

Ohio Department of Natural Resources
Division of Mineral Resources Management

**** PROCEDURE DIRECTIVE ****

Permitting 2010 – 01

Replaces PPD Permitting 2004-01

Subject: Measures for Protecting the Endangered Indiana Bat

Effective: July 19, 2010

Applicability: This Procedure Directive (PD) applies to all permit and adjacent area applications that DMRM deems complete on or after the effective date.

Purpose: Provide adequate protection of the Federal and State endangered Indiana bat and its habitat, and minimize the incidental take of the species by providing species-specific conservation measures as described herein. The information and measures contained in this PD provide guidance to coal mining permit applicants in meeting permitting and performance standards on coal mining operations as it relates specifically to the Indiana bat. For a glossary of terms and acronyms used in this PD, see Appendix J.

Background: Ohio's coal regulatory program contains several references to protection of threatened and endangered species and their habitats. Appendix I provides sections of the Ohio Revised Code (ORC) Chapter 1513 and the Ohio Administrative Code (OAC) Section 1501, applicable to endangered and threatened species. The development and implementation of species-specific conservation measures are required by a 1996 U.S. Fish and Wildlife Service (FWS) Biological Opinion to the Office of Surface Mining (OSM); and authorized by OAC 1501:13-4-05(P) and 13-4-14(R); and 30 CFR 780.16 and 784.21.

The 1996 Biological Opinion stemmed from a formal consultation between FWS and OSM, required by section 7(a)(2) of the Federal Endangered Species Act of 1973, as amended (ESA). The Biological Opinion states that "surface coal mining and reclamation operations conducted in accordance with properly implemented Federal and State regulatory programs under SMCRA are not likely to jeopardize the continued existence of listed or proposed species...." This conclusion is based on compliance with all provisions in 30 CFR. The Biological Opinion further provides that "the level of unanticipated take is not likely to result in jeopardy to any listed species...." In effect, this provision acknowledges that unanticipated take of endangered species may occur under the conditions specified by the Biological Opinion.

Unauthorized take of federally listed species is prohibited by section 9 of the ESA. To be exempt from this take prohibition, the Division of Mineral Resources Management (DMRM) and mining operators must comply with the specific terms and conditions of the Biological Opinion. One of these conditions is that MRM "must implement and require compliance with any species-specific protective measures developed by the FWS field office and the regulatory authority (with the involvement, as appropriate, of the permittee and OSM)." This PD was developed in

consultation with FWS and OSM, and incorporates requirements detailed in the July 2009 agreement among OSM, FWS and the Interstate Mining Compact Commission entitled "Range-wide Indiana Bat Protection and Enhancement Plan Guidelines." The range-wide guidelines provide a minimum set of standards for development of protective measures on coal mining operations in all states within the range of Indiana bats. This PD provides Ohio's species-specific protection measures for Indiana bats on coal mining operations.

Indiana Bat – Life History: Miller and Brown first described the Indiana bat (*Myotis sodalis*) as a new species in 1928. The Indiana bat is most similar in appearance to its close relative, the little brown bat (*Myotis lucifugus*). Indiana bats are found over much of the eastern United States. They hibernate in caves and abandoned underground mines (hibernacula) in the winter. After hibernation, Indiana bats migrate to their summer habitats where they usually roost under loose tree bark on dead or dying trees. During summer, males roost alone or in small groups, while females form maternity colonies of up to 100 or more individuals in roost trees. The entire state of Ohio is in the core summer maternity range of the species. Most maternity colonies use one or more primary roost trees and multiple alternate roost trees. Commonly used roost trees include dead oaks, elms, ashes, and cottonwoods. A few live trees such as shagbark and shellbark hickory are also used as roosts for Indiana bats because these trees produce peeling/exfoliating bark as they grow.

Indiana bats were originally listed as in danger of extinction under the Endangered Species Preservation Act of 1966, and are currently listed as endangered under the ESA. Threats to the Indiana bats include modifications to caves, mines, and surrounding areas that change airflow and alter microclimate in the hibernacula. These actions can cause direct mortality by inducing arousal and thereby leading to depletion of fat reserves. During summer months, threats relate to the loss and degradation of forested habitat. Migration pathways and swarming sites are also affected by habitat loss and degradation. In addition, White Nose Syndrome (WNS) is an emerging fungal disease that has been causing wide-spread Indiana bat mortality in hibernacula throughout parts of the northeastern United States since the winter of 2006-07.

Additional information on Indiana bats can be found in "Indiana Bat (*Myotis sodalis*) Draft Recovery Plan: First Revision" (FWS 2007) and "Indiana Bat Management Strategy" (ODNR 2008). The most updated information on Indiana bats, including the Draft Recovery Plan, is at: <http://www.fws.gov/midwest/endangered/mammals/inba/>. These documents can also be obtained by contacting the FWS Ohio Field Office at 614-416-8993.

How Coal Mine Operators Can Address Indiana Bats: Coal mining operations may affect Indiana bats in situations where proposed surface disturbance areas are located near a documented Indiana bat hibernaculum, maternity roost, and/or collection record, or when forested habitat suitable for foraging, roosting, or travel corridor is cleared to facilitate the mining activity. The general process identified in this PD for addressing potential impacts to Indiana bats (Figure 1) involves the following steps:

- Step 1: Determine if suitable Indiana bat habitat is present**
- Step 2: Determine if mining activities will impact suitable habitat**
- Step 3: Determine if suitable habitat is known or potential habitat for Indiana bats**
- Step 4: Conduct a mist-net survey or assume presence**
- Step 5: Develop and implement a Protection and Enhancement Plan (PEP)**

