



TABLE OF CONTENTS

5.18	Wildlife Considerations.....	5.18-1
5.18.1	Introduction	5.18-1
5.18.2	Methodology.....	5.18-3
5.18.3	Analysis.....	5.18-9
5.18.4	Mitigation.....	5.18-15
5.18.5	Summary.....	5.18-16

LIST OF TABLES

Table 5.18-1:	Potential Wildlife Habitat Impacts, by Alternative	5.18-10
---------------	--	---------



5.18 Wildlife Considerations

Since the publication of the Draft Environmental Impact Statement (DEIS), impact calculations have been updated in this section to include the Refined Preferred Alternatives (RPA). This information is presented in **Table 5.18-1**, identifying one wildlife crossing where impacts of the RPA differ from those of DEIS alternatives. Acreages shown for the field survey study area are modified to include alignment adjustments in the RPA. Mitigation descriptions have been edited to clarify commitments for maintaining existing wildlife connectivity.

5.18.1 Introduction

Land development and transportation needs are growing quickly, and with this growth comes an increase in road density (Evink, 2002). Wildlife populations may be able to tolerate roadway impacts beneath a certain threshold. However, as road density and development increase, animals are pressed into smaller spaces or must cross roads more frequently. Road densities are one of the best measures of the impact upon wildlife (Rudolph, 2000).

To ensure that wildlife and ecosystems remain healthy in the future, some connectivity and permeability must be provided in transportation projects. Connectivity between habitats crossed by roadways can be maintained by a range of actions from modifying planned culverts to planning extensive span bridges over habitat corridors for wildlife passage. Context sensitive designs can help create roads with fewer impacts to wildlife.

Highways are long linear features that have impacts on wildlife and wildlife habitat that are disproportionate to the acreage they occupy. Impacts occur at the time of construction and also accumulate over time (Jackson, 2000).

Wildlife and vehicle collisions, particularly involving deer, cause significant injury and damage to motorists and property (Evink, 2002). Under SAFETEA-LU, a study was conducted to assess national wildlife vehicle collisions (WVC) and identify measures to reduce WVCs. The study estimated there are between one and two million WVCs annually in the U.S. with a trend to increasing numbers of WVCs (Huijser, 2008). Each year, these accidents result in approximately 26,000 to 29,000 human injuries and at least 200 deaths (Conover et al., 1995), (Huijser, 2008). Annual costs associated with WVCs are approximately \$8.4 billion (Huijser, 2008). Note that collisions with smaller animals such as skunks, raccoons, opossums, squirrels, and turtles were not included in this calculation.

The *Wildlife-Vehicle Collision Reduction Study: Report to Congress* (Huijser, 2008) identified a wide variety of mitigation techniques for WVCs including fencing and wildlife crossings. Appropriate planning and mitigation during construction can prevent long-term degradation of wildlife populations and their associated ecosystems, as well as improve public safety (Jackson, 2000).



The impacts of highways on local/regional populations, habitat fragmentation, and metapopulation dynamics are important factors affecting the long-term persistence of wildlife populations. Highways do not affect all wildlife species equally. They may act as filters, stopping some individuals or species while letting others pass through. Over time, this filtering of species based on habitat barriers can have important impacts on species distribution across a landscape (Jackson, 2000).

Maintaining the ecological health of the project area requires that mitigation measures for highway impacts consider all species populations. By designing the highway to include structures that increase landscape permeability and provide habitat continuity, the ecological infrastructure of the project area can be maintained. Mitigation for impacts on wildlife populations will focus on perpetuating connectivity that exists within the existing SR 37 right of way for all species that are a part of the natural community. In doing so, natural processes, wildlife movement, population dynamics, and species distribution in the community would experience less impact from the construction of the interstate.

I-69 Section 6 entails upgrading an existing multi-lane, divided transportation facility to a full freeway design. Most of the right of way used for the I-69 Section 6 project already is devoted to transportation use. Accordingly, the impacts to most natural resources in I-69 Section 6 would be reduced (on a per-mile basis) in comparison with I-69 Sections 1 through 4, which were constructed on new terrain.

The resource impacts described in this section include wildlife habitat impacts within the field survey study area. The field survey study area includes all alternative right of way footprints plus an approximate 50-foot buffer. The field survey study area is the area investigated for natural resources such as wetlands, streams, forests, and wildlife habitat. For specific wildlife resource studies such as those for the Indiana bat and northern long-eared bat or for core forest, the study area was extended outside the field survey study area. The specific study area for each of those areas is identified in the supplemental reports referenced below and in the appendices.

The majority of impacts resulting from I-69 Section 6 would involve wildlife habitats that were previously impacted by the construction of SR 37. The **Human and Community Resources Map Series** provided at the end of **Section 5.3** shows direct land use impacts of the alternatives. Additionally, the **Habitat Map Series** provided at the end of this section shows the locations of all habitat communities identified by the field investigations within the I-69 Section 6 field survey study area.

Types of land use impacted are similar for the alternatives, with over half of the direct impacts occurring to developed lands. As shown in **Table 5.3-1**, about half of the right of way for I-69 Section 6 will be from the existing SR 37, at 924 acres for Alternative C1, 941 acres for Alternative C2, 921 acres for Alternative C3, 993 acres for Alternative C4, and 1,050 acres for the RPA. New right of way, outside SR 37, would include developed land, followed by upland habitat, agricultural land, and smaller areas of wetlands, water, and mines/quarries. New right of way for the alternatives would be 999 acres for Alternative C1, 1,171 acres for Alternative C2, 945 acres for Alternative C3, 1,076 acres for Alternative C4, and 1,025 acres for the RPA. New



impacts to wildlife habitat would result from reconstructing pavement and roadside features of SR 37 to meet interstate standards, and by the construction of new interchanges and local service roads.

