



TABLE OF CONTENTS

4.3 Natural Environment 4.3-1
4.3.1 Geology 4.3-1
4.3.2 Water Resources 4.3-12
4.3.3 Ecosystems 4.3-30

LIST OF TABLES

Table 4.3-1: Major Soil Associations within I-69 Section 6 4.3-5
Table 4.3-2: Summary of 100-Year Floodplains in I-69 Section 6 (from north to south) 4.3-30
Table 4.3-3: Summary of Managed Lands in or near I-69 Section 6 4.3-38

LIST OF FIGURES

Figure 4.3-1: Natural Regions 4.3-2
Figure 4.3-2: Physiographic Divisions 4.3-4
Figure 4.3-3: Soil Associations 4.3-7
Figure 4.3-4: Bedrock Geology 4.3-9
Figure 4.3-5: Mineral Resources 4.3-11
Figure 4.3-6: Aquifers and Groundwater Wells 4.3-14
Figure 4.3-7: NWI Wetlands 4.3-19
Figure 4.3-8: Lacustrine Wetland, I-69 Section 6 4.3-20
Figure 4.3-9: Emergent Wetland, I-69 Section 6 4.3-21
Figure 4.3-10: Forested Wetland, I-69 Section 6 4.3-21
Figure 4.3-11: Pleasant Run Creek, I-69 Section 6 4.3-24
Figure 4.3-12: Crooked Creek, I-69 Section 6 4.3-24
Figure 4.3-13: HUC 8 Watersheds in I-69 Section 6 4.3-25
Figure 4.3-14: Types of Floodplain Encroachment 4.3-28
Figure 4.3-15: I-69 Section 6 Floodplains 4.3-29
Figure 4.3-16: Old Field 4.3-31
Figure 4.3-17: Early- to Mid-Successional Forest 4.3-31
Figure 4.3-18: Forest Fragment 4.3-32
Figure 4.3-19: Mesic Upland Forest 4.3-32
Figure 4.3-20: Managed Lands in I-69 Section 6 4.3-39



4.3 Natural Environment

Minor editorial changes have been made to this section since the publication of the Draft Environmental Impact Statement (DEIS). The I-69 Section 6 study area has been adjusted on study area maps to be consistent with the Refined Preferred Alternative (RPA), and it is noted that the listing of the rusty patched bumble bee (*Bombus affinis*) as endangered under the Endangered Species Act became effective on March 21, 2017.

The I-69 Section 6 project is located in Morgan, Johnson, and Marion counties in central Indiana. I-69 Section 6 will use the existing SR 37 right of way, with additional adjacent right of way required based on design requirements and topography. The following sections describe the corridor’s geology (**Section 4.3.1**), water resources (**Section 4.3.2**), and ecosystems (**Section 4.3.3**).

4.3.1 Geology

4.3.1.1 Natural Regions and Physiographic Divisions

Homoya, the definitive authority on Indiana natural history, defines a natural region as

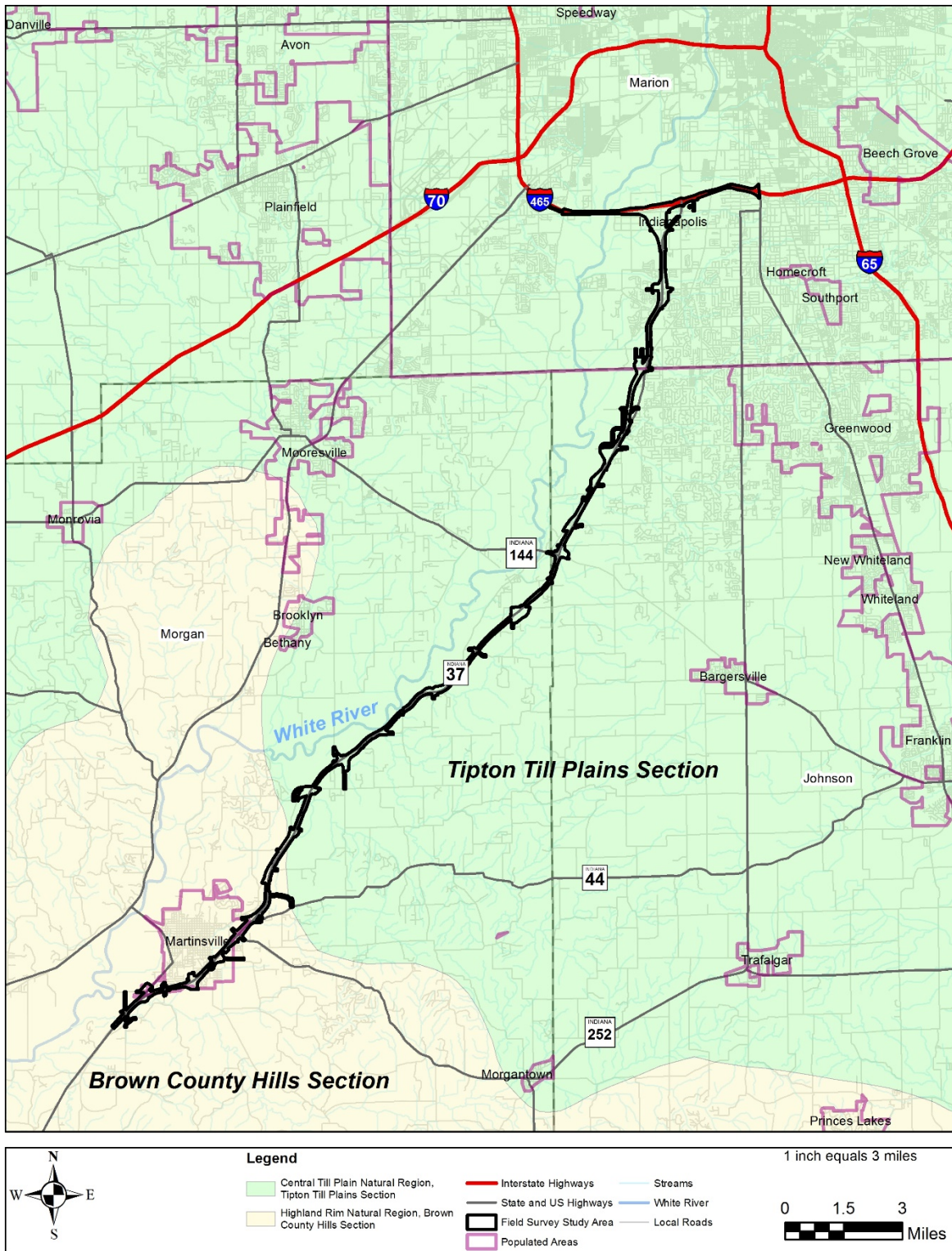
“a major, generalized unit of the landscape where a distinctive assemblage of natural features is present. It is part of a classification system that integrates several natural features, including climate, soils, glacial history, topography, exposed bedrock, pre-settlement vegetation, species composition, physiography, and flora and fauna distribution to identify a natural region. A section is a subunit of a natural region where sufficient differences are evident such that recognition is warranted” (Homoya, et al., 1985).

