact me at 203-393-0690 x112.

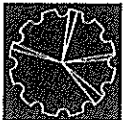
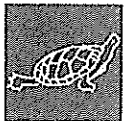
Respectfully submitted,
Evans Associates Environmental Consulting, Inc.



Beth Evans, PWS
Principal

Attachments

Cc: Kathleen Schibanoff, Olivet Management, LLC





United States Department of the Interior

FISH AND WILDLIFE SERVICE

3817 Luker Road
Cortland, NY 13045



August 28, 2013

Ms. Beth Evans
Principal
Evans Associates
205 Amity Road
Bethany, CT 06524

Dear Ms. Evans:

This is in response to your May 21, 2013, letter regarding the proposed 937-acre Knolls of Dover mixed-use community development project (Project) located along NYS Route 22 in the Hamlet of Windgale in the Town of Dover, Dutchess County, New York. The proposed project is a redevelopment of the former Harlem Valley Psychiatric Center and an adjacent parcel and includes 1,376 dwellings, as well as approximately 238,500 square feet of commercial space and 70,250 square feet of community facility or recreation center space.

We understand the U.S. Army Corps of Engineers (Corps) will be involved through authorizations under Section 404 of the Clean Water Act. As you are aware, federal agencies have responsibilities under Section 7(a)(2) of the Endangered Species Act (ESA) to consult with the U.S. Fish and Wildlife Service (Service) regarding projects that may affect federally-listed species or designated critical habitat, and confer with the Service regarding projects that may adversely affect federally-proposed species or proposed critical habitat. Enclosed with your letter was a biological assessment (BA) written to assist the Corps with their final determinations pursuant to the ESA.

The BA addressed the following species under the Service's jurisdiction: the dwarf wedgemussel (*Alasmidonta heterodon*; endangered), Indiana bat (*Myotis sodalis*; endangered), and the bog turtle (*Glyptemys [=Clemmys] muhlenbergii*; threatened), as well as the New England cottontail (*Sylvilagus transitionalis*), a federal candidate for listing.

Dwarf Wedgemussel

We agree with your assessment that no effects to dwarf wedgemussel are anticipated as there is no suitable habitat for this species in the vicinity of the Project.

Indiana Bat

As you are aware, two male Indiana bats were captured at the Project site in July 2008 (Bat Conservation and Management, Inc. 2008). In addition, there is likely a maternity colony within

5 miles from the site. In our December 18, 2009, letter to the Town of Dover for this Project, the Service recommended "that environmental documentation should have an expanded discussion regarding this species and the project's potential for impacts."

The BA generally provides this discussion. We understand that approximately 43.2 acres of upland deciduous forest and 2 acres of upland mixed forest will be impacted by the proposed Project. However, the impacts are not planned within a contiguous patch of forest, but are spread among smaller patches of forest throughout the Project. In addition, approximately 406 acres of forest will remain after full build-out of the Project and tree plantings are included as part of wetland mitigation plans. We request additional information about the proposed mechanism for permanently protecting this area.

We appreciate the inclusion of our 2009 minimization measures in the Project plans. To minimize potential impacts to Indiana bats from increased lighting in the area, we understand that all outdoor lighting will have full cut-off optics. To avoid direct effects to Indiana bats associated with tree clearing, tree removal will occur between October 1 and March 31. Also, bright orange fencing/flagging will demarcate trees to be protected compared with those to be cut prior to the initiation of any construction activities at the site.

Other Bat Species

Since our 2009 letter, we have an additional recommendation for your consideration. In addition to the Indiana bat, we recommend considering whether the project has the potential to impact other bats such as the northern long-eared bat (*Myotis septentrionalis*) and eastern small-footed bat (*Myotis labii*). The Service was petitioned to list the northern long-eared and eastern small-footed bat and published a positive 90-day finding for both species in June 29, 2011¹. This means that sufficient information was provided to conduct a more thorough analysis of their status. We anticipate publishing a 12-month finding for these species in the fall of 2013. In that document, the Service will determine whether the northern long-eared bat or eastern small-footed bat warrant protection under the ESA. If so, the Service will publish a proposal for their listing and solicit public comments on the proposal. The Service is also conducting a status assessment for the little brown bat (*Myotis lucifugus*). In 2008, all three of these species were captured at the Project site. If any of these species are proposed for listing pursuant to the ESA, this will mean that further consultation will be required between the Corps and Service for the Project.

Bog Turtle

Similar to the Indiana bat, the Service previously provided comments on the bog turtle to the Town of Dover in our 2009 letter. In that letter, we requested results of Phase 1 bog turtle habitat surveys. The BA provides a copy of those results. We understand that wetland T constitutes extensive and high-quality bog turtle habitat and wetlands E and N each contain bog turtle habitat in a matrix of wetland areas.

As was the case in 2009, we understand that Phase 2 surveys for bog turtles were not conducted and, therefore, the applicant is assuming presence of bog turtles at the site. We continue to believe this is an appropriate decision given that the wetlands identified above are all part of New York State Department of Environmental Conservation (NYSDEC) wetland DP-22, an

¹ Available at <http://www.fws.gov/midwest/es/soc/mammals/pdf/FR90DayFinding2Bats29June2011.pdf>

extensive wetland system with known bog turtle habitat within 1.5 miles south and 1 mile north of the proposed project.

We then recommended that efforts be made to avoid direct and indirect effects to the wetlands within and offsite of the proposed Project area. We provided a list of potential adverse impacts to bog turtles associated with residential and commercial development such as fragmentation of habitat and alterations to bog turtle dispersal routes; introduction of contaminated surface water runoff into the wetland from pesticides, herbicides, fertilizers, road deicers, etc.; alteration of wetland hydrology; introduction of nutrients from septic systems or wastewater treatment plants; introduction of yard and other waste materials into wetlands; introduction of people, pets, and recreational vehicles into wetlands; and death/injury of bog turtles that wander onto lawns and roads. We recommended a minimum 300-foot buffer around all wetlands (not just the sections with identified habitat) with known or likely bog turtle populations.

