

TIER 2 BIOLOGICAL OPINION

for

SECTION 3

of the

PROPOSED INTERSTATE 69 (I-69) EXTENSION FROM EVANSVILLE TO INDIANAPOLIS

for the

FEDERALLY ENDANGERED INDIANA BAT

traversing portions of

DAVISS AND GREENE COUNTIES, INDIANA

Submitted to the Federal Highway Administration

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EXECUTIVE SUMMARY

This document contains a Tier 2 Biological Opinion for Section 3 of I-69 and tiers back to the Tier 1 Revised Programmatic Biological Opinion dated August 24, 2006 for the proposed extension of I-69 from Evansville to Indianapolis, Indiana. The Federal Highway Administration (FHWA) reinitiated formal consultation on Tier 1 of the proposed I-69 extension on March 7, 2006 and submitted an addendum to the original Biological Assessment that detailed significant new information regarding potential impacts to the Federally endangered Indiana bat (*Myotis sodalis*) that were not known or available for analysis during the original formal consultation period in 2003.

The effects associated with the proposed construction, operation, and maintenance of Section 3 of I-69 are within the scope of effects contemplated in the Tier 1 Revised Programmatic Biological Opinion. Upon evaluation of the proposed project, we believe incidental take of Indiana bats in the Section 3 Action Area is likely, but the impact of such taking is not likely to jeopardize the continued existence of the Indiana bat and is not likely to adversely modify the bat's designated Critical Habitat. A Tier 2 Incidental Take Statement for Section 3 has been included at the end of the BO with its non-discretionary Reasonable and Prudent Measures and associated Terms and Conditions to further minimize the incidental take of Indiana bats in Section 3.

INTRODUCTION

This document transmits the U.S. Fish and Wildlife Service's (Service or USFWS) Tier 2 Biological Opinion (BO) for Section 3 of the proposed Interstate 69 (I-69) project. The Service's Bloomington, Indiana Field Office (BFO) received the Federal Highway Administration's (FHWA) Tier 2 Biological Assessment (BA) for Section 3 on July 29, 2009 along with a letter requesting the Service to initiate formal consultation on the proposed construction, operation, and maintenance of Section 3 of I-69 from Indianapolis to Evansville, Indiana and its effects on the federally endangered Indiana bat (*Myotis sodalis*). Subsequently, a meeting was held on August 12, 2009 to discuss and clarify certain details of the BA (See Appendix B).

The original formal consultation for Tier 1 of I-69 was concluded with the issuance of the Service's Programmatic BO (PBO) on December 3, 2003. On March 7, 2006, the FHWA requested to reinitiate formal consultation for the Indiana bat and submitted a very thorough and updated Tier 1 BA Addendum that detailed additional impacts to Indiana bats stemming from significant new information regarding this species' presence and abundance within the project's action areas, as revealed during Tier 2 field studies. The Service's 24 August 2006 Revised Tier 1 Programmatic BO (RPBO) replaced the 3 December 2003 PBO.

This Tier 2 BO for Section 3 of I-69 is prepared in accordance with section 7 of the Endangered Species Act (ESA or the Act) of 1973, as amended (16 U.S.C. 1531 et seq.) and is the culmination of formal section 7 consultation under the Act. The purpose of formal section 7 consultation is to insure that any action authorized, funded, or carried out by the Federal government is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of any officially designated critical habitat of such species. This Tier 2 BO covers the

proposed actions of the FHWA, as this agency will partially fund the road construction associated with this project. To reduce redundancy between the Tier 1 RPBO (dated 24 August 2006) and this section-specific Tier 2 BO, the Service has incorporated portions of the Tier 1 RPBO by reference in this Tier 2 BO. Similarly, portions of the Tier 2 Biological Assessment (Tier 2 BA) for Section 3 have been incorporated by reference in this Tier 2 BO.

The Section 3 Tier 2 BO is primarily based on information provided from the following sources:

- 1) Tier 1 BA [dated July 18, 2003, revised October 27, 2003; prepared by Bernardin-Lochmueller and Associates, Inc.(BLA)],
- 2) Tier 1 BA Addendum (dated March 7, 2006; prepared by BLA),
- 3) Tier 1 Revised Programmatic BO (RPBO) dated 24 August 2006),
- 4) Tier 2 Draft Environmental Impact Statement (DEIS) for Section 3 (dated 26 January 2009),
- 5) Tier 2 BA for Section 3 (dated 27 July 2009),
- 6) Indiana Bat (*Myotis sodalis*) Draft Recovery Plan: First Revision (dated April 2007),
- 7) Reports and scientific literature on Indiana bat research conducted in the action area and elsewhere, and
- 8) Meetings, phone calls, e-mails, other written correspondence with FHWA, INDOT, and their consultants. A limited number of field visits and site investigations were also conducted by personnel from the Service's BFO.

In conducting our Tier 2 evaluation, we determined whether (1) this Section of the proposed project falls within the scope of the I-69 Tier 1 RPBO, (2) the effects of this proposed action are consistent with those anticipated in the Tier 1 RPBO, and (3) the appropriate Terms and Conditions associated with the Reasonable and Prudent Measures identified in the Tier 1 Incidental Take Statement (ITS) are being adhered to (See Appendix A and page 72 of Tier 2 BA). This document serves as the Tier 2 BO for Section 3 of the I-69 Project. As such, it also provides the anticipated level of incidental take and a cumulative tally of incidental take that has been exempted under the Tier 1 RPBO.

Road construction that will occur as part of this proposed project will also require a federal permit(s) from the U.S. Army Corps of Engineers (COE). However, issuance of the COE permit will not result in any impacts to Indiana bats beyond those addressed in this consultation with the FHWA. Therefore, the Service intends to provide a copy of this BO to the COE (and EPA, IDEM and IDNR) to demonstrate that the FHWA has fulfilled its obligations under section 7 of the Act to consult with the Service for Section 3 of the project.

CONSULTATION HISTORY

The proposed action has a background that encompasses several decades of planning and planning studies by INDOT and is outlined in Chapter 1 of the Tier 1 Final Environmental Impact Statement (FEIS) and the Tier 2 DEIS for Section 3 of the I-69 Project. A chronological summary of important consultation events and actions associated with this project is presented in the Tier 1 RPBO and is hereby incorporated by reference. A complete administrative record of this consultation is on file at the BFO.

BIOLOGICAL OPINION

I. DESCRIPTION OF THE PROPOSED ACTION

The Federal Highway Administration (FHWA) and the Indiana Department of Transportation (INDOT) are proposing to construct a 142-mile extension of I-69 from Evansville to Indianapolis, Indiana. A detailed discussion of the whole project is contained in the Tier 1 RPBO. In Tier 2 of the I-69 project's NEPA process, the Alternative 3C corridor selected in Tier 1 has been divided into six (6) sections:

1. From I-64 (near Evansville) via the SR 57 corridor to SR 64 (near Princeton/Oakland City)
2. From SR 64 (near Princeton/Oakland City) via the SR 57 corridor to US 50 (near Washington)
3. From US 50 (near Washington) via the SR 57 corridor and cross country to US 231 (near the Crane Division, Naval Surface Warfare Center (NSWC Crane))
4. From US 231 (near NSWC Crane) via cross country to SR 37 (south of Bloomington)
5. From SR 37 (south of Bloomington) via SR 37 to SR 39 (Martinsville)
6. From SR 39 (Martinsville) via SR 37 to I-465 (Indianapolis)

This Tier 2 BO for Section 3 of I-69 considers impacts associated with FHWA's and INDOT's preferred alternative to construct, operate, and maintain a new interstate facility within the Alternative 3C corridor in Daviess and Greene Counties, Indiana (Figure 1). The Proposed Action for Section 3 of I-69 includes the following:

- Acquisition of approximately 1,722 acres of right-of-way (ROW) of which roughly 85% is used as agricultural land,
- Mechanical clearing/grubbing/demolition of existing forest/vegetation and man-made structures from right-of-way (typically about 320 feet wide). Some construction-related debris may be burned on-site,
- INDOT contractors will follow safeguards established in INDOT's Standard Specifications (Section 203.08 Borrow or Disposal) that include obtaining required permits, and identifying and avoiding or mitigating impacts at borrow/disposal sites that contain wetlands or archaeological resources. Special Provisions will also include prohibiting tree clearing from April 1 to September 30 within the Summer Action Area of the Indiana bats, as identified in the Tier 2 DEIS for Section 3; and prohibiting the filling of wetlands outside the construction limits.
- Clearing of approximately 69 acres of forest and other trees (>3" diameter-at-breast height/DBH) from the right-of-way (ROW) while Indiana bats are not present (i.e., between 30 September and 1 April),
- Filling/converting of 5.03 acres of wetlands, including emergent (2.40 ac.), forested (1.45 ac.) and scrub-shrub (1.18 ac.),
- Impacting approximately 34,620 linear feet of stream habitat,

- Constructing approximately 25 miles of new, 4-lane interstate from US 50 at Washington to US 231 near Scotland (see Section 3 DEIS for specifications and typical cross-sections).
- Constructing two interchanges (SR 58 and US 231). The SR 58 interchange will be a full diamond interchange. The preferred alternative for the US 231 interchange will be a tight diamond interchange. The full US 231 interchange may not be constructed at the same time as the rest of the project.
- Constructing 12 stream crossings using bridges (see list in Tier 2 BA),
- Constructing 18 overpasses/grade separations (see list in Tier 2 BA),
- Constructing a rest area near Daviess County Road 1100 North; this rest area may be constructed at a later time as funding is available.
- Relocation of 18 residential dwellings, one home business, and two billboards,
- Construction of bridges incorporating wildlife crossings over First Creek and Doans Creek.
- Installation of conventional lighting at the SR 58 and U.S. 231 interchanges, as well as the proposed rest area. The light poles will be about 40 feet high and will use 250 or 400 Watt HPS lamps. No other lighting is anticipated for any other portions of Section 3.
- Construction of multiple new frontage roads, connector roads, turn-arounds, as well as reconfiguration of some existing roadways. For example, existing U.S. 231 will be relocated near the new interchange with I-69. (See Section 3 DEIS for details).
- Revegetation of disturbed areas will occur in accordance with INDOT standard specifications. Woody vegetation will only be used at a reasonable distance beyond the clear zone to ensure a safe facility. Revegetation of disturbed soils in the right-of-way, interchange areas, and medians will utilize native grasses and native wildflowers, where practical.
- Implementation of all mitigation and “Conservation Measures” detailed in the Tier 1 RPBO and Appendix D of the Tier 1 BA Addendum (measures pertaining to hibernacula do not apply to Section 3). A summary table of the I-69 Conservation Measures is provided in Appendix A.
- Proposed mitigation for impacts to forests and wetlands in Section 3 are as follows:

<u>Mitigation Commitment (ac.)</u>	<u>Description</u>	<u>Theme</u>
194.4*	Upland forest	Replacement
77.8*	Upland forest	Preservation
24.4	Forested wetland	Replacement
17.4	Emergent wetland	Replacement
7.2	Scrub-Shrub wetland	Replacement
18,702 linear feet**	Stream Channel	Replacement

Total 321.2 acres

* Forest mitigation commitment 3:1 with a minimum of 1:1 replacement and the remaining in preservation

** An additional 17,430 linear feet (45.3 ac.) of riparian habitat development/enhancement will be compensated for within the 194.4 acres of upland/riparian habitat development

- INDOT will monitor and oversee maintenance of Section 3 mitigation lands while they are being established. INDOT will monitor mitigation lands for a minimum of 10 years.
- Operation of the interstate will occur in phases as construction of sections and subsections are completed. Local access and traffic volumes and patterns will change over time as portions of I-69 become operational. Assuming all sections of I-69 are completed by the year 2030 as non-toll facilities, then traffic on some local roadways will appreciably decrease or increase (see DEIS chapter 5.6). For example, by 2030, traffic volumes on existing SR 57 south of Elnora would decrease by approximately 50% after I-69 is constructed (DEIS page 5-116).
- Section 3 of I-69 would be operated as a non-toll facility and thus no toll readers or other toll-collecting infrastructure will be installed along the interstate.
- Maintenance of the interstate will include the removal and disposal of roadkilled animals and trash, snow plowing, application of road salt and/or sand, and maintenance and mowing of right-of-ways,
- Over time, all sections of I-69 will need to be resurfaced/repaved and bridges will need to be repaired or replaced.

Project Schedule

Construction for Section 3 has not yet been scheduled. However, INDOT is moving forward with final designs for the entire section and it is anticipated that some portions may go to construction as early as 2011 with the entire section being complete by as early as 2016. While construction is anticipated to move forward there are some elements that may be deferred for later construction including the rest area, the full U.S. 231 interchange, and several local overpasses.

Mitigation

In May 2009, INDOT purchased the Cornelius property to fulfill their Section 3 mitigation commitments. Construction of mitigation features is currently underway on the property and is expected to be completed sometime in 2010. The site is located in southern Greene County, west of the town of Newberry. The site is bordered by the West Fork of the White River on the western and northern edges and farm fields around the remaining edges. The mitigation site consists of a total of 355 acres. Of these, approximately 328 acres are included in the Umbrella Mitigation Bank (UMB) for mitigating the I-69 Section 3 impacts. The proposed combined mitigation features will create a mosaic of wetland, riparian, and bottomland woods habitat within an area where the majority of the land is currently being farmed in row crop production providing very little natural habitat value.

INDOT will be responsible for monitoring and maintaining the mitigation area while it is being established, as well as addressing long-term management per the Cornelius Mitigation and Monitoring Plan. This parcel is being proposed as the only mitigation area needed for Section 3 impacts to the Indiana bat, forest impacts, and wetland impacts. See Appendix C of the Section 3 Biological Assessment for further details.

