United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pennsylvania Field Office
315 South Allen Street, Suite 322
State College, Pennsylvania 16801-4850

July 10, 2009

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(9)

Chief, Rules and Directives Branch
Division of Administrative Services
Mail Stop TWB-05-B01M
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

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RULES AND DIRECTIVES BRANCH USNRC

Dear Sir or Madam:

This responds to the U.S. Nuclear Regulatory Commission's (NRC) letter of January 12, 2009, requesting comments on the environmental scoping process and federally protected species within the area affected by the proposed construction and operation of the PPL Bell Bend, LLC (PPL), Bell Bend Nuclear Power Plant (BBNPP). The NRC is reviewing an application submitted by PPL for a combined license for construction and operation of one new nuclear power plant at the BBNPP site. As part of the review of this application, NRC staff are preparing the environmental impact statement (EIS) required by NRC's regulations on implementing the National Environmental Policy Act of 1969 (83 Stat. 852 as amended; 42 U.S.C. 4321 *et seq.*). The EIS will include an analysis of pertinent environmental matters including those involving endangered or threatened species, and impacts to fish and wildlife. The following comments are provided pursuant to the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*), Migratory Bird Treaty Act of 1918 (40 Stat. 755, as amended; 16 U.S.C. 703-712) (MBTA), Bald and Golden Eagle Protection Act (54 Stat. 250, as amended; 16 U.S.C. 668-668d) (Eagle Act), and Fish and Wildlife Coordination Act of 1934 (48 Stat. 401, as amended; 16 U.S.C. 661-667e).

The proposed BBNPP site consists of approximately 882 acres located along the Susquehanna River, five miles northeast of Berwick, in Luzerne County, Pennsylvania. The proposed site is adjacent to the existing Susquehanna Steam Electric Station (SSES). Current land cover consists of forest, agricultural, and wetland habitats. PPL has stated there is no need for new transmission lines or corridors to connect the new reactor unit to the existing electrical grid, since the new facility would make use of the existing 500 kV transmission line and the Susquehanna-Roseland Interconnection.

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According to the BBNPP Combined License Application Environmental Report documents, approximately 564 acres would be affected by construction of the project (351 acres would be permanently affected). The total loss of habitat, including permanent and temporary impacts, would consist of the following: 173.7 acres upland forest, 38.7 acres upland scrub/shrub, 179.8 acres old field/former agriculture, 134.4 acres agriculture, 22.2 acres palustrine forested wetlands, 0.7 acre palustrine scrub-shrub wetlands, and 14 acres palustrine emergent wetlands. Approximately 37 acres of wetland habitat would be permanently lost to filling. In addition, approximately 1,000 feet of Walker Run would be relocated to a new channel, and approximately 340 feet of stream channel would be permanently filled.

Federally Protected Species

A compilation of certain federal status species in Pennsylvania is enclosed for your information. The BBNPP site is located within the range of the federally-listed, endangered Indiana bat (*Myotis sodalis*) and the federally protected bald eagle (*Haliaeetus leucocephalus*).

Indiana Bat

The Indiana bat hibernates in caves and mines during the winter months (November through March), and uses a variety of upland, wetland and riparian habitats during the spring, summer and fall. Indiana bats usually roost in dead or living trees with exfoliating bark, or living or dead trees with crevices or cavities. Female Indiana bats form nursery colonies under the exfoliating bark of dead or living trees, such as shagbark hickory, in upland or riparian areas. However, a variety of tree species such as black birch, red and white oak, and sugar maple are also used.

The proposed project is near three known Indiana bat hibernacula. Specifically, the project is located three miles south of the Shickshinny hibernaculum, six miles south of the Glen Lyon hibernaculum, and eight miles north of a newly-discovered hibernaculum in Luzerne County. In general, Indiana bats roost and forage in forest habitat during the non-hibernating period. To a lesser extent, the foraging bats also use a variety of adjacent fields, meadows, emergent wetlands, riparian corridors and shrub-lands. From late August through mid-November, they concentrate their roosting and foraging activities within a 10-mile radius of their hibernacula (*e.g.*, caves, abandoned mines) to build up fat reserves to take them through the winter hibernating period, when food is not available. Fall telemetry work conducted in Pennsylvania in 2007 confirmed that Indiana bats forage within an approximate ten-mile radius of hibernacula.

