

# **U.S. Fish and Wildlife Service West Virginia Field Office**

## **Guidance on Developing and Implementing an Indiana Bat Conservation Plan**

### ***Introduction***

Various land development and land use activities can cause the loss, degradation, and fragmentation of Indiana bat habitat. Significant adverse habitat impacts can result in the death or injury of these bats by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Within its legal authorities under the federal Endangered Species Act (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531-1543), the U.S. Fish and Wildlife Service (Service) is often in the position of providing technical assistance to project proponents to assist them in determining if potential adverse effects on Indiana bats are likely to occur and, if so, how they can avoid and minimize adverse effects. In many cases, the potential for adverse effects can be avoided or greatly reduced by early project planning that incorporates the measures outlined below. This guidance can be used to develop conservation plans for Indiana bats.

This guidance consolidates and streamlines technical advice currently provided on a project-by-project basis. Frequently, these project-by-project reviews include considerable explanation of bats needs and responses to habitat loss, degradation, and fragmentation. To provide similar context for this document, Appendix A provides summary background information concerning Indiana bats.

### ***Rationale for Plan Development***

The unauthorized “take” of federally listed species is prohibited pursuant to section 9 of the ESA. “Take” is defined in the ESA 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 modifications or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. “Harass” is further defined as actions that create the likelihood of injury to listed species to such an extent to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering.

Where there is a risk of take occurring (*e.g.*, due to effects caused by the proposed loss of forest habitat), this guidance details specific measures that can be taken to avoid and minimize the potential for adverse effects on the Indiana bat, and in many cases, significantly reduce the likelihood that take will occur. In some cases, application of this guidance may be sufficient to determine that effects on Indiana bats are insignificant or discountable. In other cases, this determination may be met through different or greater measures built into project design. In any instance where project design and Indiana Bat Conservation Plan (IBCP) implementation successfully avoids potential adverse effects on bats, it would preclude the need for take exemption or authorization, and project proponents would be able to forego the lengthy regulatory process associated with seeking “take” authorization under the ESA.

The development and implementation of an IBCP does not itself confer incidental take exemption or authorization. Consequently, if implementation of an IBCP is not sufficient to avoid potential adverse effects, incidental take would be exempted or authorized only via the issuance of biological opinions pursuant to Section 7 of the ESA, or incidental take permits pursuant to Section 10 of the ESA.

This is “guidance” and not policy, a project proponent or applicant has the option of not following the guidance’s recommendations when providing information to the Service, however, this will likely increase review times or result in projects that will adversely affect Indiana bats, and therefore require formal consultation.

### ***Plan Development and Implementation***

To avoid or minimize potential adverse effects on Indiana bats, project proponents should develop and implement an IBCP when a project will affect forests, woodlots, forested fencerows, riparian areas, or trees within areas that are known or potential Indiana bat habitat. Known Indiana bat habitat includes habitat located 1) within 5 miles of an Indiana bat female (reproductive or non-reproductive) or juvenile capture record without an identified maternity roost tree; 2) within 2.5 miles of an Indiana bat maternity roost or male bachelor colony record; and 3) within 10 miles of a priority 1 or 2 hibernaculum or 5 miles of a priority 3 or 4 Indiana bat hibernaculum.

Potential Indiana bat habitat includes all suitable foraging and roosting habitats and travel corridors where surveys have not been conducted to determine if bats are present, but presence is being assumed. The IBCP should consider the various sources and types of effects on Indiana bats due to project development, and incorporate measures to avoid and minimize the potential for adverse effects<sup>1</sup>. It is important to note that “project” includes all project features, not just the portion of the project prompting the submittal of a permit application (*e.g.*, to West Virginia Department of Environmental Protection or the U.S. Army Corps of Engineers). For example, a residential development would include all features of the development, including all forested or wooded areas to be affected or encroached upon by roads, utility lines, houses, driveways, septic areas, detention basins, stormwater basins, yards, lots, *etc.* An oil or gas project would include not only the well and well pad, but also the roads, staging areas, impoundments and holding pits, and oil and gas lines associated with the well or well field.

The IBCP becomes an integral part of the proposed project, and as such, is something the project proponent or applicant commits to implement. In order for consultation conclusions to remain valid, the IBCP must be incorporated as a mandatory condition in any permits or authorizations issued for the project. Prior to initiation of any project construction, send the IBCP to the West Virginia Field Office (WVFO) for review<sup>2</sup>. The WVFO will evaluate the proposed project, along with its IBCP, to determine

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<sup>1</sup> This approach is sequential, meaning all reasonable efforts should be taken first to avoid adverse effects on Indiana bats and their habitat. Then, minimization measures should be implemented to the maximum extent practicable. After both avoidance and minimization measures have been fully integrated into project design, include conservation measures to further minimize any remaining potential adverse effects on Indiana bats and their habitats.

