

# United States Department of the Interior Fish and Wildlife Service



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29 August 2007

Robert F. Tally, Jr.  
Division Administrator, Indiana Division  
U.S. Department of Transportation  
Federal Highway Administration  
575 North Pennsylvania Street, Room 254  
Indianapolis, IN 46204

Dear Mr. Tally:

This letter is in response to your 6 June 2007 letter requesting formal consultation regarding anticipated effects to the Federally endangered Indiana bat (*Myotis sodalis*) pursuant to section 7 of the Endangered Species Act of 1973 (ESA), as amended, resulting from the construction, operation, and maintenance of Section 1 of the proposed Interstate 69 (I-69) extension from Evansville to Indianapolis. Your letter also requested our agency's concurrence with your "not likely to adversely affect" determination for the Federally threatened bald eagle (*Haliaeetus leucocephalus*). These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (16 U.S.C. 661 et. seq.) and are consistent with the intent of the National Environmental Policy Act of 1969, the Endangered Species Act of 1973, and the U. S. Fish and Wildlife Service's Mitigation Policy.

On 24 August 2006, the U.S. Fish and Wildlife Service (Service) issued a Revised Programmatic Biological Opinion (RPBO) for the proposed 142-mile extension of I-69 from Evansville to Indianapolis, Indiana. The RPBO and a subsequent letter from the Service (dated 18 May 2007) established a two-tiered consultation process and section-specific review for each of the six I-69 Sections, with issuance of the RPBO being Tier 1 and all subsequent Section-specific project analyses constituting Tier 2 consultations. When it is determined that a specific Section of the I-69 project is likely to adversely affect federally listed species, the Service will produce a "tiered" BO. In the event of a "may affect" but "not likely

to adversely affect” determination, the Service will typically provide written concurrence and Section 7(a)(2) consultation will be considered completed for that Section of the project.

The Service has completed its review of the Tier 2 Biological Assessment (BA; dated 6 June 2006) and subsequent communications and data provided for Section 1 of I-69. We have (1) confirmed that the Indiana bat may be adversely affected, (2) assessed how the action may affect the species, including ensuring that the level of effect is commensurate with the effects contemplated in the Tier 1 RPBO, and (3) verified that the current tally of the cumulative total of incidental take that has occurred to date is below the levels originally anticipated in the 2006 programmatic incidental take statement (ITS). The Service’s formal review and consultation for this proposed action is documented within the enclosed Tier 2 BO and ITS for Section 1 (see enclosure). The Service’s issuance of the Tier 2 BO and ITS conclude formal consultation for Section 1 of the I-69 project.

According to the Tier 2 BA for Section 1 and unpublished data for 2007 from the Indiana Department of Natural Resources, there are no current records of bald eagles nesting or roosting within the Section 1 Action Area. Because bald eagle sightings and suitable habitat are generally absent from the Section 1 Action Area, I-69-related affects to bald eagles in Section 1 are extremely unlikely to occur (i.e., discountable). Therefore, no take of bald eagles is anticipated in Section 1.

Effective 8 August 2007, the bald eagle was officially removed (i.e., delisted) from the list of threatened and endangered species and will no longer be afforded protection under the ESA. Fueled by a reduction in the threats to the bald eagle, the population in the lower 48 States has increased from approximately 487 breeding pairs in 1963, to an estimated 9,789 breeding pairs in 2007. The recovery of the bald eagle is due in part to the reduction in levels of persistent organochlorine pesticides (such as DDT) occurring in the environment and habitat protection and management actions. The protections provided to the bald eagle under the Bald and Golden Eagle Protection Act (BGEPA) and the Migratory Bird Treaty Act (MBTA) are still in effect. To help provide more clarity on the management of bald eagles after delisting, we recently published a regulatory definition of “disturb”, the final National Bald Eagle Management Guidelines and a proposed rule for a new permit that would authorize limited take under the BGEPA and grandfather existing Act authorizations. For more information, please visit our website at <http://www.fws.gov/migratorybirds/baldeagle.htm>.

This precludes the need for further consultation on Section 1 of the I-69 project as required under section 7 of the Endangered Species Act of 1973, as amended. If, however, new information on endangered species within the proposed project area becomes available or if significant changes are made to the proposed project (e.g., additional tree clearing will occur), then please contact Andy King at (812) 334-4261 ext. 216 or [Andrew\\_King@fws.gov](mailto:Andrew_King@fws.gov) for further consultation.

Sincerely,

A handwritten signature in black ink, appearing to read 'Scott E. Pruitt', with a large, stylized initial 'S'.

Scott E. Pruitt  
Field Supervisor

Enclosure

cc (via e-mail): Tony DeSimone, FHWA-Indiana Division  
Tom Seeman, INDOT  
Michelle Hilary, INDOT  
Kent Ahrenholtz, BLA  
Tom Cervone, BLA  
Jason Dupont, BLA  
Albert Ferlo, Akin Gump  
Katie Smith, IDNR, Wildlife Diversity Section  
Amy Babey, USCOE, Louisville District  
Ken Westlake, USEPA, Region 5  
Virginia Laszewski, USEPA, Region 5  
Matt Buffington, IDNR, Division of Water  
Jason Randolph, IDEM  
Jennifer Szymanski, USFWS, Region 3  
Libby Washburn, USDOJ, Office of Solicitor (fax transmittal)  
Rebecca Riley, USDOJ, Wildlife & Marine Resources Section

**TIER 2 BIOLOGICAL OPINION**

for

**SECTION 1**

of the

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

for the

**FEDERALLY ENDANGERED INDIANA BAT**

traversing portions of

**GIBSON AND WARRICK, COUNTIES, INDIANA**

**Submitted to the Federal Highway Administration**

**August 29, 2007**

Prepared by:  
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U.S. Fish and Wildlife Service  
Bloomington Field Office  
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## EXECUTIVE SUMMARY

This document contains a Tier 2 Biological Opinion for Section 1 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) requested formal consultation on Tier 2 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 1 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 1 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 1 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 1.

## INTRODUCTION

This document transmits the U.S. Fish and Wildlife Service's (Service or USFWS) Tier 2 Biological Opinion (BO) for Section 1 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 1 on 7 June 2007 along with a letter requesting the Service to initiate formal consultation on the proposed construction, operation, and maintenance of Section 1 of I-69 from Indianapolis to Evansville, Indiana and its effects on the federally endangered Indiana bat (*Myotis sodalis*). 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 1 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 1 have been incorporated by reference in this Tier 2 BO.