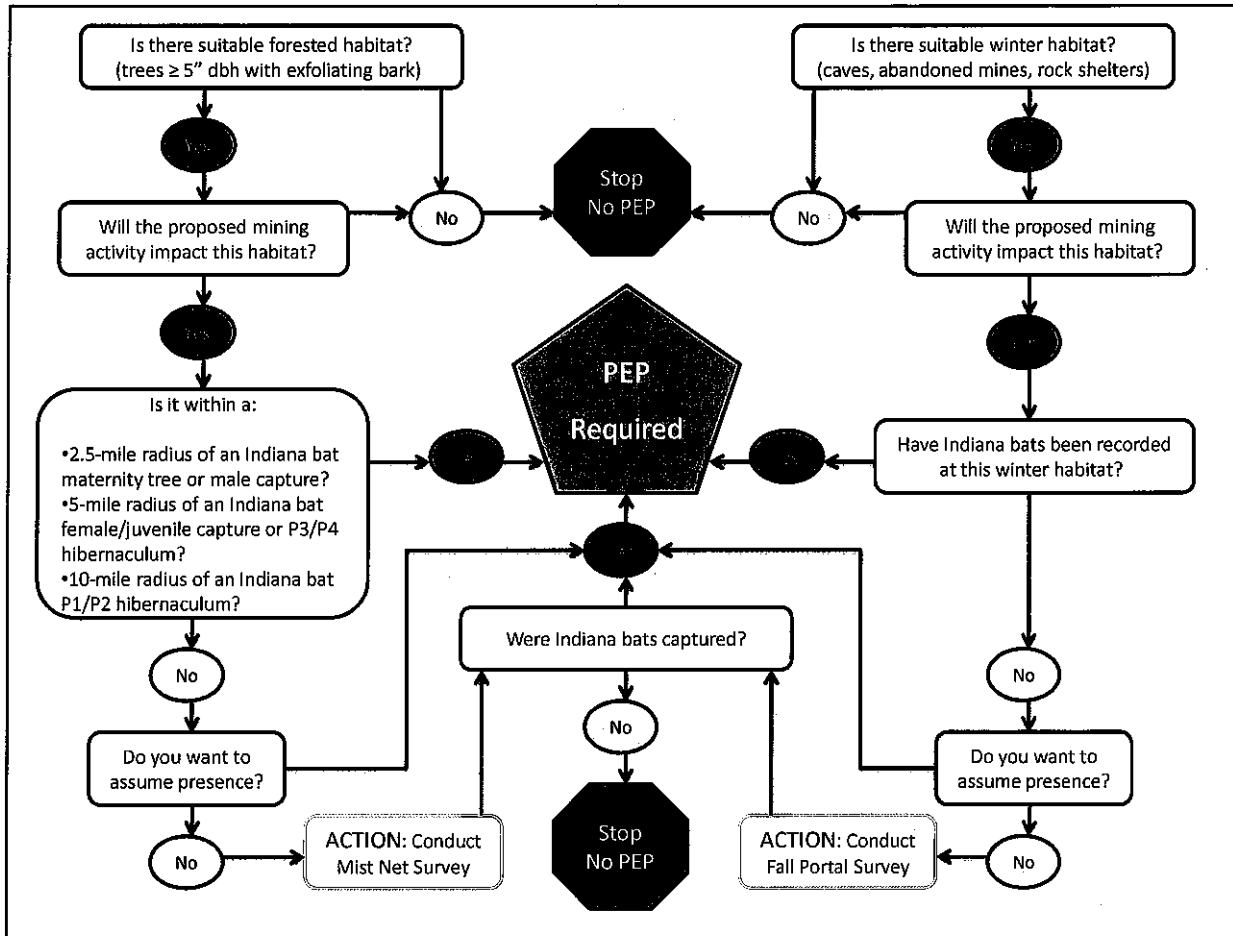


Figure 1. Flowchart of steps required to address potential impacts to Indiana bats in the coal mine application process.

STEP 1: Determine if suitable Indiana bat habitat is present

The applicant is responsible for providing information to determine if the application area contains suitable summer or winter habitat for Indiana bats. Generally, suitable habitat includes:

- Forests containing trees ≥ 5 inches diameter at breast height (dbh) with exfoliating bark.
- Caves, underground mine workings, rock shelters, etc.

Appendices A and B, and the “Draft Revised Indiana bat Recovery Plan” (USFWS 2007) contain further information on determining presence of suitable Indiana bat summer habitat (maternity habitat), fall swarming habitat, and winter habitat (i.e. hibernacula). FWS is available to assist applicants in site evaluation during development of permit applications.

The applicant must provide habitat information as part of the Fish and Wildlife Resource Information required in Part 2, Item H of the mining application in order for the application to be

administratively complete. This information must describe existing conditions on the application area, including the approximate acreage and age of forested habitat, dominant tree species, and any structures capable of providing summer or winter habitat for Indiana bats, such as caves or underground mine workings, rock shelters, etc.. The written description should be supported by aerial and ground-level photographs. If no suitable Indiana bat habitat exists within the permit area, the applicant must provide a written justification and photographs or other documentation that sufficiently demonstrates this. **If DMRM agrees that no Indiana bat habitat exists within the permit area, the PEP development process ends, and no PEP is required.** If suitable habitat exists within the project area, proceed to Step 2.

STEP 2: Determine if mining activities will impact suitable habitat

Mining applicants can justify, in certain situations, that development of a PEP is not necessary when a proposed mining activity will have no adverse effects on Indiana bats. Typically, this situation occurs when suitable habitat is present within the permit area, but that habitat will not be impacted by the mining activity. In cases where potential Indiana bat habitat is present on the application area, but will not be impacted, the applicant must clearly mark any suitable habitat on the mining map and flag those areas in the field for protection. No surface disturbance can occur on those areas marked for protection. **If a mining operation will have no adverse effects on Indiana bats, no PEP is required.** If a mining operation may result in impacts to suitable Indiana bat habitat, proceed to Step 3.

STEP 3: Determine if suitable habitat is known or potential habitat for Indiana bats

If suitable Indiana bat habitat is present on the application area, the applicant must determine whether the habitat is "known" or "potential." Known habitat is habitat occupied by Indiana bats based on capture records, survey information, or other sources, and is defined as:

1. Known summer habitat: Forests containing trees ≥ 5 inches dbh with exfoliating bark that lie within:
 - 2.5 miles of an Indiana bat maternity tree record
 - 5 miles of an Indiana bat female or juvenile summer capture record, where a maternity tree was not identified
 - 2.5 miles of an Indiana bat male summer record
2. Known fall swarming habitat: Forests containing trees ≥ 5 inches dbh with exfoliating bark within:
 - 5 miles of a Priority 3^a or 4^b hibernaculum
 - 10 miles of a Priority 1^c or 2^d hibernaculum
3. Known winter habitat: Caves, underground mine workings, rock shelters, etc. where Indiana bats have been recorded

^a Hibernaculum with a current or observed historic population of 50-1,000 Indiana bats

^b Hibernaculum with a current or observed historic population of fewer than 50 Indiana bats

^c Hibernaculum with a current or observed historic population $\geq 10,000$ Indiana bats

^d Hibernaculum with a current or observed historic population of between 1,000 and 10,000 Indiana bats.

Potential habitat is defined as suitable habitat for Indiana bats where no surveys or existing records indicate that the habitat is occupied by Indiana bats. To determine if a proposed project is within an area of known Indiana bat habitat, the applicant must send a letter or email request to DMRM or FWS that includes a map with the proposed application area delineated. DMRM and/or FWS will send a response to the applicant in writing within 30 days indicating whether the project is within an area of known Indiana bat habitat. This response must be included in Part 2, Item H of the mining application. **If known Indiana bat summer, fall swarming, and/or winter habitat exists within the permit area and will be impacted by the mining activity, development of a PEP is required (proceed to step 5).** If potential Indiana bat summer, swarming, and/or winter habitat exists within the permit area, proceed to Step 4 to determine if a PEP is required.

Step 4: Conduct a mist-net survey or assume presence

Mining applicants have two alternatives to choose from if potential Indiana bat summer, swarming, and/or winter habitat exists within the permit area. An applicant can choose to conduct surveys for Indiana bats or assume presence of the species. Each of these options is explained below.

Alternative 1: Conducting Bat Surveys. Mining applicants can conduct surveys of potential summer and/or winter habitat areas according to established protocols to determine the presence or probable absence of Indiana bats in the permit area. Summer mist-net surveys are appropriate in permit areas containing potential summer habitat. Cave/portal surveys are appropriate for permit areas containing potential winter habitat. The survey protocols for these habitats are found in Appendices D - F.

The surveys must be conducted by a biologist with all of the required Federal and State collection permits. A list of federally permitted surveyors is available from FWS. The biologist must provide a survey plan to the FWS and receive site-specific authorization prior to conducting any survey, in accordance with his/her Federal collection permit. Summer mist-net surveys may only be conducted from May 15 to August 15.

Mist-net surveys that do not result in the capture of an Indiana bat (i.e., negative surveys) shall be valid for a period of 5 years from the last day of the survey. Permit areas with negative survey results must be re-surveyed if the permit area still contains suitable/potential Indiana bat habitat that may be impacted past the 5-year window. Survey requirements will be based on the amount of suitable/potential Indiana bat habitat remaining on the site at that time. Applicants should consider the timing of their coal application submittal in relation to timing of the mist-net survey. Mist-net surveys conducted closer to submittal of the coal application will allow a greater period of time between permit issuance and expiration of the 5-year window.