<sup>2</sup> **Note that ALL tree removal within known Indiana bat habitat – regardless of the amount – is subject to the appropriate seasonal restriction.** We recommend that even projects with relatively small-scale forest impacts (*e.g.*, less than seventeen acres) consider developing and implementing an IBCP, because in doing so, the cumulative forest losses from a

whether or not the combined effects of the project and IBCP will result in insignificant or discountable effects on the Indiana bat and its habitat, or whether further consultation and coordination will be necessary due to continued adverse effects or the likelihood of take of listed bats.

### ***Plan Content***

Provide a detailed project description and map, including all project features. Include project name, company, area size (acres), acres and location of forest in the project area that will be removed and that will remain undisturbed, timing of forest removal, and any measures proposed to avoid and minimize the potential for adverse effects to Indiana bats.

Provide a list of all avoidance, minimization, and conservation measures that will be implemented, explaining how each measure will be implemented for the proposed project. The IBCP at a minimum must include a description of how impacts have been avoided and minimized to the maximum extent practicable and must include seasonal clearing for all trees greater than 5 inches (diameter at breast height (DBH) that will be removed. Recommendations of potential conservation measures can be found in Appendix B.

An on-site assessment of the quality and quantity of suitable bat habitat present within the project area should be performed by qualified biologists with knowledge and experience with Indiana bat habitat requirements, such as those listed in the List of Surveyors Qualified to Conduct Indiana Bat Surveys in West Virginia. This assessment should include a detailed analysis of potential roost trees that may be affected by the project as well as a description of potential foraging and commuting areas present within the project area. A table for recording potential roost trees is available in Appendix D. This recommendation is made to every project proponent who develops an IBCP in West Virginia. If a project proponent decides to proceed without the assistance of a qualified bat biologist it will result in delays in the consultation process and place additional burden on the Service. This guidance is intended to streamline the consultation process and if an applicant decides to use a different approach, that the Service has not previously approved, it will be placed lower on our project priority list. For more information about the *Regional Project Priority Guidance for Reviewing ESA Section 7 and Section 10 Actions* please refer to Appendix G.

Due to the large amount of tree clearing and overlapping projects occurring across the state of West Virginia, the Service is now requesting that you list past and future projects proposed by your agency/company in the last 5 years that have/will occur inside your buffer area (2-mile buffer from centerpoint of non-linear projects and ¼-mile buffer from centerline of linear projects) of your project. This data will help us to better conserve bat resources, ensure that effects from interrelated and interdependent projects are considered, evaluate cumulative impacts, and better implement recovery efforts for this species. A table for recording past/future projects is available in Appendix E.

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multitude of such projects would be reduced. Nevertheless, when total forest impacts are expected to be less than seventeen acres and the project is outside known Indiana bat habitat, the associated IBCP does not require Service review and approval.

The number of acres existing within 2-miles from the centerpoint of non-linear projects, and within ¼-mile from the centerline of linear projects should be included. The number of forested acres in this buffer area (either 2-mile area or ¼-mile area) pre- and post-construction should also be included.

Additionally a cave and mine portal search within the project area should be performed in accordance with the Phase I Cave/Mine Portal Survey Data Sheet and completed for each opening found. This data sheet is enclosed and results should be compared against the criteria listed in the enclosed Draft Protocol for Assessing Abandoned Mines/Caves for Bat Use. This survey can be performed by mining engineers, other field personnel, or biologists with experience identifying caves or mines. The survey should include a review of topographic, mining, karst occurrence, and environmental resources information maps; as well as actual field reviews of the entire proposed project area. For linear projects (e.g., transmission lines, natural gas pipelines, highways, and access roads), the field survey should include lands buffering the disturbance footprint of the proposed linear project, extending 1-kilometer (0.6 mile) on each side of the outer edges of the footprint.

A summary sheet of all of this information is included on the following page. This summary sheet should be included at the beginning of your submitted IBCP. Appendices A through F provide additional information and forms to aid in your submittal of your IBCP.

If you have further questions that have not been addressed within this document or its appendices, please check our Frequently Asked Questions document at the following link:

[http://www.fws.gov/westvirginiafieldoffice/PDF/WVFO\\_FAQs.pdf](http://www.fws.gov/westvirginiafieldoffice/PDF/WVFO_FAQs.pdf)

If your question was not answered through any of these methods, please contact our office at 304-636-6586.