The Section 1 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 1 (dated 11 December 2006),
- 5) Tier 2 BA for Section 1 (dated 6 June 2007),
- 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 adhered to. This document serves as the Tier 2 BO for Section 1 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 1 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 1 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 1 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 Gibson and Warrick counties, Indiana (Figure 1). The Proposed Action for Section 1 of I-69 includes the following:

- Acquisition of approximately 716-724 acres of right-of-way (ROW) of which 87-89% is currently being used as agricultural land,
- Mechanical clearing/grubbing/demolition of existing forest/vegetation and man-made structures from right-of-way (typically about 350 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 15 to September 15 within the Summer Action Area of the Indiana bats, as identified in the revised Tier 1 BO; and prohibiting the filling of wetlands outside the construction limits.
- Clearing of approximately 27.4 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 15 September and 15 April),
- Filling/converting 1.35 acres of emergent (1.33 ac.) and forested (0.02 ac.) wetlands,
- Impacting approximately 14,745 linear feet of stream habitat,
- Constructing approximately 13 miles of new, 4-lane interstate from I-64 to SR 64 (see Section 1 DEIS for specifications and typical cross-sections)

- Constructing 4 interchanges (I-64, SR 68, SR 168, SR 64). The I-69/I-64 interchange will be a cloverleaf (or similar design) with dedicated lanes for each movement and, therefore, no at-grade intersections. The other three interchanges will be diamond configurations that will introduce new at-grade intersections with the ramp terminals and crossroads.
- Constructing 6 overpasses (see list in Tier 2 BA and BA Errata, Figure 1),
- Construction of bridges incorporating a wildlife crossing over Pigeon Creek and its adjacent tributary. Two additional wildlife crossings will be constructed at CR 450S and at an intermittent stream south of CR 600S.
- Installation of conventional lighting at the interchanges with I-64 (approx. 15 new light poles on north side of interchange) and SR 68 (15 to 20 poles). The light poles will be about 40 feet high and will use 250 or 400 Watt HPS lamps. Some lighted overhead signs will also be erected at major interchanges.
- Construction of multiple new frontage roads, connector roads, turn arounds, as well as reconfiguration of some existing roadways. For example, existing SR 57 will be reconstructed as a connector road extending from Nobles Chapel Road (Warrick CR 950 N) northward approximately 3,000 feet to connect with SR 57 (See Tier 2 BA and Section 1 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 and medians will utilize native grasses and native wildflowers, as appropriate, such as those cultivated through INDOT’s Roadside Heritage program.
- 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 1). A summary table of the I-69 Conservation Measures is provided in Appendix A.
- Proposed mitigation for impacts to forests and wetlands in Section 1 are as follows:

Mitigation Offered: in EIS (ac)	<u>Commitment</u> <u>Offered (ac)</u>	<u>Mitigation</u> <u>Description</u>	<u>Theme</u>
82.20*	100.0**	Upland Forest	Replacement
*	30.4	Forested wetlands	Preservation
0.06	1.9**	Forested wetland	Replacement
2.66	3.0**	Emergent wetland	Replacement
8.46***	24.1**	Prairie Buffer (Streams)	Replacement
<b>Total</b>	107.30	159.4	

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

\*\* Includes 10% overcompensation plus additional acres

\*\*\* Calculated by multiplying the stream impact length by 25 feet (average OHWM width for this section) divided by 43,560 sq. ft.



- INDOT will monitor and oversee maintenance of Section 1 mitigation lands while they are being established. INDOT will monitor mitigation lands for a minimum of five years or until the site has been proven successful in meeting the established criteria set forth in consultation with the Service and other resource agencies.
- 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, through traffic volumes on existing I-164 south of I-64 would increase by approximately 14,000 more vehicles per day from traffic using I-69 north of I-64 (DEIS page 5-106).
- Section 1 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,
- Any forested medians will be managed following the IDNR State Forest timber management plan,
- Over time, all sections of I-69 will need to be resurfaced/repaved and bridges will need to be repaired or replaced.

Project Schedule: Expectations are for letting to occur in Spring 2008 with the beginning of construction in Summer 2008 for the initial construction package (i.e., the first approximate 2 miles from I-64 to SR 68). The remaining 10.8 miles is expected to go to construction in phases scheduled between 2009 and 2011.

INDOT's consultants are currently pursuing Section 1 mitigation commitments. On 18 June 2007, INDOT's consultants, BLA, reached a verbal agreement with landowners to purchase a permanent conservation easement on a 160-acre parcel of land in Gibson County that is within the Pigeon Creek Indiana Bat (IBat) Maternity Colony Area (Colony #1) identified during Tier 2 studies and described within the 2006 Tier 1 BA Addendum. This parcel is being proposed as the only mitigation area needed for Section 1 impacts to the Indiana bat, forest impacts, and wetland impacts. The conservation easement would preserve existing bottomland/wetland forest habitat (30.4 acres), protect all new plantings of additional forest and constructed wetlands and streams. The conservation easement will be permanent and will not allow the property to be developed or any permanent structures to be erected. Construction of streams and wetlands and tree plantings will commence after INDOT and FHWA have received all appropriate permits (e.g., Army Corps of Engineers and Indiana DNR). Construction of the proposed mitigation site will be concurrent with or prior to (but not later than) construction of I-69 in the vicinity of the affected maternity colony (i.e., mitigation will occur before or at the same time that construction begins within the 2.5-mile radius maternity colony area). The anticipated project schedule includes construction of the mitigation site in 2008. See Appendix B for a letter of intent to sell a Perpetual Conservation Easement to the State of Indiana by Gerald Besing (dated 16 August 2007) and the Section 1 Tier 2 Conceptual Mitigation Plan in Appendix C of the Section 1 Tier 2 BA for further details



## 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 biennial winter hibernacula surveys throughout the range and the Indiana bat's current range-wide population now stands at approximately 501,000 bats, which is a 9.6% increase over the 2005 range-wide population estimate of 457,000 bats (USFWS, unpublished data, 2007). The range-wide population estimate has been increasing since at least 2001, indicating that the species' long-term decline has apparently been arrested and possibly reversed (USFWS 2007 and USFWS, unpublished data, 2007). The species' range-wide, regional, state, and hibernacula-specific population trends are being closely monitored by the BFO.

Given the 2007 range-wide Indiana bat population estimate of 501,000, we assume that there are approximately 3,131 to 4,175 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)].

As of the winter of 2006-2007, the State of Indiana's 40 hibernacula harbored approximately 238,007 Indiana bats (47.5% of world-wide population) (USFWS, unpublished data, 2007). In 2007, 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=77,786 bats), followed by Wyandotte Cave in Crawford County (n=49,936 bats) and Jug Hole Cave in Harrison County (n=46,664 bats).

## III. ENVIRONMENTAL BASELINE

The environmental baseline for the Indiana bats and their habitat in the I-69 Action Area, including Section 1, was fully described on pages 59-79 of the Tier 1 RPBO and is hereby incorporated by reference. Additional baseline information presented in the Tier 2 DEIS for Section 1 (see Chapter 4 - Affected Environment) is also hereby incorporated by reference. This section analyzes the effects of past and ongoing environmental factors affecting Indiana bats and establishes the status of the species within the Section 1 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 1 (see Figure 5.3-8 in Section 1 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 defined in Tier 1, the Service requested that INDOT and FHWA expand the Summer Action Area (SAA) for Section 1 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 5-7 of the Section 1 Tier 2 BA for additional rationale behind the expanded Action Area for Section 1.

### **Indiana Bats within the Section 1 Summer Action Area**

The nearest sites designated as critical habitat for the Indiana bat are located over 60 miles to the east and northeast (i.e., Wyandotte Cave in Crawford Co. and Ray’s Cave in Greene Co.) of Section 1 of I-69 and therefore are not within the Section 1 action area.

### **Maternity Colonies within the Section 1 SAA**

#### **Pigeon Creek Maternity Colony #1**

In the Tier 1 RPBO, only one Indiana bat maternity colony, Pigeon Creek Maternity Colony #1, was assumed to be present in the SAA of Section 1 based upon the capture of a single pregnant Indiana bat during Tier 2 bat surveys on 23 May 2004 (Figure 1). Although, this bat was equipped with a radio-transmitter, it was not successfully located after its release and thus no roost trees were identified. Additional mist netting in 2005 failed to capture any Indiana bats in the same area. Other than the capture of the pregnant Indiana bat in 2004, the Service has no additional evidence verifying the presence of this maternity colony. Nonetheless, the Service will continue to give the species the benefit of the doubt and assume a colony is present at this location.