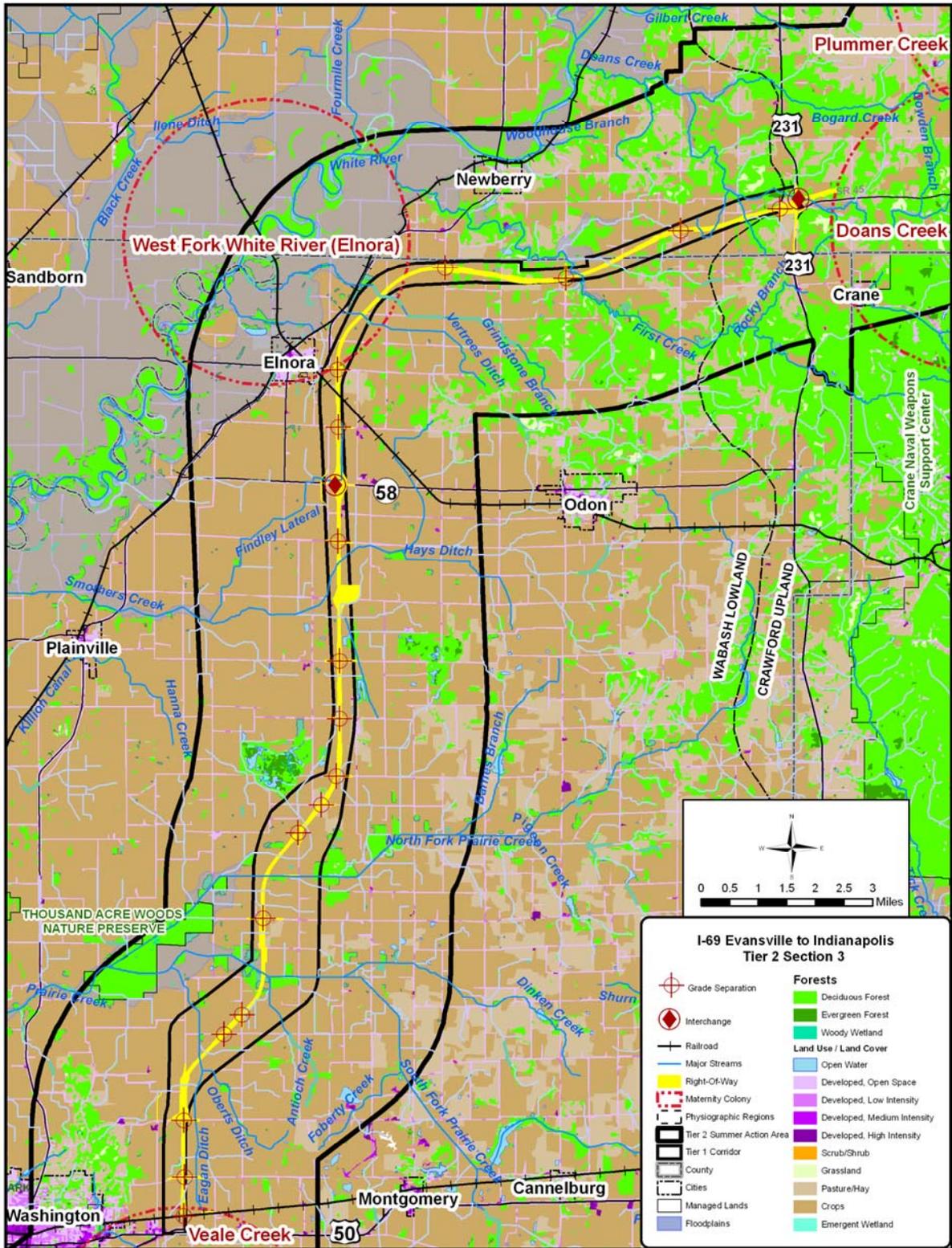


Figure 1. Preferred alignment for Section 3 of I-69, Indiana bat maternity colony areas and the Section 3 Expanded Summer Action Area.

Analytical Framework for Jeopardy Determinations

In accordance with policy and regulation, the jeopardy analysis in this Biological Opinion relies on four components: (1) the Status of the Species, which evaluates the Indiana bat range-wide condition, the factors responsible for that condition, and its survival and recovery needs; (2) the Environmental Baseline, which evaluates the condition of the Indiana bat in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the Indiana bat; (3) the Effects of the Action, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the Indiana bat; and (4) Cumulative Effects, which evaluates the effects of future, non-Federal activities in the action area on the Indiana bat. In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the proposed Federal action in the context of the Indiana bat's current status, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of the Indiana bat in the wild. The jeopardy analysis in this Biological Opinion places an emphasis on consideration of the range-wide survival and recovery needs of the Indiana bat and the role of the action area in the survival and recovery of the Indiana bat as the context for evaluating the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

II. STATUS OF THE SPECIES

Indiana bat species description, life history, population dynamics, status and distribution and threats are fully described on pages 38-54 of the Tier 1 RPBO and are hereby incorporated by reference. On 15 April 2007, the Service released the *Indiana Bat (Myotis sodalis) Draft Recovery Plan: First Revision* (USFWS 2007), which contains an excellent summary of the current status of the Indiana bat and is hereby incorporated by reference. Furthermore, since the April 2007 release of the Draft Recovery Plan, the Bloomington Field Office of the Service has collated the population data gathered during the 2007 and 2009 biennial winter hibernacula surveys throughout the range and preliminarily determined that the Indiana bat's 2009 range-wide population stands at approximately 391,000 bats, which is a 16.5% decrease over the 2007 range-wide population estimate of 468,000 bats (USFWS, unpublished data, 2009). The range-wide population estimate had been increasing since at least 2001, indicating that the species' long-term decline had perhaps been arrested and possibly reversed (USFWS 2007 and USFWS, unpublished data, 2007). The observed decline in 2009 is partly attributable to the disease White-nose Syndrome (see discussion below), specifically for decreased population estimates in the Northeast. The species' range-wide, regional, state, and hibernacula-specific population trends are being closely monitored by the BFO.

Given the 2009 range-wide Indiana bat population estimate of 391,000, we assume that there are approximately 2,445 to 3,260 maternity colonies throughout the species' entire range [assuming a 50:50 sex ratio (Humphrey et al. 1977) and an average maternity colony size of 60 to 80 adult females (Whitaker and Brack 2002)].

Species Recovery

The existing recovery program for the Indiana bat focuses on protection of hibernacula (USFWS 1983). The proposed recovery program has four broad components: 1) range-wide population

monitoring at the hibernacula with improvements in census techniques; 2) conservation and management of habitat (hibernacula, swarming, and to a degree, summer); 3) further research into the requirements of and threats to the species; and 4) public education and outreach (USFWS 2007). This recovery program continues to have a primary focus on protection of hibernacula but also increases the focus on summer habitat and proposes use of Recovery Units.

Recovery Units

The Service's proposed delineation of Recovery Units relied on a combination of preliminary evidence of population discreteness and genetic differentiation, differences in population trends, and broad-level differences in macrohabitats and land use. When Recovery Unit delimitations suggested by these factors were geographically close to state boundaries, the Recovery Unit borders were shifted to match the state boundaries in order to facilitate future conservation and management. The Indiana Bat Draft Recovery Plan proposes four Recovery Units for the species: Ozark-Central, Midwest, Appalachian Mountains, and Northeast (Figure 2) (USFWS 2007).

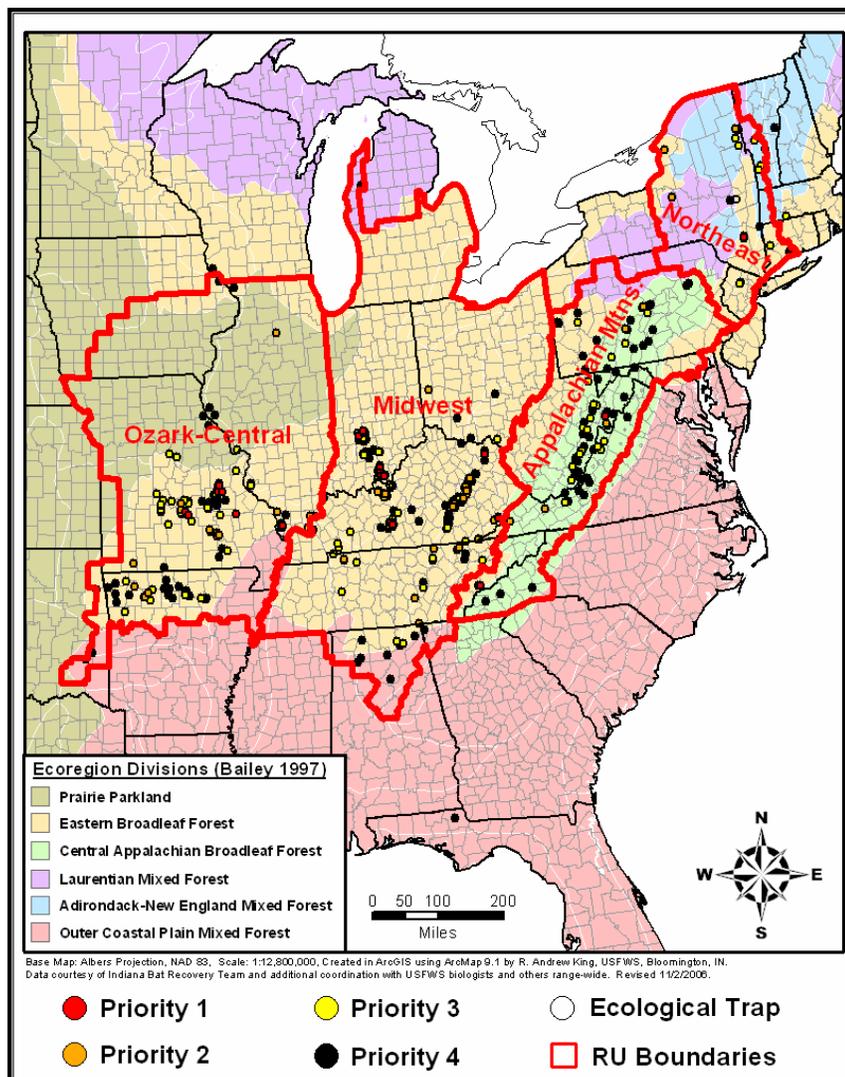


Figure 2. Proposed Indiana bat Recovery Units (Service 2007).

Population estimates for the proposed Midwest Recovery Unit in 2008-2009 were near 262,000; this accounts for two-thirds of the Indiana bat population.

As of the winter of 2008-2009, the State of Indiana's 37 hibernacula harbored approximately 190,000 Indiana bats (49% of world-wide population) (USFWS, unpublished data, 2009). In 2009, three of the top four most populous Indiana bat hibernacula were located in Indiana, with Ray's Cave in Greene County being the most populous (n=48,657 bats), followed by Wyandotte Cave in Crawford County (n=45,516 bats) and Jug Hole Cave in Harrison County (n=36,067 bats).

New Threats

Recently a new threat has emerged with serious implications for the wellbeing of North American bats, including the Indiana bat. White-nose Syndrome (WNS) was first documented in a photograph taken in a New York cave in February 2006. Since that time, over 30 sites in nine states (New York, Massachusetts, Vermont, New Hampshire, Connecticut, Virginia, West Virginia, Pennsylvania, and New Jersey) have been documented with WNS, including known Indiana bat hibernacula. In some affected hibernacula in New York and New England, 90 to 100 percent of the bats have died. Some scientists estimate that WNS has killed more than a million hibernating bats (Bat Conservation International 2009).

WNS has been characterized as a condition primarily affecting hibernating bats. Affected bats usually exhibit a white fungus on their muzzles and often on their wings and ears as well (Blehert et. al. 2009). Some affected bats may display abnormal behavior including flying during the day and in cold weather (before insects are available for foraging) and roosting towards a cave's entrance where temperature and humidity are less stable. Many of the affected bats appear to have little-to-no remaining fat reserves which are necessary to survive until spring emergence. Recently the fungus associated with WNS has been identified as a previously undescribed species of the genus *Geomyces* (named *G. destructans*) (Gargas et. al. 2009). The fungus thrives in the cold and humid conditions of bat hibernacula. It is unclear at this point if the fungus is causing the bat deaths, or if it is secondary to the cause of death. The mode of transmission is currently unknown, although biologists suspect it is primarily spread by bat-to-bat contact. In addition, people may unknowingly contribute to the spread of WNS by visiting affected caves.

Currently, WNS appears to be restricted to sites primarily within the proposed Northeast Recovery Unit, as well as several sites within the proposed Appalachian Mountain Recovery Unit. The fungus has been confirmed in eastern pipistrelle, little brown, small-footed, northern long-eared, big brown and Indiana bats. There are many factors regarding WNS that are unknown at this point including if there are species' differences in susceptibility and mortality, how long symptoms may take to manifest, and the long-term effects. Meanwhile, the FWS, States and multiple researchers are continuing to learn more about the disease and options for minimizing its impacts. To date, no WNS has been documented in the proposed Midwest Recovery Unit.

III. ENVIRONMENTAL BASELINE

The environmental baseline for Indiana bats and their habitat in the I-69 Action Area, including Section 3, was fully described on pages 59-79 of the Tier 1 RPBO and is hereby incorporated by reference. Additional baseline information is presented in the Tier 2 DEIS for Section 3 (see Chapter 5 – Environmental Consequences). The following information analyzes the effects of past and ongoing environmental factors affecting Indiana bats and establishes the status of the species within the Section 3 Action Area.

Action Area

“Action area” is defined by regulation as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR § 402.02). The action area is not limited to the “footprint” of the action nor is it limited by the Federal agency’s authority. Rather, it is a biological determination of the reach of the biological, chemical and physical impacts associated with the proposed action. In the RPBO, the Service stated that the Action Areas may need to be expanded or otherwise refined in subsequent Tier 2 BAs as the anticipated reach of direct and indirect effects of each section of I-69 are more clearly recognized and understood. Because INDOT’s Tier 2 analyses for Section 3 (see Figure 5.3-8 in Section 3 DEIS) indicated that I-69 would likely cause/induce some indirect development in Traffic Analysis Zones (TAZs) beyond the 2.5-mile buffer/boundary of the Indiana bat Summer Action Area (SAA) defined in Tier 1, the Service requested that INDOT and FHWA expand the SAA for Section 3 to include these additional areas and INDOT and FHWA agreed (i.e., the “Expanded SAA”; Figure 1). See page 32 of the Tier 1 RPBO for a detailed discussion of the I-69 Action Areas and pages 26-28 of the Section 3 Tier 2 BA for additional rationale behind the expanded Action Area for Section 3.

Indiana Bats within the Section 3 Summer Action Area

The sites nearest to the Section 3 Summer Action Area that are designated as critical habitat for the Indiana bat are located approximately 15 miles to the northeast (Ray’s Cave in Greene Co.) and over 60 miles to the southeast (Wyandotte Cave in Crawford Co.) of Section 3 of I-69 and therefore are not within the Section 3 action area.