We understand that there is no development activity proposed directly within wetlands E or T. However, there are proposed grading activities within wetland N associated with widening of Wheeler Road. The BA does not adequately consider the potential for adverse effects to bog turtles or their habitat from these activities. Additional information is needed regarding the timing and duration of specific activities that will be part of the road widening project. Also, there is no assessment of future road crossings by bog turtles and the potential for death or injury of bog turtles (at Wheeler Road or other roads within the Project).

We understand there is no development planned within 300 feet of wetland T. However, this is not the case for wetlands E and N. Development around wetland E includes recreational trails, a residential development, a community center, and improvements to roads and bridges. Development around wetland N includes residential units and roads, stormwater basins, and part of a recreational trail. The BA does not adequately consider the potential for adverse effects to bog turtles or their habitat from these activities. Additional information is needed including the timing, duration, and location of specific activities associated with these parts of the Project. Also, there is no assessment of future adverse impacts to bog turtles (e.g., collection, predation) on their habitat.

We appreciate the minimization measures already proposed by the Project sponsor. The BA includes several measures to minimize impacts to bog turtles such as installing silt fencing to isolate work areas, keeping heavy equipment and other disturbance >100 feet from wetlands (except wetland N grading activities), and measures to reduce the likelihood of accidentally trapping turtles during construction activities or around homes. The BA also includes a brief description of proposed wetland restoration and enhancement plantings. It is important to keep in mind that wetland restoration activities may have the potential for limited adverse effects to bog turtles in the short term even though there are expected long-term benefits. For example, the Service issued a Biological Opinion (Service 2012) to address this potential for "take"² of bog turtles during Service-sponsored bog turtle habitat restoration activities. Please provide detailed plans for the proposed restoration project so that it can be determined whether any incidental take authorization may be required for this aspect of the Project.

² Take is defined in Section 3 of the ESA as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.

At this time, it appears that adverse effects to bog turtles cannot be fully avoided and formal consultation between the Corps and Service is necessary. However, we will review any additional information provided before coordinating with the Corps on a final determination.

New England Cottontail


New England cottontail (NEC) may also be within the vicinity of the proposed Project area. While the NEC is not currently federally listed, it is a candidate for listing. As stated in our September 2009 letter, known locations are approximately 3 miles to the southwest, but it is less clear if NEC are using early successional habitat within or adjacent to the Project area. We encourage proactive conservation that promotes the growth of dense shrub thickets (e.g., areas with brush, shrubs, and densely growing young trees). Such efforts across the landscape may reduce the likelihood of future listing of this species. We applaud your efforts of developing an invasive species management plan that proposes to remove such invasive species as mile-a-minute (*Persicaria perfoliata*), Oriental bittersweet (*Celastrus orbiculatus*), and Japanese barberry (*Berberis thunbergii*) from the Project area. In addition to invasive species management, we encourage development of a mowing regime for the shrubby old field that is to be left undisturbed. This will promote the long-term presence of dense vegetation that is required by NEC and prevent succession to mature forest. If amenable, we can assist with development of a mowing regime, rotational schedule for invasive species removal, and application of best management practices.

As a reminder, the most recent compilation of federally-listed and proposed endangered and threatened species in New York is available for your information. Until the proposed project is complete, we recommend that you check our website every 90 days from the date of this letter to ensure that listed species presence/absence information for the proposed project is current.*

The above comments pertaining to endangered species under our jurisdiction are provided as technical assistance pursuant to the ESA. This response does not preclude additional Service comments under other legislation. Any changes in project plans or new information regarding the potential for impacts to listed species should be coordinated with both this office and with the New York State Department of Environmental Conservation (NYSDEC).

In summary, we have concerns about potential impacts to federally-listed species from the proposed Project. We recommend additional coordination among the Corps, NYSDEC, the applicant, and the Service regarding these potential impacts. Thank you for your time. If you require additional information please contact Robyn Niver at (607) 753-9334. Future correspondence with us on this project should reference project file 61166.

Sincerely,


for David A. Stilwell
Field Supervisor

*Additional information referred to above may be found on our website at:
<http://www.fws.gov/northeast/nyfo/es/section7.htm>

References:

Bat Conservation and Management, Inc. 2008. Summer woodland bat survey, Knolls of Dover.
Bat Conservation and Management, Inc., Carlisle, PA.

U.S. Fish and Wildlife Service. 2012. Biological opinion on the effects of habitat restoration practices by the U.S. Fish and Wildlife Service on the Northern Population of the Bog Turtle. U.S. Fish and Wildlife Service Region 5.

cc: NYSDEC, New Paltz, NY (Attn: L. Masi)
NYSDEC, Albany, NY (Wildlife Diversity)
COB, New York, NY (Attn: B. Orzel)



U.S. Fish & Wildlife Service

Northern Long-Eared Bat

Myotis septentrionalis

The northern long-eared bat is federally listed as a threatened species under the Endangered Species Act. **Endangered** species are animals and plants that are in danger of becoming extinct. **Threatened** species are animals and plants that are likely to become endangered in the foreseeable future. Identifying, protecting and restoring endangered and threatened species is the primary objective of the U.S. Fish and Wildlife Service's Endangered Species Program.