#### **Pigeon Creek Maternity Colony #2 and #3**

These maternity colonies were first discovered during July of 2006 during a non-I-69 related mist net survey of bats along Pigeon Creek southeast of Elberfeld in Warrick County (Figure 1). They were not considered as part of the Tier 1 RPBO consultation for I-69. Because the DEIS for Section 1 indicated that it was reasonably foreseeable that I-69 would cause some induced growth in TAZs that fell outside of the previously defined SAA and within the standard 2.5 mile buffer of both of these new colonies, the Service requested FHWA and INDOT to expand the SAA to include the TAZs and assess potential impacts to these “new” colonies within the Tier 2 BA for Section 1. Pigeon Creek Maternity Colony #2 is an assumed colony based upon the capture of a single lactating female Indiana bat that was not successfully radio-tracked to a roost tree. Pigeon Creek Maternity Colony #3 was verified by the capture of multiple lactating female Indiana bats, which were subsequently radio-tracked to a primary roost tree.

The Tier 1 BA Addendum and RPBO characterized habitat conditions for Pigeon Creek Maternity Colony #1 and the Tier 2 BA for Section 1 (pages 8-11) characterizes habitat surrounding Pigeon Creek Maternity Colonies #2 and #3. Of these three maternity colonies, bat surveyors were only successful in tracking radio-tagged bats to their diurnal roost trees (n=2) at the Pigeon Creek Maternity Colony #3.

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 and 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. **The three colonies in the Section 1**



**SAA would collectively contain up to 480 bats per year** (160 bats/colony x 3 colonies = 480 bats).

No additional maternity colonies are known or assumed to occur in the Section 1 SAA or Expanded SAA.

### **Adult Males within the Section 1 SAA**

No adult male Indiana bats were captured during mist net surveys within the originally defined SAA during 2004 or 2005. The Service considers mist net survey results to be valid for at least two years. Likewise, no adult male Indiana bats were found during night-time surveys of 54 bridges in Section 1 in 2004. No Indiana bat winter hibernacula are known to occur within the Section 1 action area (i.e., within a 5-mile buffer zone of the preferred Section 1 alignment for I-69). Nevertheless, 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.

## **General Habitat Conditions**

### **Habitat Conditions of Section 1 Summer Action Area**

Estimated forest cover within Section 1 is summarized below in Table 1. Based on satellite images of Section 1 taken in 2001 (land use coverage made available by USGS in late 2006), it appears that the overall total amount of forest cover has increased within the SAA in recent times. However, some local losses of forest habitat have occurred as well (See ‘Ongoing Stressors in the SAA’ below). INDOT’s primary I-69 consultant, BLA, provided the Service with more up-to-date forest coverage data for Section 1 during the formal consultation period (i.e., 7 August 2007) and thus the forest acreages reported in this Tier 2 BO supersedes those previously reported in the Tier 1 RPBO, Tier 1 BA Addendum, and Tier 2 BA for Section 1. 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 had a much greater resolution (5 m.) than the USGS data. The 2006 USGS forest cover data, the 2003 tree cover estimates in the Tier 1 BA Addendum, 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 1 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 originally defined SAA, approximately 9,261 acres, represents moderate to high quality roosting and foraging habitat for Indiana bats. 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), review of aerial photographs (e.g., via Google™ Earth), and from personal observations of moderate to high quality habitat during field visits to the Section 1 SAA. We also note that many of the additional forested areas within the expanded SAA also appear to be of moderate to high quality, particularly in the induced growth TAZs along Pigeon Creek.

**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

**Table 1.** Estimated amount of forest within the originally defined Section 1 Summer Action Area.

<b>I-69 Project Section Number</b>	<b>Total Acres within Originally Defined SAA</b>	<b>Total Forested Acres within SAA</b>	<b>Percent of the SAA that is Forested</b>
1	45,985	9,261	20%

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 a new GIS analysis conducted by BLA using 2006 USGS data (2001 satellite imagery), the percentage of forest cover in the original SAA and expanded SAA is approximately 20% and 23% respectively, which is higher than was previously reported from an analysis of older satellite images. For Pigeon Creek Maternity Colony #1, 9% of its surrounding landscape (2.5-mile radius area = 12,566 acres) is forested (using USGS landcover data) and approximately 16% of the area contains “tree cover”. Pigeon Creek Maternity Colony #2 has 35% forest cover and Pigeon Creek Maternity Colony #3 has 23% forest cover (using USGS landcover data; See pages 8-11 in the Tier 2 BA).

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 ranged from 53 patches in the Plummer Creek colony to 421 patches in the Pigeon Creek colony (Colony #1). Generally, a higher number of patches translate 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 Pigeon Creek Colony #1 are in Appendix A1 of the Tier 1 BA Addendum and are hereby incorporated by reference.

**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 1 alignment of I-69, BLA staff conducted surveys along 6 pairs of linear transects through six of the largest woodlots that will be directly impacted and provided the Service with a written report (BLA 2007). Six of the transects were within the footprint of the Preferred Alternative Alignment and the other six transects were surveyed within the same woodlots, but outside of the proposed alignment. The six transects within the alignment encompassed approximately 11% of the 27.4 acres of forest that will be directly impacted/destroyed and are assumed to be representative of the existing forest habitat conditions within the whole 27.4 acres. The resulting snag characteristics and projected snag estimates for the Section 1 footprint and the SAA are summarized in Table 2.

BLA (2007) 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 19% small, 70% medium,

**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 1 of I-69.

<b>Characteristics</b>	<b>Transects within Alignment</b>	<b>Transects Outside Alignment</b>
Total number of snags ( $\geq 9''$ DBH) within transect (approx. 60' wide x variable length)	26	32
Average diameter of snags (inches)	13	12
Median diameter of snags (inches)	10	11.5
Range of snag diameters (inches)	9 – 36	9 – 19
Total area sampled within transects (acres)	3.0	3.1
Density of snags in transect area (snags/acre)	$26/3.0 = 9$ snags/acre (rounded to nearest whole #)	$32/3.1 = 10$ snags/acre (rounded to nearest whole #)
Estimated total number of snags ( $\geq 9''$ DBH) that will be cleared within footprint of Preferred Alternative Alignment for Section 1 of I-69 (9 snags/acre x 27.4 impacted acres)	247 snags	
Very rough estimate of total number of snags ( $\geq 9''$ DBH) that may be present in forested areas of Section 1 Original SAA (9,261 acres) and Expanded SAA (17,565 acres)	Original SAA = 83,349 snags Expanded SAA = 158,085 snags	
% of estimated number of snags in Section 1 SAA that would be directly impacted by I-69	Original SAA = 0.30 % Expanded SAA = 0.16%	

and 11% large trees. For transects surveyed outside the alignment, there were 18% small, 68% medium, and 14% large sized trees. The majority of trees both inside and outside the alignment had medium-sized diameters (9''-18'' DBH) indicating that most of the woodlots that will be directly impacted by I-69 in Section 1 are relatively young, second-growth stands that had been previously harvested (i.e., not old-growth stands).

In regards to their quality as foraging habitat, 11 of the 12 transects were categorized as having 'moderate' or 'dense' understory vegetation, a characteristic that can deter foraging Indiana bats, which prefer more open understory conditions. Bush honeysuckle (*Lonicera* spp.), a highly invasive plant species that forms dense thickets in the understory of woodlots, was present at the proposed CR 450 S overpass area, which left unchecked quickly leads to low quality bat foraging habitat. Based on our review of the best available data, it appears the majority of the 27.4 acres that will be permanently lost to construction of I-69 in Section 1 is currently of low to moderate quality for roosting and foraging Indiana bats.