If Indiana bats are captured during the survey, Indiana bat presence within the survey area is confirmed and a PEP is required. The permitted biologist must report the capture within 24 hours to FWS, DMRM, and ODNR, Division of Wildlife. Radio telemetry must also be conducted to determine locations of roost trees (See Appendix E). While negative results are valid for 5 years, positive results (i.e., the capture of Indiana bats) will change the habitat determination from "potential" to "known." A negative mist-net survey result (i.e., no Indiana bats captured)

allows the applicant to initiate timber removal and coal extraction within the surveyed area subsequent to permit issuance without further coordination during the 5-year period. No PEP is required for sites with negative mist net surveys. However, the coal mine application must clearly state the date on which tree clearing must cease in the absence of subsequent surveys (i.e., five years from the date of the last day of the original mist net survey). Any mist net survey results must be included as part of the Fish and Wildlife Resource Information required in Part 2, Item H of the mining application.

Alternative 2: Assuming Presence of Indiana Bats. Applicants have the option to forgo a mist-net survey and assume the presence of Indiana bats if potential habitat occurs within the project area. PEPs developed under this alternative are no different from PEPs that are required when known Indiana bat habitat is present. They must describe the existing habitat, the nature and extent of proposed activities, the impact of proposed activities on the Indiana bat, and methods to avoid and minimize impacts to the bat and its habitat. If assuming presence of suitable winter habitat, applicants should be aware that hibernacula and surrounding buffers are critical to the recovery of Indiana bats, and typically must be preserved. Applicants should consider how mining plans will need to be designed when deciding whether to assume presence of Indiana bats in suitable caves/mine portals.

STEP 5. Develop and implement a Protection and Enhancement Plan

A PEP is required if any impacts to known Indiana bat habitat will occur or if the permit area contains potential Indiana bat habitat and the mining applicant decides to assume presence of the Indiana bat. A PEP should be included as part of the Fish and Wildlife Protection and Enhancement Plan in the mining application in Part 3, Item D (18) for surface mining and Part 3, Item D(20) for underground mining.

Since the purpose of a PEP is to avoid and minimize adverse effects and incidental take of Indiana bats, a PEP must address the types of adverse effects that the mining activity will cause. For instance, many mining activities involve the removal of known or potential Indiana bat summer habitat (i.e. Forested areas). Many mining activities have the potential to cause a wide variety of adverse effects on Indiana bats, including, but not limited to, destruction of summer and maternity roost trees, destruction of foraging habitat, alteration of food sources, modification of Indiana bat behavior patterns, and the injury or mortality of individual Indiana bats. Therefore, it is important that any avoidance and minimization measures included in a PEP address the many types of adverse effects that could occur.

Applicants must include two categories of avoidance and minimization measures in the PEP: (a) protection measures to avoid and minimize potential take of Indiana bats during mining and (b) enhancement measures that replace Indiana bat habitat during reclamation. Some potential measures are discussed below; however, applicants are not limited to these specific measures. Applicants may propose other protection and enhancement measures in addition to those herein (See Appendix H for the PEP Development Checklist). The completed checklist should be included as part of the PEP document.

Once DMRM has reviewed and approved the PEP, it will become an enforceable part of the SMCRA permit. The applicant shall then be responsible for implementing the PEP as written.

PEPs should be concise. Required measures outlined in the PEP should be easily discernable by mine inspectors and others monitoring compliance with the permit. The applicant should be aware that once a PEP has been approved, it is part of the issued SMCRA permit. If habitat is disturbed after the permit is issued, the applicant may not then ask to perform a survey in lieu of implementing the PEP.

Protection Measures. Protection measures are those that avoid and minimize incidental take of Indiana bats during coal mining activities. Protection measures are discussed below and must be implemented wherever practicable. In addition to those below, the applicant is encouraged to propose additional practicable protection measures.

1) *Seasonal Tree Clearing Restrictions.* Seasonal tree clearing is a required protection measure that can minimize adverse effects to Indiana bats caused by timber removal during Indiana bat occupancy periods. Seasonal clearing generally occurs in winter months when Indiana bats are hibernating. Tree clearing is defined as the removal of all trees ≥ 5 inches dbh. Selective removal of suitable Indiana bat roost trees is not permitted. Tree clearing in areas of summer habitat is prohibited between April 1 and September 30. Tree clearing in fall swarming habitat is prohibited between March 15 and November 15.

2) *Minimization of Disturbed Area.* Minimization of the disturbed area associated with the mining operation is a recommended avoidance measure. If forested habitat will be avoided, the acreage of habitat avoided must be quantified, identified on the application map, and flagged in the field. Applicants should recognize that on-site avoidance can reduce the amount of other protection and enhancement measures required for the proposed project.

3) *Riparian Buffer Zone Protection.* Riparian buffer zone protection is a recommended avoidance measure. Indiana bats often forage along streams and wetlands, where they drink water and catch flying insects. The removal of streams, wetlands, and associated wooded buffers may harm bats by removing foraging area, causing them to expend energy locating a new foraging area, and potentially engaging in intraspecific (bat to bat) competition. Project plans that avoid impacting streams and wetlands, and leave a minimum 100-foot buffer along each stream bank (total of 200 ft wide buffer) or wetland, can reduce impacts to Indiana bats and are encouraged.

4) *Staged tree removal.* Staged tree removal is a required protection measure. In order to minimize temporal loss of summer habitat and optimize the availability of suitable habitat on the permit area during mining, applicants should plan timber removal activities so that suitable habitat is removed one tree-clearing season prior to planned mining. This will ensure that forest clearing will occur only as needed to allow for mining that is anticipated to occur in the near future. Clearing large areas ahead of mining is discouraged. Applicants should recognize that any on-site minimization of proposed temporal loss can reduce the number and/or amount of other protection measures (e.g., tree girdling) required for the proposed project.

5) *Short-term Habitat Replacement.* Short-term habitat replacement is a required protection measure. The intent of short-term habitat replacement measures is to quickly meet some of the habitat needs of Indiana bats that may be adversely affected by the mining activity. At a minimum, a PEP must include short-term enhancement measures that create suitable roosting conditions for the life of the mining permit. These measures are described below:

a) **Tree Girdling:** Girdling trees (i.e., cutting of the bark and a portion of the underlying cambium layer to create a ring-like groove encircling the base of the trunk) along the perimeter of the permit area or trees within the undisturbed areas of the permit can create short-term Indiana bat roosting habitat. The need for girdling will be determined on a site-specific basis. Girdling may not be necessary if there is an adequate number (i.e., at least 6 per acre or 1 every 500' along the perimeter) of dead trees (≥ 9 " dbh) or other potential roost trees adjacent to the permit area.

If sufficient trees/snags are not available, one tree should be girdled per 500 feet of permit perimeter, or at least six trees per acre of unaffected forest habitat. Girdling trees on south-facing slopes is encouraged, as it is more likely that the solar exposure on south-facing slopes will encourage utilization of those trees by Indiana bats. Appendix G contains a preferred list of exfoliating bark tree species suitable for girdling. If there are not enough species from the tree list of the appropriate size, then other species may be substituted. A biological consultant, forester, or another person with expertise in tree identification must select and mark the trees for girdling. It is important not to girdle every available large tree, and the timing of the girdling should be in advance of or coincide with proposed forest habitat impacts.

b) **Flooded timber:** Flooding timber will kill affected trees within weeks. Eventually, the bark will begin to loosen and exfoliate. This short-term replacement for lost habitat may be created on the mine perimeter, incidental to drainage control structures. Water may back up in the drainage area of fresh water diversions, off-channel sediment traps or in the basin of a sediment pond. Leaving small areas of standing timber (<1 acre) in the pool area of a sediment pond is the most common method of implementing this technique.

6) Buffering Caves and Abandoned Underground Mines. Presence of potential or known hibernacula on coal mine sites in Ohio is rare. However, hibernacula and surrounding buffers are critical to the recovery of Indiana bats, and preservation of known Indiana bat hibernacula will generally be required. Therefore, in cases where known hibernacula exist, or potential hibernacula exist and the applicant has chosen to assume presence, permit-specific coordination with DMRM and FWS is required. Details of how mining operations will protect identified hibernacula and forested buffers must be included in the PEP.