According to the September, 2008 report entitled *A Field Survey of Terrestrial Fauna at the Proposed Bell Bend Nuclear Power Plant Site, Luzerne County, Pennsylvania*, by Normandeau Associates, the project area contains suitable spring, summer and fall habitat for Indiana bats (*e.g.*, trees with exfoliating bark and dead snags). Because of the proximity of the project site to several hibernacula, it is likely that the suitable habitat in the project area is used by Indiana bats associated with these hibernacula. Consequently, removal of individual trees or forest clearing within the project area could result in the direct take of roosting Indiana bats, which could be injured or killed when trees are cut. Land-clearing, especially of forested areas, may adversely affect Indiana bats by killing, injuring, or harassing roosting bats, and by removing or reducing the quality of foraging, roosting, or fall swarming habitat. Therefore, land-clearing associated

with the project may result in the death or injury of roosting Indiana bats if tree-cutting is conducted during the time of year when bats may be present. Due to the potential for Indiana bats to occur within the project area, we recommend that measures be implemented to avoid killing or injuring them. This can be accomplished by carrying out timber-cutting activities from November 15 to March 31, during which time bats are hibernating or concentrated near their hibernacula.

To determine whether the project would adversely affect Indiana bat maternity colonies or summer habitat for male Indiana bats, bat mist-net surveys were conducted by Dr. Karen Campbell, a Fish and Wildlife Service-approved surveyor, between June 7 and July 11, 2008, at four sites within the project area. During sampling, 16 bats of three species were captured: eight little brown (*Myotis lucifugus*), four big brown (*Eptesicus fuscus*), and four northern long-eared (*Myotis septentrionalis*). No Indiana bats were captured. Unfortunately, it appears that no mist-net sites were located within the large forested wetland at the southwestern corner of the project area, part of which would be permanently removed by the project. Consequently, we cannot conclude that Indiana bat maternity colonies or summer habitat for male Indiana bats would not be affected by the project. It is important to note that summer mist-net surveys do not provide any information about use of an area by Indiana bats in the fall, since suitable forest habitat within 10 miles of a hibernaculum is assumed to be used for fall foraging, roosting, and swarming.

According to the latest site plans, approximately 196 acres of forest habitat will be removed by this project. To reduce impacts to Indiana bats and their foraging, roosting, and swarming habitats, the applicant should implement the following avoidance, minimization, and compensation measures.

1. Seasonal restriction on tree-cutting. Any tree-clearing must be done between November 15 and March 31. This avoidance measure is necessary to avoid direct "take" of Indiana bats.

2. Configure the project to avoid and minimize impacts on forest habitat, particularly in and around wetlands and riparian areas.

3. Configure the project to avoid and minimize impacts on suitable roost trees.

4. Retain at least a 50-foot forested buffer on each side of streams and around wetlands.

5. Retain forested travel corridors.

6. Co-locate project features (*e.g.*, roads and utility lines) and cluster project features to reduce forest clearing.

7. Re-forest cleared areas with a native tree species, using at least six of the tree species listed in Appendix A. One of these species must be shagbark hickory. Species selection will be determined by site-specific characteristics (soil moisture, sun exposure, *etc.*) and availability. Trees should be planted at approximately equal rates. Monitor re-planted areas and conduct supplemental tree planting to ensure tree-stocking success is a minimum of 400 live woody stems per acre.

8. Avoid or minimize the use of pesticides and herbicides.

9. Install bat-friendly gates on hibernacula (*e.g.*, abandoned mine portals) that are known or likely to support Indiana bats, or large numbers of hibernating bats of any species.

10. After reducing forest impacts via the avoidance and minimization measures (see #1-6 above), any remaining unavoidable impacts on forest should be offset by permanently protecting forest habitat off-site at a 1:1 compensation ratio, in consultation with the Service.

Revised project plans should be submitted to the Service, documenting how the above avoidance and minimization measures have been incorporated into the project design and layout. If adverse effects to Indiana bats cannot be avoided, formal consultation between the Service and NRC may be necessary, pursuant to section 7 of the Endangered Species Act.