### **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.

The baseline acreages (e.g., % tree cover), conditions, and ongoing stressors of **Pigeon Creek Colony #1** are discussed on pages 73-75 of the Tier 1 RPBO and are hereby incorporated by reference. A couple of relatively small habitat changes have been noted to this maternity colony's environmental baseline since issuance of the Tier 1 RPBO. For example, while using

Google™ Earth (accessed on 9 August 2007) to review current forest habitat conditions, the Service noticed that some relatively recent forest clearing had occurred near the 2004 mist net capture site of the pregnant female Indiana bat in Section 1, which formed the basis for assuming the presence of the Pigeon Creek Maternity Colony #1 and was used as the center of the assumed 2.5-mile radius maternity area. The aerial photo (dated 20 December 2005) revealed that approximately 10 acres had been recently cleared to allow construction of a new private home and a small lake (Figure 2). The aerial photos and GIS maps of tree cover and core forest for this colony and others in the Tier 1 BA Addendum were taken in 2003 and did not depict this recent tree clearing, which apparently occurred sometime in 2005 (pers. comm. with J. Kieffner, BLA, 2007).



**Figure 2.** Recent forest habitat loss within the Pigeon Creek Colony #1 maternity area from private residential development.

On July 19, 2007, during a field review in the Section 1 SAA, BLA observed trees being cut from the wooded areas within the boundary of the North Warrick Industrial Park, which is at the far southeastern edge of the Pigeon Creek Colony #1 maternity area (pers. comm. with Jeremy Kieffner, BLA, 30 July 2007; see Figure 4.2-6 in Section 1 DEIS for location map of park). In a follow-up discussion, the contactor completing the work at the industrial park stated that they had cleared approximately 10 acres of woods for roadways and utilities within the boundaries of the North Warrick Industrial Park and there were currently no plans to clear additional areas. In this particular case, because the wooded areas within this industrial park are small and isolated from other patches of forest habitat, the Service doubts that Indiana bats from Pigeon Creek Colony #1 had been utilizing this area as habitat.

Therefore, the total amount of forest and core forest has been reduced in this maternity colony area by approximately 20 acres in recent years. No additional losses of forest habitat within the Pigeon Creek Colony #1 maternity area are known.

## IV. EFFECTS OF THE ACTION

Based on our analysis of information provided in your 6 June 2007 Tier 2 BA for Section 1 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 (27.4 ac. upland forest + 0.02 ac. forested wetland) anticipated from the preferred alignment is estimated to be 27.42 acres, which is approximately 50% less than estimated in the Tier 1 PBO. The 27.4 acres of forest is composed of portions of approximately 18 different woodlots crossed by the proposed alignment (See Section 1 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 1 will lose only a small portion of their total



area, often along their periphery. One small woodlot (approx. 1.8 acres) will be nearly completely lost. Given the relatively high degree of forest fragmentation and generally isolated distribution of existing woodlots in Section 1, the Service anticipates that Indiana bats are most likely to use/cross over the proposed 12.8-mile interstate in three relatively narrow stretches where more heavily wooded areas exist along the proposed alignment: 1) the Pigeon Creek crossing, 2) County Road 450 South crossing area, and 3) the State Route 64 interchange area. Therefore, not all of the 27.42 acres that will be removed for construction of the preferred alignment is likely to serve as Indiana bat habitat.

In July 2007, BLA staff surveyed trees along 12 transects within six of the largest woodlots that would be impacted by Section 1 of I-69 (See Environmental Baseline Section for details). Based upon their findings, it is estimated that approximately 247 currently existing snags (i.e., dead trees >9" in diameter with exfoliating bark that may serve as potential roost sites for IBats) may be destroyed within the 27.4 acres that will permanently be cleared for construction of I-69 (Table 2). Even though all of the surveyed woodlots did have some snags/potential roost trees the overall quality of the woodlots as roosting habitat was variable.

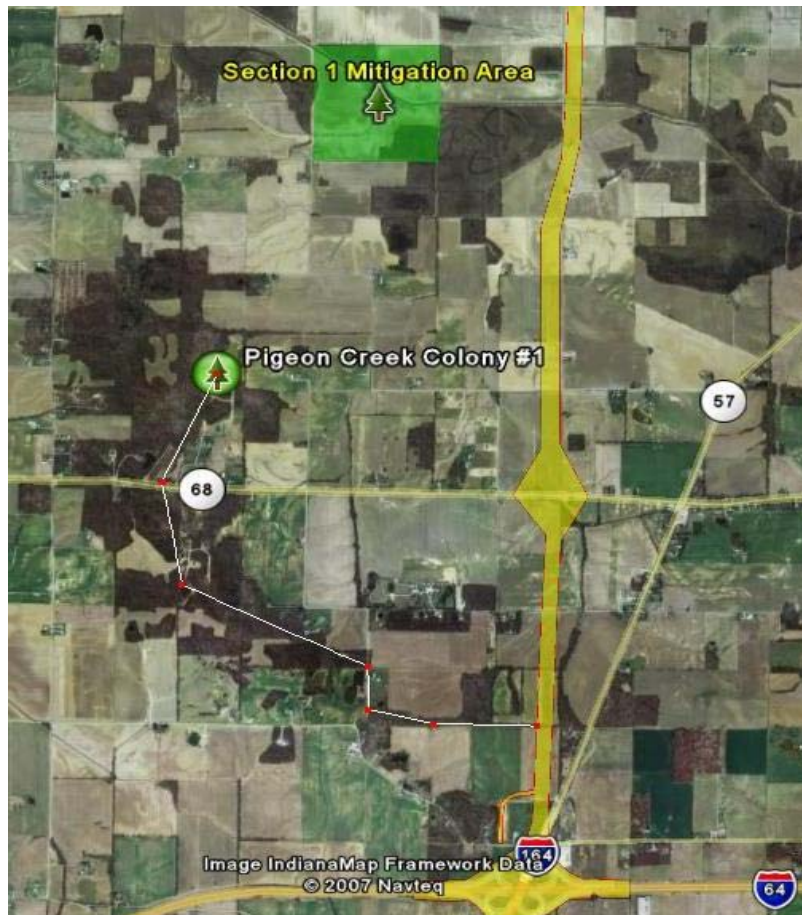
### **Effects and Risks to Local Bat Populations in the Section 1 Summer Action Area**

#### **Pigeon Creek Maternity Colony #2 and #3**

The proposed alignment for Section 1 of I-69 will not traverse these two colonies' probable use areas (Figure 1), so no direct impacts are anticipated to these bats (e.g., roadkill) or their habitat. 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 colonies. However, for the 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 1. Because direct take is extremely unlikely and induced development is not reasonably certain to occur in forested habitat, the Service does not anticipate that either Pigeon Creek Colony #2 or Pigeon Creek Colony #3 will experience any I-69 related take. Therefore, the Service believes that Section 1 of I-69 is not likely to adversely affect these two colonies.

#### **Pigeon Creek Maternity Colony #1**

Of the 27.4 acres of forest that will be cleared for I-69, approximately 11.6 acres fall within a 2.5-mile radius of the center of the Pigeon Creek Colony #1 maternity area/the original capture site of the pregnant Indiana bat. The preferred corridor for Section 1 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 1.28 miles from the original bat capture site/assumed center of maternity use area. Similarly, the nearest forest habitat that will be directly impacted is approximately 1.5 miles from the 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 (approximately 2.1 – 2.6 miles from original capture site), indirect paths along forested corridors to reach forest patches near, within, and across the proposed interstate alignment (Figure 3). Similarly, it is unlikely that this colony has a primary roost within the 11.6 acres within the proposed alignment. One or more alternate roost trees may be affected.