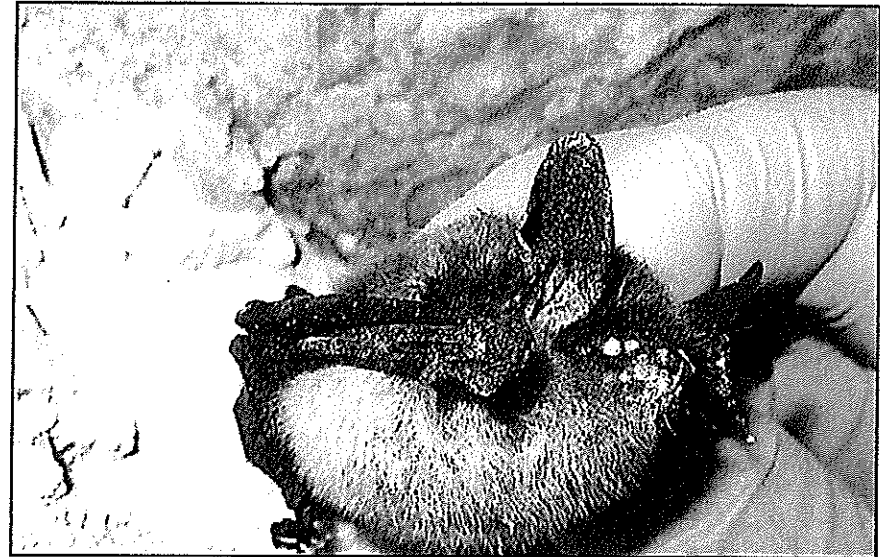
What is the northern long-eared bat?

Appearance: The northern long-eared bat is a medium-sized bat with a body length of 3 to 3.7 inches and a wingspan of 9 to 10 inches. Their fur color can be medium to dark brown on the back and tawny to pale-brown on the underside. As its name suggests, this bat is distinguished by its long ears, particularly as compared to other bats in its genus, *Myotis*.

Winter Habitat: Northern long-eared bats spend winter hibernating in caves and mines, called hibernacula. They use areas in various sized caves or mines with constant temperatures, high humidity, and no air currents. Within hibernacula, surveyors find them hibernating most often in small crevices or cracks, often with only the nose and ears visible.

Summer Habitat: During the summer, northern long-eared bats roost singly or in colonies underneath bark, in cavities or in crevices of both live trees and snags (dead trees). Males and non-reproductive females may also roost in cooler places, like caves and mines. Northern long-eared bats seem to be flexible in selecting roosts, choosing roost trees based on suitability to retain bark or provide cavities or crevices. They rarely roost in human structures like barns and sheds.

Reproduction: Breeding begins in late summer or early fall when males begin to swarm near hibernacula. After



This northern long-eared bat, observed during an Illinois mine survey, shows visible symptoms of white-nose syndrome.

copulation, females store sperm during hibernation until spring. In spring, females emerge from their hibernacula, ovulate and the stored sperm fertilizes an egg. This strategy is called delayed fertilization.

After fertilization, pregnant bats migrate to summer areas where they roost in small colonies and give birth to a single pup. Maternity colonies of females and young generally have 30 to 60 bats at the beginning of the summer, although larger maternity colonies have also been observed. Numbers of bats in roosts typically decrease from the time of pregnancy to post-lactation. Most bats within a maternity colony give birth around the same time, which may occur from late May or early June to late July, depending where the colony is located within the species' range. Young bats start flying by 18 to 21 days after birth. Maximum lifespan for the northern long-eared bat is estimated to be up to 18.5 years.

Feeding Habits: Like most bats, northern long-eared bats emerge at dusk to feed. They primarily fly through the

understory of forested areas feeding on moths, flies, leafhoppers, caddisflies, and beetles, which they catch while in flight using echolocation or by gleaning motionless insects from vegetation.

Range: The northern long-eared bat's range includes much of the eastern and north central United States, and all Canadian provinces from the Atlantic Ocean west to the southern Yukon Territory and eastern British Columbia. The species' range includes 37 States and the District of Columbia: Alabama, Arkansas, Connecticut, Delaware, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Vermont, Virginia, West Virginia, Wisconsin, and Wyoming.

Why is the northern long-eared bat in trouble?

White-nose Syndrome: No other threat is as severe and immediate as

Photo by Steve Taylor, University of Illinois

this. If this disease had not emerged, it is unlikely that northern long-eared bat populations would be experiencing such dramatic declines. Since symptoms were first observed in New York in 2006, white-nose syndrome has spread rapidly from the Northeast to the Midwest and Southeast; an area that includes the core of the northern long-eared bat's range, where it was most common before this disease. Numbers of northern long-eared bats (from hibernacula counts) have declined by up to 99 percent in the Northeast. Although there is uncertainty about the rate that white-nose syndrome will spread throughout the species' range, it is expected to continue to spread throughout the United States in the foreseeable future.

Other Sources of Mortality:

Although no significant population declines have been observed due to the sources of mortality listed below, they may now be important factors affecting this bat's viability until we find ways to address WNS.

Impacts to Hibernacula: Gates or other structures intended to exclude people from caves and mines not only restrict bat flight and movement, but also change airflow and microclimates. A change of even a few degrees can make a cave unsuitable for hibernating bats. Also, cave-dwelling bats are vulnerable to human disturbance while hibernating. Arousal during hibernation causes bats to use up their energy stores, which may lead to bats not surviving through winter.

Loss or Degradation of Summer Habitat:

Highway construction, commercial development, surface mining, and wind facility construction permanently remove habitat and are activities prevalent in many areas of this bat's range. Many forest management activities benefit bats by keeping areas forested rather than converted to other uses. But, depending on type and timing, some forest management activities can cause mortality and temporarily remove or degrade roosting and foraging habitat.

Wind Farm Operation: Wind turbines kill bats, and, depending on the species, in very large numbers. Mortality from windmills has been documented for northern long-eared bats, although a

small number have been found to date. However, there are many wind projects within a large portion of the bat's range and many more are planned.

What Is Being Done to Help the Northern Long-Eared Bat?