Bald Eagle

The EIS should also evaluate potential effects of the project on bald eagles. Although the bald eagle has been removed from the federal List of Endangered and Threatened Wildlife, it continues to be protected under the Eagle Act and the MBTA. Both acts protect bald eagles by prohibiting killing, selling or otherwise harming eagles, their nests or eggs. The Eagle Act also protects eagles from disturbance. "Disturb" means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle; 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior; or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.

On June 4, 2007, the Service released several important documents related to the protection of bald eagles under the Eagle Act, including 1) a final rule establishing a regulatory definition of "disturb"; 2) a final environmental assessment of the "disturb" regulation; 3) *National Bald Eagle Management Guidelines*; and 4) a proposed rule to establish a permit for the take of bald and golden eagles. The proposed rule would establish regulations for issuing permits to take bald and golden eagles where the take is associated with, and not the purpose of, otherwise lawful activities. A second permit type would provide for permits to take bald and golden eagle nests for safety emergencies (of humans or eagles). All of these documents can be found at http://www.fws.gov/migratorybirds/baldeagle.htm.

Bald eagle nests are located five miles upstream and ten miles downstream of the proposed BBNPP site. In addition, eagles are expanding their range in Pennsylvania, and could be found in previously undocumented locations along the Susquehanna River. Consequently, we recommend that the project be carefully evaluated in light of the *National Bald Eagle Management Guidelines* to determine whether or not bald eagles might be disturbed as a direct or indirect result of this project. If it appears that disturbance may occur, we recommend that PPL consider modifying their project consistent with the *Guidelines*. If PPL has questions about when and how to obtain a permit because they believe the proposed project will disturb bald eagles, and they are not able to implement measures to avoid disturbance, they should contact the Service's Migratory Bird Permit Program at 413-253-8643 or permitsr5mb@fws.gov.

Other Wildlife Impacts

We recommend that the EIS address additional potential impacts to fish, wildlife, and their habitats due to the proposed construction and operation of the BBNPP. We note the following wildlife resources and designations at the BBNPP site:

- Susquehanna Riverlands Important Bird Area: 247 documented bird species and 126 documented breeding birds. In particular, eight Federal Birds of Conservation Concern (USFWS 2008) have been documented within the project area: Peregrine falcon, wood thrush, blue-winged warbler, golden-winged warbler, prairie warbler, cerulean warbler, worm-eating warbler, and sedge wren.

- Wyoming Valley Important Mammal Area designation due to the site's proximity to Indiana bat hibernacula.

Forest habitat avoidance, minimization, and compensation measures for the Indiana bat, discussed above, will provide long-term benefits to many of these bird species as well as the Indiana bat and other bat species.

Wetland and Aquatic Impacts

As currently proposed, construction of the BBNPP would include permanently filling approximately 37 acres and temporarily affecting two acres of wetland habitat. In addition to evaluating direct impacts on wetlands, the EIS should evaluate potential indirect and secondary impacts of the proposed project on other wetlands and waters, including degradation of habitat and impacts to water quantity and quality (including thermal impacts) within and adjacent to the proposed development. We are especially concerned about the potential for the proposed site development plan to isolate wetland areas, cutting off their sources of water and interrupting habitat connectivity.

Clean Water Act regulations prohibit issuance of section 404 permits for discharges having less damaging, practicable alternatives. The EIS should rigorously and objectively evaluate all reasonable alternatives, including other forms of energy production and alternative sites. If impacts to wetlands are unavoidable, however, and have been minimized to the maximum extent

practicable, remaining impacts to the aquatic environment must be offset through appropriate compensatory measures. As part of the project evaluation, an inventory of potential compensation sites should be conducted.

Alternative Sites

As part of the EIS, three alternative sites for the proposed nuclear energy facility are being evaluated: the Sandy Bend Site, in Mifflin County, Pennsylvania; the Montour Site, in Montour County, Pennsylvania; and the Martins Creek Site, in Warren County, New Jersey. The following are preliminary comments for the Sandy Bend and Montour sites only. Preliminary comments for the Martins Creek Site have been provided by the Service's New Jersey Field Office in a letter addressed to Robert Schaaf, Chief, Environmental Projects Branch 3, NRC, dated March 13, 2009.