**Figure 3.** Potential Indiana bat flight path along forested corridors from center of Pigeon Creek Colony #1 to nearest I-69 alignment (2.6 miles).

Because sufficient roosting and foraging habitat will remain within this area, we believe that the amount of proposed tree clearing (11.6 ac.) and/or anticipated induced development is not extensive enough to cause the whole colony to be permanently displaced. At worst, a small proportion of colony members may be temporarily displaced from using portions of their traditional summer range. That is, we expect the action area to continue to support the existing maternity colony. A small number of displaced individuals may be adversely affected or taken by I-69-related habitat alterations.

Indiana bats associated with a maternity colony near the Indianapolis Airport have been observed to readily cross small roads (e.g., dirt, gravel, and paved) while foraging at night, but multilane divided highways were only rarely crossed and most of those crossings occurred when bats followed a stream under Interstate 70 (pers. comm. with Dale W. Sparks, Indiana State University, 2007). Sparks and his colleagues have concluded that if Indiana bats don't cross major interstates and highways often, that the presence of such transportation infrastructure in a landscape could essentially be reducing the amount of possible foraging grounds bats would otherwise be willing to visit, thus reducing the amount of food potentially available to the bats. Following this logic, some of the Pigeon Creek Colony #1 members may no longer be willing to cross over I-69 while foraging except perhaps in areas such as the bridge over Pigeon Creek (Note: I-70 in the vicinity of the Indianapolis airport is significantly wider than what I-69 in Section 1 will be). Fortunately, for this colony the majority of available habitat is west of the proposed alignment and thus would not require bats to cross the proposed interstate or reduce

access to a significant portion of their assumed colony area. 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 1 (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 1 SAA may be neutral.

The preferred I-69 alignment cuts across the eastern third of Pigeon Creek Colony #1's maternity area (Figures 1 and 3). Once Section 1 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 colony members 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, we anticipate a small number of bats will be struck by vehicles and killed.

As the Service does not have a standard means for estimating the likelihood of roadkill at the Tier 1 level, we estimated roadkill by starting with the assumption that all exposed bats (160/colony) had a 0.05% risk of being hit and killed over the course of a 17 year period. For our Tier 2 analysis, we considered the nearness of the proposed alignment to the center of the maternity colony's use area, presence of likely travel corridors providing connectivity to the proposed alignment (Figure 3), and juxtaposition of potential roosting and foraging habitat, capture locations and known roost sites (when available) and considered whether the Tier 1 roadkill estimate was reasonable. Given the positioning of forest habitat relative to the proposed interstate alignment, we believe the Tier 1 estimate remains reasonable and no more than 8 bats will be killed by vehicle collision by 2030 or approximately 1 bat every two years. The loss of 8 individuals from roadkill may cause short-term (i.e., 2 to 3 years) reductions in reproductive success, but we do not anticipate an appreciable long-term change in reproductive success or viability of the Pigeon Creek Maternity Colony #1.

Regarding the potential for I-69 to spur induced development in Section 1, the Section 1 DEIS stated, "farmland surrounds forested areas in Section 1 and is the predominant land use in the area. It is most likely that development of the approximately 295 acres identified by the expert land use panel would not occur in one location, but would be spread among several locations surrounding the interchanges; and that it would occur on land that has already been cleared (i.e., farmland)." Similarly, the Section 1 BA stated,

"Wooded areas could have an appeal to some people for residential development with or without I-69. However, "indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur." 50 C.F.R. § 402.02. Based on all of the evidence gathered, the large amount of cleared land available, the well established trend that development utilizes cleared land before using forested land, and the analysis and conclusions of the expert land use panel for Section 1, there is no reasonable certainty that the predicted induced growth will utilize forested lands. Thus, it is concluded that the predicted 295 acres of induced growth included in the expanded summer action would have an insignificant or discountable effect upon forests and thus, the Indiana bat."

The Service gives deference to the "expert land use panel" on the issue of where induced development is most likely to occur in Section 1. Thus, we do not anticipate any incidental take of Indiana bats in Section 1 as a result of induced development (295 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 1 BA and conducting the formal consultation for Section 1, the Service has concluded that applicable information within Table B1 remains valid for Section 1 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 1: 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 1, the Service does not anticipate that any new cell towers or billboards are likely to be sited/constructed in currently forested areas in Section 1 and therefore no additional forest loss is anticipated for these related actions.

Bats in the Pigeon Creek Maternity Colony #1 may be exposed to adverse effects and incidentally taken from several I-69 related activities. The following forms of incidental take of colony members are possible:

- harm from permanent direct loss of one or more alternative roost tree(s) and loss of habitat connectivity/travel corridors among forested patches in Section 1,
- harass/wound/kill/harm from disturbance and habitat loss associated w/demolition and subsequent relocation of 18 homes (0 businesses) and related structures (e.g., barns) in Section 1 (assuming one or more home owners will choose to construct a new home in a forested area; no seasonal tree-clearing restrictions and IBats assumed present),
- harass/wound/kill/harm from permanent habitat loss from I-69 related utility relocations (no timing restrictions/bats may be present) (one electric transmission crossing may result in a potential conflict that could result in a tower needing to be relocated into a wooded area in Section 1, unknown acreage of impact)
- 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., I-164). This is the most likely form of incidental take in Section 1.
- harassment of bats roosting near construction and/or operation of I-69 from noises/vibrations/disturbance levels causing roost-site abandonment and atypical exposure to day-time predators while fleeing and seeking new shelter during the day-time.

Although incidental take may occur in various forms, the total amount of incidental take to individual bats is quite small. The Service anticipates that no more than 8 Indiana bats from this colony will be taken as a result of all project-related habitat modifications (from 2017 to 2030; see Table B1 in RPBO) and no more than 8 bats (or approximately 1 bat/2 years) are anticipated to be taken as a result of roadkill.

In summary, the following effects are anticipated:

- Direct habitat modification/loss will occur, but will be minimal with a loss of approximately 1% of tree cover in the maternity colony area. So, the total amount of forest loss is relatively insignificant. It is also unlikely that this maternity area would experience a significant 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 1.
- Although no primary or alternate roost trees were located for this particular colony, given the capture location of the pregnant female, the distance to the I-69 alignment, and results of forest transects conducted by BLA in 2007, it is unlikely that a primary maternity roost is within the 11.6 acres within the proposed alignment that will be cleared for I-69. Thus no take is anticipated from the loss of a primary roost tree. Loss of one or more alternate roost trees may occur, but this also is unlikely given the location of the proposed alignment.
- Approximately three potential, east-west, travel corridors may be disrupted by the proposed interstate alignment, but because the interstate would be located near the edge of the maternity area, we anticipate that this potential adverse effect would affect a relatively small proportion of the colony members (i.e., <25%) and not be a significant source of take.
- 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 1 interchanges (e.g., SR 68).
- Proposed forest, wetland, and stream mitigation within the maternity area will ensure that at least 160 acres of suitable roosting and foraging habitat persists in this area in perpetuity (Figure 3).

Although there may be some short-term impacts to individuals, these impacts are not likely to affect the colony's long-term reproduction and viability. Thus, the Pigeon Creek Maternity Colony #1 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 160-acre parcel in Gibson 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 a maximum total 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 to males remaining within the Winter Action Area (WAA) during the summer. Less than 20 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.