Natural region classifications provide information on predominant land use, native plants, and animal species of an area. I-69 Section 6 is located within two natural regions: Central Till Plain Natural Region and the Highland Rim Natural Region (see **Figure 4.3-1**).

- Central Till Plain – The northern 20 miles of I-69 Section 6 is within the Tipton Till Plan Section of the Central Till Plan Natural Region. This includes portions of Marion, Johnson, and Morgan counties. The Central Till Plain is the largest natural region in Indiana. This region and those to the north are composed of un-dissected plains created by the Wisconsin glaciation. The Tipton Till Plains section is further characterized by un-dissected plains whose pre-settlement conditions were extensive beech-maple-oak forest on predominantly silt and silty clay loam soils. These poorly drained till soils also gave way to many forested wetlands and ponds. (Homoya et al. 1985).
- Highland Rim Natural Region – The southern seven miles of I-69 Section 6 is within the Brown County Hills Section of the Highland Rim Natural Region. This includes a portion of Morgan County. The Brown County Hills Section is characterized by deep valleys and



Figure 4.3-1: Natural Regions





siltstone, shale, and sandstone near the surface. The Highland Rim Natural Region is described as an area of “low relief” by Schneider (1966) and “relatively level” by Homoya et al. (1985).

An additional method of subdividing regions in Indiana is based on physical geography (physiography). A physiographic division is an area that has similar topography and land use, though similar to natural regions (above), physiographic regions are descriptive as well as geographic, often describing the processes of topographic formation as well as the landscape position and resulting natural community. For example, in Indiana much of topographic heterogeneity among the physiographic regions comes from glaciation during the Ice Age, the Pleistocene Period. I-69 Section 6 is located within two physiographic divisions: the New Castle Till Plains and Drainageways division of the Central Till Plan Region and the Martinsville Hills division of the Southern Hills and Lowlands Region (see **Figure 4.3-2**).

- New Castle Tills Plains and Drainageways – The northern 19 miles of I-69 Section 6 is within this physiographic division. The topography of the New Castle Till Plains and Drainageways division is generally flat. The distinguishing feature is the number of drainageways that cross the region in a southerly and southwesterly radial pattern that reflects the shape of the Huron-Erie lobe of the Wisconsin ice sheet (Gray, 2001).
- Martinsville Hills – The southern 8 miles of I-69 Section 6 is located in the Martinsville Hills division. The topography of the Martinsville Hills division is distinguished from other sections to the south due to modification by pre-Wisconsin glaciations and the presence of a generally thin layer of pre-Wisconsin glacial drift (Gray, 2001).