Sandy Bend Site

The Sandy Bend alternate site is located 2.5 miles northeast of McVeytown, along the Juniata River. The total size of the property is 420 acres, all of which would be affected by the project. The current land use has not been specified. However, aerial photography of the site indicates both open and forest habitat. You have indicated that wetlands are located within 300 feet of the project area, but the number of acres that would be affected has not been specified. The EIS should include a detailed evaluation of habitat impacts, including direct and indirect impacts on wetlands and waters, and degradation of habitat and water quantity and quality (including thermal impacts), within and adjacent to the proposed development at this site.

This site is within the range of two federally-listed, endangered species - the Indiana bat and northeastern bulrush (*Scirpus ancistrochaetus*). Development of this project area should be evaluated with respect to these species, based on the information provided below.

Depending on the anticipated impacts of the project on forest habitat, seasonal restrictions on forest removal and/or a bat mist-net survey may be warranted. Although it is not near any known Indiana bat hibernacula, the site may still contain suitable roosting and maternity habitat within the forested areas. We would need to know the extent of forest removal before making final recommendations. If mist-net surveys are needed, they should be conducted between May 15 and August 15 by a qualified, Service-approved biologist (see enclosed list) using the enclosed *Indiana Bat Mist Netting Guidelines*. Should Indiana bats or potential habitat be found during any surveys, further consultation with the Service will be necessary, including the submission of detailed project plans, and an analysis of alternatives to avoid and minimize adverse effects.

Although northeastern bulrush is not known to occur within the project area boundaries, potential habitat may occur this area. Potential habitat for northeastern bulrush could be affected if the project will directly or indirectly affect wetlands. The northeastern bulrush is typically found in ponds, wet depressions, shallow sinkholes, vernal ponds, small emergent wetlands, or beaver-influenced wetlands. These wetlands are often located in forested areas and characterized by seasonally variable water levels.

We recommend that the proposed site be surveyed for wetlands. If wetlands are present, a Service-approved botanist (see enclosed list), should conduct a thorough survey of the wetlands to determine the presence of northeastern bulrush before any permits are approved or earth-moving activities begin. Surveys for this species must be conducted between June 1 and September 30, when the flowering/fruiting culm is present. A survey report should be submitted to the Service for review and comment.

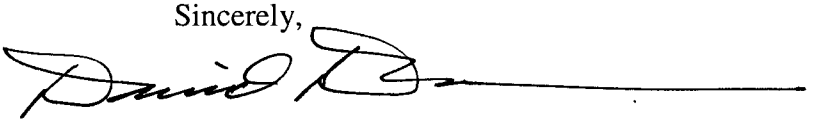
Montour Site

The Montour alternate site is located two miles northeast of Washingtonville, adjacent to the Montour Coal Fired Power Plant. The total size of the property is 2,500 acres; however, only 420 acres would be affected by the project. The current land use has not been specified. However, aerial photography of the site indicates mostly open areas with interspersed patches of forest. You have indicated that wetlands are located within 300 feet of the project area, but the number of acres that would be affected has not been specified. The EIS should include a detailed evaluation of habitat impacts, including direct and indirect impacts on wetlands and waters, and degradation of habitat and impacts to water quantity and quality (including thermal impacts), within and adjacent to the proposed development at this site.

This site is also within the range of the Indiana bat; therefore, development of this area should be evaluated with respect to this species. Depending on the anticipated impacts of the project on forest habitat, seasonal restrictions on forest removal and/or a bat mist-net survey may be warranted. Although the site is not close to any known Indiana bat hibernacula, the site may still contain suitable roosting and maternity habitat within the forested areas. We would need to know the extent of forest removal before making final recommendations. If mist-net surveys are needed, they should be conducted between May 15 and August 15 by a qualified, Service-approved biologist (see enclosed list) using the enclosed *Indiana Bat Mist Netting Guidelines.* Should Indiana bats or potential habitat be found during any surveys, further consultation with the Service will be necessary, including the submission of detailed project plans, and an analysis of alternatives to avoid and minimize adverse effects.