Because no adult males were captured within the originally defined SAA for Section 1, it is likely that none are present or they only occur at very low densities. Presumably, a small number of adult males may occur in forested habitat within the Expanded SAA areas (where no bat surveys were conducted), but because no direct or indirect loss of forest habitat is anticipated, no incidental take is anticipated from habitat loss/modification. Therefore, the only form of incidental take of adult males that is anticipated in Section 1 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., I-164).

Given the absence or presumably very low densities of adult males within the SAA, we anticipate the total number of adult males that may be taken as a result of the Proposed Action in the Section 1 SAA to be less than 5 individuals between the years 2013 and 2030 or 1 bat every three years as a result of roadkill. The potential loss of this very small number of male bats will have no measurable or significant short or long-term impacts on local or regional Indiana bat populations in the SAA or beyond.

### **Effects on Habitat Quality**

In addition to direct habitat loss (27.4 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 may be 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 1 of I-69.

During construction, water quality may be temporarily adversely affected in Section 1 streams (e.g., increased siltation) where Indiana bats drink and presumably obtain a small portion of their insect prey. Once operational, Section 1 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 1 Tier 2 Conceptual Mitigation Plan** (see Appendix C of the Section 1 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.

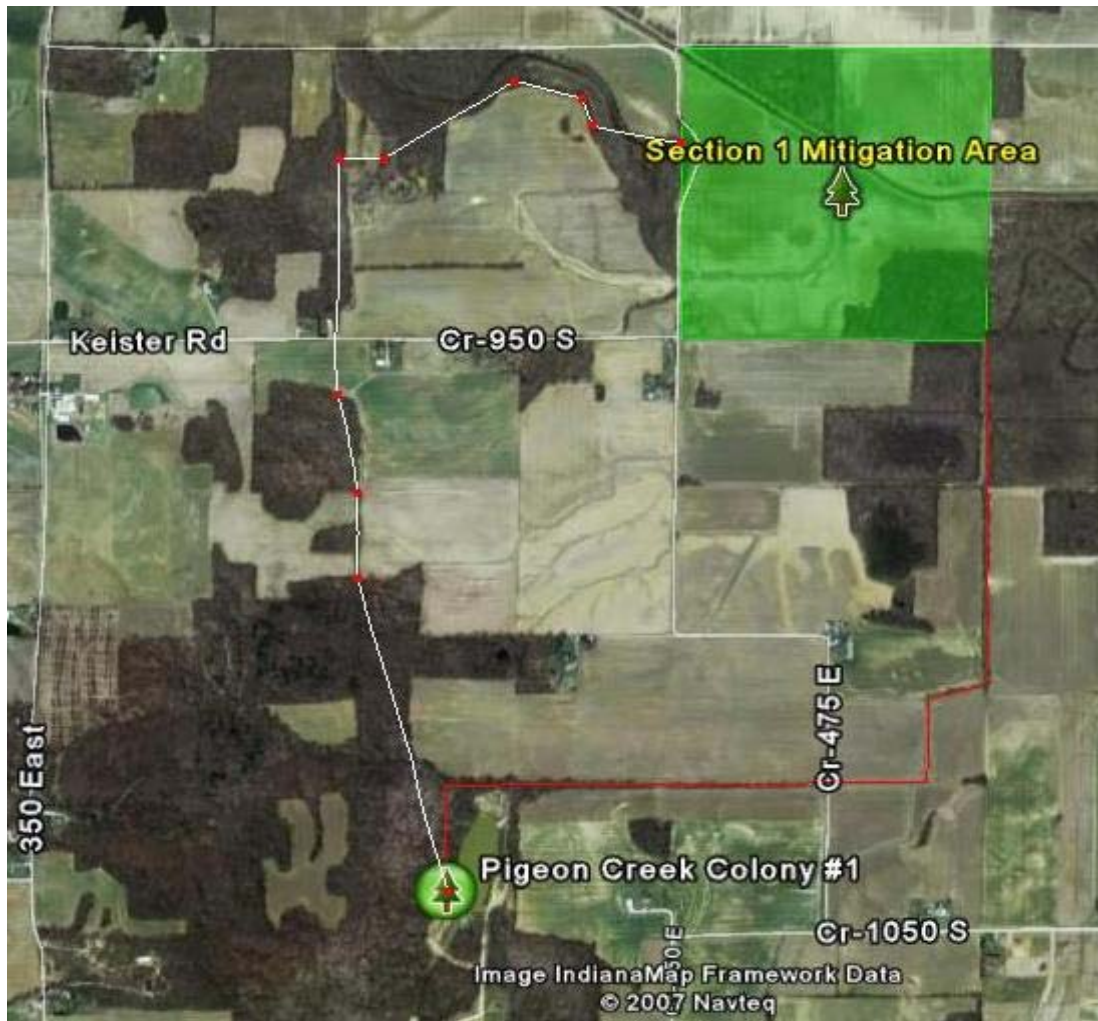
To minimize and mitigate impacts to bats due to habitat loss in Section 1, existing high quality forested habitat suitable for Indiana bat foraging and roosting within the SAA has been identified, and the State's offer to purchase a conservation easement for the proposed mitigation area in Section 1 has been accepted by the private land owners (See Appendix B). The proposed 160-acre mitigation area will be protected in perpetuity for the primary purpose of Indiana bat conservation. Based on the Service's field reconnaissance, the Service believes that the proposed mitigation area currently contains approximately 30 acres of roosting and foraging habitat that is of higher quality (i.e., larger/more mature trees with open understory) and greater maturity than most of the small woodlots that will be cleared for I-69 in Section 1. Once proposed additional tree plantings mature, the proposed site in Gibson County 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 (Figures 3 and 4). Bottomland forest is an important habitat type used by Indiana bat maternity colonies throughout the Midwest (Carter 2006).

The proposed mitigation area is appropriately situated within the assumed foraging range of the maternity colony and in this case has at least two potential travel corridors between the center of the maternity area and the mitigation area (Figure 4). Permanently protected plantings along stream corridors will also benefit water quality in the long term, as the plantings will provide a vegetated buffer that will reduce runoff, and associated sedimentation, from adjoining roadways, commercial/industrial developments, and agricultural areas. 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). All plantings will be monitored by INDOT for at least five years to insure that mitigation criteria are successfully achieved in a timely manner. 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. The conservation easement will not allow 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.

As stated above, 11.6 acres of forest will be cleared within the Pigeon Creek Colony #1 maternity area (2.5-mile radius area). As currently proposed, the 160-acre Section 1 Mitigation Area would provide the following forest mitigation ratios for this particular maternity colony: 2.6 to 1 in preservation of existing habitat and 8.3 to 1 in replacement forest habitat. For the entire Section 1 SAA, FHWA and INDOT have exceeded their 3:1 mitigation commitment for upland forest by approximately 44 additional acres in Section 1 for a mitigation ratio of 4.6:1. Therefore, additional benefits will be realized by the bats than had been anticipated in the Tier 1 RPBO. Because the 30.4 acres of existing forest habitat would be protected and 101.9 acres of new forest would be planted, the Pigeon Creek Ibat 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.

With successful implementation of the proposed Tier 2 Conceptual Mitigation Plan for Section 1 and all of the other proposed mitigation efforts and conservation measures, we anticipate that long-term habitat conditions for the Pigeon Creek Maternity Colony #1 and individual bats





**Figure 4.** Potential Indiana bat flight path (white path = 1.9 mi., red path = 1.8 mi.) from the center of Pigeon Creek Colony #1 to the proposed mitigation area for Section 1 of I-69.

within the Section 1 Summer Action Area will be sustainable and, in limited situations, may 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 Pigeon Creek Maternity Colony #1 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.