The following sections identify the natural communities located within the project area, the potential impacts to habitat as a result of the project, actions taken to avoid or minimize impacts, and potential mitigation measures where impacts would be unavoidable.

5.18.2 Methodology

Literature investigation and field surveys were conducted to identify existing natural resources and endangered and threatened species located within the I-69 Section 6 field survey study area. Biological surveys conducted for I-69 Section 6 involving bat mist netting, wetlands analysis and streams analysis are described in **Section 5.17** and **Section 5.19**. The methodology and results of these studies are detailed in the following reports provided in the appendices, as noted.

- *Summer Habitat for the Indiana Bat (*Myotis sodalis*) within the Martinsville Hills from Martinsville to Indianapolis, Indiana* (JF New, 2004), in **Appendix N**.
- *Identification of Indiana Bat Roost Trees Along the Proposed I-69 Interstate between Bloomington and Indianapolis, Indiana* (BHE, 2006), in **Appendix N**.
- *I-69 Presence/Absence Mist Netting Survey for Indiana Bat (*Myotis sodalis*) and Northern Long-eared Bat (*Myotis septentrionalis*) Section 6 (Morgan, Johnson, and Marion Counties) Upper White River Watershed* (Lochmueller Group, 2015), in **Appendix N**.
- *Wetland Technical Report*, in **Appendix E**.
- *Stream Assessment Report*, in **Appendix L**.

Classification of natural communities within the I-69 Section 6 field survey study area by habitat type facilitates the evaluation of potential impacts resulting from project implementation. The habitat type listings below were developed according to the vegetative characteristics of each community as documented during the field investigations.

Based on the results of the field investigations, 10 natural habitat types were identified within the field survey study area: (1) old field; (2) early to mid-successional forest; (3) forest fragment (4) mesic floodplain forest; (5) dry-mesic forest; (6) mesic upland forest; (7) emergent wetland; (8) scrub/shrub wetland; (9) forested wetland; and (10) open water. The **Habitat Map Series** provided at the end of this section shows the locations of all habitat communities identified by the field investigations within the I-69 Section 6 field survey study area. The basic characteristics of these habitat types are described below. Total acreages of each habitat type within the field survey study area and within the existing SR 37 right of way are shown in parentheses.

Active agricultural areas are not included as a habitat type because these areas typically occur within a matrix of other habitat types and provide little habitat when isolated. In addition,



Section 6—Final Environmental Impact Statement

agricultural habitat may vary substantially from year to year depending on management intensity or cultivation method. Cultivated agricultural lands are typified by periodic disturbance throughout the year. This includes periods of vegetation removal and bare soils during cultivation and planting and after harvest. Additionally, disturbance occurs as pastures are mowed, hayed, or grazed one or more times during the growing season.

5.18.2.1 Habitat Types and Associated Species¹

The areas in the headings below represent the total amount of the habitat type within the field survey study area, not the area to be impacted. Where this habitat is included in the existing right of way, it has been included in the acreage calculation.

Old Field — (176 acres in Field Survey Study Area, 12 acres within existing SR 37 right of way)

Habitat: Old field habitat is typically considered land that has been previously managed as active agricultural land including pasture, hay fields, or row cropland such as corn (*Zea mays*) or soybean (*Glycine max*) fields and remains undeveloped. Following managed use, these habitats lay fallow for several years, eventually reverting to an assemblage of native and naturalized grasses and forbs. Old field is a valuable habitat type for wildlife in the Midwest and this habitat type typically supports a variety of species; however, exact species composition is dependent upon the successional stage of a given old field. Succession is defined as the transition from one biotic community to another in a given habitat (Jackson, 1997). Old field succession typically progresses from meadow to scrub/shrub through a process that occurs over approximately three years. For the purposes of this project, the scrub/shrub old field habitats are included in the old field habitat type.

Species: Because of the variety of plant species inhabiting old fields, this habitat type serves as natural food plots for a wide variety of birds, butterflies, and mammals. Common plant species provide an important source of nutritious forage for seed-eating birds such as northern bobwhite (*Colinus virginianus*), mourning dove (*Zenaidura macroura*), finches (*Fringillidae* family), northern cardinal (*Cardinalis cardinalis*), and sparrows (*Passeridae* and *Emberizidae* families). Additionally, wild turkey (*Meleagris gallopavo*), eastern meadowlark (*Sturnella magna*), and eastern bluebird (*Sialia sialis*) frequent old fields in search of insects, while rodents such as voles (*Microtus* sp.), moles (*Scalopus aquaticus*), field mice (*Cricetidae* family), and groundhogs (*Marmota monax*) feed on the green vegetation and seeds found in old fields. Predators such as barn owl (*Tyto alba*), red-shouldered hawk (*Buteo lineatus*), Cooper's hawk (*Accipiter cooperii*), common garter snake (*Thamnophis sirtalis*), and racers (*Coluber constrictor*) feed on the rodents. Various flowering plants provide nectar and pollen for butterflies, moths, and bees. The

¹ Some of these habitat types are assigned names similar to those used for resources in other chapters. For example, six of the 11 habitat types use “forest” as part of the name. However, not all satisfy the USDA definition of “forest” which is used to define forests in Section 5.20. See explanation with Table 5.18-1 for more details.



nighthawk (*Chordeiles minor*) and various species of bats feed on moths that emerge from old field habitats.