Maternity Colonies within the Section 3 SAA

West Fork White River Elnora Maternity Colony (Elnora Maternity Colony)

One Indiana bat maternity colony, the Elnora Maternity Colony, is known to be present in the SAA of Section 3 based upon surveys performed in 2004 (Figure 1). A total of 13 Indiana bats were captured within Section 3 in 2004. This included three pregnant females, four lactating females, four adult males, and two juvenile males. Five of the Indiana bats captured were within the Elnora Maternity Colony area (four lactating females and one juvenile male), the remaining eight were associated with a bridge over the West Fork of White River. The bridge is not believed to be a maternity colony, rather a day and night roost for the Indiana bat. Six Indiana bats were radio-tagged and as a result four roosts were identified (including the bridge as a roost). Mist netting efforts in 2005, which focused on the areas where Indiana bats were captured in 2004, did not capture any Indiana bats. The Elnora maternity colony was delineated

by a 2.5 mile radius circle centered around a point placed between three secondary roosts and three mist net sites of Indiana bat captures in 2004. As of 2006, both roost trees identified in 2004 were still standing and in good condition (J. DuPont, BLA, pers. comm.).

The Tier 1 BA Addendum and RPBO characterized habitat conditions for the Elnora Maternity Colony and the Tier 2 BA for Section 3 (pages 32-36) also characterizes habitat surrounding the Elnora Maternity Colony.

Based on the minimum colony estimates generated during I-69 Tier 2 studies and other Indiana bat studies within Indiana (see Whitaker and Brack 2002), the Service assumes that each maternity colony likely contains 80 adult females plus their single offspring. This would result in a maximum of 160 bats per colony by mid- June when the young are born and when they become volant (i.e., capable of flight) around mid-July.

No additional maternity colonies are known to occur in the Section 3 SAA or the Expanded SAA; however, there is a very slight overlap in the newest right-of-way design for Section 3 in both the Veale Creek Maternity Colony (Section 2) and the Doan's Creek Maternity Colony (Section 4). To preserve clarity and avoid duplicating impact results, the impacts of these small areas of the Section 3 right-of-way will be counted and addressed in the Tier 2 BAs prepared for Section 2 and Section 4, respectively.

Adult Males within the Section 3 SAA

A total of four adult male Indiana bats were captured during mist net surveys within the originally defined Section 3 SAA on May 26 and August 3, 2004 (no Indiana bats were mist-netted in Section 3 in 2005). These males were associated with a bridge in the Section 3 SAA and were not found within the maternity colony area. Based on this and because forested portions of the Expanded SAA were not surveyed for bats in 2004 and 2005, the Service will assume that a small number/low density of adult male Indiana bats may occur in these areas. No other Indiana bats were found during surveys of other bridges within Section 3 and no Indiana bat winter hibernacula are known to occur within the Section 3 action area (i.e., within a 5-mile buffer zone of the preferred Section 3 alignment for I-69).

Indiana bat use of a bridge in the Section 3 SAA

Out of the 259 bridges and culverts located within the overall I-69 SAA that were surveyed during 2004 and 2005, only one bridge, located in Section 3, was found to have roosting Indiana bats. In 2004, little brown bats (*M. lucifugus*), big brown bats (*Eptesicus fuscus*) and federally endangered Indiana bats were found roosting under this bridge. This included three pregnant females, four adult males, and one juvenile male. In 2005, nine Indiana bats were observed under the bridge on August 13 during the day, and six at night. More recently, studies have indicated that Indiana bats occasionally use the bridge during the summer, and more commonly roost at the bridge during the fall and spring migration period (See Appendix E of the Section 3 Tier 2 BA). In 2006 and 2007, as many as 76 and 40 Indiana bats, respectively, were observed roosting at the bridge at one time. These peaks were in October and September. In 2008, 29 Indiana bats were observed on July 17, and 20 on September 10. It is thought that the bridge serves as a day/night roost, a migratory stop-over for the Indiana bat, and possibly a mating site (Cervone et. al., unpublished data 2008). It is assumed that the female Indiana bats found using this bridge during the summer were associated with the Elnora maternity colony.

General Habitat Conditions

Habitat Conditions of the Section 3 Expanded Summer Action Area

In order to evaluate the anticipated reach of direct and indirect effects, the original SAA has been expanded to include those areas where growth induced by the construction and operation of the project is reasonably foreseeable. Estimated forest cover within the Section 3 Expanded SAA is summarized below in Table 1. This information is based on satellite images of Section 3 taken in 2001 (land use coverage made available by USGS in late 2006) as well as field data verified by the Engineering and Environmental Assessment Consultants (EEAC) who prepared the Section 3 DEIS. INDOT's primary I-69 consultant, BLA, has provided the Service with more up-to-date forest coverage data for the Tier 2 analyses and thus the forest acreages reported in this Tier 2 BO supersedes those previously reported in the Tier 1 RPBO and Tier 1 BA Addendum. Note that the "tree cover" estimates previously reported for each of the 13 maternity colonies in the SAA and the hibernacula within the WAA in the documents above were based on 2003 aerial photos made available via the National Agricultural Imagery Program (NAIP) which have a much greater resolution (5m) than the USGS data. The 2006 USGS forest cover data, the 2003 tree cover estimates in the Tier 1 BA Addendum, field verification information produced by the EEACs, and images accessed via Google™ Earth represent the best available data for purposes of this consultation.

The Service will use the forest data summarized in Table 1 as an approximate baseline of currently existing forest habitat available within the Section 3 Expanded SAA. Based on the amount and distribution of core and edge forest and degree of connectivity among forest patches (see BA Addendum), the majority (at least 2/3) of the forest habitat within the expanded SAA, approximately 14,170 acres (including the maternity colony area), represents moderate to high quality roosting and foraging habitat for Indiana bats (including those areas within the TAZs predicted to incur additional growth near the U.S. 231 interchange). We believe this is a reasonable characterization of habitat because the project is within the core of the Indiana bat's maternity range and based on GIS-based analyses presented in the BA Addendum, field data derived from forest plots and transects collected by BLA (see below) and review of aerial photographs (e.g., via Google™ Earth).

I-69 Project Section Number	Total Acres within Expanded SAA (includes maternity colony area)	Total <u>Forested</u> Acres within Expanded SAA (includes maternity colony)	Percent of the Expanded SAA that is Forested (includes maternity colony)
3	88,726	14,170	16%

Table 1. Estimated amount of forest within the defined Expanded Section 3 Summer Action Area.

Key parameters that may affect the quality of the summer habitat for bats within the action area are the overall percentage of forest cover in a specified area, the size of existing forest patches, and the degree of connectivity among forest patches. Based on a thorough review of literature on Indiana bat summer habitat, Rommé et al. (1995) concluded that areas with less than 5%

deciduous forest coverage will not support summering Indiana bats. Localized areas considered as optimal habitat tend to have greater than 30% forest cover.

Based on the GIS analysis conducted by BLA using 2006 USGS data (2001 satellite imagery), the percentage of forest cover in the Elnora Maternity Colony area is approximately 9.7% (2.5-mile radius area = 12,566 acres). Approximately 10% of the colony area contains “tree cover”. The remaining Expanded SAA (excluding the maternity colony area) is approximately 17% forested.

The current number of total tree cover “patches” for each of the original 13 maternity colony areas in the Alternative 3C corridor of I-69 ranges from 53 patches in the Plummer Creek Colony to 421 patches in the Pigeon Creek Colony (Colony #1). Generally, a higher number of patches translates to more fragmentation and lower connectivity. Few large class patches, with no mid-size patches and then a scattering of very small patches suggests a high level of connectivity. GIS-based maps depicting tree cover patches and degree of connectivity within the Elnora Colony are in Appendix A of the Tier 1 BA Addendum and are hereby incorporated by reference.

Other analyses of Tier 2 Forests, created from USGS (2001) and EEAC forest data, found 88 forest tracts totaling 2,444 acres of core forest were available in the Remaining Expanded Section 3 Summer Action Area (area not including maternity use areas) in Section 3. This is a substantial increase from the 543 acres of core forest reported available in the Tier 1 BA Addendum using the Tier 1 Remaining Summer Action Area and 1990 USGS data.

Existing Forest Habitat Conditions within the Preferred Alternative Alignment

To better characterize the forest maturity (i.e., diameter of tree trunks at breast height - DBH), tree species composition, sub-canopy conditions (i.e., degree of vegetative clutter and presence/absence of invasive plant species), and amount of currently available roosting habitat (i.e., number/size/density of suitable snags with exfoliating bark) within the woodlots that will be directly impacted by the preferred Section 3 alignment of I-69, BLA staff conducted surveys along 22 linear transects. These 22 transects were approximately 60 feet wide and ranged from 210 feet to 1,720 feet in length. Eleven of the transects were within the proposed right-of-way and accounted for a total of 13.6% of the 69 acres of forest habitat (9.4 acres) that will be directly impacted. For comparison, the other eleven transects were within the same woodlots, but outside of the proposed alignment. These samples totaled 9.6 acres. The transects are assumed to be representative of the existing forest habitat conditions within the whole 69 acres. The resulting snag characteristics and projected snag estimates for Section 3 are presented in Table 2.

BLA estimated the diameters of upper canopy dominant trees along the transects and estimated the percentage of trees that fell into each of three different size classes: small (<9”), medium (9”-18”), and large (>18”) trees. As expected, there was very little difference in the size distribution of trees between transects that were within the alignment and those outside the alignment. On average, transects surveyed within the alignment had 38% small, 49% medium, and 13% large trees. For transects surveyed outside the alignment, there were 46% small, 44% medium, and 10% large sized trees. The majority of trees both inside and outside the alignment had small to medium-sized diameters (less than or equal to 18” DBH) indicating that most of the woodlots that will be directly impacted by I-69 in Section 3 are relatively young, second-growth stands that had been previously harvested.

In regards to their quality as foraging habitat, 14 of the 22 transects were categorized as having ‘moderate’ or ‘dense’ understory vegetation, a characteristic that can deter foraging Indiana bats, which prefer more open understory conditions. Japanese and/or bush honeysuckle (*Lonicera* spp.), highly invasive plant species that form dense thickets in the understory of woodlots, were present in eight of the surveyed transects. These species, if left unchecked, can take over and quickly lead to low quality bat foraging habitat. Based on our review of the best available data, it appears the majority of the 69 acres that will be permanently lost to construction of I-69 in Section 3 is currently of low to moderate quality for roosting and foraging Indiana bats. The forests within the most northeastern portion of the section appear more suitable for Indiana bats than other areas of Section 3.

Characteristics	Transects within Alignment	Transects Outside Alignment
Total number of snags ($\geq 9''$ DBH) within transect (approx. 60' wide x variable length)	52	46
Average diameter of snags (inches)	13.9	11.9
Median diameter of snags (inches)	12	12
Range of snag diameters (inches)	9 – 42	9 – 19
Total area sampled within transects (acres)	9.4	9.6
Density of snags in transect area (snags/acre)	$52/9.4 = 5.5$ snags/acre	$46/9.6 = 4.8$ snags/acre
Estimated total number of snags ($\geq 9''$ DBH) that will be cleared within footprint of Preferred Alternative Alignment for Section 3 of I-69 (5.5 snags/acre x 69 impacted acres)	380 snags	
Very rough estimate of total number of snags ($\geq 9''$ DBH) that may be present in forested areas of Section 3 Remaining SAA (11,688 acres) and Remaining Expanded Section 3 SAA (12,943 acres) (an average of 5.15 snags/acre was used)	Remaining SAA = 60,193 snags Remaining Expanded Section 3 SAA = 66,654 snags	
% of estimated number of snags in Section 3 SAA that would be directly impacted by I-69 (using an average of 5.15 snags/acre)	Remaining SAA = 0.59 % Remaining Expanded Section 3 SAA = 0.53%	

Table 2. Snag sizes, densities, and estimated totals based upon line transect surveys conducted within and adjacent to woodlots that will be directly impacted by Section 3 of I-69 (note: no direct forest impacts are anticipated within the maternity colony area).

Ongoing Stressors in the SAA

The following State, local, and private actions within the SAA are likely adversely affecting Indiana bats to variable degrees, and are likely to continue into the reasonably foreseeable future: 1) loss and degradation of roosting and foraging habitat, 2) commercial and private timber harvesting, 3) cutting of snags, 4) degradation of water quality, and 5) roadkill along existing roadways. Stressors specific to the Section 3 SAA include surface coal mining, growth at the West Gate at Crane Technology Park and legal drain maintenance.

The baseline acreages (e.g., % tree cover), habitat conditions, and general ongoing stressors of the Elnora Colony are discussed on pages 73-75 of the Tier 1 RPBO and are hereby incorporated by reference (note that the forest data presented has since been revised). No additional losses of forest habitat within the Elnora Creek Maternity Colony Area or remaining SAA are presently known. Data from the U.S. Forest Service, North Central Research Station’s 2005 report

“Indiana Forests: 1999-2003, Part A” indicate that while there has been a loss of continuous forests (resulting in smaller, more fragmented stands), there has been an overall increase in forested land across the state.

IV. EFFECTS OF THE ACTION

Based on our analysis of information provided in your 27 July 2009 Tier 2 BA for Section 3 of I-69, we have determined that the adverse effects of the proposed action are consistent with those contemplated in the 24 August 2006 Tier 1 RPBO. Therefore, the previous discussion of adverse effects and incidental take analyses on pages 81-91 and Appendices A and B of the Tier 1 RPBO remain valid and are hereby incorporated by reference. No additional adverse effects beyond those discussed in the Tier 1 RPBO are anticipated from the Proposed Action. Both the harmful and beneficial effects of the “Tier 2 BA” estimated impacts and proposed mitigation acreages were taken into consideration for both our incidental take and jeopardy analyses for this Tier 2 BO. Anticipated effects are summarized below.