4.3.1.2 Soils

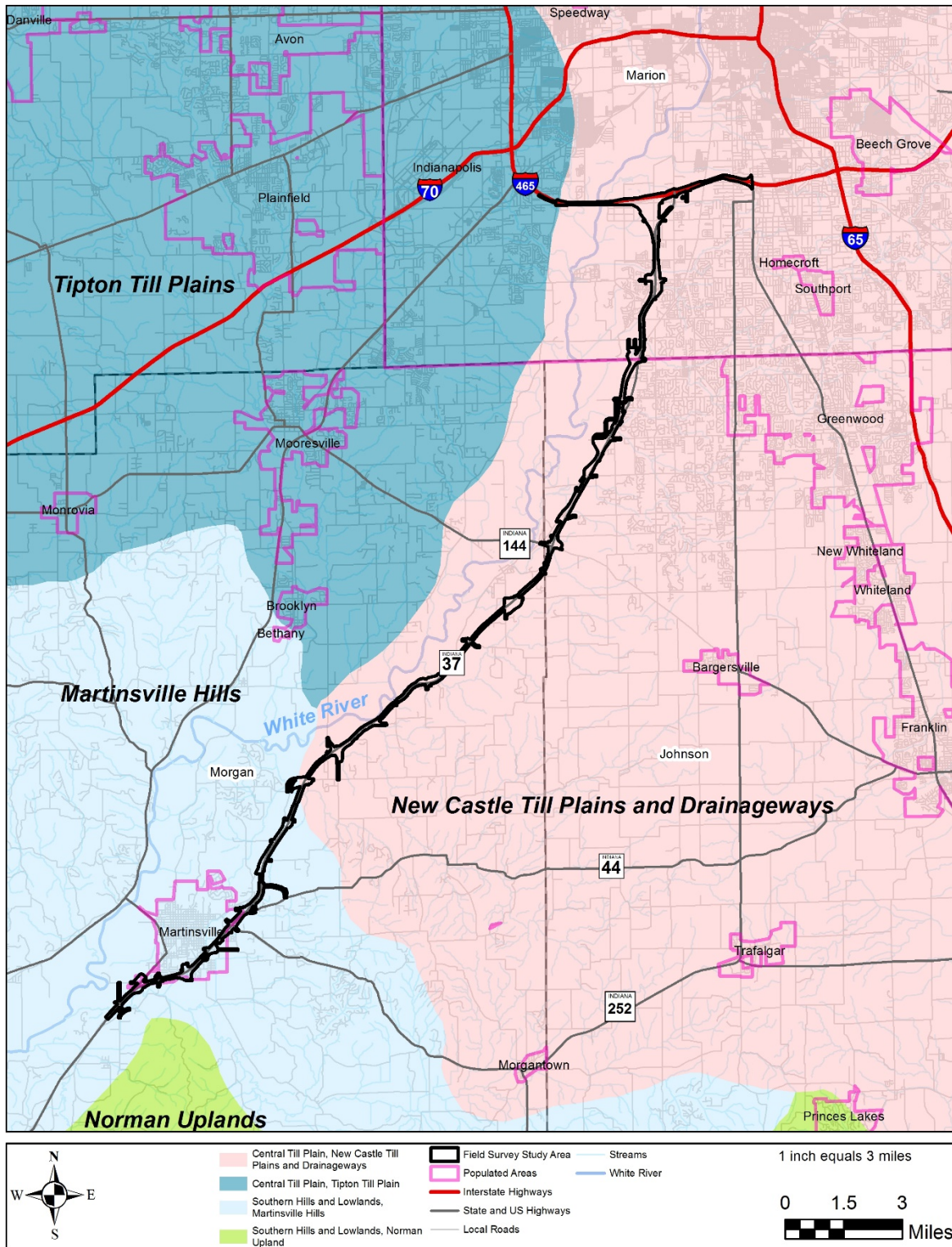
Glaciation

Approximately the northern 19 miles of I-69 Section 6 are comprised of glaciated terrain within the Tipton Till Plain to the southern extent near Clear Creek in Morgan County (approximately 0.4 mile south of the SR 37/Egbert Road intersection). The southern portion in Morgan County is comprised of un-glaciated terrain. A glacier is defined as a slowly moving sheet of ice, often containing boulders, cobbles, gravel, and sand. Land that once was glaciated is often very flat with rich soils; unglaciated land is often much more hilly and forested (from not being cleared for agricultural or other development uses). The heavy weight of the glacier acted to scour and compress the land during advancement and to deposit soil, rocks, and other debris during retreat.

Two thirds of Indiana north of I-69 Section 6 was covered by thick continental ice from the Illinoian Glacial Stage (125,000 years ago) and the Wisconsin Glacial Stage (70,000 years ago). The retreat of these ice sheets resulted in channel filling of the White River and modified topography owing to the deposition of sediment carried by glaciers and outwash into channels. This sediment ranged in size from boulders to clay. This deposition resulted in a variety of shapes including some very well sorted by size and some unsorted. Glacial lakes, till plains, kames, eskers, and moraines are common in I-69 Section 6.



Figure 4.3-2: Physiographic Divisions





Soil Associations

A soil association is a landscape that exhibits a distinctive pattern of soils in defined proportions. These associations generally consist of one or more major and at least one minor soil unit. Often, soils appear in several major soil associations, but occur within it in different proportions (Strum and Gilbert, 1978). Major soil associations are useful for defining the general land use appropriate for a given area. Within a given county, I-69 Section 6 crosses several major soil associations: three for Marion County, three for Johnson County, and eight for Morgan County (IndianaMap: http://maps.indiana.edu/: Soil Associations-STATSGO). Soils generally conform to the underlying bedrock configurations across these counties. The impacted soil associations are listed in Table 4.3-1, shown on Figure 4.3-3, and described below.

The shrink/swell potential of soil is a primary consideration for road construction. Shrink/swell potential is the relative change in soil volume that occurs with changes in moisture content. The extent of shrinking and swelling is influenced by the amount and type of clay present in the soil. Shrinking and swelling of soils can cause damage to building foundations, roads, and other structures (USDA, 1993).

Table 4.3-1: Major Soil Associations within I-69 Section 6

Table with 3 columns: Marion County, Johnson County, Morgan County. Rows list soil associations such as Sawmill-Lawson-Genesee (IN029), Miami-Crosby-Treaty (IN040), Fox-Ockley-Westland (IN026), Bloomfield-Princeton-Ayrshire (IN088), Miami-Fincastle-Xenia (IN058), Negley-Parke-Chetwynd (IN086), Wellston-Berks-Gilpin (IN104), and Rensselaer-Darroch-Whitaker (IN003).

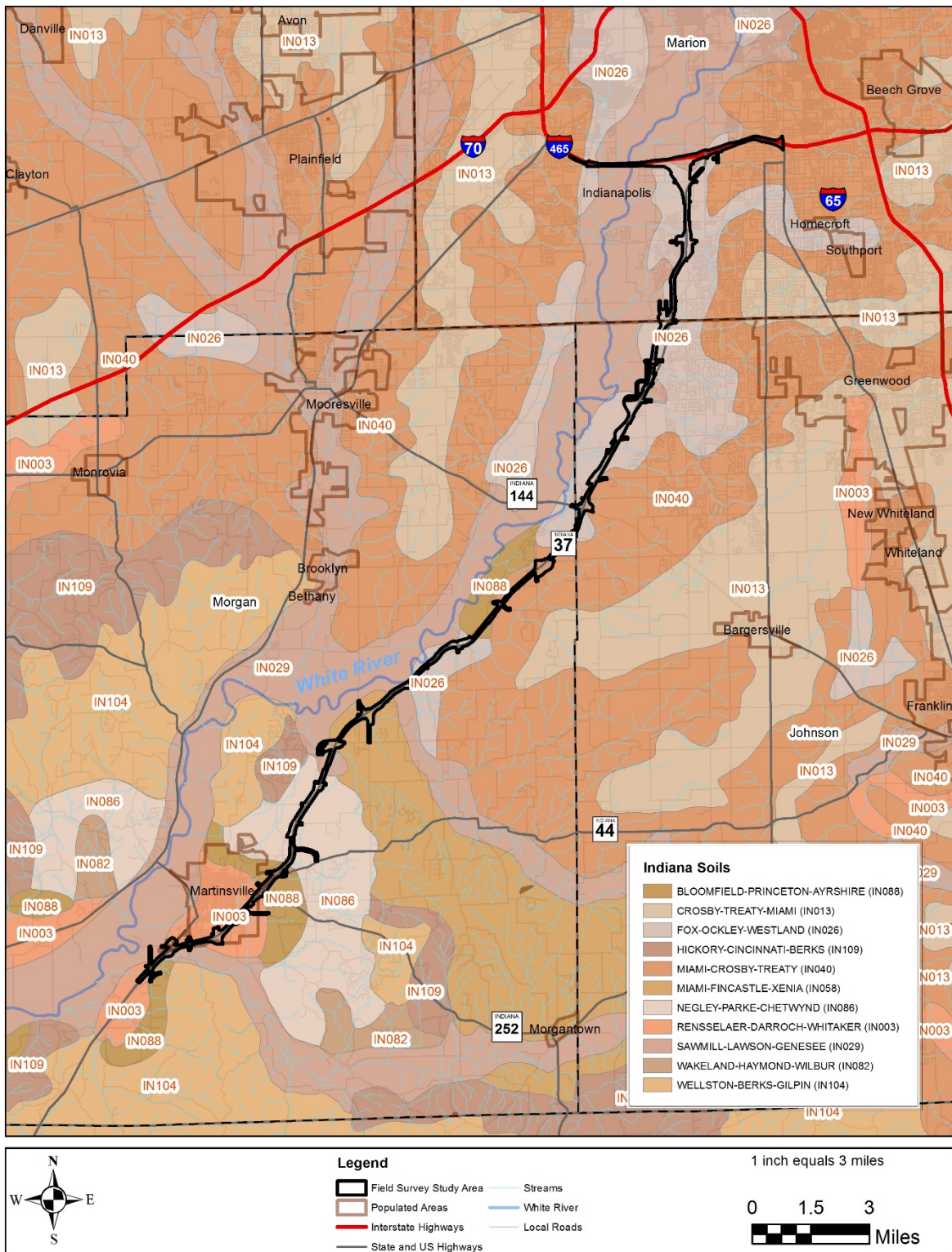
Major soil associations within I-69 Section 6 are described below:

- Sawmill-Lawson-Genesee (IN029): The Sawmill-Lawson-Genesee association consists of deep, well drained to very poorly drained, nearly level soils formed in loamy alluvium. Within I-69 Section 6, this association occurs within the bottomlands or floodplain of the White River drainage. Soils in this association are suitable for industrial, recreation and residential uses when the frequency of flooding by the White River has been reduced by terraces. These soils are often farmed where protection against flooding is not adequately provided. Bottomland forests and riparian corridors are also common along the White River. Shrink swell potential is low to moderate (Strum and Gilbert. 1978).



- Miami-Crosby-Treaty (IN040): The Miami-Crosby-Treaty association consists of deep, well drained to somewhat poorly drained, nearly level to moderately steep soils formed in a thin silty layer and the underlying glacial till. This association occurs on slightly to moderately dissected upland plains between the uplands and the bottomlands. Soils in this association are suitable for agriculture if adequately drained. These soils are considered unsuitable for most nonfarm uses due to moisture and erosion hazards. Shrink swell potential is low to moderate (Strum et al. 1978).
- Fox-Ockley-Westland (IN026): The Fox-Ockley-Westland soil association consists of nearly level to strongly sloping, well-drained soils that are moderately deep and deep over sand and gravel, and that formed in loamy outwash on terraces of outwash plains. These soils are well suited for farming when on flat to gently sloping terrain. Some areas along SR 37 have been converted to urban development. Shrink swell potential is low to moderate (Strum and Gilbert, 1978).
- Bloomfield-Princeton-Ayrshire (IN088): The Bloomfield-Princeton-Ayrshire soils are on uplands and soils are deep, nearly level to moderately steep, well drained, formed in windblown silt and sand. Where topography is gently sloping, these soils are suitable to cultivation. On more steep slopes, pasture lands and forested areas are prominent. Shrink-swell potential is low (Strum, 1981).
- Miami-Fincastle-Xenia (IN058): The Miami-Fincastle-Xenia soil association consists of nearly level to very steep, well-drained to somewhat poorly drained soils that formed in loess and the underlying glacial till on uplands. Soils are generally suited to cultivated crops where ground is level to gently sloping, however cultivation can be limited by the erosion and wetness. Shrink-swell potential is moderate (Strum, 1981).
- Negley-Parke-Chetwynd (IN086): The Negley-Parke-Chetwynd soil association is found on uplands where soils are deep, gently sloping to very steep, well drained, and medium textured, formed in outwash, glacial till or loess. The majority of this association is wooded due to slopes and potential for erosion. However, soils on ridgetops and knolls are suited to cultivation, hay, and pasture. Shrink-swell potential is low.
- Wellston-Berks-Gilpin (IN104): The Wellston-Berks-Gilpin soil association is found on uplands. Soils are moderately deep and deep, gently sloping to very steep, and well drained. These soils are formed in loess and residuum from sandstone and shale, or in loess and the underlying residuum of sandstone. Erosion potential, steepness, and limited soil depth to bedrock make these soils unsuited to cultivation or development. Slopes are generally wooded with only minor areas used for crop, hay, or pasture. Shrink-swell potential is low (Strum, 1981).
- Rensselaer-Darroch-Whitaker (IN003): The Rensselaer-Darroch-Whitaker soil association occurs on bottom land where soils are deep, nearly level, well drained, and formed in loamy and silty alluvium. Most of the area within this association has wooded slopes or has been cleared for cultivation or hay/pasture. The shrink-swell potential of this association is moderate (Strum, 1981).

Figure 4.3-3: Soil Associations





Soil Types

Within a given association, there can be many soil types. Soils in I-69 Section 6 consist primarily of deep to moderately deep soils derived from glacial till. Soils from I-465 to Bluff Creek near the CR 800 W and SR 37 intersection are nearly level to moderately sloping, well drained, and formed in loamy outwash. Transitioning into the Highland Rim Natural Area, soils are gently rolling to very steep and derived from loess and residuum from sandstone and shale. The approximately 16 miles of I-69 Section 6 in Morgan County includes soils that are moderately deep, nearly level to strongly sloping, well drained, and formed in loess and residuum from limestone, sandstone, and shales (Strum, 1981).

I-69 Section 6 does not cross clay soil units, but does have soil units with clay components. Generally, the soils within I-69 Section 6 are consistently loamy to silt loams. However, it is unlikely that lacustrine-derived clays containing a significant percentage of expansive clay are located within the area. This material has low load-bearing capacity; subsidence is a concern when structures (such as bridges) are placed on it (Gray, 1971). Soil borings will give a better understanding of the mineral content of the soil within the corridor. Borings will be conducted during geotechnical investigations for the preferred alternative in the design phase of the project.