In addition to foraging in old fields, several species of wildlife use this habitat for nesting and shelter, including the cottontail rabbit (*Sylvilagus floridanus*), badger (*Taxidea taxus*), meadow vole (*Microtus pennsylvanicus*), red fox (*Vulpes vulpes*), American woodcock (*Scolopax minor*), field sparrow (*Spizella pusilla*), northern bobwhite, song sparrow (*Melospiza melodia*), and American goldfinch (*Carduelis tristis*). Butterflies such as the monarch (*Danaus plexippus*) and eastern black swallowtail (*Papilio polyxenes*) also frequent this habitat type. This is only a partial list of species that use old field habitats.

Early to Mid-Successional Forest — (63 acres within Field Survey Study Area, 11 acres within existing SR 37 right of way)

Habitat: Early to mid-successional forest communities resemble a later stage of old field and are sometimes included under the same category. The early to mid-successional forest community typically develops by year three of succession and is characterized by a community consisting of between 10 percent and 50 percent woody plants that are seedlings or saplings. An area is considered woodland once it consists of greater than 50 percent saplings. Early to mid-successional forest is not included in the forest impacts in **Section 5.20**, because it does not meet the U.S. Department of Agriculture (USDA) definition of forest.¹ The USDA defines a forest as land area at least 1.0 acre in size and at least 120 feet wide with at least 10 percent live cover of trees or had had, in the past, at least 10 percent live canopy cover of trees assessed based on the presence of stumps, snags or other evidence (USDA 2016).

Species: The early to mid-successional forest communities provide food sources and shelter for a variety of wildlife. As with all vegetative communities, the specific plant species would determine the species of wildlife present. Representative wildlife found in this habitat type includes northern mockingbird (*Mimus polyglottos*), catbird (*Dumetella carolinensis*), brown thrasher (*Toxostoma rufum*), loggerhead shrike (*Lanius ludovicianus*), Bell’s vireo (*Vireo bellii*), field sparrow, opossum (*Didelphis virginiana*), cottontail rabbit, northern bobwhite, wild turkey, and most resident and migratory songbirds (IDNR, 2004).

Forest Fragment — (86 acres within Field Survey Study Area, 20 acres within existing SR 37 right of way)

Habitat: While forest fragment is not typically classified as a community type, it represents a unique and valuable wildlife habitat worthy of recognition. Forest fragment primarily consists of fencerows, shrubby ditches and partially forested waterways that lack a floodplain, such as small intermittent creeks. This habitat type generally represents those areas between agricultural fields that are too small to be classified as old field or forest. Given the scale and extent of most agricultural landscapes, forest fragments are often the only refuge readily available to wildlife in some areas. Forest fragments are not included in the forest impacts in **Section 5.20**, because they do not meet the USDA definition of forest.



Species: Wildlife species that commonly use forest fragments include cottontail rabbit, Virginia opossum, raccoon (*Procyon lotor*), white-tailed deer (*Odocoileus virginianus*), white-footed mouse (*Peromyscus maniculatus*), gray squirrel (*Sciurus carolinensis*), American robin (*Turdus migratorius*), American tree sparrow (*Spizella arborea*), song sparrow (*Melospiza melodia*), blue jay (*Cyanocitta cristata*), brown-headed cowbird (*Molothrus ater*), and grackle (*Quiscalus quiscula*).

Mesic Floodplain Forests — (86 acres within Field Survey Study Area, 10 acres within existing SR 37 right of way)

Habitat: Mesic floodplain forests occur in lower elevation areas within riparian corridors and often have prolonged periods of standing water. Wetland habitat types sometimes can be found within forested floodplains. This description focuses on the floodplain forest. Forested wetlands are discussed later in this section. Mesic floodplain forest regimes meet the USDA definition of forest.

Species: Mesic floodplain forests provide valuable habitat for birds, mammals, amphibians, reptiles, and insects. Mesic floodplain forests with dense herbaceous cover provide ideal nesting grounds for waterfowl. Tree snags and cottonwoods (*Populus* spp.) provide food and shelter for many species of songbirds (Sullivan, 1995). Wildlife that typically use floodplain forests include Indiana bat (*Myotis sodalis*), northern long-eared bat (*Myotis septentrionalis*), bald eagle (*Haliaeetus leucocephalus*), red-tailed hawk (*Buteo jamaicensis*), red-eyed vireo (*Vireo olivaceus*), northern cardinal, catbird, house wren (*Troglodytes aedon*), eastern mole (*Scalopus aquaticus*), raccoon, common muskrat (*Ondatra zibethicus*), white-tailed deer, and turtles (*Chelydra serpentina*, *Kinosternon subrubrum*, *Trachemys scripta*.) (Sullivan, 1995).

Dry-Mesic Forest — (127 acres within Field Survey Study Area, 18 acres within existing SR 37 right of way)

Habitat: The dry-mesic forest natural community is one of the most common community types in Indiana. In terms of moisture gradient, it is intermediate between dry upland forest and mesic upland forest. It is often found on north and east facing slopes as well as the transition from floodplain forests to dry upland forests in areas with little topographical relief. As the most prevalent forest type within I-69 Section 6, it is found throughout the field survey study area. Dry-mesic forest regimes meet the USDA definition of forest.