The total forest loss (approximately 67 acres upland forest + 1.5 acres forested wetland) anticipated from the preferred alignment is estimated to be 69 acres, which is approximately 40% less than estimated in the Tier 1 RPBO. The 69 acres of forest is composed of portions of approximately 14 different woodlots crossed by the proposed alignment (See Section 3 Tier 2 BA, Appendix B). Because FHWA and INDOT were largely successful in avoiding and minimizing impacts to forest habitat, most impacted woodlots in Section 3 will lose only a small portion of their total area, often along their periphery. One small woodlot (approximately 4.5 acres) near County Road 750 North will be nearly completely lost. Given the relatively high degree of forest fragmentation and generally isolated distribution of existing woodlots in the majority of Section 3, the Service anticipates that Indiana bats are most likely to use/cross over the proposed 25.3 mile interstate within the last four to five miles of Section 3, closer to the proposed U.S. 231 interchange where more heavily wooded areas exist along the proposed alignment. Therefore, not all of the 69 acres that will be removed for construction of the preferred alignment is likely to serve as Indiana bat habitat. No forests within the maternity colony use area will be directly impacted and less than one acre of tree cover in the colony use area will be impacted.

In July 2007, BLA staff surveyed trees along 22 transects within eleven of the largest woodlots that would be impacted by Section 3 of I-69 (See Environmental Baseline Section for details). Based upon their findings, it is estimated that approximately 380 currently existing snags (i.e., dead trees >9” in diameter with exfoliating bark that may serve as potential primary roost sites for Indiana bats) may be destroyed within the 69 acres that will permanently cleared for construction of I-69 (Table 2). Even though most of the surveyed woodlots did have some snags/potential roost trees the overall quality of the woodlots as roosting habitat was variable. Furthermore, only a fraction of these snags, those with direct solar exposure (along edges or within canopy openings), are likely to be suitable as potential maternity roost trees.

Effects and Risks to Local Bat Populations in the Section 3 SAA

Elnora Maternity Colony The proposed alignment for Section 3 of I-69 crosses a small piece of the southeastern most portion of the colony’s probable use area (Figure 1). Because there is no connectivity between the original capture and known roosting sites and the preferred alignment, no direct impacts are anticipated to these bats (e.g., roadkill) or their habitat. The preferred

corridor for Section 3 will not directly affect the forest habitat within the center of the assumed maternity colony use area (Figure 3). At its closest point, I-69 will be approximately 2.1 miles from the assumed center of maternity use area. Similarly, the nearest forest habitat that will be directly impacted is approximately 1.8 miles from an original bat capture site. Because Indiana bats typically avoid crossing large open fields and have a strong tendency to travel and forage along forested edges (FWS 2007), there is a greatly reduced potential that bats in this particular colony will travel the relatively long (ranging from 6.6 – 13.9 miles from original capture sites and/or roost trees), indirect paths along forested corridors to reach forest patches near, within, and across the proposed interstate alignment (Figure 3 and Table 3).

The Service originally had some concern that anticipated, I-69 induced, private development could cause a loss of forest habitat or otherwise cause take of Indiana bats in the TAZs nearest the colony. However, for reasons clearly explained in the Tier 2 BA, FHWA, INDOT, and their local panel of land use experts do not believe that it is likely for I-69 induced residential or commercial growth to occur in forested portions of TAZs in the Expanded SAA in Section 3. Because direct take is extremely unlikely and induced development is not reasonably certain to occur in forested habitat, the Service does not anticipate that the Elnora Colony will be displaced or experience any I-69 related take.

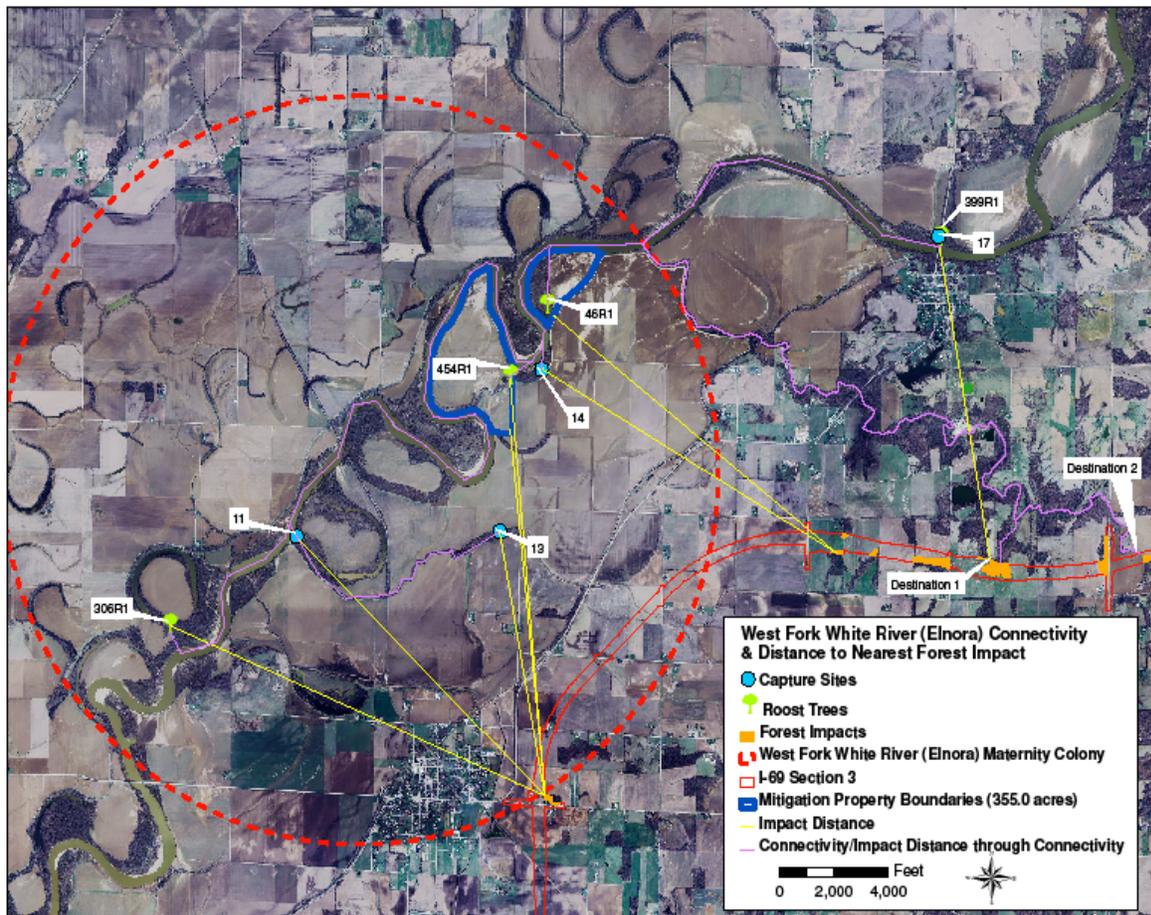


Figure 3. Potential Indiana bat flight path along forested corridors from Elnora Colony to I-69 alignment, mitigation sites, and forest impacts.

Connectivity and Distance to Impacts from known Indiana bat Roost Trees and Indiana bat Capture Points					
West Fork (Elnora) White River Maternity Colony					
<i>Site</i>	<i>Connectivity Routes to I-69 (miles)</i>		<i>Straight-line Distance to Impacts (miles)</i>	<i>Distance to Impacts through Connectivity Routes (miles)</i>	
Roost Trees					
	Destination 1	Destination 2		Destination 1	Destination 2
306R1	13.5	14.6	2.9	13.5	14.6
399R1	8.1	9.2	2.1	8.1	9.2
454R1	7.4	8.5	2.8	7.4	8.5
46R1	6.6	7.8	2.5	6.6	7.8
Capture Sites					
11	12.1	13.2	2.5	12.1	13.2
13	13.9	15.1	1.8	13.9	15.1
14	7.2	8.3	2.4	7.2	8.3
17	8.1	9.2	2.1	8.1	9.2

Table 3. Connectivity and Distance to Impacts from Indiana bat roost and capture points.

Furthermore, once I-69 becomes operational, local travel patterns will change and some night-time traffic volume will be diverted off of local highways and onto I-69. Because the current unknown rate of roadkill on existing roadways in Section 3 (e.g., nightly traffic on SR 57) should fall once I-69 becomes operational, the overall or net effect of I-69 on roadkill of Indiana bats in the Section 3 SAA may be insignificant.

Regarding the potential for I-69 to spur induced development in Section 3, the Section 3 BA states (page 54):

“Farmland, forest, wetlands, and streams are the possible resources that the project’s indirect land use changes would affect. However, further analysis of the percent of forests, wetlands, and streams compared to the percent of farmlands in the induced growth TAZs suggested that the land converted would be agricultural land. For example, almost all of the land in the TAZs that are expected to have growth near the US 50 and SR 58 interchanges near the middle and high school is agricultural. Most of the induced growth in Section 3 is expected around the US 50 area. For example, in two of the more forested TAZs, numbers 2803203 and 1402704 near US 231 in Daviess and Greene counties, 40.3% of the combined land is forest but there are still 431 acres of agricultural land available for the projected 14.8 acres of induced development. Collectively in the TAZs that are anticipated to experience induced growth, agriculture is the predominant land use (See Table 5.24-1). Therefore, given the abundance of available agricultural land in the more desirable locations, it is reasonable to assume that, in the foreseeable future, any land required for development will be converted from agricultural land. By comparison, land requiring extraordinary site preparation or permitting through a time-consuming and often expensive process presents an economic disadvantage and is undesirable to a developer.”

The Service gives deference to the “expert land use panel” on the issue of where induced development is most likely to occur in Section 3. Thus, we do not anticipate any incidental take of Indiana bats in Section 3 as a result of induced development (145 acres) in forested areas.

In Table B1 in Appendix B of the Tier 1 RPBO, the Service deconstructed the Proposed Action and summarized the anticipated direct and indirect environmental consequences and likely

responses of exposed Indiana bats. After reviewing the Section 3 BA and conducting the formal consultation for Section 3, the Service has concluded that applicable information within Table B1 remains valid for Section 3 of I-69. In addition to project elements assessed in Table B1, the Service also considered potential adverse effects from the following anticipated indirect I-69 related actions in Section 3: induced construction/operation of new cell towers and commercial billboards (lighted and unlighted) along I-69. Because open agricultural land is so plentiful in Section 3, the Service does not anticipate that any new cell towers or billboards are likely to be sited/constructed in currently forested areas in Section 3 and therefore no additional forest loss is anticipated for these related actions (see Appendix B for additional discussion and map).

In summary, the following outcomes are anticipated for the Elnora Maternity Colony:

- Direct habitat modification/loss will be insignificant (< 1 acre). It is also unlikely that this maternity area would experience any long-term decrease in quality of roosting or foraging habitat as a direct result of I-69.
- Seasonal tree-cutting restrictions will ensure no direct impacts/take occurs from the construction of I-69 during the maternity colony season. INDOT has also extended this restriction to include all borrow areas used by construction contractors.
- Indirect loss of forest or wetland habitat from residential and commercial development is not anticipated in Section 3.
- Direct impact from vehicle collision is not anticipated based on a lack of habitat connectivity to the interstate alignment.
- No take is anticipated from the loss of a primary or alternate roost tree.
- This maternity colony has access to ample additional habitat that is available nearby in the unlikely case that some individual bats should become displaced from their traditional foraging/roosting areas.
- I-69 may not induce a significant amount of residential/commercial development in currently forested areas, but it may speed up the rate of development that otherwise would have occurred within the SAA at a slower rate, particularly in the immediate vicinity of and within easy commuting distance of Section 3 interchanges (neither of which are within the maternity colony area).
- Proposed forest, wetland, and stream mitigation within the maternity area will result in a net gain of forest and wetland habitat and ensure that at least 328 acres of suitable roosting and foraging habitat persists in this area in perpetuity (Figure 3).

It is unlikely there will be any direct or indirect adverse impacts to individuals of the Elnora Maternity Colony and the colony is likely to persist within the SAA into the reasonably foreseeable future following construction, operation, and maintenance of the I-69 project. Furthermore, with successful implementation and maturation of the proposed mitigation on the 328-acre parcel in Greene County, and all of the other proposed mitigation efforts and conservation measures, we anticipate that long-term habitat conditions for this maternity colony will be sustainable and may exceed currently existing conditions.

Adult Males

In the Tier 1 RPBO, we estimated that a maximum of 50 adult males may be taken by the year 2030 as a result of the entire I-69 Proposed Action with the majority (60%) occurring as roadkill,

particularly for males remaining within the Winter Action Area (WAA) during the summer. Ten adult males were estimated to be taken in the entire portion of the I-69 SAA corridor extending outside of the WAA to the north and south.

Several adult males were captured within the originally defined SAA for Section 3 at a bridge in the northern part of the section. Furthermore, a small number of adult males may occur in forested habitat within the Expanded SAA and other forested areas where no bat surveys were conducted. These males may be at risk of colliding with vehicles.

Roadkill

The preferred alignment passes through a more forested portion of the section south of Newberry and near the proposed U.S. 231 interchange. Once Section 3 of I-69 is operational, fast-moving vehicles may strike bats as they fly across the interstate at night between the months of April and November. We are uncertain how or whether Indiana bats currently travel across or parallel to the proposed interstate alignment or whether they avoid the area entirely. Assuming that some individual bats do and will continue to use this area (primarily males), we anticipate a small number of bats will be struck by vehicles and killed. In addition, based on the DEIS for Section 3 (page 5-115 to 117), traffic volume in the vicinity of the bridge being used by bats in this Section is predicted to slightly increase (2%) once I-69 becomes operational, increasing the likelihood of roadkill in this area. Traffic volume is also predicted to increase along U.S. 231 near the proposed interchange.

The only form of incidental take of Indiana bats that is anticipated in Section 3 is:

- death/kill from direct collision with vehicles traveling at high speeds (i.e., roadkill) on I-69 and/or by increased traffic volumes on other local roadways (e.g., U.S. 231 and SR 57).

Given the low density of Indiana bats within the remaining SAA (outside of the maternity colony area), we anticipate the total number of bats that may be taken as a result of the Proposed Action in the Section 3 SAA to be less than 5 individuals between the years 2013 and 2030, or 1 bat every three and a half years, as a result of roadkill. The potential loss of this very small number of bats will have no measurable or significant short or long-term impacts on local or regional Indiana bat populations in the SAA, Midwest Recovery Unit or beyond.