Enhancement Measures. Enhancement measures occur during reclamation and help replace long-term habitat needs of Indiana bats that were adversely affected by the mining activity. A partial list of potential enhancement measures is provided below. A PEP must address each of the following enhancement measures:

1) Reforestation. A Post Mining Land Use (PMLU) must be chosen that results in reforestation of at least 70 percent of the disturbed Indiana bat habitat, unless off-site mitigation measures are incorporated (see "Offsite Habitat Mitigation Measures" section below). The total reforested habitat shall be based on the pre-mining acreage of summer habitat/fall swarming habitat. Applicants must choose from one of the following PMLUs: (1) fish and wildlife habitat, (2) forestry, or (3) undeveloped (Note: an undeveloped post-mining land use is only applicable if the pre-mining land use is undeveloped). If none of these PMLUs is compatible with the land-

owner's intention for long-term management of the permit area, off site mitigation measures may be implemented in lieu of some or the entire required reforestation. Areas to be reforested must be delineated on a separate "Indiana bat enhancement plan map" included as an addendum to Part 3, Item D(18) for surface mining and Part 3, Item D(20) for underground mining.

2) *Tree Species Selection and Planting.* Reforestation planting plans must include a minimum of six different tree species from the list found in Appendix G. Species selection should be determined by site-specific characteristics (soil moisture, sun exposure, etc.) and seedling availability. Trees must be planted at a minimum density of 600 stems per acre. A minimum of four species identified as Exfoliating Bark Species in Appendix G must be planted and equal at least 40 percent of the minimum stems per acre required for final bond release. The applicant may select the remaining 60 percent of the minimum stems per acre from any of the tree categories listed in the species list. Each of the selected tree species should be planted at approximately equal rates. Tree survival at the time of final bond must meet the minimum State-specific program requirement for the corresponding land-use, and cannot be less than 300 stems per acre (even if the PMLU requires less; i.e., undeveloped land). Low compaction grading techniques, such as those encouraged by DMRM's mined land technical reforestation guidance and the Forestry Reclamation Approach (FRA), are recommended to increase the survival rate of planted trees (Burger et al., 2005). The applicant must demonstrate in the PEP how they plan to minimize compaction to encourage tree growth and survival (e.g., FRA, soil ripping).

3) *Herbaceous Ground Cover.* The use of native species is required when establishing the herbaceous ground cover unless the applicant can demonstrate that non-native species included in a planting plan are compatible with tree planting and are non-invasive, slow growing, and beneficial to wildlife. A list of potential native herbaceous plant species is available from FWS, Columbus Field Office.

4) *Travel Corridors.* When the PMLU may result in significant fragmentation of suitable Indiana bat habitat, creation of forested travel corridors is recommended. In general, Indiana bats are reluctant to cross open areas. Travel corridors linking roosting and foraging habitats are an important feature of Indiana bat summer habitat. Therefore, a minimum travel corridor of four rows of trees should be planted to establish a suitable travel corridor at least 50 feet wide.

5) *Restoring Stream Buffer Zones.* Bats rely on streams and other water bodies for drinking water and as insect food sources. Therefore, the applicant is encouraged to reforest impacted intermittent/perennial stream buffer zones during reclamation with a minimum 100-foot riparian corridor on each side of the stream.

6) *Water Sources.* If suitable water sources are not available on or within ½ mile of the permit area, applicants must attempt to replace previously existing water sources (streams, wetlands, shallow water depressions) with water sources that are available throughout a significant portion of the dry months. The techniques described in "A Guide to Creating Vernal Ponds" (Biebighauser 2003), published by the USDA Forest Service, are highly recommended for the creation of adequate watering areas. The document is available on the internet at <http://herpcenter.ipfw.edu/outreach/VernalPonds/VernalPondGuide.pdf>.

Off-site Habitat Mitigation Measures. For some permit applicants, scheduling, land-owner desires, and other business requirements may preclude the use of the enhancement measures discussed above. In particular, the guidance requires reforestation of at least 70 percent of Indiana bat habitat disturbed within the permit area to meet the long-term habitat replacement needs of Indiana bats onsite. However, such reforestation may not always match the applicant and/or landowner's intentions for long-term management of the permit area. In these cases, the applicant has several options that could be implemented and would result in the necessary forest replacement or protection, including, but not necessarily limited to, (a) restoring suitable Indiana bat habitat on unforested land offsite, (b) acquiring or otherwise providing protection to known or potential Indiana bat habitat through land donation, acquisition, and/or permanent conservation easements, (c) buying credits from an approved Indiana bat conservation bank. Although the specific type of action or arrangement may vary, the result of these actions should be permanent protection of conserved, enhanced, and/or restored Indiana bat habitat, with known Indiana bat habitat being the priority.

To utilize off-site mitigation, applicants must develop a PEP that details the type of action or arrangement proposed, including the time frame for its implementation, the location of the mitigation, and any other pertinent information. Off-site mitigation will normally include a separate, legally-binding agreement with FWS or its designee that ensures implementation of the required habitat restoration/protection. This agreement must be signed prior to issuance of the SMCRA permit. DMRM does not regulate off-site mitigation. Compliance with offsite mitigation measures will typically be monitored by FWS and/or a third party conservation easement holder.

Changed Circumstances. PEPs are valid as long as no new information regarding the project or the Indiana bat becomes available. In the event that new information becomes available that would affect areas under existing PEPs or areas where previous surveys have been conducted, further consultation may be necessary. Permittees and/or applicants must consult with DMRM to address any potential adverse effects upon which the new information might shed light.

Contacts and Sources for Additional Information

Ohio Division of Mineral Resources Management, (614)-265-6633
www.dnr.state.oh.us/mineral

Ohio Division of Wildlife, (614)-265-6300
www.dnr.state.oh.us/wildlife

U.S. Fish and Wildlife Service, (614)-416-8993
www.fws.gov

U.S. Office of Surface Mining, (614)-416-2238
www.osmre.gov


Other Reference Documents

Biebighauser, Thomas R. (2003) A Guide to Creating Vernal Ponds, USDA Forest Service. 33pp.

Ohio Department of Natural Resources. 2008. Indiana Bat Management Strategy.

U.S. Fish and Wildlife Service. 2007. Indiana bat (*Myotis sodalis*) Draft Recovery Plan: First Revision. U.S. Fish and Wildlife Service, Fort Snelling, MN. 258 pp.

Attachments: Appendices A through J



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APPENDIX A

BASIC INFORMATION FOR EVALUATING SUITABLE/POTENTIAL SUMMER AND/OR WINTER HABITAT FOR INDIANA BATS

Applicants are responsible for developing and providing sufficient information demonstrating whether suitable summer and/or winter Indiana bat habitat exists within a proposed project area. To accomplish this, the applicant must have detailed knowledge of the project area that is sufficient to adequately and accurately describe the potential Indiana bat habitat conditions that may or may not exist on-site.

Information sources can include, but are not limited to, on-site visits, review of aerial photography and other maps, previous mining records (if applicable), forest inventories, previous species survey reports, and the work of the applicant's consultants or other designees. At a minimum, the applicant must determine if suitable summer roosting habitat and/or suitable winter hibernation habitat is present. The following information, which is not all-inclusive, can be useful in determining if summer and/or winter Indiana bat habitat is present. If any mine portals or caves are present, they should be evaluated using criteria in Appendix B.

1) Information to Determine if Potential Summer Habitat is Present

- Acreage of forests containing trees ≥ 5 " dbh with exfoliating bark
- Distance to available water from project area (e.g., ponds, perennial streams, lakes)
- Aerial and ground-level photographs of the project area
- An adequate and accurate description of suitable Indiana bat habitat relative to the proposed project (i.e., is habitat present and will it be adversely affected or otherwise impacted?)