Thank you for the opportunity to comment on the BBNPP project. Please contact Cindy Tibbott of my staff at 814-234-4090 if you have any questions or require further assistance regarding this matter.

Sincerely,



David Densmore
Supervisor

Enclosures

References

U.S. Fish and Wildlife Service. 2008. Birds of Conservation Concern 2008. United States Department of Interior, Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, Virginia. 85 pp. (Online version available at http://www.fws.gov/migratorybirds/)

Federally Listed, Proposed, and Candidate Species in Pennsylvania

(revised November 19, 2008)

Common Name	Scientific Name	Status[1]	Distribution (Counties and/or Watersheds)
MAMMALS			
Indiana bat	*Myotis sodalis*	E	Hibernacula: Armstrong, Beaver, Blair, Centre, Fayette, Huntingdon, Lawrence, Luzerne, Mifflin and Somerset Co. Maternity sites: Adams, Bedford, Berks, Blair, Greene, and York Counties. Potential winter habitat state-wide in caves or abandoned mines. Potential summer habitat state-wide in forests or wooded areas.
BIRDS			
Piping plover	*Charadrius melodus*	E	Designated critical habitat on Presque Isle (Erie Co.). Migratory. No nesting in PA since 1950s, but recent colonization attempts at Presque Isle
REPTILES			
Bog turtle	*Clemmys (Glyptemys) muhlenbergii*	T	Adams, Berks, Bucks, Carbon, Chester, Cumberland, Delaware, Lancaster, Lebanon, Lehigh, Monroe, Montgomery, Northampton, Schuylkill and York Co. *Historically found in Crawford, Mercer and Philadelphia Co.*
Eastern massasauga rattlesnake	*Sistrurus catenatus catenatus*	C	Butler, Crawford, Mercer and Venango Co. *Historically found in Allegheny and Lawrence Co.*
MUSSELS			
Clubshell	*Pleurobema clava*	E	French Creek and Allegheny River (and some tributaries) in Armstrong, Clarion, Crawford, Erie, Forest, Mercer, Venango, and Warren Co.; Shenango River (Mercer and Crawford Co.) *Has not been found recently in 13 streams of historical occurrence in Butler, Beaver, Fayette, Greene, Indiana, Lawrence, and Westmoreland Co.*
Dwarf wedgemussel	*Alasmidonta heterodon*	E	Delaware River (Pike and Wayne Co.). *Has not been found recently in streams of historical occurrence in the Delaware River watershed (Bucks, Carbon, Chester, Philadelphia Co.) or Susquehanna River watershed (Lancaster Co.)*
Northern riffleshell	*Epioblasma torulosa rangiana*	E	French Creek and Allegheny River (and some tributaries) in Armstrong, Clarion, Crawford, Erie, Forest, Mercer, Venango, and Warren Co. *Has not been found recently in streams of historical occurrence, including: Shenango River (Lawrence Co.), Conewango Creek (Warren Co.)*

Common Name	Scientific Name	Status[1]	Distribution (Counties and/or Watersheds)
MUSSELS (continued)			
Rayed bean	*Villosa fabalis*	C	French Creek and Allegheny River (Armstrong, Clarion, Crawford, Erie, Forest, Mercer, Venango, Warren Co.); Cussewago Creek (Crawford Co.). *Has not been found recently in 5 streams of historical occurrence in Armstrong, Lawrence, Mercer and Warren Co.*
Sheepnose	*Plethobasus cyphyus*	C	Allegheny River (Forest and Venango Co.). *Has not been found recently in streams of historical occurrence, including: Allegheny River (Armstrong Co.), Beaver River (Lawrence Co.), Ohio River (Allegheny and Beaver Co.), and Monongahela River (Washington Co.)*
FISH			
Atlantic sturgeon[2]	*Acipenser oxyrinchus oxyrinchus*	C	Delaware River and other Atlantic coastal waters
Shortnose sturgeon[2]	*Acipenser brevirostrum*	E	Delaware River and other Atlantic coastal waters
PLANTS			
Northeastern bulrush	*Scirpus ancistrochaetus*	E	Adams, Bedford, Blair, Cambria, Carbon, Centre, Clinton, Columbia, Cumberland, Dauphin, Franklin, Fulton, Huntingdon, Lackawanna, Lehigh, Lycoming, Mifflin, Monroe, Perry, Snyder, Tioga, and Union Co. *Historically found in Northampton Co.*
Small-whorled pogonia	*Isotria medeoloides*	T	Centre, Chester and Venango Co. *Historically found in Berks, Greene, Monroe, Montgomery and Philadelphia Co.*