Disease Management: Actions have been taken to try to reduce or slow the spread of white-nose syndrome through human transmission of the fungus into caves (e.g. cave and mine closures and advisories; national decontamination protocols). A national plan was prepared by the Service and other state and federal agencies that details actions needed to investigate and manage white-nose syndrome. Many state and federal agencies, universities and non-governmental organizations are researching this disease to try to control its spread and address its affect. See www.whitenosesyndrome.org/ for more.

Addressing Wind Turbine

Mortality: The Service and others are working to minimize bat mortality from wind turbines on several fronts. We fund and conduct research to determine why bats are susceptible to turbines, how to operate turbines to minimize mortality and where important bird and bat migration routes are located. The Service, state natural resource agencies, and the wind energy industry are developing a Midwest Wind Energy Habitat Conservation Plan, which will provide wind farms a mechanism to continue operating legally while minimizing and mitigating listed bat mortality.

Listing: The northern long-eared bat is listed as a threatened species under the federal Endangered Species Act. Listing a species affords it the protections of the Act and also increases the priority of the species for funds, grants, and recovery opportunities.

Hibernacula Protection: Many federal and state natural resource agencies and conservation organizations have protected caves and mines that are important hibernacula for cave-dwelling bats.

What Can I Do?

Do Not Disturb Hibernating Bats:

To protect bats and their habitats, comply with all cave and mine closures, advisories, and regulations. In areas without a cave and mine closure policy, follow approved decontamination protocols (see <http://whitenosesyndrome.org/topics/decontamination>). Under no circumstances should clothing, footwear, or equipment that was used in a white-nose syndrome affected state or region be used in unaffected states or regions.

Leave Dead and Dying Trees

Standing: Like most eastern bats, the northern long-eared bat roosts in trees during summer. Where possible and not a safety hazard, leave dead or dying trees on your property. Northern long-eared bats and many other animals use these trees.

Install a Bat Box: Dead and dying trees are usually not left standing, so trees suitable for roosting may be in short supply and bat boxes may provide additional roost sites. Bat boxes are especially needed from April to August when females look for safe and quiet places to give birth and raise their pups.

Support Sustainability: Support efforts in your community, county and state to ensure that sustainability is a development goal. Only through sustainable living will we provide rare and declining species, like the northern long-eared bat, the habitat and resources they need to survive alongside us.

Spread the Word: Understanding the important ecological role that bats play is a key to conserving the northern long-eared and other bats. Helping people learn more about the northern long-eared bat and other endangered species can lead to more effective recovery efforts. For more information, visit www.fws.gov/midwest/nleb and www.whitenosesyndrome.org

Join and Volunteer: Join a conservation group; many have local chapters. Volunteer at a local nature center, zoo, or national wildlife refuge. Many state natural resource agencies benefit greatly from citizen involvement in monitoring wildlife. Check your state agency websites and get involved in citizen science efforts in your area.

US FISH AND WILDLIFE SERVICE

NORTHERN LONG-EARED BAT INTERIM CONFERENCE AND PLANNING GUIDANCE

USFWS Regions 2, 3, 4, 5, & 6

January 6, 2014

Appendix D: Conservation Measures for the NLEB

This appendix provides a list of recommended conservation measures for the NLEB. Conservation measures are considered any measures that contribute to the conservation of the NLEB and include, but are not limited to, avoidance measures, minimization measures, mitigation measures, and proactive measures. The basis for these suggestions come from our knowledge and experience with the Indiana bat, and may change in the future as we learn more about the specific needs of the NLEB.

These conservation measures should further be considered as advisory recommendations by the FWS since there are no requirements to avoid or minimize impacts to a proposed species unless it becomes listed. Also, note that application of any of these measures should be based on the anticipated effects of a specific project on the NLEB in a specific area; therefore, not all measures will be appropriate for all projects.

The seasonality of NLEB habitat use varies somewhat throughout its range, and thus the time periods associated with conservation measures varies accordingly. These differences are due to local and regional variability in climate, which are known or anticipated to drive NLEB seasonal habitat use. For example, the summer maternity season may be longer in the southerly portions of the species' range versus the northerly portions. When referenced in a conservation measure, please see the table at the end of this appendix for the appropriate time period based on the project location.

The FWS may adjust the seasonal dates or other aspects of these conservation measures based on site-specific and project-specific information.

Conservation Measures for NLEB Hibernacula and 5-mile Buffer:

NLEB may be present in hibernacula during the regional or local hibernation season (see Table 1). They may also be present in larger numbers within a 5-mile radius of hibernacula during spring staging and fall swarming. However, males and non-reproductive females may be closer to hibernacula year-round.

1. Take actions to protect NLEB hibernacula. Where a known NLEB hibernaculum is experiencing threats, work with the FWS and other partners to provide the necessary protections (e.g. limit human disturbance, install bat-friendly gates, ensure the use of "clean" clothing and gear).
2. Participate in actions to manage and reduce the impacts of WNS on NLEB. A national plan was prepared by the FWS and other state and federal agencies that details actions needed to investigate and manage white-nose syndrome. Many

state and federal agencies, universities and non-governmental organizations are researching this disease in an attempt to control its spread and address its effects.