**Indiana Bat Bat Summary Sheet**

**Project Name:** \_\_\_\_\_

**Project Location:** \_\_\_\_\_

**County:** \_\_\_\_\_

**Does project have a Federal Nexus?** Yes / No

**If yes, list Federal action agency(ies):** \_\_\_\_\_

**Project type:** linear / non-linear

*(2-mile buffer from centerpoint for non-linear; ¼-mile buffer around centerline for linear)*

**Habitat assessments were conducted in:** \_\_\_\_\_

**SUMMARY TABLE OF PROJECT ACREAGE IMPACTS**

# acres within the Project Area:	
# acres of forest to be cleared within the Project Area:	
# acres forest in the Project Area prior to project construction:	
# acres forest in the Project Area following to project construction:	
Total # acres in buffer area ( $\lambda$ ): <i>(2-mile buffer from centerpoint for non-linear; ¼-mile buffer around centerline for linear)</i> <i>(2-mile buffer area is always 8,042 acres for non-linear projects)</i>	
# forested acres in buffer area prior to project construction:	
# forested acres in buffer area after project construction ( $\alpha$ ):	
% forest remaining within buffer area post-construction ( $(\alpha \div \lambda) \times 100$ ):	%

**Caves/mine portal presence?** Yes / No

**If yes, suitable habitat?** Yes / No

**SUMMARY TABLE OF IMPACTS TO POTENTIAL ROOST TREES**

*(Use best professional judgment to categorize potential roost trees below; trees should not be classified into more than one category)*

<b>TOTAL # Potential Indiana Bat Primary Roost Trees within the Project Area:</b>	
# Potential Indiana Bat Primary Roost Trees to be avoided:	
# Potential Indiana Bat Primary Roost Trees to be impacted:	
<b>TOTAL # Potential Indiana Bat Secondary Roost Trees within the Project</b>	
# Potential Indiana Bat Secondary Roost Trees to be avoided:	
# Potential Indiana Bat Secondary Roost Trees to be impacted:	

**Avoidance and Minimization Measures to be Applied on Project**

- Seasonal tree clearing (all trees greater than 5" DBH) **REQUIRED**
- Avoid cutting potential roost trees
- Avoid high quality foraging areas
- Minimize limits of disturbance (narrowed LOD or ROW)
- Minimize impacts (clearing) around suitable swarming and summer habitat and wetland/riparian zones
- 50-foot or greater forested buffer left along both sides of streams
- Collocate project features with previously disturbed or cleared areas
- Phase tree clearing over multiple years
- Reforest disturbed areas
- Restore or enhanced riparian/wetland areas
- Strong erosion and sedimentation best management practices
- Pollution control plan in place
- Suitable habitat acreage permanently preserved within or adjacent to the project site
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

**Conservation Measures to be Applied on Project**

- Erecting artificial roosting structures on a 1:1 ratio for each potential primary roost tree that is lost during project development (a 2-year minimum monitoring plan of artificial structures) ( \_\_\_ structures)
- Erecting artificial roosting structures on a 4:1 ratio to replace potential secondary roost trees that are lost during project development (a 2-year minimum monitoring plan of artificial structures) ( \_\_\_ structures)
- Erecting artificial bark, bat boxes, or other artificial roosting structures (a 2-year minimum monitoring plan of artificial structures) ( \_\_\_\_\_ structures)
- Girdling trees on a 1:1 ratio for each potential secondary roost tree that is lost during project development ( \_\_\_ trees)
- Preservation of suitable Indiana bat habitat within or adjacent to the project site ( \_\_\_ acres)
- Creation of watering areas, wetlands, or ponds
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

## APPENDIX A *Indiana bat– Background and Overview*

The Indiana bat is listed as “endangered” under the ESA. Indiana bats are temperate, insectivorous, migratory bats that hibernate in mines and caves in the winter and spend summers in wooded areas. The key stages in their annual cycle are: hibernation, spring staging and migration, pregnancy, lactation, volancy (able to fly) /weaning, fall migration and swarming. While varying with weather and latitude, generally both species will hibernate between mid-fall through mid-spring each year. The spring migration period likely runs from mid-March to mid-May each year, as females depart shortly after emerging from hibernation and are pregnant when they reach their summer area. Young are born between mid-June and early July, with nursing continuing until weaning, which is shortly after young become volant in mid- to late-July. Fall migration likely occurs between mid-August and mid-October.

### Summer Habitat and Ecology

Suitable summer habitat for the Indiana bat consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts, as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure.

Many species of bats, including the Indiana bat, consistently avoid foraging in or crossing large open areas, choosing instead to use tree-lined pathways or small openings (Patriquin and Barclay 2003, Yates and Muzika 2006). Further, wing morphology of the Indiana bat suggests that they are adapted to moving in cluttered habitats. Thus, isolated patches of forest may not be suitable for foraging or roosting unless the patches are connected by a wooded corridor.