2) Information to Determine if Potential Winter Habitat is Present

- Underground mining history of the area
- Summary of interviews with landowners and/or mineral rights owners regarding presence of caves, rock shelters, and/or abandoned underground mines, when available
- Geologic core sample data from exploration, if applicable
- Copy of topographic, mining, and environmental resources information maps
- Results of field inspections of areas containing potential hibernacula (see Appendices B and C)

APPENDIX B

CRITERIA TO DETERMINE IF A CAVE/PORTAL MAY BE A SUITABLE INDIANA BAT HIBERNACULUM

1. Openings should be at least one foot in diameter or larger.
2. Passage should continue for 100 feet (ft) or more and open into cave/mine workings (may not be verifiable by inspector).
3. There should be some amount of air flow in or out of entrance. (Note: Air flow is not always detectable and changes by day and/or season)
4. Bats will use vertical shafts. Vertical passage should be at least 2 ft in diameter with some airflow.
5. Foliage and other vegetation in front of cave/mine openings do not stop use by bats. The animals can navigate through foliage.
6. Bats can access mines via old buildings such as a fan house.
7. Cave/Mine entrances that are flooded or prone to flooding (debris on ceiling), collapsed, or otherwise inaccessible to bats should be excluded from survey.
8. Openings that have occurred recently (within the past 1-2 years) due to subsidence can be omitted from the survey provided that the applicant provides a written description and photographs in the survey report.

Note: The data form in Appendix C should be used to report the results of the cave/portal assessment.

APPENDIX C

CAVE/PORTAL ASSESSMENT DATA SHEET

Location: _____

Observers: _____

Latitude/Longitude: _____

Date: _____ Time: _____ Temperature (external): _____

	Cave/Portal #1	Cave/Portal #2	Cave/Portal #3	Cave/Portal #4
Opening (vertical or horizontal)				
Opening size: height x width (or diameter)				
Internal dimensions: height x width				
Slope (up or down from entrance)				
Entrance stable?				
Direction of airflow (in or out of portal)				
Amount of airflow (slight, heavy)				
Internal air warmer or cooler than external temperature?				
Evidence of collapse?				
Ceiling condition				
Amount of water in portal				
Evidence of past flooding?				
Observed length of portal				
Distance to nearest water source				
Percent obstruction of portal entrance by trees, slide, etc				
Foraging signs (e.g., moth wings)?				
Are any portals suspected or known to be connected? Which ones?				
Any observable side passages?				

APPENDIX D

SUMMER MIST-NET SURVEYS AND MINIMUM REPORTING REQUIREMENTS

From the Revised Draft Indiana Bat Recovery Plan (USFWS 2007), Appendix 5: Indiana Bat Mist-Netting Guidelines. The final version of the protocol will be posted at <http://www.fws.gov/midwest/Endangered/mammals/inba/index.html>

In addition, a draft disinfection protocol for bat field studies is available to reduce the transfer of White Nose Syndrome between bats. The draft protocol can be found at http://www.fws.gov/northeast/white_nose.html. The website should be checked regularly for current information on disinfection of field materials and other guidance.

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 capture of bats confirms their presence, failure to catch bats does not absolutely confirm their absence. However, the netting effort as outlined below is considered minimally sufficient to document the presence/absence of Indiana bats on the permit area. There have been instances in which additional effort yielded detection when the standard effort did not.

Some mist-netting projects will require modification (or clarification) of these guidelines; these situations must be resolved through coordination with DMRM and FWS. Consultation with FWS is always recommended, particularly for large-scale netting efforts. In accordance with Federal collection permits, surveyors must obtain site-specific authorization from the local FWS field office prior to commencing mist-net surveys. DMRM and FWS accept the results of these surveys to determine presence for the purposes of Section 7 consultation. Negative survey results are valid for no more than five years from the date of the survey.

NETTING SEASON: May 15 - August 15

May 15-August 15 are acceptable limits for documenting the presence of summer populations of Indiana bats, especially maternity colonies. (However, see Kiser and MacGregor 2005 for precautions regarding early-season surveys between May 15 and June 1, as well as late-season surveys between August 1 and August 15). Capture of reproductive adult females (i.e., pregnant, lactating, or post-lactating) and/or young of the year during May 15-August 15 indicates that a maternity colony is active in the area. Outside these dates, data cannot be used to document the presence or probable absence of summer populations.

EQUIPMENT

- Mist-nets to be used for Indiana bat surveys should be the finest, lowest visibility mesh commercially available. In the past, this was 1 ply, 40 denier monofilament—denoted 40/1. Currently, monofilament is not available, and the finest on the market is 2 ply, 50 denier nylon denoted 50/2. The finest mesh size available is approximately 38 mm (~1 1/2 in).

- No specific hardware is required. There are many suitable systems of ropes and/or poles to hold nets. The system of Gardner et al. (1989) has been widely used.

NET PLACEMENT

- Potential travel corridors such as streams or logging trails typically are the most effective places to net. Place 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 7 m high consisting of three or more nets stacked on top one another and up to 20 m wide. (Nets of different width may be used as the situation dictates).
- Occasionally, it may be desirable to net where there is no good corridor. Take caution to get 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 researchers.
- Exercise safety precautions when placing nets. Poles and nets must be clear of overhead wires.
- See Kiser and MacGregor (2005) for additional discussion of net placement.

RECOMMENDED NET SITE SPACING

- Stream and other linear corridors – one net site per km (0.6 mi) of stream or corridor.
- Non-corridor study areas – two net sites per square km of habitat (equivalent to one net site per 123 acres).

MINIMUM LEVEL OF EFFORT

Netting at each site should include at least four net nights which consists of: 1) a minimum of two net locations at each site (at least 30 m apart, especially in linear habitat such as a stream corridor); and 2) a minimum of two nights of netting (i.e., two net locations for two nights = four net nights per site). A “net night” is defined as one net set up for one night. The sample period should begin at sunset and continue for at least 5 hours (longer sample periods may improve success). For purposes of determining presence or probable absence of Indiana bats, four net nights at a site are not required if Indiana bats are caught sooner (i.e., if Indiana bats are caught on the first night of netting, a second night is not required for purposes of documenting presence).

CHECKING NETS

Each net should be checked approximately every 10 minutes. Some researchers prefer continuous monitoring (with or without an electronic bat detector); care must be taken to avoid noise and movement near the nets if this technique is used. When monitoring the site continuously with a bat detector, bats can be detected immediately when they are captured in the net. Prompt removal from the net decreases stress on the bat and potential for the bat to escape (MacCarthy et al. 2006). Monitoring the net with a bat detector also allows the researcher to assess the effectiveness of their net placement (i.e., if bats are active near the nets but avoiding capture); this may allow for adjustments that will increase netting success on subsequent nights. There should be no disturbance near the nets, other than to check nets and remove bats.

WEATHER AND LIGHT 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 bats are at the site but 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: 1) precipitation; 2) temperatures below 10°C; and/or 3) strong winds (use good judgment— moving nets are more likely to be detected by bats). Further, consider human safety when netting during adverse weather.

It is typically best to set nets under the canopy where they are out of moonlight, particularly when the moon is ½-full or greater. Areas illuminated by artificial light sources should also be avoided.

DOCUMENTATION OF INDIANA BAT CAPTURES

Photo documentation of Indiana bats captured during mist-netting is not required, but is encouraged. Photos taken of a bat's head, calcar, tragus, toe hairs, etc. using a macro lens or a digital camera's macro-mode are often diagnostic and aid in validating the record.