In summary, construction of Section 1 of I-69 will cause direct loss of 27.4 acres 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, over all long-term habitat restoration and protection are expected to improve the habitat conditions for Indiana bats, particularly for Pigeon Creek Maternity Colony #1. Up to 8 females and/or juveniles in the Pigeon Creek Colony #1 may be harmed/incidentally taken as a result of habitat loss and modification and up to 13 bats (males, females, and juv.) may be killed by vehicle collisions. Thus, we estimated the maximum overall amount of I-69 related incidental take of Indiana bats within the Expanded SAA to be no more than 21 bats (16 females/juv. + 5 males) spread over a 17-year long period. On an annual basis, this equates to about 1.2 bats being taken per year. The loss of this number of bats may have short-term reproductive consequences, but no long-term reproductive or viability implications are anticipated. Therefore, we anticipate the SAA for Section 1 will continue to support the existing maternity colonies 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 6 June 2007 Tier 2 BA for Section 1 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 in addition to the model based cumulative impacts. 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 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 279 acres of tree cover potentially lost as cumulative effects from the maintenance of legal drains within the Pigeon Creek Maternity Colony #1 area alone. However, BLA recently contacted the county surveyors in Gibson and Warrick counties and received letters stating that neither county had any reasonably certain plans for clearing trees from legal drains within the Section 1 SAA (pers. comm. with Jeremy Kieffner, BLA, 8 August 2007). Therefore, what was previously believed to be the largest threat to this

colony from cumulative impacts (i.e., a 279-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 26 adult females/juveniles from this maternity colony from the potential amount of forest loss associated with the dredging of legal drains in Section 1. This very conservative Tier 1 estimate was clearly 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 1 are causing forest habitat loss and modification. For example, as previously mentioned in the Environmental Baseline section, the Service noticed that approximately 10 acres of forest recently had been cleared within the central portion of the Pigeon Creek Maternity Colony #1 (Figure 2). This clearing is associated with the Oakridge Estates subdivision and additional wooded residential lots are for sale and eventually are likely to be developed. At the Service's request, BLA investigated and emailed the following information on 10 August 2007 pertaining to this particular residential development and a similar one located directly south of it on the south side of SR 68:

The subdivision to the north of SR 68 is called Oakridge Estates and there are 29 lots plated out in this subdivision. Of the 29 lots, there are 12 homes built and a total of 19 lots have been sold (including the 12 already built homes). A total of 13 lots are located in forested settings and the other 16 are located in open land. 5 of the 19 lots sold are located in the forested lots. The average area being cleared of forests for the building of homes in this area is 0.9 acre. Therefore, assuming that all 13 forested lots are sold and homes are built on them excluding the lots that already have homes built on them, a total of 9.9 acres of additional forests may be cleared in this subdivision.

The subdivision to the south of SR 68 is called Whispering Winds and there are 28 lots plated out in this subdivision. Of the 28 lots, there are 15 homes built and a total of 25 lots have been sold (including the 15 already built homes). All of the 28 lots in this subdivision are located in forested settings. The average area being cleared of forests for building of homes in this area is 0.8 acres. Therefore, assuming that all 28 lots are sold and excluding the lots that have already been cleared (15), a total of 10.4 acres of additional forests may be cleared in this subdivision.

Therefore, the total amount of forest and core forest has been reduced in this maternity colony area in recent years and the potential for additional losses (according to BLA calculations) of at least 20 acres is likely. No additional planned residential developments within forested areas within the Pigeon Creek Colony #1 area are known at this time. However, a planned commercial development, the North Warrick Industrial Park, may also continue to reduce the availability of some marginally suitable summer habitat for local bats. In addition to the potential for adverse effects from the habitat loss, these developments also demonstrate that a relatively low level of tree clearing does occur within the SAA during the summer months when Indiana bats may be present and directly in harms way.

The Tier 1 RPBO, stated that the Pigeon Creek Maternity Colony (#1) had a relatively low percentage of existing "tree cover" (15%). Based on a new GIS analysis conducted by BLA using 2006 USGS data (2001 satellite imagery), the percentage of forest cover in the original SAA and expanded SAA is approximately 20% and 23% respectively, which is higher than was previously reported from an analysis of older (1992) satellite images. So, there apparently had been a net increase in forest cover leading up to at least 2001. This apparent increase is consistent with the state-wide increase in Indiana's overall forested land mass from 1999-2003 (see the Tier 1 RPBO for more details and discussion on relevant forest trends in Indiana).

## 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 1 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 Pigeon Creek Colonies #2 and #3
- We anticipate that the Pigeon Creek Colony #1 will not be displaced by direct or indirect effects associated with the construction, operation, and maintenance of Section 1.
- Given the configuration of existing forest habitat, relatively long travel distance to the proposed interstate alignment, and current woodlot conditions, the Service believes it is extremely unlikely that a primary roost tree will be lost during construction of Section 1 of I-69.
- A small amount of incidental take, approximately 17 bats, may occur within the Pigeon Creek Colony #1 over a period of many years. Hence, we do not anticipate negative impacts to long-term reproductive success or viability of the colony.
- In theory, even if I-69 were to permanently destroy Pigeon Creek Colony #1 (which it most certainly will not), it would not likely constitute an appreciable reduction in the species' reproduction (0.02 – 0.03% loss of assumed viable reproductive colonies) nor an appreciable reduction in the species' range. Because nearly half of all known Indiana bats (47.5% of all *M. sodalis* in 2007) spend the winter in southern Indiana, this region, by default, serves as a major hub for the species' maternity colony distribution as well. So, the hypothetical loss of the Pigeon Creek Colony #1 in southwest Indiana would not cause an appreciable gap within the range of known maternity colonies.
- Thus, at worst, we believe a short-term reproductive loss could occur within a single maternity colony.
- To the contrary, we anticipate the proposed action may improve the long-term conditions for Indiana bats within the action area. Because the proposed 160-acre Section 1 Mitigation Area has been strategically located to improve upon the existing high-quality forest habitat along Pigeon Creek, we believe adverse impacts to Pigeon Creek Colony #1 and any adult males occurring in the immediate area will be further minimized and should not be long lasting. Because 30.4 acres of existing forest habitat would be protected and 101.9 acres of new forest would be planted, the Pigeon Creek Maternity Colony #1 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, if the proposed mitigation area completely fails, this maternity colony is still likely to persist within the other available habitat within its traditional summer range.

# **SECTION 1**

## **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 1 of I-69 will occur as a direct or indirect result of the Proposed Action in the following forms:

- harm through habitat modification/permanent direct loss of roosting habitat/alternate roost trees and loss of foraging habitat and loss of connectivity/travel corridors among forested patches in Section 1,
- harass/wound/kill/harm from disturbance and habitat loss associated w/demolition and subsequent relocation of 18 homes (0 businesses) and related structures (e.g., barns) in Section 1,
- harass/wound/kill/harm from permanent habitat loss from I-69 related utility relocations,
- harassment of bats roosting near construction and/or operation of I-69 from noises/vibrations/disturbance levels causing roost-site abandonment and atypical exposure to day-time predators while fleeing and seeking new shelter during the day-time, and
- 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., I-164). This is the most likely form of incidental take in Section 1.

Based on our analysis, the Service believes three Indiana bat maternity colonies occur within the Expanded SAA, but that only Pigeon Creek Maternity Colony #1 is likely to be adversely impacted as a result of the Proposed Action. Adverse effects on the Pigeon Creek Maternity Colony #1 include habitat loss/modification and loss of individuals from roadkill.