Species: Because dry-mesic forests are often dominated by oaks (*Quercus* spp.) and hickories (*Carya* spp.), they provide an abundance of food for wildlife. This diverse plant system also provides habitat for many different species of birds, mammals, and amphibians such as white-tailed deer, gray squirrels, raccoons, striped skunks (*Mephitis mephitis*), bats (*Myotis* spp., *Eptesicus fuscus*, *Perimyotis subflavus*), eastern box turtles (*Terrapene carolina*), broad-headed skinks (*Eumeces laticeps*), wild turkey, and great horned owls (*Bubo virginianus*).



Mesic Upland Forest — (81 acres within Field Survey Study Area, 10 acres within existing SR 37 right of way)

Habitat: Mesic upland forests are often characterized by a dense canopy and an understory of shade-tolerant species. These areas are typically found on north-facing slopes and level ground with moderately high moisture availability. Within this general community type, species composition varies as a result of topographic variation, soil types, level of anthropogenic disturbance, and available moisture. These forests, where extensive, assist in regional climate control as the dense canopy shades forested wetlands and associated creeks and ephemeral streams, thus buffering temperature extremes. Mesic upland forest regimes meet the USDA definition of forest.

Species: These areas may provide food chain support for many different wildlife species. For example, many bird species such as tufted titmouse (*Baeolophus bicolor*), Carolina chickadee (*Poecile carolinensis*), wood thrush (*Hylocichla mustelina*), blue jay and downy woodpecker (*Picoides pubescens*) use these areas and associated wetlands as a source of food, water, nesting material, and shelter. Mammals such as woodchuck (*Marmota monax*), striped skunk, red fox, and white-tailed deer are also commonly found in mesic upland forest where they procure food and shelter from this diverse forest community.

Emergent Wetlands — (13 acres within Field Survey Study Area, 2 acres within existing SR 37 right of way)

Habitat: Emergent wetlands support erect, largely herbaceous perennial species and permanent water for most of the growing season during years of normal precipitation levels. These wetlands maintain the same appearance each year unless extreme climatic conditions cause flooding or other extreme local changes. Emergent wetlands traditionally include marsh, meadow, and fens. Dominant herbs in these wetlands include: cattails (*Typha* spp.), bulrush (*Scirpus* spp.), sedges (*Carex* spp.), manna grass (*Glyceria* spp.), smartweeds (*Polygonum* spp.), pickerelweed (*Pontederia* spp.), arrow arum (*Peltandra* spp.), and arrowheads (*Sagittaria* spp.). Emergent wetlands in the project corridor are discussed in greater detail in **Section 5.19**.

Species: Emergent wetlands are dominated by herbaceous vegetation. The hydrology can vary from saturated soils near the surface to several inches of inundation, dictating the vegetative community and associated wildlife species usage. The high productivity and availability of food, water, and cover allows wetlands to provide ideal habitat for a diverse array of wildlife. Emergent wetlands harbor resident and migratory waterfowl including geese, ducks, herons, and other birds. Depending on hydrology levels, emergent wetlands may also provide habitat for muskrat, snakes, frogs, salamanders, turtles, various beneficial insects and their larvae, dragonflies (Order Odonata, suborder Anisoptera), damselflies (Order Odonata, suborder Zygoptera), midges (Order Diptera, family Chironomidae), and caddisflies (Order Trichoptera).



Scrub/Shrub Wetlands — (<1 acre within Field Survey Study Area, none within existing SR 37 right of way)

Habitat: Scrub/shrub wetlands support largely woody species less than 20 feet in height. All hydrological regimes are included except sub-tidal. Vegetation includes true shrub species, but also young trees and trees and shrubs that are stunted because of environmental conditions. Scrub/shrub wetlands within I-69 Section 6 are broad-leaved, deciduous communities consisting of species such as buttonbush, willows, and swamp rose.

Species: Scrub/shrub wetlands often occur in areas that are maintained by man and remain in an early successional state. This early successional state allows for a dense layer of shrubs, herbaceous vegetation, and vines to form. This thick layer of vegetation provides cover and habitat for a variety of species. In addition, depending on the hydrologic regime, habitat for aquatic species could also be provided. Representative wildlife includes great blue heron (*Ardea herodias*), green heron (*Butorides striatus*), swamp sparrow (*Melospiza georgiana*), eastern cottontail rabbit, muskrat, and various species of amphibians, reptiles, and insects.

Forested Wetlands — (5 acres within Field Survey Study area, <1 acre within existing SR 37 right of way)

Habitat: Forested wetlands support largely woody species greater than 20 feet in height. They include various hydrological regimes and various layers of vegetation including canopy trees, subcanopy trees, shrubs, and a ground layer of herbaceous vegetation. Forested wetlands traditionally include bottomland hardwood and swamp communities. Forested wetlands meet the USACE criteria for classification as a wetland. They may meet the USDA definition of forest if they are larger than 1.0 acre and at least 120 feet wide. Forested wetlands in the project corridor are discussed in greater detail in **Section 5.19**.