3. Avoid disturbing/injuring hibernating bats.
 - Avoid entering NLEB hibernacula during the hibernation season, unless authorized for survey, research, or other management purposes.
 - Comply with all cave and mine closures, advisories, and regulations.
 - Avoid burning or other sources of smoke within 0.25 mile of known or assumed NLEB hibernacula during hibernation season, or coordinate with the local FWS office.
 - Activities involving continuing (i.e., longer than 24 hours) noise disturbances greater than 75 decibels measured on the A scale (e.g., loud machinery) should be avoided within a one-mile radius of known or assumed NLEB hibernacula.
4. Avoid destruction/alteration (e.g., fill, cause collapse of) of caves/mines that may support hibernating bats.
 - Avoid woody vegetation or spoil (e.g., soil, rock, etc.) disposal within 100 feet of known or assumed NLEB hibernacula entrances and associated sinkholes, fissures, or other karst features.
 - When blasting within 0.5 miles of a known or presumed occupied hibernacula entrances and passages, coordinate with the local FWS office to ensure that the blasting will be conducted in a manner that will not compromise the structural integrity or alter the karst hydrology of the hibernacula.
 - When drilling or fracking within 0.5 miles of a known or presumed occupied hibernacula entrances and passages, coordinate with the local FWS office to ensure that the drilling will be conducted in a manner that will not compromise the structural integrity or alter the karst hydrology of the hibernacula. Since fracking can affect lateral geology for much greater distances, a wider buffer may be necessary to protect hibernacula from this activity.
 - Avoid modifying cave or mine entrances that may support hibernating bats. If there are safety concerns or concerns about bats (e.g., disturbance, vandalism) at a site, install only "bat friendly" cave/mine gates. Consult the FWS office in your state for more information on "bat friendly" cave/mine gates.
5. Avoid/minimize alterations of clean drinking water and foraging areas.
 - Protect potential recharge areas of cave streams and other karst features that are hydrologically connected to known or assumed hibernacula.

- Set back equipment servicing and maintenance areas at least 300 feet away from streambeds, sinkholes, fissures, or areas draining into sinkholes, fissures, or other karst or mine features.
 - Follow available standards on spill prevention, containment, and control.
 - Restrict use of herbicides for vegetation management near known or assumed NLEB hibernacula to those specifically approved for use in karst (e.g., sinkholes) and water (e.g., streams, ponds, lakes, wetlands).
 - Implement strict adherence to sediment and erosion control measures, ensure restoration of pre-existing topographic contours after any ground disturbance, and restore native vegetation (where possible).
6. Avoid disturbing/killing/injuring NLEBs during spring staging/fall swarming.
- Avoid clearing of suitable spring staging and fall swarming habitat within a 5-mile radius of known or assumed NLEB hibernacula during the staging and swarming seasons.
 - Activities involving continuing (i.e., longer than 24 hours) noise disturbances greater than 75 decibels measured on the A scale (e.g., loud machinery) within a five-mile radius of known or assumed NLEB hibernacula should be avoided during the spring staging and fall swarming seasons.
 - During spring staging and fall swarming, use tanks to store waste fluids to ensure no loss of bats by entrapment in waste pits within 5 miles of known or presumed hibernacula or assumed NLEB hibernacula.
 - Avoid prescribed burning or other sources of smoke in known or assumed NLEB habitat during the swarming/staging or hibernation season, or coordinate with the local FWS office.
 - Operate wind turbines during periods (e.g., months, hours, wind speeds) when NLEB activity is unlikely.
7. Avoid or minimize the spread of White-Nose Syndrome (WNS).
- If you must enter a cave or mine that could harbor hibernating bats, and it does not have a cave and mine closure policy, follow approved WNS decontamination protocols (see whitenosesyndrome.org/topics/decontamination). Under no circumstances should clothing, footwear, or equipment that was used in a WNS-affected state or region be used in unaffected states or regions.
8. Maintain spring staging/fall swarming forested habitat within a 5-mile radius of known or assumed NLEB hibernacula.
- Retain snags, dead/dying trees, and trees with exfoliating (loose) bark ≥ 3 -inch diameter at breast height (dbh) in areas \leq one mile from water.
 - Minimize impacts to all forest patches.

- Maintain forest patches and forested connections (e.g., hedgerows, riparian corridors) between patches.
- Maintain natural vegetation between forest patches/connections and developed areas.

Conservation Measures for NLEB In Known or Potential Summer Habitat

NLEB may be present in suitable summer habitat during the regional or local summer season (see Table 1). See the main guidance document for a description of suitable NLEB summer habitat. See Appendix C for assistance in establishing a NLEB home range based on capture records.

9. Determine where NLEB occur in the summer.
 - Coordinate with partners to gather and evaluate NLEB location information.
 - Review both positive and negative data (e.g., acoustic transect surveys).
 - For wind facilities, review project pre-construction surveys and post-construction fatality reports for detection of NLEB.
 - We recommend that large landholders (e.g., U.S. Forest Service, Department of Defense, National Wildlife Refuges, state natural resource agencies) perform baseline bat surveys.
10. Take actions to protect NLEB and their habitat within known NLEB homeranges.
11. Avoid killing or injuring NLEB during tree clearing activities.
 - Do not clear maternity colony summer habitat during the summer maternity season to avoid direct effects to females (pregnant, lactating, and post-lactating) and juveniles (non-volant and volant).
12. Minimize other direct effects to NLEB.
 - Avoid clearing of summer habitat during the time of year when females are pregnant or the pups are non-volant (consult the FWS office for these times).
 - Minimize use of pesticides (e.g., rodenticides, sticky traps) in and around structures with roosting bats.
 - During prescribed burns, where the proposed perimeter fire line is constructed by hand, construct it at least two tree-lengths away from any known NLEB habitat, or potential roost trees that have been identified. If such trees are adjacent to a fixed part of the fire line such as the road, a trail, or the river, they will have fire line constructed around the bases, so long as their remaining in place does not jeopardize firefighter safety.

- Whenever possible, conduct prescribed burns outside of the summer maternity season. Burns conducted during the summer maternity season should be low/moderate intensity to minimize direct impacts to NLEB.
- Fire-effects monitoring should be used before, during, and after the burns to ensure that burning conditions and effects are within the desired ranges.
- Use tanks to store waste fluids to ensure no loss of bats by entrapment in waste pits.
- Avoid conducting construction activities after sunset in known or suitable summer habitat to avoid harassment of foraging NLEBs.
- Operate wind turbines during periods (e.g., months, hours, wind speeds) when NLEB activity is unlikely.