[1] E = Endangered; T = Threatened; P = Proposed for listing; C = Candidate
[2] Atlantic sturgeon and shortnose sturgeon are under the jurisdiction of the National Marine Fisheries Service

U.S. FISH AND WILDLIFE SERVICE
Pennsylvania Field Office

QUALIFIED INDIANA BAT SURVEYORS

The following list includes persons known by the U.S. Fish and Wildlife Service to have the skills and experience to conduct surveys for Indiana bats. Any individuals handling or conducting surveys for Indiana bats must first obtain a permit from the Pennsylvania Game Commission. All Indiana bat captures must be reported in writing to the Service and Commission within 72 hours. Indiana bat surveys should be overseen by a qualified surveyor, who should be present in the field at all times during the investigation. Mist-net surveys should be carried out in accordance with the Service's *Indiana Bat Mist Netting Guidelines*. If any Indiana bats are captured during mist-netting, a surveyor with bat telemetry experience should be prepared to place a transmitter on the bat(s) to identify roost trees and foraging habitat. Various sampling techniques, including mist-netting, Anabat detection, radio-telemetry, harp-trapping and hibernacula surveys, are used to detect and monitor bats. Some individuals on this list may not be qualified to conduct all types of sampling.

This information is not to be construed as an endorsement of individuals or firms by the Service or any of its employees. Persons not on this list, but who have documented experience in conducting scientific studies of, or successful searches for, Indiana bats may submit their qualifications to the Service for review. The submission must include documentation that the requestor has experience successfully locating and identifying Indiana bats in their hibernacula and their summer habitat. Additions to and deletions from this list are at the sole discretion of the Service. This list is subject to revision at any time without prior notice.

Chris Sanders, Jessica Kapp, Michael O'Mahony
Sanders Environmental, Inc.
322 Borealis Way
Bellefonte, PA 16823
814-364-8776; 814-659-8257 (cell)
sanders@batgate.com

John Chenger, Matt Hopkins & Kevin Rhome
Bat Conservation & Management
220 Old Stone House Road
Carlisle, PA 17015
717-241-2228
814-442-4246 (cell)

Dr. Virgil Brack, Jr.
Environmental Solutions & Innovations
781 Neeb Road
Cincinnati, OH 45233
513-451-1777
513-451-3321 (fax)

Jeffrey Brown, Amy Henry & Russell Rommé
BHE Environmental, Inc.
11733 Chesterdale Road
Cincinnati, OH 45246
513-326-1500
513-326-1550 (fax)

James A. Hart
Western Pennsylvania Conservancy
PA Natural Heritage Program
19 Wyrick Avenue
Shippensburg, PA 17257
717-530-1931
jahart@pa.net

Hal Bryant
Eco-Tech, Inc.
P.O. Box 8
Frankfort, KY 40602-0008
502-695-8060
502-695-8061 (fax)
myotis2000@aol.com

Stacy Wolbert
145 Lamb Drive
Morrisdale, PA 16858
814-360-1290
stacy_wolbert@yahoo.com

Robert F. Madej
R.D. Zande & Associates
1237 Dublin Road
Columbus, OH 43215
800-340-2743
614-486-4387 (fax)

Dr. Karen Campbell
Biology Department
Albright College
Reading, PA 19614
610-921-2381

Neil Bossart
Civil & Env. Consultants, Inc.
333 Baldwin Road
Pittsburgh, PA 15205
412-429-2324
nbossart@cecinc.com

John Macgregor
Berea Ranger District
Daniel Boone National Forest
1835 Big Hill Road
Berea, KY 40403
606-745-3100