4.3.1.3 Bedrock

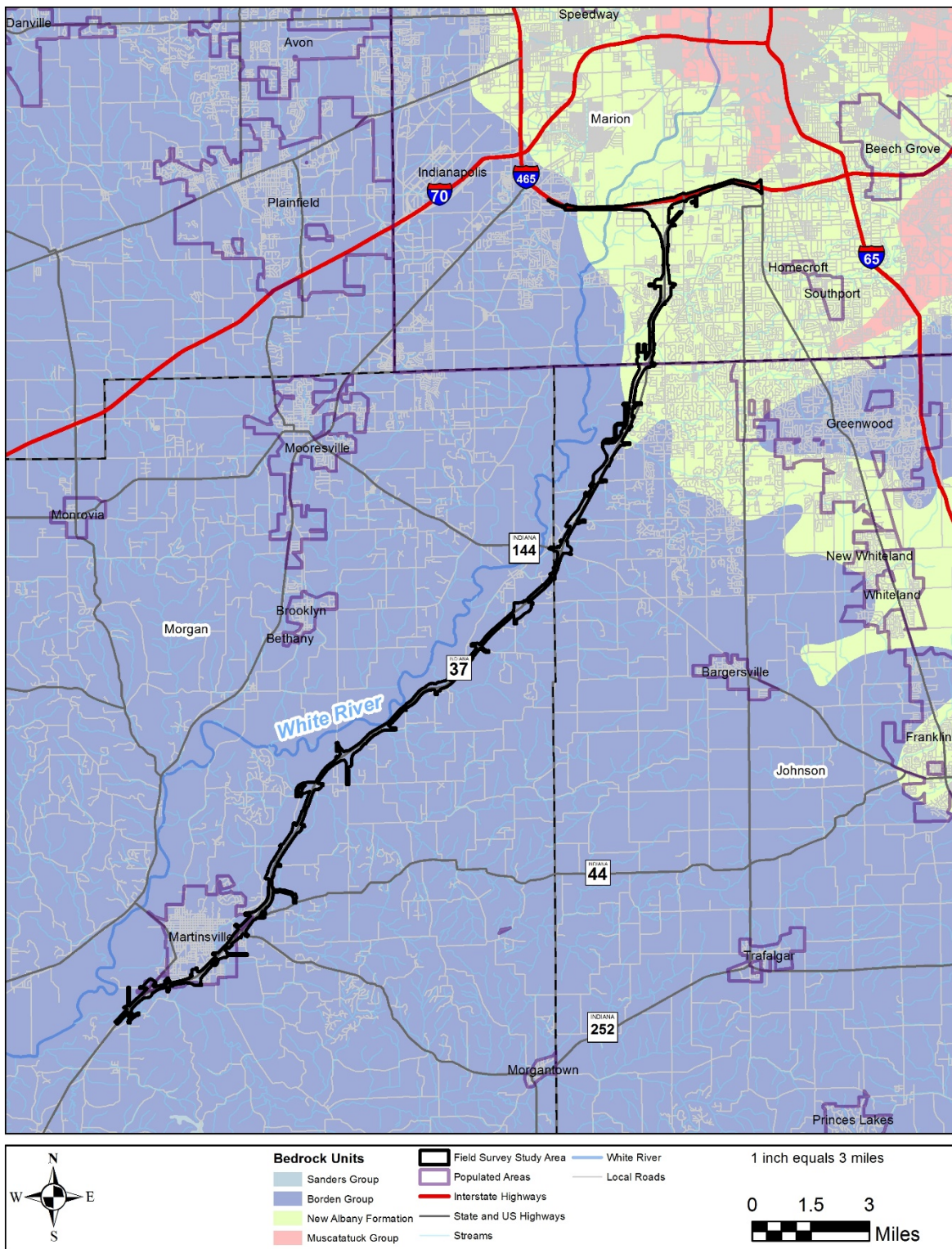
The surface bedrock units in I-69 Section 6 were eroded in a manner that bedrock units vary from younger in the south to older to the north. These include lower Mississippian through middle Devonian Age rock units. The bedrock slope in the area dips on average 30 to 40 feet per mile to the southwest. The Borden Siltstone is exposed in the bedrock hills at Martinsville and extending north to the Johnson and Marion county line. It is underlain by the New Albany (black) Shale which becomes exposed in southern Marion County and is usually covered by the glacial deposits (Hall, 1998) (see **Figure 4.3-4**).

4.3.1.4 Topography

The primary controls of topography in I-69 Section 6 are stream dissected bedrock hills and glacial deposits. The I-69 Section 6 topography results largely from the action of the last glaciation. This glaciation resulted in the leveling of the landscape with numerous potholes and extensive till plains throughout the Till Plain regions within Marion, Johnson, and Morgan counties located in the northern three quarters of the study area. I-69 Section 6 extending from north of Martinsville in Morgan County to the Johnson County line follows the tightly meandering channel of the White River. The channel deposits include Wisconsin and earlier glacial deposits. The study area follows some bedrock hills with summits of 750 to 800 feet above mean sea level (msl). The lower slopes are mantled by glacial tills and kames.

North of the Morgan and Johnson county lines the glacial mantle on the bedrock hills is thicker and deposits have a more diverse morphology than to the south and in the White River channel and floodplain areas. The average elevation of Marion County is about 760 feet above msl, with

Figure 4.3-4: Bedrock Geology





the highest elevation at 995 feet msl, and the lowest at 490 feet msl. The average elevation of Morgan County is about 604 feet msl, with the highest elevation at 950 feet msl, and the lowest at 590 feet msl.

4.3.1.5 Minerals

Limestone is an important mineral resource in the vicinity of I-69 Section 6. Limestone reserves are quarried and processed from exposures within three miles of SR 37 and I-465. These limestone reserves are limited to the North Vernon Limestone in the Muscatatuck Group of middle Devonian Age. The limestone bedrock is covered by approximately 40 feet of New Albany shale and the overlying glacial tills.

No commercial mining of coal, clay or iron ore is known to be occurring presently within the vicinity of I-69 Section 6 (IndianaMap: <http://inmap.indiana.edu/index.html>). Sand and gravel operations and reserves are located in I-69 Section 6, primarily associated with the White River valley deposits near Martinsville and Indianapolis.