13. Avoid/minimize altering clean drinking water and foraging areas.

- Minimize use of herbicides and pesticides. If necessary, spot treatment is preferred over aerial application.
- Minimize use of chemicals (e.g., colorants) in/around storm water detention basins.
- Minimize potential lighting impacts (e.g., reduce the number of lights, use motion sensors, use shields/full cut-off lens, angle lights downward and away from forest).
- Contaminants, including but not limited to oils and solvents, should be strictly controlled so the quality, quantity, and timing of prey resources are not affected.
- Implement sediment and erosion control measures, ensure restoration of pre-existing topographic contours after any ground disturbance, and restore native vegetation (where possible).
- Site equipment servicing and maintenance areas at least 300 feet away from waterbodies (e.g., wetlands, streams). Follow available standards on spill prevention, containment, and control.
- Avoid filling, channelizing, or degrading streams, wetlands, and other watering areas.

14. Maintain summer maternity habitat.

- Retain and avoid impacting potential roost trees, which includes live or dead trees and snags ≥ 3 inches dbh that have exfoliating bark, cracks, crevices, or cavities. Do not remove trees surrounding potential roosts to maintain the microclimate.
- Where possible and not a safety hazard, leave dead or dying trees standing.
- Avoid reducing the suitability of forest patches with known NLEB use.
- Maintain or improve forest patches and forested connections (e.g., hedgerows, riparian corridors) between patches.

- Clearly demarcate trees to be protected vs. cut to help ensure that contractors do not accidentally remove more trees than anticipated.
- Avoid/minimize tree clearing that fragments large forested areas or tree lined corridors. For example, route linear features along the edge of a woodlot instead of through the middle of it; use horizontal directional drilling for pipeline crossings of wooded stream corridors and upland tree lines.

15. Conduct humane exclusion of NLEB in structures.

- Minimize use of pesticides (e.g., rodenticides, sticky traps) in and around structures with roosting bats.
- If bats (of any species) are using structures (e.g., barns or other out-buildings) as roosts, and these structures are proposed for removal, removal should be performed outside of the summer maternity season, unless there are human health or safety concerns associated with the structure. Consult a nuisance wildlife specialist for humane exclusion techniques¹.
- Prior to the initiation of any construction activities on bridges, including the removal of any bridge structures, we recommend the underside of each bridge be carefully examined for the presence of bats. If any bats are found roosting in the bridge, contact your state FWS office.

Conservation Measures for NLEB During Migration

- 16. During spring and fall migration, operate wind turbines during periods (e.g., months, hours, wind speeds) when NLEB activity is unlikely.
- 17. Use of feathering below a cut-in speed of 6.9 m/s at night during migratory seasons has been used to avoid mortality of the Indiana bat. When NLEB are potentially exposed to wind turbines, we suggest that this cut-in speed be used to avoid mortality of migrating NLEBs.

¹ Ensure that all required state and federal permits are in place.

Table 1. Estimated annual NLEB seasonal habitat use time periods by state. Dates currently unavailable for some states (blank cells). Contact those FWS offices for more information.

State/Region	Hibernation Season	Spring Staging Season	Summer Maternity Season	Fall Swarming Season
Maine				
Vermont				
New Hampshire				
Massachusetts				
Connecticut				
New York	Oct 1-May 1		Apr 1-Sep 30	Aug 1-Oct 30
New Jersey (Northern)	Nov 15-Apr 1		Apr 1-Sep 30	Aug 16-Nov 15
Minnesota	Oct 1-May 15		Apr 1-Sep 30	
Wisconsin	Oct 1-May 15	Apr 1-May 15	Apr 1-Sep 30	Aug 15-Oct 15
Michigan			Apr 1-Sep 30	
North Dakota	Oct 1-May 15		Apr 1-Sep 30	
South Dakota	Oct 1-Apr 1		Apr 1-Sep 30	
Montana	Oct 1-May 15		Apr 1-Sep 30	
Wyoming	Oct 1-Apr 1		Apr 1-Sep 30	
Nebraska	Nov 15-Mar 15		Apr 1-Sep 30	
Ohio	Nov 15-Mar 15	Mar 16-May 14	Apr 1-Sep 30	Aug 16-Nov 15
Iowa	Nov 1-Mar 31		Apr 1-Sep 30	
Indiana	Nov 15-Mar 31	Apr 1-May 14	Apr 1-Sep 30	Aug 16-Nov 15
Pennsylvania				
Illinois	Nov 1-Mar 31		Apr 1-Sep 30	Aug 16-Nov 15
Kentucky	Nov 15-Mar 31	Apr 1-May 14	May 15-Aug 15	Aug 16-Nov 15
Missouri	Nov 1-Mar 31	Apr 1-May 14	May 15-Aug 15	Aug 16-Nov 15
North Carolina	Oct 15-Apr 15	Apr 1-May 14	May 15-Aug 15	Aug 16-Nov 15
Virginia	Nov 15-Mar 31	Apr 1-May 14	Apr 15-Sep 15	Aug 16-Nov 15
West Virginia	Nov 15-Mar 31	Apr 1-May 14	Apr 1-Nov 14	Aug 15-Nov 14
Tennessee	Oct 15-Mar 31	Mar 16-May 14	May 15-Aug 15	Aug 16-Nov 15
Kansas	Nov 1-Mar 31		May 15-Aug 15	
Oklahoma	Nov 1-Mar 31	Apr 1-May 14	May 15-Aug 15	Aug 16-Nov 15
Arkansas	Dec 1-Mar 15	Apr 1-May 14	Apr 1-Aug 15	Aug 16-Nov 30
Louisiana	Dec 1-Mar 15	Apr 1-May 14	May 15-Aug 15	Aug 16-Nov 30
Mississippi	Dec 1-Mar 15	Apr 1-May 14	May 15-Aug 15	Aug 16-Nov 30
Alabama	Dec 1-Mar 15	Apr 1-May 14	May 15-Aug 15	Aug 16-Nov 30
Georgia	Dec 1-Mar 15	Apr 1-May 14	May 15-Aug 15	Aug 16-Nov 30

Eastern Small-footed Myotis



Small-footed Myotis



Photo credits: Alan Hicks

Scientific Name *Myotis leibii*
(Audubon and Bachman,
1842)

Family Name Vespertilionidae
Evening Bats and Vesper Bats

Did you know?