Effects on Habitat Quality

In addition to direct habitat loss (69 forested acres and 3.6 non-forested acres), proposed actions may result in a decrease in the quality of remaining habitat within the Action Area. Factors that may lead to a loss in the quality of remaining habitat include: increased habitat fragmentation; increased human disturbance (e.g., more lighting associated with road improvements, increased traffic and associated noise levels); foraging habitat over culverted or relocated streams will be relatively poor until the aquatic community becomes re-established; and water quality in the Action Area may be negatively impacted, at least in the short term during construction activities, and potentially to some degree over the long-term from road salts, motor oil, and various hazardous materials leaked during traffic accidents. Over time, it is expected that fragmentation of habitat in some portions of the Action Area will increase as new indirect development occurs particularly near proposed interchanges. However, as the mitigation plantings mature into suitable Indiana bat habitat this will be, at least, partially compensated.

Increased human presence/disturbance in the project area may affect the quality of summer bat habitat, but these effects are expected to be relatively minor. Some Indiana bats in the SAA that have not previously been exposed to artificial lighting, high noise levels and highway traffic may initially avoid habitat near I-69 or use it to a lesser extent (pers. comm. with D. Sparks, Indiana State University, 2007), but this will probably only be a relatively minor adverse effect of the project. No incidental take is anticipated from the additional lights and traffic noise levels that will occur with the operation of Section 3 of I-69.

During construction, water quality may be temporarily adversely affected in Section 3 streams (e.g., increased siltation) where Indiana bats drink and presumably obtain a small portion of their insect prey. Once operational, Section 3 streams/legal drains will receive roadway runoff containing salts (applied by INDOT maintenance staff) and other vehicular-based contaminants, which may further degrade their current conditions, which in some cases are already of poor quality. Anticipated adverse impacts to water quality will be addressed in erosion control plans that INDOT will be implementing during all construction activities, which will help alleviate short-term sedimentation impacts on aquatic insect communities. Because the bulk of the Indiana bats' prey base is made up of terrestrially based insects (i.e., not aquatic-based, Tuttle et al. 2006), short and/or long-term adverse effects to local water quality are not likely to rise to a level where incidental take of Indiana bats is reasonably certain to occur.

Effects of Avoidance, Minimization and Mitigation Measures

The FHWA and INDOT have incorporated measures into the proposed project design to avoid, minimize and mitigate the impacts of the project to the extent practical. Proposed avoidance, minimization and mitigation procedures are discussed in the Revised Tier 1 Forest and Wetland Mitigation and Enhancement Plan (see Appendix D of the Tier 1 BA Addendum), the Section 3 Tier 2 Cornelius Mitigation and Monitoring Plan (see Appendix C of the Section 3 Tier 2 BA), and the Conservation Measures section of the Tier 1 BA Addendum and are hereby incorporated by reference. A summary of the proposed Conservation Measures and their current implementation status is provided in Appendix A of this BO.

To minimize and mitigate impacts to bats due to habitat loss in Section 3, existing high quality forested habitat suitable for Indiana bat foraging and roosting, as well as areas suitable for restoration, were identified within the SAA. In May, 2009 the State purchased a mitigation site as part of the I-69 Sections 2 and 3 Umbrella Mitigation Bank (UMB) and initiated restoration activities (See Appendix C of the Section 3 Tier 2 BA).

The Cornelius Mitigation Site is located in southern Greene County, west of the town of Newberry, and near the point where CR 700 South meets the White River. The site is bordered by the West Fork of the White River on the western and northern edges and farm fields around the remaining edges. The proposed mitigation site is located in the Lower White 8-digit watershed (HUC ID 05120202) and the entire site is within the 100-year floodplain of the West Fork of the White River. One of the unique properties of this mitigation site is the fact that the White River forms the majority of the property boundary. The perimeter property boundary of both tracts comprising this mitigation site totals nearly 24,000 linear feet, over 17,430 linear feet of which borders the river.

The mitigation site consists of two tracts, one is approximately 258 acres and the second is approximately 97 acres. Of these 355 acres, approximately 328 acres is included in the UMB for mitigating the I-69 Section 3 impacts. The mitigation is to be comprised of approximately 24.4

acres of forested wetlands, 17.4 acres of emergent wetlands, 7.2 acres of scrub-shrub wetlands, 194.4 acres of bottomland forests, and 18,702 linear feet (6.9 ac) of stream channel development (intermittent and/or ephemeral). Additional mitigation will include preservation of 77.8 acres of existing bottomland/wetland forest and 17,430 linear feet of riparian habitat development and enhancement along the West Fork of the White River. The reforestation activities will include the development of wooded riparian habitat along the West Fork of the White River and the proposed stream channels, totaling 45.3 acres. Furthermore, the newly developed stream channels will connect the different habitat areas and provide a diversity of hydrologic regime and habitat.

The mitigation area is appropriately situated within the foraging range of the Elnora Maternity Colony and contains two known Indiana bat roost trees (Figure 3). Permanently protected plantings along the West Fork of the White River will benefit water quality in the long term, as the plantings will provide a vegetated buffer that will reduce runoff and associated sedimentation from adjoining land use. In the long term, mitigation plantings will provide a bottomland forest that is well stocked with a diversity of species of trees including multiple species that are known to provide Indiana bat roosting habitat (e.g., cottonwood, oaks, hickory, maples). Once the additional tree plantings mature, the site will provide a large contiguous block of bottomland forest that provides increased connectivity among other existing blocks of forested habitat and will thereby provide valuable habitat for Indiana bats foraging and roosting in the area (Figure 3). Bottomland forest is an important habitat type used by Indiana bat maternity colonies throughout the Midwest (Carter 2006).

INDOT will be responsible for monitoring (a minimum of 10 years) and maintaining the mitigation area while it is being established, as well as addressing long-term management per the Cornelius Mitigation and Monitoring Plan. The environmental benefits of this site will be significant and will continue to increase as the site matures. Silvicultural manipulation in this area will be limited to activities which will enhance the quality of habitat for Indiana bats, as agreed to by the Service's BFO. A restrictive covenant will be recorded for the property and will disallow manipulation of vegetation (e.g., mowing, timber harvest, timber stand improvement, firewood collecting) in the mitigation area without consultation/prior approval from the Service's BFO. INDOT's consultants have received confirmation from Indiana Department of Natural Resources (DNR), Division of Fish and Wildlife, that the DNR will accept the Cornelius property for long term management. Formal documentation/agreements have not yet been developed.

For the entire Section 3 SAA, FHWA and INDOT have exceeded their 3:1 mitigation commitment for upland forest by approximately 48 additional acres, for a mitigation ratio of 4:1. Therefore, additional benefits will be realized by the bats than had been anticipated in the Tier 1 RPBO. Because 77.8 acres of existing forest habitat will be protected and 194.4 acres of forest will be developed and/or enhanced, the Elnora Maternity Colony will experience a net gain of forest habitat as part of the Proposed Action and receive both short and long-term benefits that will continue in perpetuity.

With successful implementation of the proposed Tier 2 Cornelius Mitigation and Monitoring Plan for Section 3 and all of the other proposed mitigation efforts and conservation measures, we anticipate that long-term habitat conditions for the Elnora Maternity Colony and individual bats within the Section 3 Summer Action Area will be sustainable and will likely be an improvement over existing conditions.

An extensive bat monitoring and research program has also been committed to by the FHWA and INDOT. Therefore, the Elnora Maternity Colony will be studied and monitored the summer prior to and at least five summers post-construction, beginning with the first summer following the start of construction. Final details of the proposed monitoring plan will be developed in consultation with the Service for each affected project section as construction plans and schedules are finalized. During these monitoring efforts, the FHWA and INDOT will locate and identify property owners of newly discovered roost trees and the Service will work with FHWA, INDOT, and the land owners (private or otherwise) to promote conservation of the Indiana bat habitat occurring at each new location.

Finally, FHWA, INDOT and BLA, have worked with the Service's BFO to design an educational poster that will be made publicly available via the internet and interpretive displays about Indiana bats that will eventually be placed in rest stops along I-69. The Draft Indiana bat recovery plan (USFWS 2007) identifies public education and awareness about Indiana bats as a priority activity needed for recovery of the species. One rest area is proposed for Section 3 but may be built at a later time as additional funds become available.

In summary, construction of Section 3 of I-69 will cause direct loss of 72.6 acres (69 acres of forest and 3.6 acres non-forested wetland) of suitable Indiana bat summer habitat (i.e., roosting and foraging habitat and forested travel corridors) but additional habitat loss from indirect development is expected to be negligible. Although short-term reductions in habitat quality may occur, overall long-term habitat restoration and protection are expected to improve the habitat conditions for Indiana bats, particularly for the Elnora Maternity Colony. No female and/or juvenile bats in the Elnora Maternity Colony are expected to be harmed/incidentally taken as a result of direct and/or indirect impacts from the proposed construction, operation and maintenance of the I-69 project in Section 3. We estimate the maximum overall amount of I-69 related incidental take of Indiana bats within the Expanded SAA to be no more than 5 bats (spread over a 17-year long period) due to vehicle collision (roadkill). Therefore, we anticipate the SAA for Section 3 will continue to support the existing maternity colony into the foreseeable future.

V. CUMULATIVE EFFECTS

In the context of the Endangered Species Act, cumulative effects are defined as the effects of future State, tribal, local or private actions that are "reasonably certain" to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered because they require separate consultation pursuant to Section 7 of the Endangered Species Act (e.g., new surface coal mining permits).

Based on our analysis of information provided in the 27 July 2009 Tier 2 BA for Section 3 of I-69 and subsequent communications, we have determined that the currently anticipated sources of cumulative effects are consistent with those contemplated in the 24 August 2006 Tier 1 RPBO and that the currently anticipated levels of adverse cumulative effects, particularly dredging of legal drains, has been reduced to an insignificant level. No additional adverse effects beyond those discussed in the Tier 1 RPBO are anticipated as a result of cumulative effects. Therefore, most of the previous discussion of adverse effects and incidental take analyses on pages 94-97 and Appendices A and B of the Tier 1 RPBO remain valid and are hereby incorporated by reference. Exceptions are noted below.

For the Tier 1 BA Addendum, in addition to cumulative impacts generated by the REMI model, impacts to tree cover from possible legal drain dredging were estimated and included. These impacts could potentially occur regardless of the I-69 construction. Legal drains were identified through consultation with county officials as those streams legally maintained by the county or maintained through privately funded local groups. For the BA Addendum analysis, impacts were assumed to be 75 feet from either side of a legal drain. The legal drain impacts represented a “worst-case” scenario for tree cover impacts as not all legal drains are likely to be maintained, and maintenance may not result in impacts on both sides of the stream, or the entire 75 feet. Taking this worst-case-scenario approach, BLA originally estimated that there would be a total of 25 acres of tree cover potentially lost as a result of cumulative effects from the maintenance of legal drains within the Elnora Maternity Colony Area alone.

In the Tier 2 evaluation, a total of 29 acres of tree cover impacts from legal drain maintenance along Vertrees and Weaver ditches were calculated, along with an additional 63 acres of impacts within the remaining ESAA. Coordination with the conservancy boards of both Prairie Creeks and Smothers Creek indicated that removing riparian forest along these legal drains within the I-69 Action Area is not reasonably certain to occur in the future. Forest along these 3 legal drains would account for 22 acres of the potential impact in the remaining ESSA for Section 3. Attempts were made to contact members of the Weaver Ditch Conservancy Board, as well as Vertrees Ditch, but were not successful. It appears that most of the forests along these two legal drains which could potentially be impacted are within the 100-year floodplain for the West Fork of the White River. Because frequent flooding of this area occurs from backwater flooding induced by the West Fork of the White River, as opposed to headwater flooding from the upstream watershed that could be impeded by log-jams and debris, maintenance on the legal drains within the West Fork of the White River floodplain is not anticipated. Therefore, limited tree clearing would be expected. Furthermore, it appears that these ditches are maintained periodically, and riparian tree-clearing along the drainages is not a routine maintenance activity. Weaver and Vertrees ditches account for 29 acres of the potential impact in the colony area, as well as 41 acres of potential impact in the remaining ESAA for Section 3.

Therefore, what was previously believed to be a threat to this colony from cumulative impacts (i.e., a 29-acre reduction in tree cover by 2030 from dredging of legal drains) is no longer a significant concern and no loss of forest habitat or take is currently anticipated from the dredging of county-controlled legal drains. In Table B4 of the Tier 1 RPBO, the Service had previously anticipated the loss of up to 2 adult females/juveniles from this maternity colony from the potential amount of forest loss associated with the dredging of legal drains in Section 3. This very conservative Tier 1 estimate was most likely an overestimate of take since the threatening activity is no longer considered to be reasonably certain to occur after further coordination in Tier 2.

Some ongoing developments in Section 3 may cause forest habitat loss and modification. For example, as previously mentioned in the Environmental Baseline section, the West Gate at Crane Technology Park is an industrial park within the Crane Naval Surface Warfare Center, located where the Daviess, Greene and Martin County borders meet. Currently, plans include development of 30 to 200 acres. According to the DEIS, the Conceptual Plan for the industrial park indicates that areas that are currently forested will remain forested (i.e., development is only anticipated to occur in already cleared areas).

VI. CONCLUSION

After reviewing the section-specific information, including 1) scope of the project, 2) the environmental baseline for the action area, 3) the status of the Indiana bat and its known and potential occurrence within the action area, 4) the aggregate effects of the proposed construction, operation, and maintenance of the interstate and associated development, and 5) any cumulative effects, it is the Service's biological opinion that Section 3 of the I-69 Project by itself nor when considered in conjunction with the larger I-69 project from Evansville to Indianapolis is not likely to jeopardize the continued existence of the Indiana bat.

Our basis for this conclusion follows:

- Because I-69 will have a long narrow/linear footprint, the amount of adverse impacts to any one habitat patch or maternity area along its path is minimal when compared to impacts of a similarly sized area that has a non-linear configuration.
- No adverse effects from I-69 are anticipated to the Elnora Maternity Colony.
- We anticipate very few Indiana bats may be taken as a result of roadkill (no more than 5 over a 17 year period).
- We anticipate that the Elnora Maternity Colony will not be displaced by direct or indirect effects associated with the construction, operation, and maintenance of Section 3.
- To the contrary, we anticipate the proposed action will likely improve the long-term conditions for Indiana bats within the action area. Because the proposed 328-acre Section 3 Mitigation Area has been strategically located to improve upon the existing high-quality forest habitat along the West Fork White River, we believe adverse impacts to the Elnora Maternity Colony and any adult males occurring in the immediate area will be further minimized and should not be long lasting. Because 77.8 acres of existing forest habitat would be protected and 194.4 acres of forest would be developed/enhanced, the Elnora Maternity Colony would experience a net gain of forest habitat as part of the Proposed Action and receive both short and long-term benefits that will continue in perpetuity. Note, in the unlikely event the proposed mitigation area completely fails, this maternity colony is still likely to persist within the other available habitat within its traditional summer range.
- We do not anticipate any significant impacts to the local population of Indiana bats, the proposed Midwest Recovery Unit population, nor the species within its entire range.