Species: Many forested wetlands are located within larger tracts of forests (including those described earlier in this section); therefore, wildlife in forested areas also may be found in forested wetlands. Often, forested wetlands are inundated seasonally, which provides an ideal habitat for emergence of spring aquatic life. Representative wildlife dependent upon forested wetlands include waterfowl and songbirds such as wood ducks (*Aix sponsa*), great blue heron, green heron, swamp sparrow, and other wildlife such as turtles, salamanders, frogs, snakes, and mammals.

Open Water — (80 acres within Field Survey Study Area, none within existing SR 37 right of way)

Habitat: Open water habitat types in the I-69 Section 6 field survey study area consist of lakes and ponds. Open water habitat is described in **Section 5.19**.

Species: Open water habitat can provide breeding, foraging, and resting habitat for a variety of wildlife species including amphibians, birds, mammals, fish, and insects. Although natural open water habitats provide spawning sites, nursery areas, feeding sites, and cover for various species



of fish, many manmade features including stock and detention ponds, and flooded gravel pits may not provide suitable habitat for certain species of fish or other aquatic species, especially if these features are hydrologically isolated.

5.18.3 Analysis

A landscape change that would fragment habitats usable by these species is not anticipated with the mainline of I-69 Section 6. Interchanges, overpasses, and local service roads may further fragment wildlife habitats. Conversion of SR 37 to I-69 would involve impacts to wildlife habitats, but they would be minimal when compared to the impacts caused by the construction of SR 37.

Since right of way used for the I-69 Section 6 project is already devoted to transportation use, species within and near the study corridor are anticipated to have acclimated to the existing condition of the project area. All interchanges and most local service road changes would be located along SR 37, adjacent to SR 37, or within or near the right of way of existing local roadways.

Where possible, the alternative alignments are located to minimize impacts on wildlife habitat areas. Mitigation for impacts on wildlife populations will focus on perpetuating connectivity that may exist within the existing SR 37 right of way for all species that are a part of the natural community.

Avoidance of wetland habitat types was prioritized during the development and screening of the alternatives. I-69 Section 6 crosses through some scattered forested tracts along the existing SR 37 alignment, therefore impacts to forest habitat types are unavoidable.

5.18.3.1 Impacts by Habitat Type and Alternative

The **Habitat Map Series** provided at the end of this section depicts the impacts to wildlife habitat for each of the alternatives. More detailed descriptions of impacts to forests, wetlands, and streams are provided in **Section 5.19** and **Section 5.20**. There may be slight discrepancies in some totals due to rounding.

Each alternative would directly impact forested and wetland areas that provide wildlife habitat. These impacts may be addressed by recognizing the long-term effects of the highway, documenting the highway effects on wildlife populations, using landscape analyses to identify “connectivity zones” for wildlife and their habitat, working with transportation engineers to solve technical problems, and designing good monitoring studies to evaluate mitigation techniques.

Initial measures to avoid sensitive biological communities were taken when the corridor was selected in Tier 1 (see the Tier 1 FEIS, Section 5.23-4, *Natural Environmentally Sensitive Areas* [p. 5-240ff] and the Tier 1 FEIS, Table 5.23-2, *Natural Environmentally Sensitive Areas and*



Efforts to Avoid, Minimize or Mitigate Impacts [p. 5-249ff]). One notable effort to reduce impacts to wildlife/wildlife habitat was the decision made during the development and screening of alternatives to prioritize the avoidance of and minimization of impacts to wetland habitats. In the locations of stream crossings, direct impacts to stream, wetland, and floodplain functions and values were minimized to the extent practicable by using existing highway alignments.

Table 5.18-1 shows the impacts by habitat type for each alternative. The I-69 Section 6 alternatives would impact 378 acres of wildlife habitat for Alternative C1, 367 acres for Alternative C2, 302 acres for Alternative C3, 361 acres for Alternative C4, and 371 acres for the RPA. The **Habitat Map Series** provided at the end of this section shows the I-69 Section 6 alternatives and the location of all habitat communities identified by the field investigations within the field survey study area.

Table 5.18-1: Potential Wildlife Habitat Impacts, by Alternative

Habitat Type	Alternatives				
	Alt C1	Alt C2	Alt C3	Alt C4	RPA
Dry-Mesic Upland Forest (acres)	56	64	44	65	67
Forest Fragment (acres)	56	57	53	57	62
Mesic Floodplain Forest (acres)	43	42	36	41	51
Mesic Upland Forest (acres)	38	40	22	39	42
Early to Mid-Successional Forest (acres)	34	44	41	40	39
Old Field (acres)	92	85	79	90	94
Upland Habitat Subtotal (acres)	319	332	275	332	355
Open Water (PUB, L1U) (acres)	47	22	17	18	6
Wetlands (PEM, PSS, and PFO in acres)	12	13	10	11	10
Total Natural Habitat (acres)	378	367	302	361	371
Total Natural Habitat Within Existing SR 37 Right of Way (acres)	77	80	75	80	82

Note: Dry-Mesic Upland Forest, Mesic Floodplain Forest, and Mesic Upland Forest are included in the forest impacts in Section 5.20, Forest Impacts. Mid Successional Forest and Forest Fragments are not included in the forest impacts in Section 5.20 because they do not meet the USDA definition of forest. Comparable forest numbers reported in this section may differ slightly from those reported in Section 5.20 due to rounding.