If a bat from the genus *Myotis* is captured during mist-netting that cannot be readily identified to the species level, species can be verified through fecal DNA analysis. Collect one or more fecal pellets (i.e., guano) from the bat in question by placing it temporarily in a holding bag (15 minutes is usually sufficient, no more than 30 minutes is recommended). The pellet (or pellets) collected should be placed in a 1.5 ml vial with silica gel desiccant; pellets from each individual bat should be stored in separate vials. Samples should be stored out of direct light. Samples should be shipped to Dr. Jan Zinck, Department of Biology, Portland State University, 630 SW Mill St., Portland, Oregon, 97201 for subsequent fecal DNA analysis to assign or confirm the specimens' identification to the species level. The current cost for sequencing is approximately \$50 per individual pellet of guano. Contact Dr. Zinck (e-mail: zinckj@pdx.edu) prior to shipping samples. To our knowledge, this is the only lab that currently provides this service. Any additional information (or additional sources) on this technique will be made available on the Indiana bat webpage on the Service's Region 3 website (<http://www.fws.gov/midwest/Endangered/mammals/inba/index.html>).

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APPENDIX E

RADIO TELEMETRY

If one or more Indiana bats are captured during survey efforts, the following radio telemetry protocols apply. Applicants should coordinate with the FWS and DMRM during radio-telemetry efforts. Radio telemetry will provide vital data regarding roosting habitat and could provide information on home range and foraging behavior for use during the ESA consultation process. In particular, this information will provide valuable insight into the selection of appropriate avoidance and minimization techniques and assist in satisfying applicant responsibilities under the ESA.

The following protocols apply to all radio telemetry efforts:

1. A federally permitted biologist that is experienced in handling Indiana bats and attaching radio transmitters shall attach radio transmitters to all (> 6.0 grams) Indiana bats captured at each site.
2. The radio transmitter and adhesive shall not weigh more than 10 percent of a bat's total body weight. However, in all cases, the lightest transmitters capable of accomplishing the required task should be used, especially with pregnant females and newly volant juveniles.
3. Ideally, radio telemetry equipment (e.g., receivers, antennas, and transmitters) will all utilize the same frequency range. For example, 172 MHz is the most commonly used frequency in Kentucky and will generate consistency and allow for increased opportunities for cooperation among biologists, researchers, and agencies.
4. The qualified biologist or technician must track all radio-tagged bats to their diurnal roosts for at least 5 consecutive days and must conduct a minimum of two evening emergence counts at each identified roost tree during that period. If radio telemetry shows roost trees exist in areas that are off of the project area, the adjacent landowner(s) must be contacted and the landowner(s) must grant access to those areas prior to conducting these activities. If access is denied, roost tree locations should be determined using triangulation. Persons conducting radio telemetry work should never trespass on private property. If a radio tagged bat is not relocated after release, then the survey report should contain a map highlighting all of the roads/areas that surveyors used when searching for the missing bat.
5. Daily radio telemetry searches for roost trees must be conducted during daylight hours and must be conducted until the bat(s) is located or for at least 4 hours each day.

Qualified biologists are encouraged to continue radio tracking efforts, on a voluntarily basis, for the life of each transmitter. This will generate better data related to Indiana bat roosting behavior on the project site and will further assist applicants, DMRM and FWS in completing the coordination.

APPENDIX F

FALL PORTAL/CAVE SURVEY REQUIREMENTS

All portals/caves on the permit area must be evaluated for characteristics that may indicate use by Indiana bats (See Appendices B and C). This will facilitate determination of the need for a bat survey. Fall portal/cave surveys must be conducted between September 15 and October 31, and prior to any tree clearing. If the minimum external air temperature falls below 10 C, the survey should be postponed until acceptable temperatures are attained. Otherwise, the sampling period, weather conditions, and equipment should comply with those specified in the Appendix D. Harp traps may be used to survey potential hibernacula where the cave or portal configurations are suitable and where open areas at the sides and top of traps can be enclosed. Entrances to caves or portals should be entirely enclosed by the survey gear.

All cave/portal openings from interconnected systems should be netted simultaneously. In cases where one team of surveyors cannot feasibly sample all caves or portals in one night, a modified method may be used. This method may only be used in association with caves and portals that are known to be interconnected. During use of this modified method, half of the interconnected openings are netted on the first night. The other half of the openings are completely blocked using plastic or other material. On the second night, this is reversed. Caves and portals that are completely isolated do not need to be netted simultaneously.

CAUTION: Entry of abandoned underground mines is prohibited by Federal MSHA regulation 30CFR 75.202. Entry of any mine is only for certified miners or by State approval. Entry of abandoned underground mines can be extremely dangerous because of the potential for ceiling collapse and presence of toxic gases. Safety or health problems may occur as a result of entering abandoned underground mines. The FWS does not authorize or regulate this activity.

APPENDIX G

TREE SPECIES LIST FOR INDIANA BAT PROTECTION AND ENHANCEMENT PLANS

Exfoliating Bark Species

<i>Acer rubrum</i>	Red Maple
^a <i>Acer saccharinum</i>	Silver Maple
<i>Acer saccharum</i>	Sugar Maple
<i>Carya cordiformis</i>	Bitternut hickory
<i>Carya glabra</i>	Pignut hickory
<i>Carya laciniosa</i>	Shellbark hickory
^b <i>Carya ovata</i>	Shagbark hickory
<i>Carya tomentosa</i>	Mockernut hickory
<i>Oxydendron arboreum</i>	Sourwood
<i>Pinus echinata</i>	Shortleaf pine
^a <i>Populus deltoides</i>	Cottonwood
<i>Quercus alba</i>	White oak
<i>Quercus coccinea</i>	Scarlet oak
<i>Quercus imbricaria</i>	Shingle oak
<i>Quercus prinus</i>	Chestnut oak
<i>Quercus rubra</i>	Northern red oak
<i>Quercus stellata</i>	Post oak
<i>Quercus velutina</i>	Black oak
<i>Sassafras albidum</i>	Sassafras
^a <i>Ulmus americana</i>	American elm
^b <i>Ulmus rubra</i>	Slippery elm

Nitrogen-fixing Trees

<i>Cercis canadensis</i>	Redbud
<i>Robinia pseudoacacia</i>	Black locust

Other Trees

^b <i>Castanea dentata</i>	Chestnut
<i>Cornus florida</i>	Flowering dogwood
<i>Diospyros virginiana</i>	Persimmon
<i>Morus rubra</i>	Red mulberry
<i>Prunus serotina</i>	Wild black cherry

^a Species survival and growth is best in moist areas, including stream riparian zones.

^b Species survival and growth is best in drier habitats.

APPENDIX H

PROTECTION AND ENHANCEMENT PLAN CHECK LIST

This checklist is provided to assist the applicant in the development of an Indiana bat PEP. The completed checklist should be included as part of the PEP.

Description of Potential Summer/Winter Habitat

- General description
- Aerial photo with suitable habitat delineated
- Number of acres of permit area covered by forest containing trees \geq 5 inches dbh with exfoliating bark
- Representative photographs of the permit area
- Evaluation of presence of suitable hibernacula
- Distance to water sources

Description of Proposed Project Impacts

- Type and size of project
- Potential impacts to bat habitat (hibernacula, roost trees)
- Potential impacts to bat behaviors (feeding, breeding, sheltering, migrating, hibernating)

Protection Measures

- Minimization of disturbed area/avoidance of summer and/or winter habitat on-site
- Seasonal tree clearing restrictions
- Staged tree removal
- Protection of aquatic resources
- Preservation of stream buffer
- Flooded Timber, if applicable
- Tree girdling, if applicable
- Protected areas delineated on mining map
- Protected areas flagged in field
- Other protection measures
- Protection measures section is concise and easily discernable by an inspector

Enhancement Measures

- PMLU compatible with 70% reforestation
- Tree planting plan
- Minimum of 6 different tree species, including 4 Exfoliating Bark Species
- Appropriate herbaceous ground cover
- Travel corridors
- Restored water sources
- Off-site mitigation, if applicable
- Other long-term habitat replacement options
- Enhancement measures section is concise and easily discernable by an inspector
- Reforestation areas delineated on a separate "Indiana bat enhancement plan map"

Summary

- Summary of potential threats posed to Indiana bats by the proposed action, avoidance and minimization measures selected by the applicant, and final conclusion of affects to the bat population.