Because of our analysis, we do not believe that the proposed action “would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of the Indiana bat by reducing the reproduction, numbers, or distribution of the Indiana bat (50 CFR 402).” For the proposed action to “reduce appreciably” the Indiana bat’s survival and recovery, the proposed action would have to impede or stop the process by which the Indiana bat’s ecosystems are restored and/or threats to Indiana bat are removed so that self-sustaining and self-regulating populations can be supported as persistent members of native biotic communities (USFWS and NMFS 1998, page 4-35). We do not believe the proposed project impedes or stops the survival and recovery process for the Indiana bat because:

The species’ resiliency to some level of natural and anthropogenic disturbances has been demonstrated (See Previous Incidental Take Authorizations in the Tier 1 RPBO). We believe

that the proposed roadway construction, operations, and maintenance, while potentially resulting in the incidental take of some individuals, are not a significant threat to the species in the proposed Midwest Recovery Unit nor the species as a whole and, therefore, do not rise to the level of jeopardy. No component of the proposed action is expected to result in harm, harassment, or mortality at a level that would reduce appreciably the reproduction, numbers, or distribution of the Indiana bat.

SECTION 3 (TIER 2)

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by Service as intentional or negligent 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. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the FHWA or their designee (e.g., INDOT) for the exemption in section 7(o)(2) to apply. The FHWA has a continuing duty to regulate the activity covered by this incidental take statement. If the FHWA fails to assume and implement the terms and conditions of the incidental take statement, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the FHWA must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR §402.14(i)(3)].

INDIANA BAT

AMOUNT OR EXTENT OF TAKE

The Service believes it is likely that incidental take of Indiana bats in Section 3 of I-69 will occur as a direct or indirect result of the Proposed Action in the following forms:

- death/kill from direct collision with vehicles traveling at high speeds (i.e., roadkill) on I-69 and/or increased traffic volumes on other local roadways (e.g., U.S. 231 and S.R. 57).

Based on our analysis, the Service believes one Indiana bat maternity colony occurs within the Expanded SAA. Based on the colony's proximity and connectivity to the project alignment, and the unlikelihood of indirect development within the maternity colony area, no direct or indirect impacts to the colony are anticipated. Although very difficult to predict, we anticipate no more than 5 Indiana bats will be killed by vehicles during the first 17 years that Section 3 is operational or approximately 1 bat every three and a half years as long as the interstate is

operated. No significant, long-term adverse effects are anticipated to accrue to any local populations.

Therefore, the overall estimated maximum amount I-69 related incidental take of Indiana bats from all sources within the Expanded SAA is no more than 5 individuals (all from roadkill) during the first 17 years of operation (approx. 2013-2030).

It is unlikely that direct mortality of small-sized bats from roadkill will be detected, that is, we do not expect that most dead or moribund bats are likely to be found. The same is true for take associated with habitat modification and loss; detecting or finding dead individuals is unlikely. However, as outlined in the Tier 1 RPBO, we can track the level of anticipated take by monitoring the amount of habitat modification as a surrogate. The Proposed Action will result in the loss of 69 forested acres in Section 3 of I-69. The Service anticipates that reproductive and viability consequences at the maternity colony level are not likely to occur with the proposed amount of habitat modification. If the amount of habitat modification exceeds the specified levels, the trigger for reinitiation has been met. Furthermore, the FHWA will keep track of any known Indiana bat roadkills to ensure that the anticipated amount of incidental take is not exceeded.

Currently anticipated levels of adverse impacts to Indiana bat summer habitat/forest in Section 3 are significantly lower than what previously had been considered in the Tier 1 RPBO. The Tier 1 incidental take estimate of 112 acres of forest habitat had been anticipated based upon a worst-case-scenario representative alignment, but in Tier 2, the Preferred Alternative Alignment will only impact 69 acres, a 40% reduction and far below the anticipated project-wide total of 2,148 acres of direct forest loss (Table 4). This anticipated level brings the cumulative total of Tier 2 estimated forest habitat loss for the entire I-69 Evansville to Indianapolis project to 96.4 acres (27.4 in Section 1 and 69 in Section 3). For a running summary of habitat impacts per Section, see Appendix D of the Section 3 Tier 2 BA.

	Loss of Forest Anticipated in Tier 1 RPBO/BA Addendum for Section 3	Loss of Forest Anticipated in Tier 2 BA & Tier 2 BO for Section 3
3	112 acres	69 acres

Table 4. Estimated direct loss of Tier 2 Forest within the I-69 Section 3 SAA.

Additionally, we anticipate that the Proposed Action will result in the loss of approximately 3.7 acres of non-forested wetlands in Section 3 of I-69 (Table 5). This anticipated level brings the cumulative total of incidental take of Tier 2 estimated non-forested wetlands for the entire I-69 Evansville to Indianapolis project to 4.9 acres. This impact level is still well below the 20 acres originally anticipated for the entire I-69 Evansville to Indianapolis project in the Tier 1 RPBO and ITS.

	Loss of Non-forested Wetlands Anticipated in Tier 1 RPBO/BA Addendum for Section 3	Loss of Non-forested Wetlands in Tier 2 BA & Tier 2 BO for Section 3
3	3 acres	3.7 acres

Table 5. Estimated direct loss of non-forested wetlands within the I-69 Section 3 SAA

EFFECT OF THE TAKE

In the accompanying biological opinion, the Service determined that the aggregate level of anticipated take is not likely to result in jeopardy to the Indiana bat.

TIER 2 REASONABLE AND PRUDENT MEASURES

In addition to the Tier 1 Reasonable and Prudent Measures (RPMs) contained within the 24 August 2006 Incidental Take Statement for Tier 1 of the I-69 Evansville to Indianapolis project, the Service believes the following Tier 2 RPMS are necessary, appropriate, and reasonable for further minimizing incidental take of Indiana bats in Section 3 of I-69:

1. In the Section 3 Tier 2 BA, the FHWA proposed to implement numerous conservation measures and mitigation efforts as part of their proposed action and these measures are hereby incorporated by reference. These measures will benefit a variety of wildlife species, including Indiana bats. FHWA should take necessary steps to ensure that successful implementation of all conservation measures is achieved to the fullest extent practicable in a timely manner.
2. The implementation status of all the proposed conservation measures, mitigation efforts, and research and any related problems need to be monitored and clearly communicated to the Service on an annual basis.

TIER 2 TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, the FHWA (and/or INDOT and their contractors or assigns) must comply with the following Tier 2 Terms and Conditions (T&Cs), which implement the Tier 2 RPMs above. These Tier 2 T&Cs are non-discretionary and are in addition to the Tier 1 T&Cs.

1. Once initiated, all Service-approved construction and tree plantings within the Section 3 Mitigation Area (Cornelius Property) must be completed within 3 calendar years.
2. FHWA will provide the Service with a written annual report that summarizes the previous year's conservation and mitigation accomplishments, remaining efforts, and any problems encountered within Section 3. This annual report will be completed throughout the 5-year post-construction monitoring period. The annual report for Section 3 may be a stand-alone document or included as part of the annual report required under the 2006 Tier 1 T&C Number 2.

In conclusion, the Service believes that no more than 5 individuals will be incidentally taken between the years 2013 and 2030 as the result of roadkill and direct habitat loss will be limited to approximately 69 acres of forest habitat and 3.6 acres of non-forested wetland habitat within the Section 3 Expanded SAA. Such take will be monitored by reporting known Indiana bat vehicle collisions and tracking the amount of habitat modification. These acreages represent less than a 1% loss of the Section 3 Expanded SAA's forested acreage and will be cleared over a period of at least a couple of years. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise

result from the proposed action. If, during the course of the action, the anticipated levels of incidental take (i.e., habitat modification and/or roadkill) are exceeded by more than 10% (or tree clearing occurs during the period April 1-September 30 in the SAA), then such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The FHWA must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action/program on listed species or critical habitat, to help implement recovery plans, or to develop information. Conservation recommendations generally do not focus on a specific project, but rather on an agency's overall program.

The Service provides the following conservation recommendations for the FHWA's consideration; these activities may be conducted at the discretion of FHWA as time and funding allow:

INDIANA BAT CONSERVATION RECOMMENDATIONS

1. Provide funding for scientific research on White-nose syndrome in bats.
2. Working with the Service, develop national best management practices (BMPs) for addressing Indiana bat issues associated with FHWA-funded projects within the range of the Indiana bat.
3. In coordination with the BFO, purchase or otherwise protect additional Indiana bat hibernacula and forested swarming habitat in Indiana.
4. Provide funding to expand on scientific research and educational outreach efforts on Indiana bats in coordination with the Service's BFO.
5. Provide funding to staff a full-time Indiana Bat Conservation Coordinator position within the BFO, which has the Service's national lead for recovering this wide-ranging species.

In order for the Service to be kept informed of actions for minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION NOTICE

This concludes formal programmatic consultation with FHWA on the construction, operation, and maintenance of the Section 3 portion of the I-69 from Evansville to Indianapolis, Indiana and associated development. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that the may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action (e.g., highway construction and associated development) are subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

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APPENDIX A. Tier 1 I-69 Evansville to Indianapolis Conservation Measures for the Indiana Bat (*Myotis sodalis*)

#	Tier 1 Conservation Measures	Status (as of 10/01/2009)
A. Context Sensitive Solutions		
1	Alignment planning - alignments will be located beyond 0.5 miles from known IBat hibernacula	completed
2	Avoid Blasting within 0.5 miles of IBat hibernacula from 15 September to 15 April	to be completed
3	Survey potential hibernacula for IBats	completed
4	Avoid and minimize impacts to karst hydrology connected to IBat hibernacula	to be completed
5	Tree removal - to avoid direct take of IBats, tree cutting within 5 miles of a known hibernaculum will only be allowed from 15 November to 31 March	to be completed
6	Alignment planning - alignments will be located to minimize impacts to forested areas and core forests	ongoing
7a	Tree cutting - to avoid direct take of IBats, no trees >3 inches DBH will be cut down from 1 April to 30 September	ongoing
7b	To locate IBats within the action area, mist net surveys will be conducted as part of Tier 2 studies. If captured, IBats will be radio-tracked to locate roost trees	completed
8a	Bridge surveys will be conducted in action area as part of Tier 2 studies	completed
8b	Bat friendly bridges will be designed where feasible and appropriate	to be completed
8c	The Patoka River floodplain will be bridged in its entirety to minimize impacts to riparian habitat	to be completed
9	Stream relocations - site-specific plans will be developed including stream mitigation and monitoring plans	ongoing
10	Medians and Alignments - variable-width medians and independent alignments will be used to minimize impacts	ongoing
11	Minimize Interchanges - efforts will be made to minimize interchanges in karst areas	ongoing
12	INDOT will adhere to the multi-agency Wetland and Karst MOUs	ongoing
13a	Water quality - equipment servicing and maintenance areas will be restricted to designated areas away from streams and sinkholes and their immediate watersheds	ongoing
13b	Water quality - road-side ditches will be constructed with filter strips and containment basins	to be completed
13c	Construction equipment will be maintained in proper mechanical condition	ongoing
13d	Roadways will be designed to contain accidental spills	ongoing
13e	Herbicide use will be minimized in identified environmentally sensitive areas	to be completed
13f	Revegetation - disturbed soil areas will be revegetated with native grasses and wildflowers	ongoing
13g	Low Salt Zones - low salt and no salt spray strategy will be developed in karst areas	to be completed
13h	Bridges will be designed with none or a minimum number of in-span drains and water will be directed toward drainage turnouts at the ends of the bridge	to be completed
14	Erosion control measures will be implemented during construction	ongoing
15	Parking and Turning Areas - for heavy equipment will be outside and away from environmentally sensitive areas.	ongoing
B. Restoration / Replacement		
1	Summer Habitat Creation/Enhancement - Wetland and forest mitigation will occur within the action area with priority given to sites within 2.5 miles of IBat capture sites or roost trees. Mitigation sites will be planted with a mixture of native trees that is largely comprised of species that have been identified as having relatively high value as potential Indiana bat roost trees. Tree plantings will be monitored for five years after planting to ensure establishment and protected in perpetuity via conservation easements.	ongoing

APPENDIX A. Continued.