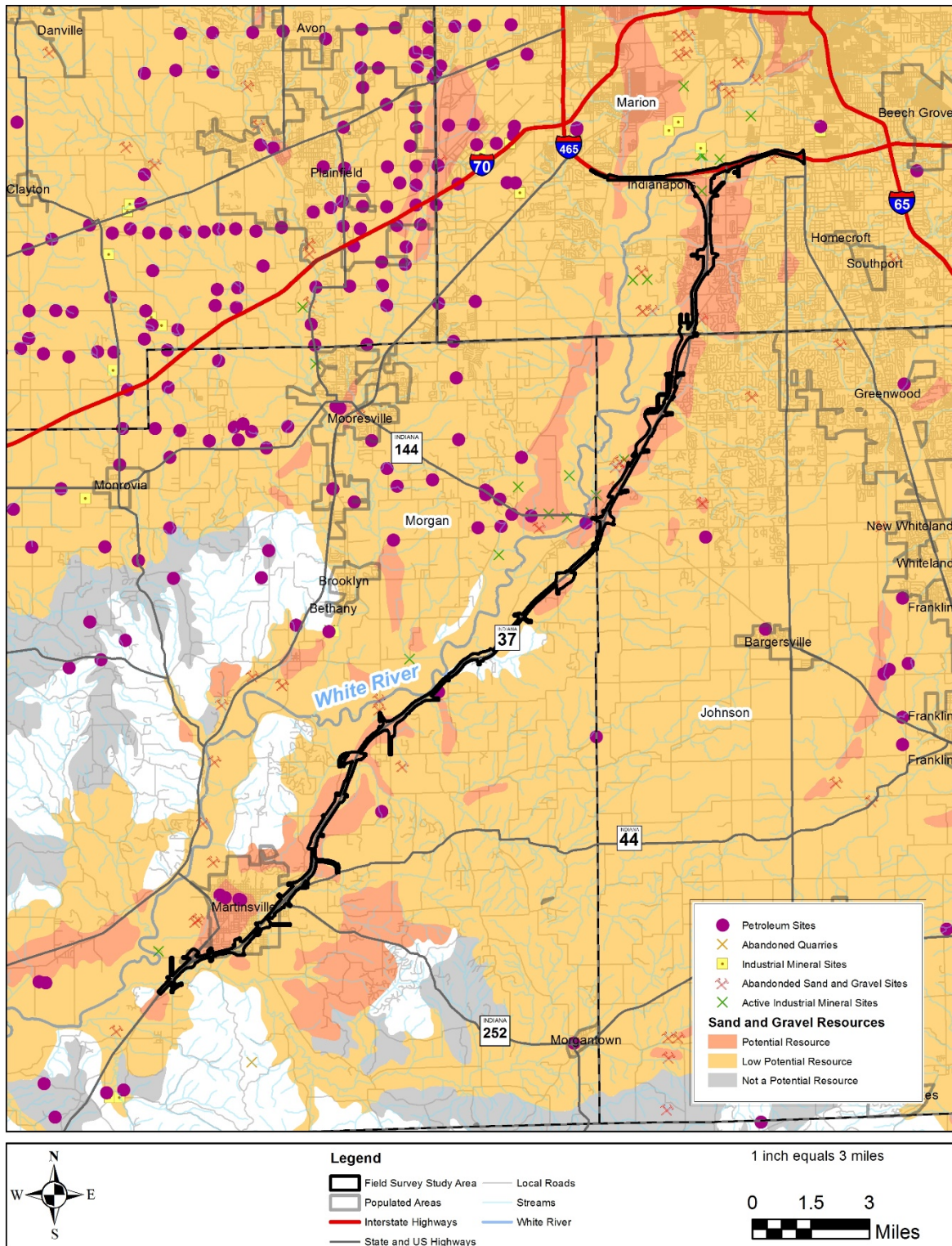
Information contained on the Indiana Geological Survey (IGS) Petroleum Database Management System Website was reviewed on the IndianaMap website: <http://inmap.indiana.edu/index.html> (see **Figure 4.3-5**). No oil or natural gas production is located along I-69 Section 6.

4.3.1.6 Seismic Risks

Seismic considerations for the I-69 Evansville to Indianapolis studies are based primarily on potential impacts from faults in the New Madrid seismic zone, and to a lesser extent, the Wabash Valley seismic zone. A seismic zone is an area with a geographic and historical distribution of earthquakes. The New Madrid seismic zone is a series of faults beneath the continental crust in a weak spot known as the Reelfoot Rift. It cannot be seen on the surface. The New Madrid seismic zone extends more than 120 miles southward from Cairo, Illinois, at the junction of the Mississippi and Ohio rivers, into Arkansas and through parts of Kentucky and Tennessee. The Wabash Valley seismic zone corresponds to a small concentration of earthquakes within the Wabash Valley fault system. This fault system is in Southeastern Illinois, Southwestern Indiana, and Northwestern Kentucky (Central United States Earthquake Consortium, 2016).

In recent history, earthquakes in the New Madrid seismic zone have been more numerous and larger in magnitude than those in the Wabash Valley seismic zone. However, the Wabash Valley seismic zone is considered capable of producing New Madrid-size earthquake events. Documentation of earthquakes with an epicenter in the general vicinity of I-69 Section 6 is limited to a single earthquake epicenter located approximately 14 miles west of the I-69 Section 6 field survey study area and 11 miles northwest of Martinsville. This epicenter recorded a magnitude 5.0 earthquake on January 29, 1907.

Figure 4.3-5: Mineral Resources





The American Association of State Highway and Transportation Officials (AASHTO) Load and Resistance Factor Design (LRFD) Bridge Design Specifications address the requirements for seismic design. They divide the United States into four separate seismic zones and give seismic design requirements for these zones rated from 1 to 4, with Zone 1 having the lowest seismic risk. Determination of the seismic zone for a given location in the project corridor is based on acceleration coefficients and site class given in the specifications.

Seismic design requirements also depend on the importance category assigned to each bridge by the owner. Three importance categories are identified in the specifications: critical, essential, and other, and the basis of classification, which includes consideration of social/survival and security/defense requirements. Structures within the I-69 Section 6 corridor will be designed to seismic design requirements for zones 1 and 2. The design of bridges for I-69 Section 6 will be in accordance with the latest edition of the AASHTO LRFD Bridge Design Specifications, and INDOT will select the importance category for each bridge.

4.3.1.7 Karst

Karst ecosystems are an important and unique feature of southern Indiana. Karst erosional landforms and drainage are well developed in southern Indiana where the Mississippian System's limestone bedrock is exposed in the Crawford Upland. The term karst refers to "landscapes characterized by caves, sinkholes, underground streams, and other features formed by the slow dissolving, rather than the mechanical eroding of bedrock" (American Geological Institute, 2001). Karst forms as water dissolves bedrock. Carbonic acid is a weak acid naturally found in water. This acid is formed as water reacts with carbon dioxide in the atmosphere. The slightly acidic water readily dissolves the mineral calcite, which is found in limestone, marble, and dolomite. These rocks, particularly limestone, are associated with karst terrain. I-69 Section 6 crosses an area where the karst forming limestone is significantly below surface drainage, where karst and caves have not formed. Consequently, there is no karst or karst ecosystem habitat in I-69 Section 6.