Dr. Lynn Robbins
Southwest Missouri State Univ.
Biology Department
901 South National
Springfield, MO 65804
417-836-5366

Dr. Michael Gannon
Department of Biology
Penn State University
Altoona College
3000 Ivyside Park
Altoona, PA 16601-3760
814-949-5210

Steve Pernick
L.R. Kimball and Associates
615 West Highland Avenue
Ebensburg, PA 15931
814-472-7700
pernis01@lrkimball.com

Ryan Leiberher
Skelly and Loy, Inc.
2601 N. Front St.
Harrisburg, PA 17110
717-232-0593
rleiberher@skellyloy.com

Bryon DuBois
Trident Environmental Consultants
1856 Route 9
Toms River, NJ 08755
732-818-8699
bdubois@tridentenviro.com

Dr. Phillip Clem
University of Charleston
2300 MacCorkle Ave., SE
Charleston, WV 25304
304-357-4793

Michael R. Schirmacher
Bat Conservation International
PO Box 4254
Hidden Valley, PA 15502
843-408-1695
mschirmacher@batcon.org

James Kiser
Stantec
1901 Nelson Miller Parkway
Louisville, KY 40223
812-206-0100, 606-434-9018 (cell)
james.kiser@stantec.com

Kristen Watrous
Stantec
55 Green Mountain Drive
South Burlington, VT 05403
802-383-0425, 802-578-7161 (cell)
kristen.watrous@stantec.com

Tim Blackburn
825 19th Street, 2nd Floor
Altoona, PA 16601

INDIANA BAT MIST NETTING GUIDELINES

RATIONALE

A typical mist net survey is an attempt to determine presence or probable absence of the species, it does not provide sufficient data to determine population size or structure. Following these guidelines will standardize procedures for mist netting. It will help maximize the potential for capture of Indiana bats at a minimum acceptable level of effort. Although the capture of bats confirms their presence, failure to catch bats does not absolutely confirm their absence. Netting effort as extensive as outlined below usually is sufficient to capture Indiana bats. However, there have been instances in which additional effort was necessary to detect the presence of the species.

NETTING SEASON

May 15 - August 15

These dates define acceptable limits for documenting the presence of summer population of Indiana bats, especially maternity colonies. Several captures, including adult females and young of the year, indicate that a nursery colony is active in the area. Outside these dates, even when Indiana bats are caught, data should be carefully interpreted: If only a single bat is captured, it may be a transient or migratory individual.

EQUIPMENT

Mist nets - Use the finest, lowest visibility mesh commercially available:

1. In the past, this was 1 ply, 40 denier monofilament - denoted 40/1
2. Currently, monofilament is not available and the finest on the market is 2 ply, 50 denier nylon - denoted 50/2
3. Mesh of approximately 1 ½ (1 ¼ - 1 ¾) in (~38 mm)

Hardware - No specific hardware is required. There are many suitable systems of ropes and/or poles to hold the nets. See NET PLACEMENT below for minimum net heights, habitats, and other netting requirements that affect the choice of hardware. The system of Gardner, *et al.* (1989) has met the test of time.

NET PLACEMENT

Potential travel corridors such as streams or logging trails typically are the most effective places to net. Place the nets approximately perpendicular across the corridor. Nets should fill the corridor from side to side and from stream (or ground) level up to the overhanging canopy. A typical set is seven meters high consisting of three or more nets "stacked" on top one another and up to 20 m wide. (Different width nets may be purchased and used as the situation dictates.)

Occasionally it may be desirable to net where there is no good corridor. Take caution to get the nets up into the canopy. The typical equipment described in the section above may be inadequate for these situations, requiring innovation on the part of the observers.