### Maternity Colonies and Roosts

Upon emergence from the hibernacula in the spring, females seek suitable habitat for maternity colonies. Coloniality is a requisite behavior for reproductive success. Indiana bat maternity colonies vary greatly in size, with most documented maternity colonies containing less than 100 adult females. Both species show some degree of interannual fidelity to single roost trees and/or maternity areas. Maternity colonies use networks of roost trees often centered on one or more primary roost trees. Indiana bat maternity colonies use a minimum of 8 to 25 trees per season (Callahan *et al.* 1997; Kurta *et al.* 2002).

A typical Indiana bat primary roost is typically located under exfoliating bark of a dead ash, elm, hickory, maple, oak, or poplar, although any tree that retains large, thick slabs of peeling bark may be suitable. Primary Indiana bat roosts are usually in trees that are in early-to-mid stages of decay.

### Reproduction

Young Indiana bats are typically born in late-May or early June, with females giving birth to a single offspring. Lactation then lasts 3 to 5 weeks, with pups becoming volant between early July and early August.

## Migration

Males and non-reproductive females may summer near hibernacula, or migrate to summer habitat some distance from their hibernaculum. Indiana bats are known to often migrate hundreds of kilometers from their hibernacula. Migration is an energetically demanding behavior for the Indiana bat, particularly in the spring when their fat reserves and food supplies are low and females are pregnant.

## Winter Habitat and Ecology

Suitable winter habitat (hibernacula) includes underground caves and cave-like structures (e.g. abandoned or active mines, railroad tunnels). Generally, Indiana bats hibernate from October to April depending on local weather conditions (November/December to March in southern areas and as late as mid-May in some northern areas).

Caves that meet temperature requirements for Indiana bats are rare. Most Indiana bats hibernate in caves or mines where the ambient temperature remains below 10°C (50.0°F) but infrequently drops below freezing (Hall 1962, Myers 1964, Henshaw 1965, Humphrey 1978). Caves that historically sheltered the largest populations of hibernating Indiana bats were those that provided the largest volumes and structural diversity, thus ensuring stable internal temperatures over wide ranges of external temperatures, with a low likelihood of freezing (Tuttle and Kennedy 2002).

Indiana bats generally hibernate in large clusters, sometimes with other species, with densities of 300 to 484 bats per square foot. Indiana bats have shown a high degree of philopatry to the hibernacula used, returning to the same hibernacula annually.

Upon arrival at hibernacula in mid-August to mid-November, Indiana bats “swarm,” a behavior in which large numbers of bats fly in and out of cave entrances from dusk to dawn, while relatively few roost in caves during the day. Swarming continues for several weeks and mating occurs during the latter part of the period. After mating, females enter directly into hibernation but not necessarily at the same hibernaculum where mating occurred. A majority of bats of both sexes enter hibernation by the end of November (by mid-October in northern areas).

After hibernation ends in late March or early April (as late as May in some northern areas), most Indiana bats migrate to summer roosts. Females emerge from hibernation prior to males.

Reproductively active females store sperm from autumn copulations through winter. Ovulation takes place after the bats emerge from hibernation in spring. The period after hibernation and just before spring migration is typically referred to as “staging,” a time when bats forage and a limited amount of mating occurs. This period can be as short as a day for an individual, but not all bats emerge on the same day.

## Spring Staging and Fall Swarming Habitat and Ecology

In general, Indiana bats use roosts in the spring and fall similar to those selected during the summer. Suitable spring staging/fall swarming habitat consists of the variety of forested/wooded habitats where they roost, forage, and travel, which is most typically within 5 miles of a hibernaculum. This includes forested patches as well as linear features such as fencerows, riparian forests and other wooded

corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Isolated trees are considered suitable habitat when they exhibit the characteristics of a suitable roost tree and are less than 1,000 feet from the next nearest suitable roost tree, woodlot, or wooded fencerow.

### Threats

The primary threats to Indiana bats in West Virginia are white-nose syndrome (WNS), and habitat losses due to a wide variety of land development and land use practices that remove forest. WNS is causing significant mortality at numerous bat hibernacula, with Indiana bat mortality rates exceeding 60%. We expect further declines as the disease continues to spread across the species' range.