5.18.3.2 Streams and Wildlife Crossings

Indian Creek, Clear Creek, Stotts Creek, Crooked Creek, Bluff Creek, Honey Creek, Pleasant Run, Little Buck Creek, State Ditch, and the White River are the perennial streams in the I-69 Section 6 field survey study area. These crossings are on the same, or essentially the same alignments as SR 37 or I-465. Therefore, all alternatives, including the RPA, would have the same potential for wildlife impacts at these crossings. The creeks have been previously modified and impacted at these locations (i.e., captured in ditches, concrete channels, pipes, and culverts, or bridged). Impacts from alterations to stream segments within existing SR 37 structures that



result from the I-69 conversion are considered minor. In addition, many of the remaining impacts are from extensions of these existing structures (i.e., lengthening of existing culverts, widening of existing bridges, re-routing of concrete channels). Individual crossings are described in **Section 5.19**. Field observations at these crossings were made in June 2016.

Below is a summary of the existing bridge conditions along SR 37 and I-465 within I-69 Section 6. Descriptions of the current wildlife passage conditions as well as preliminary plans for the modification to these resulting from the I-69 Section 6 alternatives are included below. All alternatives, including the RPA, would have similar impacts and construction activities would be similar at these locations.

There are currently four general options for each bridge location:

1. Bridge deck widening while maintaining the existing deck and overlay with some widening of the substructure;
2. Bridge deck replacement and widening, and widening of the substructure;
3. Superstructure replacement and widening, and widening of the of substructure; and
4. Complete structure replacement and widening.

For the purposes of this study, the usable space beneath a structure for crossing by an animal is referred to as a wildlife passageway. Wildlife passageways are defined as the usable space between the structural components of bridges (i.e. bridge piers, wingwalls, etc.) and under the superstructure that is available for wildlife to cross. The length of the passageway is measured as the horizontal distance on relatively low sloped to horizontal spans with no physical obstacles to crossing (i.e. rip rap, deep water, large fallen debris, low headspace, etc.). More detailed spatial information and illustrations of these passageways are located in **Appendix AA**.

White River, eastbound and westbound crossing (Marion County, I-465): This section of the White River is located approximately one mile east of the Mann Road bridge over I-465 and approximately two miles west of the existing SR 37 interchange. I-69 Section 6 would replace these bridges. Impacts to the riparian habitat would be minimal since this crossing is on the existing I-465 alignment. The existing riparian zone is highly fragmented due to existing agriculture and residential land use along the river; however, this crossing does provide an important wildlife corridor in a developed area. Along the east bank of the White River, approximately 215 feet of wildlife passageway is available between bridge spans. Along the west bank, approximately 155 feet of wildlife passage is available. This crossing is frequently used by wildlife as evidenced by deer tracks, coyote scat, raccoon, and opossum tracks within these passageways. I-69 Section 6 is not anticipated to significantly change the existing conditions at this location.

State Ditch, eastbound and westbound crossing (Marion County, I-465 east of Mann Road): This section of State Ditch is located approximately one-half mile east of the Mann Road bridge over I-465 and approximately 2.5 miles west of the existing SR 37 interchange. I-69 Section 6 would replace and widen the bridge. Impacts to the riparian habitat would be minimal



since this crossing is on the existing alignment. The existing riparian zone is highly fragmented due to existing agriculture and residential land use along State Ditch. Approximately 65 feet would be available for wildlife passage if water is low enough for passage through the channel of State Ditch. Observations of water level throughout consecutive field investigations suggest this would be possible during most of the year, aside from spring flooding and after major stormwater events. Deer tracks were observed within the channel along sand bars and within the soft sediment. When water within the channel prevents passage, a total of 10 feet on the east side and 10 feet on the west side (between bridge piers and slopewalls) is available for wildlife passage. I-69 Section 6 is not anticipated to significantly change the existing conditions at this location.

Little Buck Creek, northbound and southbound crossing (Marion County, SR 37 just north of Southport Road): This section of Little Buck Creek is located approximately 1,000 feet north of the intersection of SR 37 and Southport Road, and approximately 1,600 feet south of the intersection of SR 37 and Banta Road. I-69 Section 6 would replace and widen the bridge deck and widen the substructure. Impacts to the riparian habitat would be minimal since this crossing is on the existing alignment, but all alternatives, including the RPA, would create additional impacts along the riparian corridor due to the widening of the existing structure. The existing riparian zone is highly fragmented due to existing agriculture, commercial, and residential land use along the creek. An average of 10 feet of wildlife passageway is available along both banks of the creek. Deer tracks were observed within the passageway, which indicates that wildlife uses the crossing. Similar to conditions observed at the State Ditch crossing, wildlife passage is possible within the stream channel during low water conditions. Raccoon and opossum tracks were observed along sediment bars within the channel. I-69 Section 6 is not anticipated to significantly change the existing conditions at this location.

Pleasant Run Creek, northbound and southbound crossing (Marion County, SR 37, south of Wicker Road): This section of Pleasant Run Creek is located approximately 0.42 miles north of the intersection of SR 37 and County Line Road and approximately 580 feet south of the intersection of SR 37 and Wicker Road. Since the I-69 mainline in the RPA is shifted slightly west of the existing SR 37 alignment at this location, the Pleasant Run Creek bridges would be replaced. Impacts to the riparian habitat would be minimal since this crossing is nearly on the existing alignment, but all alternatives, including the RPA, would create additional impacts along the riparian corridor due to the replacement or widening of the existing structure. In addition, Alternative C1, Alternative C4, and the RPA would result in a new creek crossing for a local service road north to Wicker Road. Alternatives C2 and C3 would result in three new creek crossings for local access improvements. The existing riparian zone is highly fragmented due to existing agriculture and residential land use along the creek. The main avenue for wildlife passage beneath SR 37 would be through the channel of the creek. Under “normal” low water conditions, the creek is a shallow channel and numerous observations of animal scat and tracks were noted within the channel. Approximately 15 feet of horizontal space on the north bank and approximately 10 feet of horizontal space on the south bank is available for wildlife passage.