4.3.2 Water Resources

4.3.2.1 Groundwater Resources

Aquifers

An aquifer is a reservoir of groundwater. Aquifer formations can be composed of bedrock, often with increased permeability from cracks, fractures, or conduits (such as caverns) located within the rock (i.e., a consolidated aquifer), or in formations such as loose gravel, sand, silt, or clay (i.e., an unconsolidated aquifer), from which groundwater can be extracted. Water is available from both consolidated and unconsolidated aquifers in I-69 Section 6. The consolidated aquifer systems in the region are bedrock aquifers composed of Mississippian aged limestone and



sandstone. The unconsolidated aquifers predominant in I-69 Section 6 include surficial sand deposits (see **Figure 4.3-6**).

Bedrock Aquifer Systems — the bedrock (consolidated) aquifers in I-69 Section 6 are limited to formation of the Devonian and Mississippian/New Albany Shale Aquifer and the Mississippian/Borden aquifer system. The New Albany Shale is composed of carbon-rich shale while the Mississippian/Borden aquifer is composed of siltstone and shale. These groups are generally thought of as aquitards, and are generally unproductive. As a consequence, well production in these areas is typically low ranging from less than two gallons per minute (gpm) to rarely as much as ten gpm. However, the few wells that intersect fracture zones can have greater yields (Maier, 2003).

Unconsolidated Aquifer Systems — As the majority of the I-69 Section 6 route parallels that of the White River, the White River and Tributaries Outwash aquifer system services a large portion of the project area. This system is capable of meeting the needs of many high-capacity users with withdrawal facilities able to receive up to 3000 gpm (Maier, 2005). An additional unconsolidated aquifer system that services the project area is the Dissected Till and Residuum Aquifer system. There is little capacity for groundwater production in this system throughout Marion, Johnson, and Morgan Counties (Maier, 2010).

Sole Source Aquifers — A sole source aquifer is an aquifer that has been designated by the United States Environmental Protection Agency (USEPA) as the sole or principal source of drinking water for an area. As such, it receives special protection. There is no designated sole source aquifer within or near I-69 Section 6. The USEPA Sole Source Aquifer Protection Program¹ lists only one Sole Source Aquifer in Indiana – the St. Joseph Aquifer System near South Bend.

Groundwater Flow

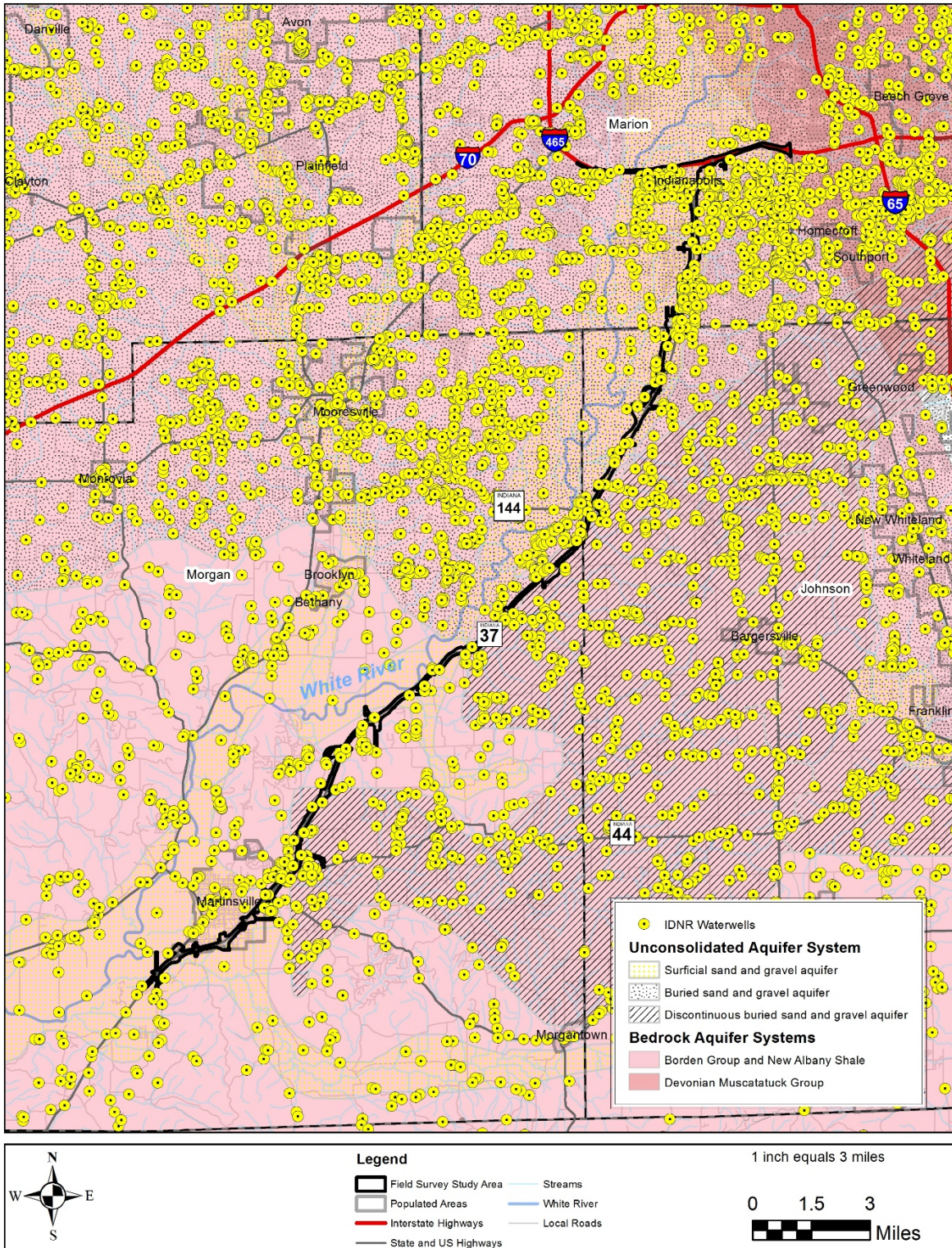
IGS data was used to analyze groundwater in I-69 Section 6. The data from the water well records and topography suggest the following.

- Regional groundwater flow in I-69 Section 6 is divided by watershed. Along the project route, groundwater flow is generally west toward the White River, which parallels I-69 Section 6.
- Groundwater flow varies locally as the groundwater drains towards local surface water outlets.