Forest habitat losses occur due to coal mining, wind power development, oil and gas development, commercial and residential development, and various forestry practices. These habitat losses have the potential to adversely modify Indiana bat suitable roosting/foraging habitat. Kurta (2005) noted that impacts on reproductive success are a likely consequence of the loss of traditional roost sites. He suggested that reduced reproductive success may be related to stress, poor microclimate in new roosts, a reduced ability to thermoregulate through clustering, or reduced ability to communicate and thus locate quality foraging areas. He further suggested that the magnitude of these impacts would vary greatly depending on the scale of roost loss (i.e., how many roosts are lost and how much alternative habitat is left for the bats in the immediate vicinity of the traditional roost sites). Recovery from the stress of hibernation and migration may be slower as a result of the added energy demands of searching for new roosting/foraging habitat especially in an already fragmented landscape where forested habitat is limited. Pregnant females displaced from preferred roosting/foraging areas will have to expend additional energy to search for alternative habitat; which would likely result in reduced reproductive success for some females. Females that do give birth may have pups with lower birth weights given the increased energy demands associated with longer flights, or their pups may experience delayed development. These longer flights would also be experienced by pups once they become volant which could affect the survival of these pups as they enter hibernation with potentially reduced fat reserves. Overall, the effect of the loss of roosting/foraging habitat on individual bats from the maternity colonies may range from no effect to death of juveniles. The effect on the colonies could then be reduced reproduction for that year.

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## **APPENDIX B.**

### **Recommendations for Avoidance and Minimization Measures**

#### **All projects must include seasonal clearing**

- Avoid impacts to potential roost trees (e.g., avoid cutting these trees).
- Avoid impacts to documented foraging areas or areas which are likely to support foraging.
- To minimize impacts on foraging and roosting Indiana bats, avoid or minimize impacts on forests, woodlands, and forested fence rows. Configure projects to avoid and/or minimize impacts on suitable summer and swarming habitat, particularly in and around wetlands and riparian areas.
- Minimize the right-of-way (ROW) by narrowing or rerouting the ROW around high quality Indiana bat summer habitat.
- Retain at least a 50-foot forested buffer (but preferably a 100-150 foot buffer) on each side of streams and around wetlands.
- Co-locate project features (e.g., roads and utility lines) and cluster project features (e.g., houses) to reduce forest clearing.
- Phase tree clearing over multiple years, if applicable to the project. Indicate the rate at which forest will be cleared, as well as the total duration of this effect (e.g., 5 acres/year for 10 years).
- Reforest temporarily cleared areas with tree species preferred by Indiana bats, in accordance with Appendix C. Ensure soils are segregated during earth disturbance activities and ensure soils are not compacted, to allow for successful tree establishment.
- Restore or enhance degraded riparian areas or wetlands by planting native trees and shrubs.
- Avoid use of invasive, exotic plant species when re-foresting and when stabilizing soils.
- Develop and implement stringent erosion and sedimentation controls to protect water quality and the Indiana bat prey base in streams and wetlands.
- Develop and implement a pollution prevention plan with strong erosion and sedimentation best management practices to ensure hazardous materials and storm runoff do not contaminate soils, wetlands, or waterways.
- Set aside protected suitable habitat within or adjacent to the project area to ensure that undisturbed bat habitat will remain on the landscape.

## **Recommendations for Conservation Measures**

- Erecting bat boxes, artificial bark, or other artificial roosting structures and monitoring these structures, or combination of structures, for a minimum of two years. The Service highly recommends that project proponents use artificial roosting structures on a 1:1 ratio to replace each potential primary roost tree that is lost during project development.
- Erecting artificial roosting structures on a 4:1 ratio to replace potential secondary roost trees that are lost during project development (2 year monitoring of structures). For every 4 potential secondary roost trees that may be impacted by project development the Service recommends that applicants erect one artificial roosting structure.
- The Service recommends that project proponents replace potential secondary roost trees that are lost during project development.
- Girdling trees on a 1:1 ratio for each potential secondary roost tree that is lost during project development
- Preserve suitable Indiana bat habitat within or adjacent to the project area permanently.
- Create watering areas for bats such as wetlands or ponds.

The conservation measures listed above are standard recommendations for small scale projects with limited habitat removal and therefore might not be applicable to large scale projects (linear and non-linear) or projects that propose to remove high quality bat habitat. Conservation measures are project specific and if you have a large scale project (requires a large amount of tree removal) or a project that proposes to remove high quality habitat please coordinate with the WVFO during the early stages of planning to avoid significant delays in the consultation process. For certain projects the development of an IBCP and implementation of the above listed conservation measures may not be enough to avoid adverse impacts to the Indiana bat or its habitats.

## **Recommendations for Artificial Structures/Monitoring**

The Service recommends that project proponents select artificial roosting structures that are Bat Conservation International (BCI) certified (or have equivalent certifications). The Service prefers the use of artificial bark and/or rocket boxes since recent monitoring data have indicated that these types of structures are preferred by bats. Structures should also be large enough to support a maternity colony. The Service prefers the use of artificial roosting structures because they provide immediate roosting habitat, as opposed to tree girdling which can take many years to become suitable for Indiana bats.