Although very difficult to predict, we anticipate no more than 13 Indiana bats (8 adult females and/or juveniles and 5 adult males) will be killed by vehicles during the first 17 years that Section 1 is operational or approximately 1 bat/year as long as the interstate is operated. No significant, long-term adverse effects are anticipated to accrue neither to this maternity colony nor to any local populations of adult males.

We estimated the maximum amount I-69 related incidental take of adult female, juvenile, and adult male Indiana bats from all sources within the Expanded SAA to be no more than 21 individuals (13 from roadkill + an additional 8 adult females/juveniles as harm from habitat loss/modification and/or harassment) during the first 17 years of operation (approx. 2013-2030). On an annual basis, this equates to 1.2 bats (1 or 2 whole bats) being taken per year.

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 approximately 28 (rounded up from 27.4 ac.) forested acres in Section 1 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.

Currently anticipated levels of adverse impacts to Indiana bat summer habitat/forest in Section 1 are significantly lower than what previously had been considered in the Tier 1 RPBO. The Tier 1 incidental take estimate of 55 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 27.4 acres, a 50% reduction and far below the anticipated project-wide total of 2,148 acres of direct forest loss. This anticipated level brings the cumulative total of forest habitat loss for both Section 1 of I-69 and the entire I-69 Evansville to Indianapolis project to 28 acres (rounded 27.4 up to nearest whole acre) (Table 1).

**Table 1.** Estimated direct loss of Tier 2 Forest within the I-69 Section 1 SAA.

<b>Project Section</b>	<b>Loss of Forest Anticipated in Tier 1 RPBO/BA Addendum for Section 1</b>	<b>Loss of Forest Anticipated in Tier 2 BA &amp; Tier 2 BO for Section 1</b>
1	55 acres	28 acres

Additionally, we anticipate that the Proposed Action will result in the loss of approximately 1.33 acres of non-forested wetlands in Section 1 of I-69 (Table 2). This anticipated level brings the cumulative total of incidental take of non-forested wetlands for the entire I-69 Evansville to Indianapolis project to 1.33 acres. This impact level is well below the 20 acres originally anticipated for the entire I-69 Evansville to Indianapolis project in the Tier 1 RPBO and ITS.

**Table 2.** Estimated direct loss of non-forested wetlands within the I-69 Section 1 SAA.

<b>Project Section</b>	<b>Loss of Non-forested Wetlands Anticipated in Tier 1 RPBO/BA Addendum for Section 1</b>	<b>Loss of Non-forested Wetlands in Tier 2 BA &amp; Tier 2 BO for Section 1</b>
1	4 acres	1.33 acres

## **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 1 of I-69:

1. In the Section 1 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. Before any construction of Section 1 of I-69 commences, the FHWA, in consultation with the Service must develop a detailed, site-specific, final mitigation plan for the proposed Section 1 Mitigation Area. The mitigation plan will not be conceptual, but rather will contain detailed descriptions for each phase of mitigation including 1) initial construction and establishment, 2) 5-year, post-construction monitoring phase, and 3) long-term management. The Section 1 Final Mitigation Plan will address and/or establish the following: quantifiable criteria and methods for assessing success of all mitigation plantings and functionality of constructed wetlands and streams, approved lists of tree/plant species to be planted (and their relative abundance/%), approved lists of herbicides for weed control, proposed construction schedules, annual post-construction monitoring schedules, and a long-term, ongoing management/stewardship strategy.

To ensure timeliness, the FHWA must begin construction and/or reforestation within the Section 1 Mitigation Area either before (the most preferable option) or during the first summer reproductive season (15 April – 15 September) immediately after any I-69 related tree clearing or construction begins anywhere within the 2.5-mile radius maternity area of Pigeon Creek Maternity Colony #1 (see Figure 1). Once initiated, all Service-approved construction and tree plantings within the Section 1 Mitigation Area 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 1. This annual report will be completed throughout the 5-year post-construction monitoring period. The annual report for Section 1 may be a stand-alone document or included as part of the annual report required under the 2006 Tier 1 T&C Number 2.

**ATTENTION:** If at any point in time during this project, the exempted project-wide or section-specific habitat acreages or annual number of roadkilled bats quantified in the AMOUNT OR EXTENT OF TAKE section of this ITS are exceeded by more than 10%, then the Service will assume that the exempted level of take for this project may have been exceeded and the FHWA should immediately reinitiate formal consultation.

In conclusion, the Service believes that no more than 21 individuals will be incidentally taken between the years 2013 and 2030 as the result of permanent loss of currently suitable summer roosting and foraging habitat and from roadkill of Indiana bats. Such take will be monitored by tracking the amount of habitat modification. Direct habitat loss will be limited to approximately 28 acres of forest habitat and 1.33 acres of non-forested wetlands within the Section 1 SAA. These acreages represent less than a 1% loss of the Section 1 SAA's forested acreage and will be cleared over a period of at least several 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 15-September 15 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

1. 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.

2. Provide funding to expand on scientific research and educational outreach efforts on Indiana bats in coordination with the Service's BFO.
3. In coordination with the BFO, purchase or otherwise protect additional Indiana bat hibernacula and forested swarming habitat in Indiana.
4. 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 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.



## LITERATURE CITED

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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 8/29/2007)
<b>A. Context Sensitive Solutions</b>		
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 15 April to 15 September	to be completed
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	to be completed
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	to be completed
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	to be completed
13d	Roadways will be designed to contain accidental spills	to be completed
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	to be completed
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	to be completed
15	Parking and Turning Areas - for heavy equipment will be outside and away from environmentally sensitive areas.	to be completed
<b>B. Restoration / Replacement</b>		
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>B. Restoration / Replacement (continued)</b>		
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
<b>C. Conservation / Preservation</b>		
1	Hibernacula Purchase - one or more will be purchased to conserve Ibat 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 Ibat 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
<b>D. Education / Research / Monitoring</b>		
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 Ibat 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 Ibat 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.	to be completed
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 <a href="http://igs.indiana.edu/arcims/statewide/index.html">http://igs.indiana.edu/arcims/statewide/index.html</a> .	completed

## APPENDIX B. Letter of Intent for Proposed Section 1 Mitigation Area

Besing Land Trust  
506 Brook Meadow Circle  
Evansville, IN 47711

16 August 2007

Tom Seeman  
Project Manager  
100 N. Senate Avenue, Room N642  
Indianapolis, IN 46204

RE: Letter of Intent to Sell  
Project: 0710405  
Code: 5079  
Parcel: 1  
County: Gibson  
Owner(s): Besing Land Trust dated April 18, 1981

Dear Mr. Seeman,

Pursuant to our conversations and meetings be it known that we intend to sell a Perpetual Conservation Easement for mitigation purposes to the State of Indiana over the land described in Exhibit "A" (see attached). This land will be used as mitigation for the I-69 Evansville to Indianapolis project.

The purchase price of \$3,800 per acre has been approved by all parties and as soon as the language of the "Declaration of Restrictions and Covenants upon Real Estate" is approved by Darvin Besing and Gerald Besing, Co-Trustees of the Besing Land Trust, then arrangement will be made to transfer the property rights.

Respectfully,

  
\_\_\_\_\_  
Gerald Besing, Trustee, Besing Land Trust

## **APPENDIX B. Continued.**

### **EXHIBIT “A”**

**Project : 0710405**  
**Code : 5079**

Sheet 1 of 1

#### ***Parcel : 1***

The South Half of the Southwest Quarter of Section 25, Township 3 South, Range 10 West, and the Northeast Quarter of the Southwest Quarter Section 25, Township 3 South, Range 10 West, and the Northwest Quarter of the Southwest Quarter of Section 25, Township 3 South, Range 10 West.