#	Tier 1 Conservation Measures	Status
B. Restoration / Replacement (continued)		
2	Wetland MOU will be followed	ongoing
3	Forest Mitigation - Forest impacts occurring within each of the 13 2.5-mile radius maternity colony areas would be mitigated by replacement (i.e. planting of new forest and purchase of existing) at approximately 3:1, preferably in the vicinity of the known roosting habitat.	ongoing
C. Conservation / Preservation		
1	Hibernacula Purchase - one or more will be purchased to conserve I Bat winter habitat from willing sellers in the action area	to be completed
2	Hibernacula Protection - cave gates, fences, or alarm systems will be constructed to prevent unauthorized human entry	to be completed
3	Autumn/Spring Habitat Purchase - autumn swarming/spring staging habitat will be purchased from willing sellers as part of conservation for I Bat habitat to the greatest extent practicable. Some parcels containing important autumn swarming/spring staging habitat may be acquired near key hibernacula regardless of whether the hibernacula are acquired themselves.	to be completed
4	Summer Habitat Purchase - at fair market value in the Action Area from "willing sellers" to preserve summer habitat. Any acquired summer habitat area would be turned over to an appropriate government conservation and management agency for protection in perpetuity via conservation easements.	ongoing
D. Education / Research / Monitoring		
1	Monitor any caves that had gates installed as an I-69 conservation measure.	to be completed
2	Install warning signs at caves as appropriate.	to be completed
3	Provide \$50,000 to supplement the biennial I Bat winter surveys at known hibernacula in the action area and elsewhere in Indiana	in process
4	Provide \$125,000 for research on the relationship between quality autumn/spring habitat near hibernacula and hibernacula use within/near the Action Area. This research should include methods attempting to track bats at longer distances such as aerial telemetry or a sufficient ground workforce. A research work plan will be developed in consultation with the USFWS.	in process
5	Conduct additional mist net surveys at 50 sites to monitor status of the 13 known I Bat maternity colonies in the action area. Surveys will be completed the summer before construction begins in a given section and will continue each subsequent summer during the construction phase and for at least five summers after construction has been completed. If Indiana bats are captured, radio transmitters will be used in an attempt to locate roost trees, and multiple emergence counts will be made at each located roost tree. These monitoring efforts will be documented and summarized within an annual report prepared for the Service.	ongoing
6	Educational Poster - Total funding of \$25,000 will be provided for the creation of an educational poster or exhibit and/or other educational outreach media to inform the public about the presence and protection of bats, particularly the Indiana bat.	in process
7	Rest Areas - rest areas will be designed with displays to educate the public on the presence and protection of sensitive species and habitats. Attractive displays near picnic areas and buildings will serve to raise public awareness as they utilize the Interstate. Information on the life history of the Indiana bat, protecting karst, and protecting water quality will be included in such displays.	to be completed
8	Access to Patoka River NWR - If reasonable, an interchange will be constructed that would provide access to a potential Visitor's Center at the Patoka River National Wildlife Refuge.	ongoing
9	GIS Information - GIS maps and databases developed and compiled for use in proposed I-69 planning will be made available to the public. This data provides information that can be used to determine suitable habitats, as well as highlight other environmental concerns in local, county, and regional planning. Digital data and on-line maps are available http://igs.indiana.edu/arcims/statewide/index.html .	completed

APPENDIX B.

Supplemental Information from the August 12, 2009 meeting regarding the Section 3, Tier 2 Biological Assessment

Meeting with U.S. Fish and Wildlife Service
At USFWS Bloomington, Indiana Field Office
 August 12, 2009 at 10:30 a.m. EST

Attendee	Organization
Robin McWilliams Munson	US Fish and Wildlife Service (USFWS)
Jason DuPont	Bernardin Lochmueller & Associates (BLA/PMC)

As a representative for FHWA and INDOT preparing the I-69 Biological Assessments, Jason DuPont from BLA the Project Management Consultant met with Robin McWilliams Munson of USFWS on August 12, 2009 at the USFWS Bloomington Field Office. The purpose of the meeting was to discuss the Section 3 Tier 2 Biological Assessment (BA) for the I-69 Evansville to Indianapolis highway. The following summarizes the discussion including clarification and supplemental information for each topic addressed relative to the BA.

USFWS Tier 2 BA Questions/Comments and Responses/Additional Information

Comment: Pg. 9, Two billboards displaced. Any plans to replace, if so, where (forest concerns?)?

Response: The two billboards are currently located near the existing US 231/SR 45 intersection area. It is anticipated that the billboards, if they are relocated, would be near their current location, or the relocated US 231/SR 45 intersection, which is within existing agriculture land use. Therefore, it is not anticipated that any forest will be impacted. A figure showing this area is attached for reference.

Comment: Pg. 24, Are there any plans to relocate the 10 utility towers within forested areas (particularly near 231)?

Response: There are no anticipated utility tower relocations within forested areas, including in the US 231 interchange area. A figure showing the potential tower relocation areas is attached. The last sentence of the first paragraph on page 24 of the BA is intended to address the 10 towers in addition to the other local utility relocations.

Comment: Pg. 30, last paragraph, is alignment = to ROW?

Response: The term "alignment" is used interchangeably with the right-of-way in the BA.

Comment: Pg. 31, How were forest sample transects selected? Why not Prairie Creek area?

Response: The forest transects were distributed throughout the Section to develop a 10% sample of the impacted forests. The transects were all completed within right-of-way impact areas, with the "outside" transects used to identify remaining habitat in the event that an unknown roost were to be removed by the highway clearing. There are no impact areas near Prairie Creek and thus no samples.

Comment: Pg. 72 How much bridging of the floodplains is planned? The entire floodplain of the 3 mentioned and some of others, or only part of the floodplains of those mentioned?

Response: There is no commitment to bridge these floodplains. However, preliminary hydraulic sizing of the bridge structure indicates that a majority (>50%) of the FEMA mapped floodplains at these crossing locations will be spanned.

Comment: Pg. 50 BA indicates no issues with lighting? Is there a citation for this?

Response: This conclusion was drawn because the lights are going to be approximately 40 feet above the interstate. The tallest vehicles expected would be between 15- 18 feet tall. This would leave 22-25 feet of open space for the bats based on these dimensions if Indiana bats are drawn to the lights to forage on insects it is not anticipated that roadkill will exceed the previously anticipated levels. This response addresses the evaluation approach coordinated previously with the BFO. We are unaware of any scientific literature addressing this specific issue.

Comment: Pg. 60 Legal drain maintenance is dealt with adequately for Prairie Creek, but for Vertrees and Weaver Ditches the explanation as to why no maintenance is required could use more info if available. Have these ditches been cleared/dredged previously? Any reason why the drainage boards would not return your calls? Would it be worth trying again?

Response: These ditches are cleared and regularly maintained for the majority of their lengths. Because they are maintained, and the identified areas within the White River floodplain have not been cleared, we do not expect them to be in future maintenance activities.

We called the identified contacts again just prior to submittal of the BA and the contact identified is very elderly and unable to communicate. The other number is disconnected. Based on the regular maintenance along this drain, and our communication with other local drain contacts, we do not believe it is reasonably certain that any additional maintenance would result in forest removal.

Comment: Any potential holders/partners/managers for the Cornelius site besides INDOT?

Response: IDNR. Discussions are ongoing. The Division of Fish and Wildlife is a potential division for management for this site. If the Division of Forestry is identified we would like to meet with USFWS to discuss what stipulations we could include to coordinate the management of timber on these areas to optimize bat habitat.

Comment: Is copy of purchase agreement for Cornelius available?

Response: The property is owned by INDOT. The warranty deed and other transfer documents are included in Appendix C.

Comment: Pg. 68 Describe a little more the current habitat at mitigation site (#snags, tree sps. in preservation area, foraging acreage, etc.) to show current value to bat.

Response: Field reviews on 3 August 2007, 3 April 2008 and 17 April 2008 found tree species consisting of silver maple (*Acer saccharinum*), sycamore (*Platanus occidentalis*), hackberry (*Celtis occidentalis*), red mulberry (*Morus rubra*), black willow (*Salix nigra*), boxelder (*Acer negundo*), cottonwood (*Populus deltoides*), osage orange (*Maclura pomifera*), red maple (*Acer rubrum*), tulip poplar (*Liriodendron tulipifera*), green ash (*Fraxinus pennsylvanica*), white ash (*Fraxinus americana*), and sandbar willow (*Salix interior*). Approximately 35% of trees had diameter-at-breast-heights (DBH) greater than 18 inches, 45% had DBHs 9 to 18 inches and 20% had DBHs less than 9 inches. Numerous snags were located within this area and ranged from 9 to 18 inches DBH. In addition to the potential roosting habitat in this area, this mitigation site is located along the south bank of the White River and also contains a small open water pond area to provide foraging areas for the bats. With the addition of ephemeral channels and the additional tree planting areas included in the mitigation plan, it is anticipated that this area will mature into prime Indiana bat habitat.

The bat mist netting study that was completed in 2004 in this area identified 7 different species of bats. These seven species included *Myotis sodalis* (federally endangered), *Nycticeius humeralis* (state endangered), *Myotis lucifugus*, *Eptesicus fuscus*, *Myotis septentrionalis*, *Pipistrellus subflavus*, and *Lasiurus borealis*. There were 2 roost trees, 1 within the mitigation site and one immediately adjacent to the mitigation site (silver maples), that have been identified. Emergence counts showed no bat emerging from the roost tree within the mitigation site and 4 bats emerging from the roost tree immediately adjacent to the mitigation site. This mitigation site has been designed to restore and protect a unique yet dwindling bottomland oxbow ecosystem habitat.

Comment: Discuss publicly owned/managed lands – i.e. classified forests?

Response: There are no managed lands located within the Section 3 alternative. Thousand Acre Woods Nature Preserve is located to the west of the preferred alternative, approximately over 0.5 mile away and is privately owned by The Nature Conservancy. The Elnora Memorial Park is also located within the town of Elnora to the west of the alignment approximately 0.5 mile away and is locally owned by the Elnora Park Board.

There are scattered locations of classified forest along the Section 3 alternative. The majority is located in the most northern part, near the US 231 interchange. Thousand Acre Woods Nature Preserve also contains a large amount of classified forest. Other than these areas there are very few locations of small classified forest scattered about.

Comment: Mention specific areas where wildlife crossings will be incorporated

Response: First Creek and Doan's Creek were chosen as committed wildlife crossing locations. While the South Fork of Prairie Creek does connect to Thousand Acre Woods, it was not chosen due to the severe fragmentation of any associated habitat in eastern portions of the stream. It is believed that the habitat was not adequate to concentrate movements. However, the current preliminary hydraulic sizing of the bridge structure opening would be adequate for a wildlife crossing at the South Fork of Prairie Creek (10 feet high x 325 feet wide with a 25 foot overbank area). Detailed wildlife crossing designs will continue to be developed as the final designs of the highway are completed.

Comment: Under Direct Impacts, should be some discussion regarding operational impacts to bats (roadkill), and maintenance impacts, in addition to the construction impacts (forest removal).

Discuss if/where bats may cross road (or not)

Discuss maintenance impacts such as herbicide use, mowing, salt, etc.

Response: It is possible that Indiana Bats will cross the interstate, however from the locations of the maternity colonies, roost trees, and capture sites it appears the probability of the bats foraging away from the corridor and not crossing the interstate is more likely. See the response below regarding connectivity and attached maps and table regarding possible connectivity corridors for more information.

Forest removal should not have a large impact on Indiana bats, the commitment has been made to not remove any trees with a diameter of 3 inches or greater between April 1 and September 30. Tree removal and snag removal will also be kept to a minimum and limited to the construction limits. Based on table 4 in the Section 3 BA, we believe that there is ample amount of forest habitat available for the Indiana Bats. In regard to herbicide use, a commitment has been made to minimize the use of herbicides in environmentally sensitive areas, such as karst areas that are protective of Indiana bats and their prey. Environmentally sensitive areas will be determined in coordination with INDOT, and as appropriate, INDOT consultants. Appropriate signage will be posted along the interstate to alert maintenance staff. In regards to salting, a commitment has been made to develop a low salt and no spray strategy in karst areas for this project. A signing strategy for these items will also be developed. The low salt zones will be determined in coordination with INDOT.

Comment: Is info available about where native vegetation could be planted w/in ROW?

Response: Proposed areas for native vegetation include the SR 58 interchange area, US 231 interchange area, and the Rest Area. The SR 58 interchange area as well as the rest area will have ample of open area to plant native vegetation. There will be less open area within the US231 interchange for native vegetation planting.

Comment: Discuss/map the relationship/connectivity btw. the mitigation site, roost sites, capture sites and the bridge roost and i-69 corridor/forest impact areas. Maybe expand on Fig. 17.

Could include:

Distance from nearest impact area to the maternity colonies and mitigation sites.

Is there connectivity to I69 from any of these locations

Is the bridge site connected to the maternity/mitigation areas

Response: The distance between the nearest forest impact and the outer boundary of the West Fork of White River (Elnora) Maternity Colony circle is approximately 120 feet. The nearest forest impact to the Section 3 Mitigation Site (Cornelius Property) is approximately 2.5 miles. The nearest straight-line distance to forest impacts from any bat capture site is approximately 1.8 miles, while the nearest forest impact to any roost tree is approximately 2.5 miles.

Anticipated flyway connectivity for Indiana bats between the White River (Elnora) maternity colony and I-69 would be along First Creek at minimum distance of approximately 6.6 miles. The attached a map shows the anticipated flyways from all roost trees and capture sites to I-69. The attached table notes all of the distances both straight line and along anticipated Indiana bat flyways from each capture and roost site to the nearest I-69 forest impact location. While the I-69 alternative crosses both Weaver and Vertrees Ditches within the White River (Elnora) maternity colony circle, these drains contain very limited riparian vegetation and include very long sections which contain no trees at all. One capture site (#13) is located approximately 1.2 miles from the I-69 alternative along Weaver Ditch; however, approximately 1.0 mile of this distance contains no trees along the Ditch, and the channel downstream has continuous wooded riparian vegetation to the White River. Based on the abundance of foraging area along the West

Fork of the White River, including tributaries and adjacent oxbow lakes and sloughs, significant distance along anticipated flyways between Indiana bat usage areas and the I-69 alignment, we do not anticipate significant use of the portion of First Creek crossed by I-69. Also, the lack of continuous tree cover for flyways to closer portions of the I-69 alignment and forest impacts limits connectivity.