Artificial roosting structures can be installed at any time of year prior to construction (preferred) or immediately after construction (within the same year). If monitoring is proposed to occur the same season that structures are erected they must be in place before March 31<sup>st</sup>. For example, if a project proponent plans to monitor an artificial bat structure as part of the 2 year monitoring recommendation in May the structure would need to be erected before March 31 of that year,

otherwise the project proponent will need to wait an additional year to begin monitoring. The purpose of the 2 year monitoring is to identify if structures are effective and to correct inefficiencies to make sure structures function as intended.

Artificial structures should be inspected twice per season to determine occupancy. Once occupancy is confirmed, the applicant should conduct emergence surveys (in combination with acoustic detectors) or mist-netting on the occupied structure to determine species composition. Mist netting of occupied structures should occur if species identifications cannot be made via visual inspection of the structures or through use of acoustic detectors. If the applicant elects to mist net the occupied structure, the Service recommends that it be done early in the season when bats are pregnant, but not too close to term, or once the young are flying. Mist netting should not be conducted between June and July to minimize stress on bats. Additionally, if mist-netting is conducted year one and a maternity colony is documented, netting does not need to be conducted again in year two.

A qualified bat biologist should conduct the annual monitoring of the artificial structures and must be involved in the placement and netting of these structures since most project proponents do not have the appropriate permits or expertise.

Applicants should submit a letter to the WVFO verifying that conservation measures are in place and that monitoring has been completed. Please note that artificial structure monitoring updates should be submitted annually and a complete report should be submitted when the conservation measures and structure monitoring commitments have been fulfilled.

**APPENDIX C.**  
**Preferred Tree Species**

Planting plans should include at least six of the tree species listed below, one of which should be shagbark hickory. To promote diversity, do not include more than 15 percent of any one tree species in planting plans.

<i>Acer rubrum</i>	red 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
<i>Carya ovata</i>	shagbark hickory
<i>Carya tomentosa</i>	mockernut hickory
<i>Fraxinus americana</i>	white ash
<i>Fraxinus nigra</i>	black ash
<i>Fraxinus pennsylvanica</i>	green ash
<i>Platanus occidentalis</i>	sycamore
<i>Populus deltoides</i>	eastern cottonwood
<i>Quercus alba</i>	white oak
<i>Quercus coccinea</i>	scarlet oak
<i>Quercus prinus</i>	chestnut oak
<i>Quercus rubra</i>	northern red oak
<i>Quercus velutina</i>	black oak
<i>Robinia pseudoacacia</i>	black locust
<i>Sassafras albidum</i>	sassafras
<i>Ulmus americana</i>	American elm
<i>Ulmus rubra</i>	slippery elm

**APPENDIX D.**

**Potential Roost Tree Information Sheet**

Please provide tabular information as shown below along with photos of each tree and a map that shows the location of each tree along the project limits-of-disturbance.

<b>Tree ID#</b>	<b>Species</b>	<b>DBH (inches)</b>	<b>Live/Dead</b>	<b>Coordinates</b>	<b>Avoid/Remove</b>

**APPENDIX E.**

*In the table below list all past and future projects<sup>‡</sup> proposed by/for the project proponent<sup>§</sup> in the last 5 years that have/will occur inside the buffer area (2-mile buffer from centerpoint of non-linear projects and ¼-mile buffer from centerline of linear projects) of the project.*

<b>Project Title</b>	<b>Type of Project</b>	<b>Year of Concurrence</b>	<b>Year of Project Completed / to be Completed</b>	<b>GPS Coordinates</b>	<b>Tentative Amount of Tree Clearing</b>

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<sup>‡</sup> Such as well pads and associated features (access roads, staging areas, tank pads, etc.), pipelines and their associated features (roads, staging areas, etc.), compressor stations, processing facilities, etc. *and* including projects submitted for the project proponent by other consultants.

<sup>§</sup> Whereby project proponent refers to the current company, its subsidiaries, and any other names the company may have previously been known as.