The Eastern Small-footed Myotis is the smallest Myotis in the eastern United States. It differs from other bats in that it typically roosts in rock crevices and talus, rather than trees.

Summary

Protection Species of Special Concern in New York State, not listed federally.

This level of state protection means: A native species at risk of becoming Threatened; does not qualify as Endangered or Threatened, but have been determined to require some measure of protection or attention to ensure that the species does not become threatened. NYSDEC may regulate the takin

Rarity G1G3, S2

A global rarity rank of G1G3 means: Critically Imperiled, Imperiled, or Vulnerable globally -- Conservation status is uncertain, and could range from very high to moderate risk of extinction due to rarity or other factors. More information is needed to assign a single conservation status.

A state rarity rank of S2 means: Typically 6 to 20 occurrences, few remaining individuals, acres, or miles of stream, or factors demonstrably make it very vulnerable in New York State.

Conservation Status in New York

Although the species has been recorded from 40 hibernacula, there are just nine overwintering locations with approximately 50 or more individuals (including one site with a high count of 46). Many of the hibernacula contain few individuals. The small number of total individuals statewide and the small number of high-quality occurrences are the primary ranking considerations.

Short-term Trends

The population appears to be stable. The total maximum count, using high counts from each of the 40 known hibernacula between 1982 and 2006, is 3,396.

Long-term Trends

The long-term trends are unknown.

Conservation and Management

Threats

Some mines may suffer from collapse or closure and a few cave occurrences are probably threatened or reduced in quality due to the commercialization or frequent winter visitation by spelunkers. The main threat is disturbance during the winter hibernation period and, although this currently does not appear to be a major threat at the best sites (mines), it could be a problem at some of the cave sites.

Conservation Strategies and Management Practices

Cave or mine gating should be given serious consideration at sites that may otherwise receive heavy winter usage. Fencing around openings may be sufficient at some of the more remote locations. Gates or fences will need monitoring to ensure that they remain effective. Gates over entrances must be designed in accordance with specifications that allow easy entrance by bats and do not restrict or alter air movement patterns within subterranean systems.

Research Needs

Determination of the percentage of the wintering population that is visible during hibernacula counts is necessary to develop population estimates and trends. Determining the summer distribution and habitat preferences of reproductive females is also a research need (New York State Department of Environmental Conservation 2006).

Habitat

This species winters in caves and mines with the largest overwintering populations currently known from mines in the northern part of the state. Several individuals, including a few lactating females, have been mist-netted in deciduous forests during the summer months in southeastern and central New York, but the species is likely to be more widespread in the state during the summer months. Several studies in the northeast and southeast have indicated that Small-footed Myotis roost and form maternity colonies in fractures in rock ledges and talus. This type of roosting behavior may contribute to the low numbers observed during winter hibernacula counts in New York because many individuals may not be readily detectable on cave or mine walls, but additional research is needed to confirm this.

Associated Ecological Communities

Acidic Talus Slope Woodland

An open to closed canopy woodland that occurs on talus slopes (slopes of boulders and rocks, often at the base of cliffs) composed of non-calcareous rocks such as granite, quartzite, or schist.

Appalachian Oak-hickory Forest

A hardwood forest that occurs on well-drained sites, usually on ridgetops, upper slopes, or south- and west-facing slopes. The soils are usually loams or sandy loams. This is a broadly defined forest community with several regional and edaphic variants. The dominant trees include red oak, white oak, and/or black oak. Mixed with the oaks, usually at lower densities, are pignut, shagbark, and/or sweet pignut hickory.

Beech-maple Mesic Forest

A hardwood forest with sugar maple and American beech codominant. This is a broadly defined community type with several variants. These forests occur on moist, well-drained, usually acid soils. Common associates are yellow birch, white ash, hop hornbeam, and red maple.

Calcareous Cliff Community

A community that occurs on vertical exposures of resistant, calcareous bedrock (such as limestone or dolomite) or consolidated material; these cliffs often include ledges and small areas of talus.

Chestnut Oak Forest

A hardwood forest that occurs on well-drained sites in glaciated portions of the Appalachians, and on the coastal plain. This forest is similar to the Allegheny oak forest; it is distinguished by fewer canopy dominants and a less diverse shrublayer and groundlayer flora. Dominant trees are typically chestnut oak and red oak.

Cliff Community

A community that occurs on vertical exposures of resistant, non-calcareous bedrock (such as quartzite, sandstone, or schist) or consolidated material; these cliffs often include ledges and small areas of talus.

Hemlock-northern Hardwood Forest

A mixed forest that typically occurs on middle to lower slopes of ravines, on cool, mid-elevation slopes, and on moist, well-drained sites at the margins of swamps. Eastern hemlock is present and is often the most abundant tree in the forest.

Limestone Woodland

A woodland that occurs on shallow soils over limestone bedrock in non-alvar settings, and usually includes numerous rock outcrops. There are usually several codominant trees, although one species may become dominant in any one stand.