RECOMMENDED NET SITE SPACING:

Stream corridors - one net site per km of stream.
Non-corridor land tracts - two net sites per square km of forested habitat
(= 1 net site for every 123 acres of forested habitat)

MINIMUM LEVEL OF EFFORT

Netting at each site should consist of:

- At least four net-nights (unless bats are caught sooner) (one net set up for one night = one net-night)
- A minimum of two net locations at each site (at least 30m apart, especially in linear habitat such as a stream corridor)
- A minimum of two nights of netting
- Sample Period: begin at sunset; net for at least 5 hr
- Each net should be checked approximately every 20 min
- No disturbance near the nets, other than to check nets and remove bats

WEATHER CONDITIONS

Severe weather adversely affects capture of bats. If Indiana bats are caught during weather extremes, it is probably because they are at the site and active despite inclement weather. On the other hand, if bats are not caught, it may be that there are bats at the site but they may be inactive due to the weather. Negative results combined with any of the following weather conditions throughout all or most of a sampling period are likely to require additional netting:

- Precipitation
- Temperatures below 10°C
- Strong winds (Use good judgement: moving nets are more likely to be detected by bats.)

MOONLIGHT

There is some evidence that small myotine bats avoid brightly lit areas, perhaps as predator avoidance. It is typically best to set nets under the canopy where they are out of the moon light, particularly when the moon is ½-full or greater.

U.S. FISH AND WILDLIFE SERVICE
Pennsylvania Field Office

QUALIFIED NORTHEASTERN BULRUSH SURVEYORS

The following list includes persons known by the U.S. Fish and Wildlife Service to have the skills and experience to conduct surveys for the northeastern bulrush (*Scirpus ancistrochaetus*). Observations of the northeastern bulrush at previously undocumented sites must be reported in writing to the Service within 48 hours. Northeastern bulrush surveys should be overseen by a qualified surveyor, who should be present in the field at all times during the investigation.

This information is not to be construed as an endorsement of individuals or firms by the Service or any of its employees. Persons not on this list, but who have documented experience in conducting scientific studies of, or successful searches for, the northeastern bulrush may submit their qualifications to the Service for review. The submission must include documentation that the requestor has experience successfully locating and identifying the northeastern bulrush and its habitat. Additions to and deletions from this list are at the sole discretion of the Service. This list is subject to revision at any time without prior notice.

Richard Mellon
Mellon Biological Services
200 Flint Court South
Yardley, PA 19067
(215) 493-0697

Staff Botanist
Western Pennsylvania Conservancy
316 Fourth Ave.
Pittsburgh, PA 15222
(412) 288-2777

Bob Beran
Beran Environmental Services
2322 W. Sunbury Road
Boyers, PA 16020
(724) 735-2766
(724) 679-0272 (cell)

Dr. Larry Klotz
Biology Department – Shippensburg University
1871 Old Main Drive
Shippensburg, PA 17257
(717) 477-1402
1hklot@ship.edu

Dr. Alfred Schuyler
Department of Biology
Academy of Natural Sciences
1900 Benjamin Franklin Parkway
Philadelphia, PA 19103-1195
(215) 299-1193

Larry G. Brewer
Environmental Solutions & Innovations, Inc.
781 Neeb Road
Cincinnati, Ohio 45233
(513) 451-1777
lbrewer@environmentalsi.com

Dr. Ann Rhoads
Morris Arboretum
9414 Meadowbrook Avenue
Philadelphia, PA 19118
(215) 247-5777, ext. 134

Joe Isaac
RD 1 Box 117F
Pulaski, PA 16143
(412) 964-8770

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Appendix A

TREE SPECIES LIST FOR INDIANA BAT HABITAT RESTORATION

Acer rubrum	red maple
Acer saccharum	sugar maple
Carya cordiformis	bitternut hickory
Carya glabra	pignut hickory
Carya laciniosa	shellbark hickory
Carya ovata	shagbark hickory
Carya tomentosa	mockernut hickory
Fraxinus americana	white ash
Fraxinus nigra	black ash
Fraxinus pennsylvanica	green ash
Platanus occidentalis	sycamore
Populus deltoides	eastern cottonwood
Quercus alba	white oak
Quercus coccinea	scarlet oak
Quercus prinus	chestnut oak
Quercus rubra	northern red oak
Quercus velutina	black oak
Robinia pseudoacacia	black locust
Sassafras albidum	sassafras
Ulmus americana	American elm
Ulmus rubra	slippery elm

Planting plans should include at least six of the tree species listed above, one of which must be shagbark hickory. To promote diversity, no more than 15 percent of any one tree species shall be included in planting plans.