Honey Creek, northbound and southbound crossing (Johnson County, SR 37, north of Stones Crossing Road): This section of Honey Creek is located approximately 0.27 miles north



of the intersection of SR 37 and Smith Valley Road and approximately 0.44 mile south of the intersection of SR 37 and Bluff Road. The existing bridges would be replaced and widened. Impacts to the riparian habitat would be minimal since this crossing is on the existing alignment, but all alternatives, including the RPA, would create additional impacts along the riparian corridor due to the replacement and widening of the existing structure. The existing riparian zone is highly fragmented due to existing agriculture, commercial, recreational, and residential land use along the creek. Approximately 40 feet of wildlife passageway is available on both banks of the creek. Deer tracks were observed within the passageway, which indicates that wildlife uses the crossing.

Bluff Creek, northbound and southbound crossing (Johnson County, SR 37, immediately south of SR 144 interchange): This section of Bluff Creek is located approximately 195 feet south of SR 144. Impacts to the riparian habitat would occur as part of the interchange construction at I-69 and SR 44/CR 44. There is no substantive riparian corridor along this section of the creek due to fragmentation from commercial and agricultural land. No wildlife passageways exist beneath the SR 37 bridge over the creek since the slopewalls of the bridge are steeply armored with riprap.

Crooked Creek, northbound and southbound crossing (Morgan County, SR 37, northwest of Perry Road): This section of Crooked Creek is located approximately 0.3 miles northeast of the intersection of SR 37 and Perry Road. The southbound bridge is anticipated to have a superstructure replacement and widening, and to have the substructure widened. The northbound bridge would have a deck replacement and widening, and to have the substructure widened. All alternatives, including the RPA, would include a new crossing of the creek west of SR 37 to connect Perry Road with Old SR 37. Impacts to the riparian habitat would occur. Immediately adjacent to the bridge, the riparian habitat is wide, and is not impacted by residential or agricultural use until approximately 360 feet northwest of the existing crossing and 300 feet south of the crossing. Approximately 15 feet along the north bank of the creek and approximately 20 feet along the south bank are available for wildlife passage. Deer tracks were observed within the passageway, which indicates that wildlife uses the crossing.

Stotts Creek, northbound and southbound crossing (Morgan County, SR 37, north of New Harmony Road): This section of Stotts Creek is located approximately 575 feet north of the intersection of SR 37 and New Harmony Road. The southbound bridge is anticipated to undergo deck replacement and widening, and the substructure would be widened. The northbound bridge would be replaced and widened. All four alternatives would include a new crossing at New Harmony Road. Impacts to the riparian habitat would be minimal since this crossing is on the existing alignment, but all alternatives, including the RPA, would create additional impacts along the riparian corridor due to the replacement and widening of the existing structure and the placement of the new structure. The existing riparian zone is highly fragmented due to existing agriculture and residential land use along the creek. This bridge is located at the convergence of the creek and the White River. Animal evidence was observed throughout the riparian habitat parallel to the White River (northeast of the bridge) and heading along the northeast bank of the creek. A similar pattern was observed along the south bank. Approximately 30 feet of wildlife



passageway is available along the north bank of the creek. The south bank is not accessible beneath the northbound SR 37 bridge due to deep water, logs, and woody debris.

Clear Creek, northbound and southbound crossing (Morgan County, SR 37, south of Egbert Road): This section of Clear Creek is located approximately 0.35 miles south of the intersection of SR 37 and Egbert Road. The southbound bridge would be replaced and widened. The northbound bridge would have a superstructure replacement and widening, and the substructure would be widened. Alternative C2 would include a new crossing of the creek west of Old SR 37 for a local service road. Other alternatives would not. The superstructure replacement of the northbound bridge and the replacement of the southbound bridge are not intended to alter the bank morphology or hydrology of the stream reach. However, the stream reach in this location is unstable and the stream bank has failed near the existing southbound bridge structure. This bank failure has resulted in a portion of the right of way fence and the wing wall of the bridge failing and falling into the stream. The stream banks will be stabilized as part of the replacement and rehabilitation of the structures. This may result in alterations to the stream channel and sediment bars either directly or indirectly. To the extent possible, sediment bars or stream banks will be maintained for wildlife passage. The crossing is almost completely surrounded by an existing riparian zone. Based on observations of current conditions beneath the bridge and wildlife trails (patterns of passage within the brush), crossing is completed through the stream channel and not using the space between the bridge slopewalls and piers. Water levels within the stream channel are generally low and numerous sand/sediment bars are present for passage by smaller animals. Deer tracks were observed throughout the stream channel. The stream channel offers approximately 40 feet of passage between the north and south banks for those animals that are capable of crossing through the water within the stream channel.