Maple-basswood Rich Mesic Forest

A species rich hardwood forest that typically occurs on well-drained, moist soils of circumneutral pH. Rich herbs are predominant in the ground layer and are usually correlated with calcareous bedrock, although bedrock does not have to be exposed. The dominant trees are sugar maple, basswood, and white ash.

Red Cedar Rocky Summit

A community that occurs on warm, dry, rocky ridgetops and summits where the bedrock is calcareous (such as limestone or dolomite, but also marble, amphibolite, and calcsilicate rock), and the soils are more or less calcareous. The vegetation may be sparse or patchy, with numerous lichen covered rock outcrops.

Shale Cliff And Talus Community

A community that occurs on nearly vertical exposures of shale bedrock and includes ledges and small areas of talus. Talus areas are composed of small fragments that are unstable and steeply sloping; the unstable nature of the shale results in uneven slopes and many rock crevices.

Shale Talus Slope Woodland

An open to closed canopy woodland that occurs on talus slopes composed of shale. These slopes are rather unstable, and they are usually very well-drained, so the soils are shallow and dry. The canopy cover is usually less than 50%, due to the instability of the substrate.

Associated Species

Big Brown Bat (*Eptesicus fuscus*)
Little Brown Bat (*Myotis lucifugus*)
Northern Myotis (*Myotis septentrionalis*)
Indiana Bat (*Myotis sodalis*)
Eastern Pipistrelle (*Pipistrellus subflavus*)

Identification Comments

Identifying Characteristics

This is a very small bat with tiny feet. Measurements are as follows: total length of 72-84 mm, tail length of 30-39 mm, hind foot length 6- 8 mm, forearm length of 30-36 mm, and wingspread of 212-248 mm; the weight of an adult is 3-8 g (Banfield 1974, Godin 1977, Schwartz and Schwartz 1981, Merritt 1987). The dorsal pelage is pale yellowish brown to golden brown, the ears are black, and the face has a black mask. The tragus, a fleshy projection at the entrance to the ear, is long and pointed. There are no prominent chin or nose flaps. The belly hair varies from pale buff to whitish. The bases of the hairs on the back are blackish and the wing and tail membranes are very dark brown. The tail reaches the edge of the interfemoral membrane (the membrane that stretches between the legs of bats that is used for flight and for catching insects). The base of this membrane and the undersurfaces of the wing membranes are sparsely furred. The calcar (a cartilaginous extension of the ankle) has a definitive keel. The sexes are similar in appearance.

Characteristics Most Useful for Identification

The combination of the small size, golden-yellow pelage, and lack of a mask make this bat readily distinguishable from other species of bats in New York. The small hind foot and long-keeled calcar are also diagnostic.

Behavior

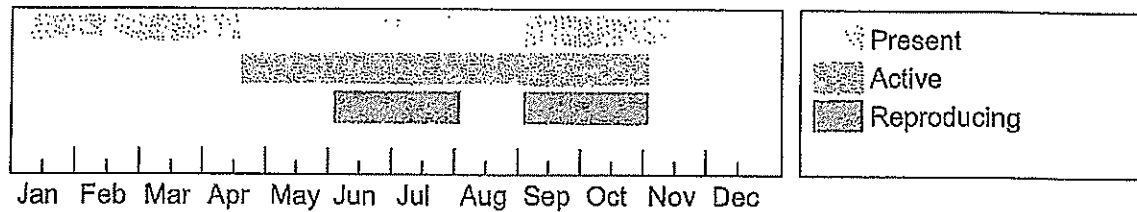
Mating behavior is similar to that of the Little Brown Bat (*Myotis lucifugus*) (Wimsatt 1945) and so, probably, are other facets of reproduction (Banfield 1974). Breeding may occur in the fall, with the sperm stored in the uterus over the winter. Active gestation lasts probably two months, with a single offspring born annually, probably in early July (Merritt 1987). Survival rates are significantly lower for females (42%) than for males (76%) (van Zyll de Jong 1985). One individual is reported to have lived 12 years (Hitchcock 1965). Colonies are usually small (fewer than 15 individuals), although a few number in the hundreds up to approximately 2,000.

Diet

The diet consists almost exclusively of flying insects, but specific data are lacking. Feeding flights are relatively slow and fluttery and often occur over ponds and streams and along roads.

The Best Time to See

Emerges from its daytime retreat shortly after sunset, while there is still some light. In the northeastern U.S., seldom enters hibernation caves before mid-November; departs by March, or possibly earlier in Vermont (Godin 1977).



The time of year you would expect to find Eastern Small-footed Myotis in New York.

Similar Species

Eastern Pipistrelle(*Pipistrellus subflavus*): The Eastern Pipistrelle can be distinguished from the Small-footed Myotis by its pink forearms and lack of a black mask.

Indiana Bat(*Myotis sodalis*): The Indiana Bat can be distinguished from the Small-footed Myotis by its slightly larger size, uniform gray-brown pelage, pink nose, and lack of a black mask.

Northern Myotis(*Myotis septentrionalis*): The Northern Myotis can be distinguished from the Small-footed Myotis by its slightly larger size, gray-brown pelage, long ears, unkeeled calcar, and lack of a black mask.

Little Brown Bat(*Myotis lucifugus*): The Little Brown Bat can be distinguished from the Small-footed Myotis by its slightly larger size, brown-white bi-colored pelage, unkeeled calcar, and lack of a black mask.

Taxonomy

Kingdom Animalia

└ Phylum Craniata

└ Class Mammals (Mammalia)

└ Order Bats (Chiroptera)

└ Family Vespertilionidae (Evening Bats and Vesper Bats)

Additional Resources

Links

NatureServe Explorer

<http://natureserve.org/explorer/servlet/NatureServe?searchName=MYOTIS+LEIBII>

Google Images

<http://images.google.com/images?q=MYOTIS+LEIBII>

Bat Conservation International

<http://www.batcon.org/home/default.asp>

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