Appendix I

Ohio Mining Program Requirements for Protection and Enhancement of Wildlife Resources

§ 1513.07 Coal mining and reclamation permit.

(B)(4)(a)(vi) The collection of site-specific resource information and production of protection and enhancement plans for fish and wildlife habitats and other environmental values required by the chief under this chapter.

OAC 1501:13-4-01(B) Coordination with requirements under other laws. The chief shall, to avoid duplication, provide for the coordination of review and issuance of permits for coal mining and reclamation operations with any other federal or state permit process applicable to these operations including, at a minimum, the applicable requirements of the Endangered Species Act of 1973, as amended (16 U.S.C. 1513 et seq.), the Fish and Wildlife Coordination Act as amended (16 U.S.C. 661 et seq.), the National Historic Preservation Act of 1966, as amended (16 U.S.C. 470 et seq.), the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. 703 et seq.), and the Bald Eagle Protection Act, as amended (16 U.S.C. 668a). Where there are involved federal or Indian lands covered by the Archaeological Resources Protection Act of 1979 (16 U.S.C. 470aa et seq.), the chief shall provide for the coordination of review and issuance of permits for coal mining and reclamation operations with any permit process applicable to these operations under the Archaeological Resources Protection Act of 1979 (16 U.S.C. 470aa et seq.).

OAC 1501:13-4-05 Permit application requirements for reclamation and operations plans.

OAC 1501:13-4-14 Underground mining permit application requirements for reclamation and operations plans.

(P) or (R) Fish and wildlife plan.

(1) Resource information. Each application shall include fish and wildlife resource information for the permit area and adjacent area.

(a) The scope and level of detail for such information shall be determined by the chief in consultation with state and federal agencies with responsibilities for fish and wildlife shall be sufficient to design the protection and enhancement plan required under paragraph (P)(2) of this rule.

(b) Site-specific resource information necessary to address the respective species or habitats shall be required when the permit area or adjacent area is likely to include:

(i) Listed or proposed endangered or threatened species of plants or animals or their critical habitats listed by the secretary of the interior under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.), or those species or habitats protected by similar state statutes;

(ii) Habitats of unusually high value for fish and wildlife such as important streams, wetlands, riparian areas, cliffs supporting raptors, areas offering special shelter or protection, migration routes, or reproduction and wintering areas; or

(iii) Other species or habitats identified through agency consultation as requiring special protection under state or federal law.

(2) Protection and enhancement plan. Each application shall include a description of how, to the extent possible using the best technology currently available, the operator will minimize disturbances and adverse impacts on fish and wildlife and related environmental values, including compliance with the Endangered Species Act, during the surface coal mining and reclamation operations and how enhancement of these resources will be achieved where practicable.

(a) This description shall:

(i) Be consistent with the requirements of rule 1501:13-9-11 of the Administrative Code;

(ii) Apply at a minimum, to species and habitats identified under paragraph (P)(1) of this rule;

(iii) Include protective measures that will be used during the active mining phase of the operation. Such measures may include the establishment of buffer zones, the selective location and special design of haul roads and powerlines, and the monitoring of surface water quality and quantity; and

(iv) Include enhancement measures that will be used during the reclamation and postmining phase of the operation to develop aquatic and terrestrial habitat. Such measures may include restoration of streams and other wetlands, retention of ponds and impoundments, establishment of vegetation for wildlife food and cover, and the replacement of perches and nest boxes. Where the plan does not include enhancement measures, a statement shall be given explaining why enhancement is not practicable.

(3) Fish and wildlife service review. Upon request, the chief shall provide the resource information required under paragraph (P)(1) of this rule and the protection and enhancement plan required under paragraph (P)(2) of this rule to the U.S. department of the interior, fish and wildlife service regional or field office for their review. This information shall be provided within ten days of receipt of the request from the service.

OAC 1501:13-5-01 Review, public participation, and approval or disapproval of permit applications and permit terms and conditions.

A) Public notices of filing of permit applications, applications for revisions to permits, and applications for permit renewal.

(1) After the chief determines an application for a permit, for a significant revision to a permit, or for a permit renewal to be complete, the applicant shall place an advertisement in a local newspaper of general circulation in the locality of the proposed coal mining and reclamation operations at least once a week for four consecutive weeks. The advertisement shall contain, at a minimum, the following information:

(2) Upon receipt of a complete application for a permit, for a significant revision to a permit or for a permit renewal, the chief shall issue written notification of:

(a) The applicant's intention to mine coal at a particularly described tract of land;

(b) The application or permit number;

(c) Where a copy of the application may be inspected; and

(d) Where comments on the application may be submitted under paragraph (C) of this rule.

(3) The written notification described in paragraph (A) (2) of this rule shall be sent to:

(a) Federal, state, and local government agencies with jurisdiction over or an interest in the area of the proposed operations;

(b) Government planning agencies with jurisdiction to act with regard to land use, air, or water quality planning in the area of the proposed operations;

(c) Sewage and water treatment authorities and water companies, either providing sewage or water services to users in the area of the proposed operations or having water sources or collection, treatment, or distribution facilities located in these areas;

(d) The federal or state government agencies with authority to issue all other permits and licenses needed by the applicant in connection with operations proposed in the application; and

(e) The board of county commissioners, the board of township trustees, the legislative authorities of municipal corporations, private water companies, regional councils of governments, and the boards of directors of conservancy districts in each county or part of a county in which the proposed operations are located.

(B) Comments and objections on permit applications, applications for revisions to permits and applications for permit renewal.

(1) Within thirty days of notification by the chief, as provided under paragraph (A) (3) of this rule, written comments or objections on an application for a permit, significant revision to a permit, or permit renewal may be submitted to the chief by such public entities with respect to the effects of the proposed mining operations on the environment within their area of responsibility.

(2) Written comments regarding or objections to an application for a permit, significant revision to a permit, or permit renewal may be submitted to the chief by any person having an interest which is or may be adversely affected by the decision on the application, or by an officer or head of any federal, state or local government agency or authority, within thirty days after the last publication of the newspaper notice required under paragraph (A) of this rule.

(E) Criteria for approval or denial of an application. No application for a permit, significant revision to a permit, or permit renewal shall be approved unless the application affirmatively demonstrates, and the chief finds, in writing, on the basis of information set forth in the application or from information otherwise available, that is documented in the approval and made available to the applicant, that:

(14) The operations are not likely to jeopardize the continued existence of endangered or threatened species or are not likely to result in the destruction or adverse modification of their critical habitats as determined under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.);

OAC 1501:13-9-11 Protection of fish, wildlife, and related environmental values.

(A) Any person conducting coal mining operations shall, to the extent possible using the best technology currently available, minimize disturbances and adverse impacts of the activities on fish, wildlife and related environmental values, and achieve enhancement of such resources where practicable.

(B)(1) No coal mining operation shall be conducted which:

(a) Is likely to jeopardize the continued existence of endangered or threatened species listed by the United States secretary of the interior;

(b) Is likely to result in the destruction or adverse modification of designated critical habitats of such species in violation of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.); or

(c) Will result in the unlawful taking of a bald or golden eagle, its nest, or any of its eggs.

(2) A person who conducts coal mining operations shall promptly report to the chief the presence in the permit area of any critical habitat of a threatened or endangered species listed by the United States secretary of the interior, any plant or animal listed by the state as threatened or endangered, or any bald or golden eagle nest, of which that person becomes aware and which was not previously reported to the chief by that person. Upon notification the chief shall consult with appropriate state and federal fish and wildlife agencies and, after consultation, shall identify whether, and under what conditions, the operator may proceed.