Indian Creek, northbound and southbound crossing (Morgan County, SR 37, south of Old State Road 37 intersection, south of Martinsville): This section of Indian Creek is located south of Martinsville, approximately 800 feet north of the project terminus. The southbound bridge would have a deck replacement and widening, and the substructure would be widened. The northbound bridge would be replaced and widened. Alternative C2 would include a new local service road crossing at the creek east of SR 37. Other alternatives would not provide this crossing. The riparian habitat is fairly complete surrounding the bridge and wildlife crossing area and numerous deer trails were observed. Impacts to the riparian habitat would be minimal since this crossing is on the existing alignment, but all alternatives, including the RPA, would create additional impacts along the riparian corridor due to the replacement and widening of the existing structure. The bridges are three-span, with a great deal of scour around the existing piers. Two piers on each bridge (northbound and southbound) are within the stream channel. Scour pits exist around these piers, making passage within the channel difficult. Field observations beneath the SR 37 bridges indicate that passage beneath the bridges on the south side is not possible as the banks are armored from the slopewalls to the stream channel with rip rap. Approximately 40 feet of wildlife passage is available under the north side of the bridges.



5.18.4 Mitigation

Initial measures to avoid sensitive biological communities were taken when the corridor was selected in Tier 1. To address the remaining potential impacts of the project on wildlife, additional mitigation measures include: financial and technical assistance to support land use planning efforts by local governments to facilitate protection of sensitive areas from development; mitigation of wetland impacts at appropriate ratios pursuant to INDOT's Wetlands Memorandum of Understanding (MOU); mitigation of upland forest impacts at a 3 to 1 ratio (with a goal of 1 to 1 replacement and 2 to 1 preservation for each acre impacted) pursuant to the United States Fish and Wildlife Service (USFWS) revised Biological Opinion (BO) for the Tier 1 project (issued August 24, 2006 (with Amendments issued May 25, 2011, July 24, 2013, and April 2, 2015)); compliance with the terms and conditions of the USFWS revised BO for the Tier 1 project; and adoption of measures to protect wildlife, such as not reducing wildlife permeability across I-69 compared to current conditions. Mitigation for impacts to wetlands and forests are described in detail in **Section 5.19**, **Section 5.20**, and **Chapter 7, Mitigation and Commitments**. The revised BO for Tier 1 is provided in **Appendix W**.

In a letter dated May 17, 2016 (see **Appendix C**), the IDNR commented on the I-69 Section 6 preliminary alternatives. According to the IDNR, "[w]ith any stream crossings, the design must include consideration of fish and wildlife passage. Any new or modified structure must not create conditions that are less favorable for passage under the structure compared to the current conditions. Wherever possible, bridges should be used for stream crossings rather than culverts. If culverts must be used, we recommend a three-sided structure." Also, IDNR's formal comments on the DEIS stated, "The DEIS indicates that wildlife passage options exist at most structures. There needs to be a commitment to maintain or improve existing wildlife and fish passage through existing crossing structures, and to provide the same or better level of passage for any new structures that will be installed. Not all structures may have full riprap slopes, and vegetation is present within the existing right-of-way at most crossings. These conditions greatly improve wildlife movement along a stream, and can prevent animals from attempting to cross the road." See **Volume III, Comments and Responses**, Part A, Agency Comments – State Agencies (AS) Section of this FEIS

I-69 Section 6 includes nine locations where wildlife uses the existing structure to cross under the highway, as indicated by field reconnaissance, habitat and landscape connectivity, and size and characteristics of the existing bridges. **Section 5.18.3.2** describes the current and planned wildlife passage conditions at each of these existing bridge locations. As requested by IDNR, existing wildlife and fish passage conditions will be maintained or improved at each location, generally by avoiding riprap in the area of the crossing or by providing an otherwise traversable surface. The only location where provisions will not be provided are at the SR 37 bridges over Bluff Creek, which are not conducive to wildlife passage. See **Appendix AA** for maps, photographs, and additional information on these crossings.

There would be no net loss of the number of crossings, resulting in landscape permeability (ease with which wildlife can cross under I-69) being relatively unchanged. Current wildlife use of the existing structures indicates they have adapted to and use these areas to cross the highway. New



bridges will be sized to accommodate the existing waterway and serve as wildlife crossings, as requested by IDNR. Modifications to existing bridges or culverts to improve wildlife crossings will be made if feasible. With the proposed crossing improvements, it is anticipated that landscape permeability across the interstate highway would not decrease over current conditions along SR 37 with the construction of I-69 Section 6.

INDOT recognizes the value of bridge and culvert structures for allowing and supporting wildlife and fish passages at highway crossings. This project is committed to maintaining existing connectivity for wildlife crossing along the route by not creating conditions that are less favorable to wildlife passage. During the design phase of the project, when structure sizing is being determined for new and existing crossings, accommodations for wildlife will be considered. Where feasible, bridges will be used in place of culverts at stream crossings. If new bridges are to be constructed along the proposed I-69 route, these bridges will be designed with consideration of wildlife passage by avoiding riprap in the crossing area or otherwise providing a traversable crossing surface.

5.18.5 Summary

I-69 Section 6 is predominately agricultural lands with scattered residential and commercial use north of Martinsville and south of Indianapolis. Alternative alignments have been located to minimize impacts to wildlife habitats where possible. **Table 5.18-1** summarizes the area of impact based on habitat types for each alternative. Mitigation for impacts to wildlife habitat and species will focus on maintaining or enhancing connectivity that exists within the current SR 37 corridor. For more information on mitigation for impacts, reference **Chapter 7, Mitigation and Commitments**.