## APPENDIX F.

### Useful Terminology

- “Known habitat” refers to suitable summer or winter habitat located within 10 miles of a documented priority 1 or 2 hibernacula, within 5 miles of a documented maternity capture record or documented priority 3 or 4 hibernacula, or within 2.5 miles of a documented maternity roost tree.
- “Maternity habitat” refers to suitable summer habitat used by juveniles and reproductive (pregnant, lactating, or post-lactating) females.
- “Non-maternity habitat” refers to suitable summer habitat used by non-reproductive females and/or males.
- “Occupied” refers to suitable habitat that is expected or assumed to be in use by Indiana bats at the time of impact.
- “Potential habitat” occurs statewide where suitable roosting, foraging and travel habitat for the Indiana bat exists. Known habitat also includes potential habitat for those currently undocumented uses.
- “Suitable habitat” refers to summer and/or winter habitat that is appropriate for use by Indiana bats.
  - Suitable winter habitat for Indiana bats (hibernacula) is restricted to underground caves and cave-like structures (e.g., abandoned mines, railroad tunnels). These hibernacula typically have a wide range of vertical structures; cool, stable temperatures, preferably between 4°C and 8°C; and humidity levels above 74% but below saturation.
  - Suitable summer habitat consists of the variety of forested/wooded habitats where they roost, forage and travel. This includes forested blocks as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Isolated trees are considered suitable habitat when they exhibit the characteristics of a suitable roost tree.
- “Suitable primary maternity roost tree” Refers to a dead or partially dead tree that is at least 9 inches DBH and has cracks, crevices, and/or loose or exfoliating bark. Trees in excess of 16 inches DBH are considered optimal for maternity colony roosts, but trees in excess of 9 inches DBH appear to provide suitable maternity roosting habitat. Primary

roosts are often found near clearings or edges of woodlands where they receive greater solar radiation, a factor that may be important for reproductive females and their young<sup>5</sup>. Primary roosts occur in open forest, along the edge of a woodlot, in gaps within a forest, in a copse of dead trees, as part of a wooded fenceline, in grazed woodlands, or in pastures with scattered trees<sup>6</sup>.

- “Suitable roost tree” refers to a tree (live or dead) with a DBH of 5 inches or greater that exhibits any of the following characteristics: exfoliating bark, crevices, or cracks. Indiana bats typically roosts under exfoliating bark, and in cavities of dead, dying, and live trees, and in snags (i.e., dead trees or dead portions of live trees).
- “Unoccupied” refers to suitable habitat not expected to be in use by Indiana bats at the time of impact.

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<sup>5</sup> Vonhof, M.J. and R.M.R. Barclay. 1996. Roost-site selection and roosting ecology of forest-dwelling bats in southern British Columbia. *Canadian Journal of Zoology*. 74:1797-1805.

<sup>6</sup> Gardner J.E., J.D. Garner, and J.E. Hofmann. 1991. Summer roost selection and roosting behavior of *Myotis soldais* (Indiana bat) in Illinois. Unpublished report. Illinois Natural History Survey. Champaign. 56p.

## **Appendix G**

### **Regional Project Priority Guidance for Reviewing ESA Section 7 and Section 10 Actions**



# United States Department of the Interior



## FISH AND WILDLIFE SERVICE

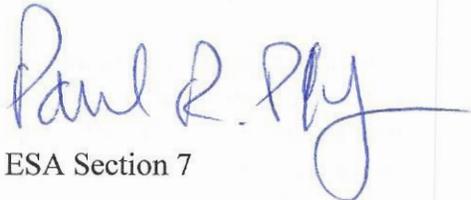
300 Westgate Center Drive  
Hadley, MA 01035-9589

In Reply Refer To:  
FWS/Region 5/ES

**JUL 21 2014**

### Memorandum

To: Field Office Supervisors, Region 5

From: Assistant Regional Director, Ecological Services 

Subject: Regional Project Priority Guidance for Reviewing ESA Section 7  
and Section 10 Actions

### Background

As part of the Region's 2014 Endangered Species Act (ESA) Paradigm Shift initiative, we have developed a prioritization tool to achieve "better conservation more efficiently" with our limited staff resources. All Ecological Services (ES) Field Offices (FOs) are expected to adopt this tool as soon as possible, although each office has discretion to decide how best to use it. While many biologists and offices already use some type of prioritization process, we believe use of this tool by all offices will achieve greater conservation because the tool provides a consistent and transparent approach to prioritization that is supported by all levels of ES throughout the Region.

The tool incorporates two of the key drivers of the "paradigm shift" concept: being *proactive* rather than reactive, and *strategic* rather than opportunistic. Instead of handling project reviews on a "first-come first-served" basis, we will take a proactive and strategic approach to screening each ESA Section 7 and Section 10 project as it is received by the FO. We will strategically assign the relative conservation value and processing efficiency of each incoming project and based on these factors, assign its relative priority within the project review queue.