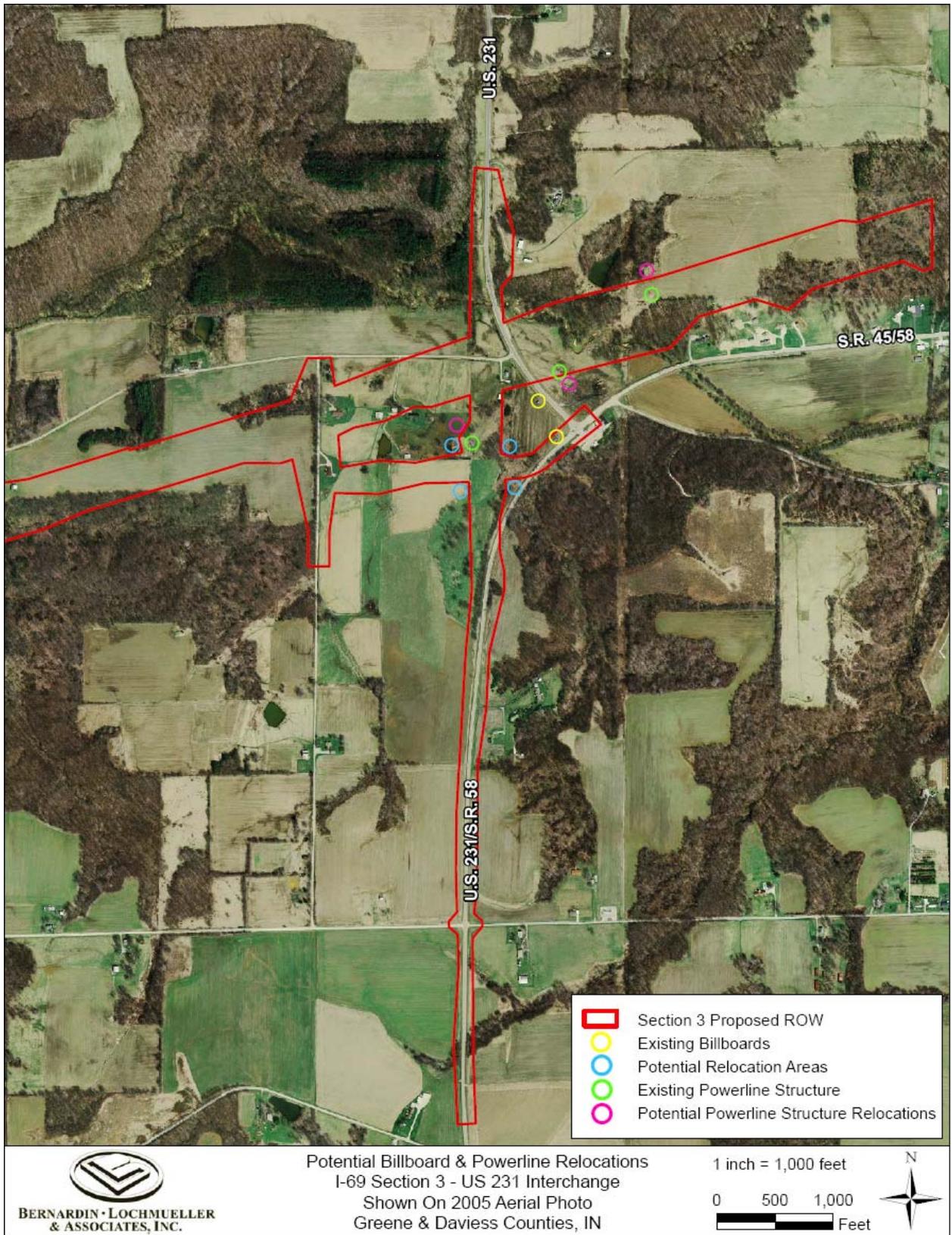
While the Doan's Creek Maternity Colony will be more intensely evaluated relative to potential impacts from Section 4, similar information regarding connectivity and distance to the nearest forested impacts from Section 3 from roost trees and bat capture sites is detailed below as well as in the attached table and figure. The Doan's Creek maternity colony is connected to the Section 3 alignment by the Doan's Creek riparian corridor. The shortest connectivity route to the Section 3 alignment from a roost tree is approximately 4 miles, while the shortest connectivity route from a capture point is 4.6 miles. The shortest straight-line distance to forest impacts from a roost tree is 2.5 miles, while the shortest to a capture point is 2.9 miles. Substantial alternative roosting and foraging habitat is located in closer proximity to the Doan's Creek maternity colony capture and roost sites than the forest habitat impact areas associated with Section 3.

The bridge site is connected to the maternity colony and mitigation areas via the West Fork of the White River. The bridge is located approximately 2.5 miles away from the outer boundary of the maternity colony circle and approximately 2.7 miles from the mitigation site. Two roost trees are located on and immediately adjacent to the mitigation site, with a capture site located approximately 1,000 feet from the mitigation site.

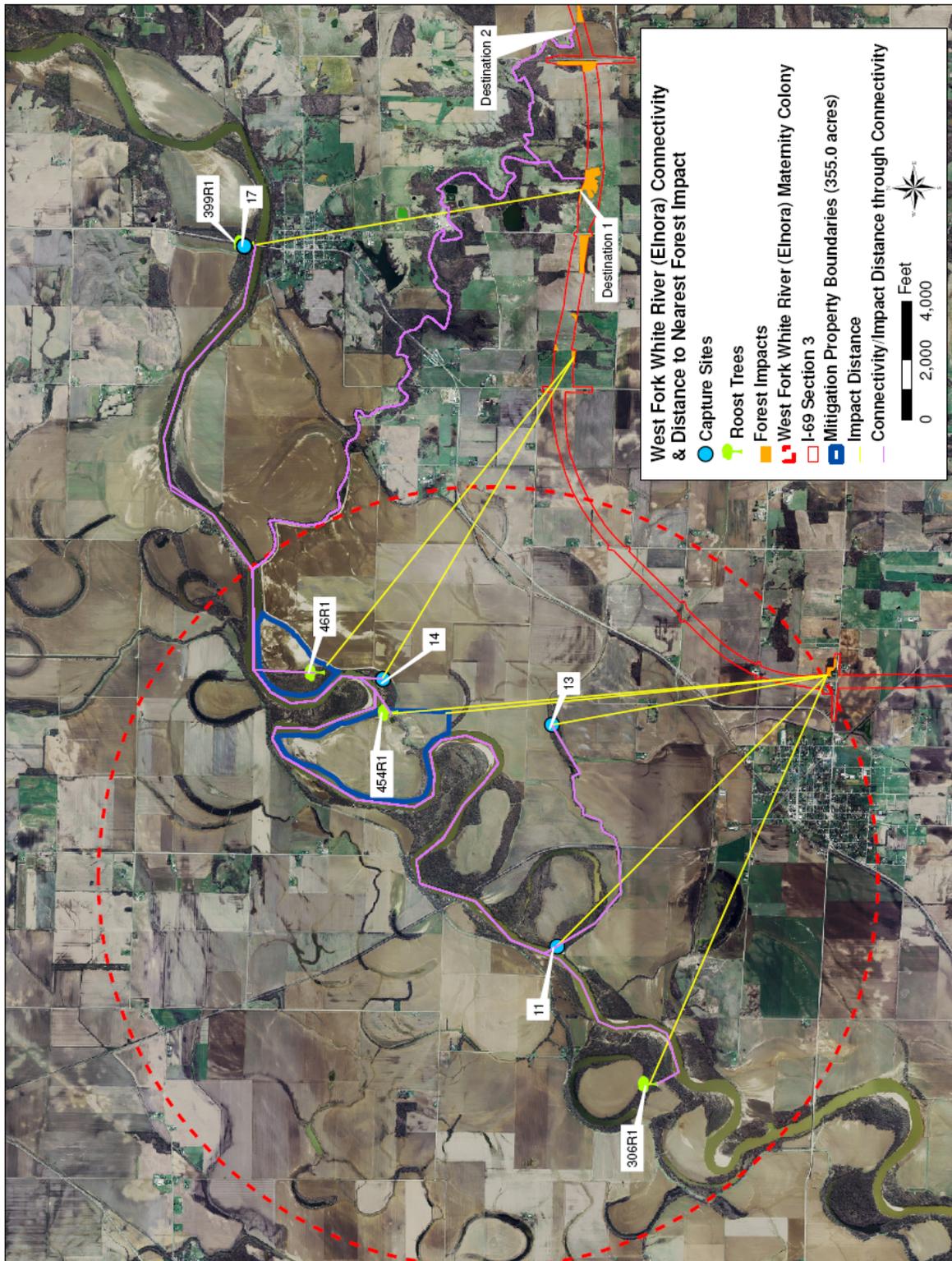
Meeting Follow-up Communication

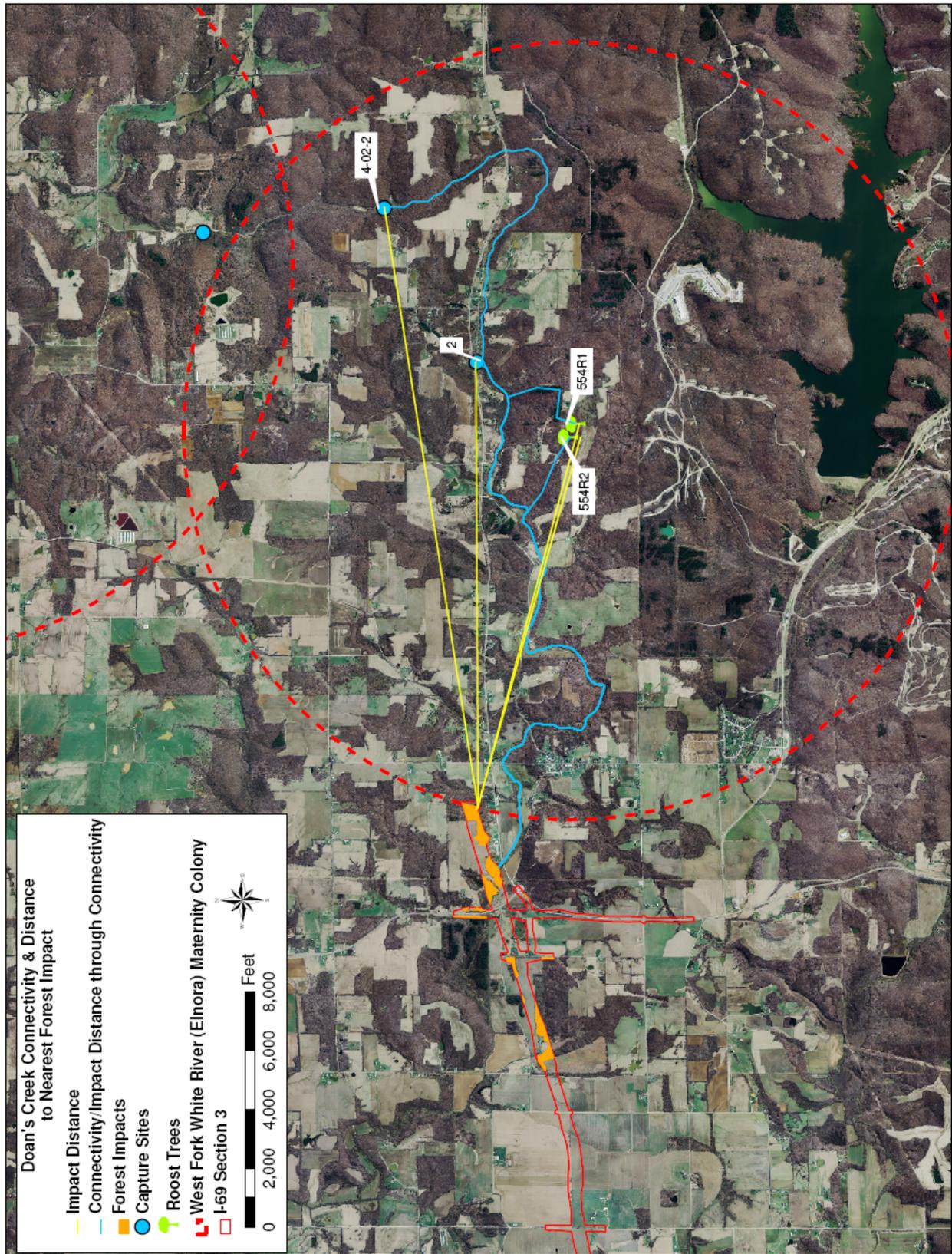
Comment: Is info available about 2008 surveys of the White River bridge and bat use?

Response: The attached White River 2008 Indiana Bat Summary Data table provides the total number of Indiana bats observed at the bridge and the sex for those which were verified. Indiana bats appear to use this bridge to a lesser degree during spring migration and to a greater degree, during fall migration. For their spring migration, they arrived as early as March 28, 2007 and April 4, 2008. For their fall migration, the earliest arrival of the Indiana bat was August 23, 2007 and July 8, 2008. They have stayed under this bridge as late as November 21, 2006, December 5, 2007 and October 16, 2008. No data collected to date indicates the use of this site as a maternity roost for Indiana bats.



Connectivity and Distance to Impacts from known Indiana bat Roost Trees and Indiana bat Capture Points					
West Fork (Elnora) White River Maternity Colony					
<i>Site</i>	<i>Connectivity Routes to I-69 (miles)</i>		<i>Straight-line Distance to Impacts (miles)</i>	<i>Distance to Impacts through Connectivity Routes (miles)</i>	
Roost Trees	Destination 1	Destination 2		Destination 1	Destination 2
306R1	13.5	14.6	2.9	13.5	14.6
399R1	8.1	9.2	2.1	8.1	9.2
454R1	7.4	8.5	2.8	7.4	8.5
46R1	6.6	7.8	2.5	6.6	7.8
Capture Sites					
11	12.1	13.2	2.5	12.1	13.2
13	13.9	15.1	1.8	13.9	15.1
14	7.2	8.3	2.4	7.2	8.3
17	8.1	9.2	2.1	8.1	9.2
Doan's Creek Maternity Colony					
<i>Site</i>	<i>Connectivity Routes to I-69 (miles)</i>		<i>Straight-line Distance to Impacts(miles)</i>	<i>Distance to Impacts through Connectivity Routes (miles)</i>	
Roost Trees					
554R1	5		2.6	5	
554R2	4		2.5	4	
Capture Sites					
2	4.6		2.9	4.6	
4-02-2	7.3		3.9	7.3	





White River Bridge - Bat Survey
2008 Indiana Bat Summary Data

Date of Survey	Indiana Bats Identified		
	Number of Individuals	Male	Female
8-Jan	0	0	0
30-Jan	0	0	0
23-Feb	0	0	0
12-Mar	0	0	0
4-Apr	2	0	0
6-Apr	0	0	0
11-Apr	0	0	0
12-Apr	0	0	0
17-Apr	1	0	0
24-Apr	5	1	0
29-Apr	0	0	0
8-May	21	9	12
15-May	0	0	0
21-May	0	0	0
29-May	0	0	0
5-Jun	0	0	0
7-Jun	0	0	0
17-Jun	0	0	0
22-Jun	0	0	0
28-Jun	0	0	0
6-Jul	4	1	0
8-Jul	12	1	0
12-Jul	6	4	0
17-Jul	29	10	1
31-Jul	6	2	1
7-Aug	10	5	1
13-Aug	3	1	0
18-Aug	5	2	1
27-Aug	5	1	0
10-Sep	20	13	0
25-Sep	8	6	1
5-Oct	2	2	0
16-Oct	4	3	1
25-Oct	0	0	0
7-Nov	0	0	0
22-Nov	0	0	0
29-Nov	0	0	0
6-Dec	0	0	0
31-Dec	0	0	0
Totals	143	61	18