(3) Nothing in these rules shall authorize the taking of an endangered or threatened species or a bald or golden eagle, its nest, or any of its eggs in violation of the Endangered Species Act of 1973, as amended, 16 U.S.C. 1531 et seq., or the Bald Eagle Protection Act, as amended, 16 U.S.C. 668 et seq.

(C) Each person who conducts coal mining operations shall:

(1) Restore, enhance where practicable, or maintain natural riparian vegetation on the banks of streams, lakes, and other wetland areas;

(2) Restore, enhance where practicable, or avoid disturbance to habitats of unusually high value for fish and wildlife;

(3) Afford protection to aquatic communities by avoiding stream channels as required by paragraph (E) of rule 1501:13-9-04 of the Administrative Code or restoring stream channels as required in paragraph (F) of rule 1501:13-9-04 of the Administrative Code.

(4) To the extent possible prevent, control, and suppress range, forest, and coal fires which are not approved by the chief as part of a management plan;

(5) If fish and wildlife habitat is to be a primary or secondary postmining land use, the operator shall in addition to the requirements of rule 1501:13-9-17 of the Administrative Code:

(a) Select plant species to be used on reclaimed areas, based on the following criteria:

(i) Their proven nutritional value for fish and wildlife;

(ii) Their uses as cover for fish and wildlife; and

(iii) Their ability to support and enhance fish and wildlife habitat after release of bonds; and

(b) Distribute plant groupings to maximize benefit to fish and wildlife. Plants should be grouped and distributed in a manner which optimizes edge effect, cover, and other benefits for fish and wildlife;

(6) Where cropland or pastureland is to be the postmining land use, and where appropriate for wildlife and crop management practices, intersperse the fields with trees, hedges, or fence rows throughout the harvested area to break up large blocks of monoculture and to diversify habitat types for birds and other animals. Wetlands shall be preserved or created rather than drained or otherwise permanently abolished. When practical and consistent with these rules, ponds shall be designed and built as permanent ponds in order to enhance fish and wildlife habitat;

(7) Where the undeveloped land use is to be returned to a fish and wildlife land use, and as appropriate for wildlife and other management practices, preserve or create rather than drain or permanently abolish wetlands. When practical and consistent with these rules, ponds shall be designed and built as permanent ponds in order to enhance fish and wildlife habitat; and

(8) Where the primary land use is to be residential, public service, or industrial land use, intersperse reclaimed lands with greenbelts utilizing species of grass, shrubs and trees useful as food and cover for birds and small animals, unless such greenbelts are inconsistent with the approved postmining land use.

(D) Each operator shall, to the extent possible using the best technology currently available:

(1) Ensure that electric powerlines and other transmission facilities used for, and incidental to, mining operations on the permit area are designed and constructed to minimize electrocution hazards to raptors unless the chief determines such requirements are unnecessary;

- (2) Locate and operate haul and access roads so as to minimize impacts to important fish and wildlife species or other species protected by state or federal law; and
- (3) Fence, cover or use other appropriate methods to exclude wildlife from ponds that contain hazardous concentrations of toxic-forming materials.

Appendix J

Glossary of Terms Used in this PD

Adjacent area – As defined by OAC 1501:13-1-02(E) - The area outside the affected area or permit area where air, surface or ground water, fish, wildlife, vegetation or other resources protected by 1513. of the Revised Code, determined according to the context in which “adjacent area” is used, are or reasonably could be expected to be adversely affected by proposed coal mining and reclamation operations including probable impacts from underground working.

Assuming presence – Means that applicants must develop fish and wildlife protection and enhancement plans that include appropriate protective and enhancement measures as if Indiana bats are actually identified through a survey of the permit and adjacent areas. Assuming presence is an alternative to conducting surveys to determine the actual presence or probable absence of Indiana bats on a proposed mine site.

Biological opinion – FWS’s September 24, 1996, report to OSM. The report provides formal section 7 ESA consultation regarding the continuation and approval of surface coal mining and reclamation operations under State and Federal regulatory programs adopted under SMCRA and its implementing regulations. The document represents FWS’s biological opinion and conference report on the effects of coal mining and reclamation operations on listed and proposed species and designated and proposed critical habitats in accordance with section 7 of the ESA.

Endangered Species Act (ESA) – Federal law passed in 1973, as amended. The law provides protection for plant and animal species that are being threatened or in danger of becoming extinct.

Endangered species – Plant and animal species designated by the Secretary of Interior and listed in 40 CFR as being in danger of becoming extinct.

Exfoliating bark – Bark on trees that is peeling or separating from the trunk. The separation provides openings and spaces that serve as roosting habitat for Indiana bats.

Fish and wildlife protection and enhancement plans – The plan describing how the operator will minimize disturbances and adverse impacts on fish and wildlife and related environmental values, including compliance with the Endangered Species Act, during mining and reclamation operations and how enhancement of these resources will be achieved. The plan is required by OAC 1501:13-4-05(P)(2) and 13-4-14(R)(2) and must be submitted with all coal mining permit applications to be deemed complete.

Fish and wildlife resource information – Site-specific information on fish and wildlife resources including endangered or threatened species and habitats of unusually high value in the proposed permit and adjacent areas. The information is required by OAC 1501:13-4-05(P)(1) and 13-4-14(R)(1) and must be submitted with all coal mining permit applications.

FWS – U.S. Fish and Wildlife Service

Hibernacula – Caves, underground mines, or other underground openings where bats congregate and/or hibernate.

Incidental take – Any take of listed wildlife species that results from, but is not the purpose of, an otherwise lawful activity by a Federal agency or the recipient of a Federal grant or permit. Under the terms of section 7 of the ESA, a taking that is incidental to and not intended as part of an agency action, is not a prohibited taking if the taking is in compliance with the terms and conditions of the incidental take statement. The 1996 Biological Opinion provides an incidental take statement for coal mining operations under SMCRA.

For the exemption in section 7 of the ESA to apply, OSM and State regulatory authorities must fully regulate the activity covered by the incidental take statement. If the regulatory authority (1) fails to require permittees to adhere to the terms and conditions of the incidental take statement, including, when necessary, the addition of site-specific permit terms or conditions, or (2) OSM fails to monitor compliance with the incidental take statement's terms and conditions through program evaluation activities, the protective coverage of section 7 of the ESA may lapse.

Jeopardy – A determination by the FWS that an action is likely to reduce the likelihood of both survival and recovery of a listed species by reducing the reproduction, numbers, or distribution of that species.

Maternity colony – A number (more than 1) of pregnant and/or lactating female bats and their young.

Mist-net survey – A scientific method for testing an area to determine presence or probable absence of Indiana bats using nets. Persons approved and licensed by FWS must conduct surveys. The approved mist-net survey techniques are included in Appendix 3.

MRM - Ohio Division of Mineral Resources Management

OAC – Ohio Administrative Code

ORC – Ohio Revised Code

OSM – U.S. Office of Surface Mining

PD – Procedure Directive issued by the Ohio Division of Mineral Resources Management

Presence or probable absence – The result of a survey of an area to determine if Indiana bats exist in the area. If the survey does not capture Indiana bats, they are either absent in the area or occur in low numbers to where adverse affects to the Indiana bat are either insignificant or discountable.

Riparian zones – Vegetated/wooded areas along stream courses and other water bodies.

Roosting and foraging areas – Upland and flood plain wood lots, riparian areas, wooded corridors, and individual trees with exfoliating bark that support Indiana bats.

SMCRA – Surface Mining Control and Reclamation Act of 1977, as amended.

Species-specific conservation measures – Actions taken and/or actions necessary to protect and enhance survival and habitat of the Indiana bat.

Take – Section 9 of the ESA prohibits the take of listed species of fish and wildlife without a special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harassment is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns, which include, but are not limited to, breeding, feeding, or sheltering.