For many FOs, the most effective approach to making these determinations is a team approach. At appropriate frequencies, FO biologists and their supervisor should quickly assess the conservation value, efficiency, and cooperation for each new project. The biologist's expertise in the topic species and knowledge of the project type, the project's probable impacts and conservation measures, and the office's history dealing with the agency, applicant, or consultant are relevant to evaluating the three factors. Based on this assessment, the biologists and supervisor would agree on the appropriate categorization of the project, and the supervisor would make the assignments to the biologists based on the workload priority category. Each FO will develop guidelines for establishing the order for completing assignments, along with acceptable target time frames.

## Purpose and Strategy

The purpose of this guidance is to help FOs improve the overall conservation value of projects reviewed under Section 7 or Section 10 of the ESA. The primary goal of this process is to *maximize conservation value per unit effort of work*. In other words, we want to spend more time on those projects for which our involvement can affect the greatest increase in conservation. So, perhaps not intuitively, a project that has a high conservation value *without requiring our efforts* should *not* be our primary focus, because the *conservation per unit effort* would be low. For example, when a project comes in with significant avoidance, minimization, and conservation measures, we should not focus significant efforts on obtaining additional conservation benefits. Instead, we should quickly complete our review of those projects to enable us to spend time on other projects.

The factors to be considered in determining which projects we should spend most of our time on are *conservation value, efficiency, and cooperation*. “Conservation value” refers to whether the implemented project will yield a significant *beneficial* impact or preclude a significant *adverse* impact to listed, proposed, or candidate species or proposed or designated critical habitat. We want to facilitate those projects that are likely to result in a significant conservation benefit, and, conversely, we want to modify those projects that are likely to have significant adverse impacts. A project has a high conservation value (HCV) if it has or could have a significant beneficial effect *or* it precludes or could preclude a significant adverse impact. Projects that are received with HCV should be processed quickly. A project has a low conservation value (LCV) if its expected impacts are neither highly beneficial nor highly adverse and our involvement will not result in a significant increase in conservation value.

“Efficiency” refers to the amount of time required to process a project and is based on the complexity of the review. This determination will be based on (1) how well we understand the species’ ecology and response to stressors; (2) how well we understand the species’ response to beneficial, avoidance, and minimization measures and whether such measures have already been incorporated into the project description; (3) whether the project is routine or a new kind of project requiring additional time to become familiar with industry practices, technologies, and economics; and (4) whether the project is being implemented under an existing programmatic consultation or habitat conservation plan. Routine projects that can be processed efficiently will be designated as high efficiency (HE), and new, challenging projects will be designated as low efficiency (LE). In general, projects that are not likely to adversely affect (NLAA) under Section 7, will be efficient to process, and those projects should be considered HE when appropriate.

“Cooperation” refers to the extent to which an agency or applicant has followed the FO Web Site Project Review process, provided good documentation of its proposed action, and been responsive to FO inquiries or requests for information. A project will receive a “high cooperation” (HC) or a “low cooperation” (LC) designation based on the level of cooperation demonstrated during project development. Prior experience with an agency or applicant can influence this factor.

## Criteria and Categories

As shown in the table below, there are eight possible workload priority categories. Each category has additional considerations for improving workload management.

Category	Conservation Value	Efficiency	Cooperation	Considerations
1	HCV	HE	HC	Highest priority (conservation measures included in project description – prioritize to complete review, conservation measures to be added by us, spend as much time as is needed)
2	HCV	HE	LC	High priority (may want to invest time in training repeat agency or applicant to improve process)
3	HCV	LE	HC	High priority (even though it may be a new, novel project or impacts; consider creating programmatic)
4	HCV	LE	LC	In addition to above consideration, consider training applicants/agency and programmatic process.
5	LCV	HE	HC	Process these after HCV projects completed.
6	LCV	HE	LC	Invest time in training repeat agency or applicant to improve process.
7	LCV	LE	HC	Invest time in training repeat agency or applicant to improve process.
8	LCV	LE	LC	These are completed as time allows and are of lowest priority.

Our highest priority should be given to projects in categories 1 to 4; within this group the highest priority should be given to HCV projects with HE (categories 1 and 2). In this scheme, high processing efficiency (HE) is ranked higher than projects with high cooperation (HC) but the considerations suggest that, in some cases, it may be worth an investment in time trying to improve cooperation from LC to HC.

Projects in categories 5 to 8 (LCV + LE + LC) should receive the lowest priority. Because these projects will always yield only a *low* conservation value per unit effort of work and will never be HCV, we should process them to meet minimum legal standards while spending a minimal amount of time doing so.

It is expected that each FO will adopt this tool as soon as possible, as previously stated. If there are specific questions as to how to use the tool or clarifications, please contact Glenn Smith, Assistant Chief, Division of Endangered Species, at 413-253-8627. If there are questions concerning the expectations of the use of this tool please feel free to contact me.