¹ USEPA, “Designated Sole Source Aquifers in EPA Region 5: Illinois, Indiana, Michigan, Minnesota, Ohio, owa,” <https://www3.epa.gov/region5/water/gwdw/solesourceaquifer/pdfs/ssa-r5.pdf>



Figure 4.3-6: Aquifers and Groundwater Wells





Groundwater Quality

Groundwater quality is generally within recommended drinking water standards established by the USEPA and Indiana Department of Environmental Management (IDEM).² However, groundwater in the region is generally hard due to high concentrations of dissolved calcium and magnesium. Total dissolved solids levels often exceed the USEPA non-mandatory water quality standards for drinking water. The groundwater typically has iron and manganese concentrations greater than the secondary standards for drinking water. Chloride, fluoride, nitrate, sulfate, and pH levels in the groundwater are usually below the secondary standards for drinking water, but some areas exceed this level. Some of these contaminants are naturally occurring (Groundwater Resources in the White and West Fork White River Basin, Indiana, 2002).

The quantity and quality of the groundwater in the White River Basin meet the needs of most users. Groundwater in Indiana generally is hard to very hard; magnesium and calcium ion concentrations are highest in unconsolidated bedrock aquifers. The Dissected Till and Residuum aquifer system consists of thin, eroded residuum and till overlying bedrock. These tills have generally low permeability at the near-surface. Therefore, this system is not very susceptible to contamination by surface waters. Conversely, the White River and tributaries outwash aquifer is fairly shallow with little clay within the thick sequences of sand and gravel. This aquifer, as a result, is highly susceptible to contamination from surface water (IDNR, 2002). See **Section 5.19.3** for more information on groundwater in I-69 Section 6.

Groundwater within the more urbanized Martinsville and Indianapolis portions of I-69 Section 6 has historic water quality issues and scattered exceedances of residential drinking water standards³ related to long term commercial and industrial operations, runoff from paved roadways and parking lots, and population density. Industrial land use has had a direct effect on water quality within the watershed due to its legacy of industrial waste contamination. Agricultural lands along I-69 Section 6 contribute contamination to groundwater resulting from herbicide application and livestock (IDNR, 2002).

Wellhead Protection Areas

Wellhead protection is “protection of all or part of the area surrounding a well from which the well’s groundwater is drawn” (www.epa.gov). The Safe Drinking Water Act and the Indiana Wellhead Protection Rule (327 IAC 8.4-1) mandate a protection program for all community public water systems. The program involves delineating a Wellhead Protection Area (WHPA), identifying potential sources of contamination and creating management and contingency plans

² The Safe Drinking Water Act authorizes USEPA “to set standards for maximum levels of contaminants in drinking water, regulate the underground disposal of wastes in deep wells, designate areas that rely on a single aquifer for their water supply, and establish a nationwide program to encourage the states to develop programs to protect public water supply wells (i.e., wellhead protection programs).” (Source: USEPA, www.epa.gov). IDEM is the Indiana governmental agency responsible for water supply protection programs in the state.

³ See IDEM’s Safe Drinking Water Information System for a record of EPA drinking water exceedances by source. <https://myweb.in.gov/IDEM/DWW/>



for the WHPA. The program also requires communities to implement the plan and report to IDEM how they have protected groundwater resources. A WHPA will vary in size depending on a variety of factors including the goals of the state’s protection program and local geological features.

Coordination with IDEM indicates that there are six WHPAs in or adjacent to the I-69 Section 6 corridor. Refer to **Figure 4.3-6** for aquifers and groundwater wells.

Public Water Supply Systems

Six public water supply systems provide drinking water in the vicinity of I-69 Section 6. The source for each of them is groundwater from the White River basin. Public water wells are present within 500 feet of existing SR 37. Public water services that use a public water well in or near I-69 Section 6 include:

- Painted Hills Utility Company,
- Martinsville Water Utility,
- Mapletown Utilities,
- Bargersville Water Department,
- Indiana American Water-Johnson County, and
- Citizens Energy Group (formerly Indianapolis Water)

Private Wells

There are 171 private water wells reported to the Indiana Department of Natural Resources (IDNR) within the I-69 Section 6 field survey study area (IndianaMap: <http://maps.indiana.edu/layerGallery.html?category=WaterWells>: Wells IDNR (2013)). Additional wells not reported to IDNR are anticipated to exist along I-69 Section 6. Refer to **Figure 4.3-6** for aquifers and groundwater wells.

4.3.2.2 Wetlands, Lakes, and Ponds

Wetlands are highly important ecosystems that include swamps, bogs, marshes, mires, fens, and other wet areas. The State of Indiana defines wetlands as “areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (USACE, 2014). Wetlands are often transition areas between upland and deepwater habitats. Wetlands provide a number of important values and functions, including groundwater recharge and discharge, food sources, nutrient recycling, floodwater storage and attenuation, water purification, and habitat for a diverse number of plant and animal species. They can also possess properties that are considered valuable to humans, such as economic considerations, recreational opportunities, and aesthetic pleasure. The I-69 Section 6 field survey



study area includes emergent, scrub/shrub and forested wetlands as well as lakes and ponds. The lakes are associated with former quarry operations and the ponds are primarily man-made for storm water detention/retention, quarries, and fish hatcheries.

Since the time of European settlement, most wetlands across the United States have been filled, dredged, and drained. The United States Fish and Wildlife Service (USFWS) estimated that prior to European settlement Indiana had some 5,600,000 acres of wetlands. Over the past 200 years, Indiana has lost approximately 85 percent of its wetlands (Dahl, 1990). In a mid-1980s study by the IDNR, Indiana was estimated to have approximately 813,032 acres of wetlands remaining (Rolley, 1991). Among the 50 states, Indiana ranks fourth in proportion of original wetland acreage lost (Dahl, 1990). Most wetland losses in the U.S. were due to drainage for agricultural use. Of Indiana's remaining wetlands, approximately one-third are considered to be state regulated/isolated wetlands. An isolated wetland is not subject to regulation under Section 404 of the Clean Water Act (CWA) but is regulated by the State of Indiana.

The federal and state laws that protect the remaining wetlands and other water resources that are applicable to this project are:

- Clean Water Act (CWA)
 - Section 404 - This pertains to the discharge of fill material into Waters of the United States and is implemented by the United States Army Corps of Engineers (USACE) (33 U.S.C §1344)
 - Section 401 - This requires each state to establish and evaluate water quality standards and to certify that the discharge of fill will not violate the standards. This is implemented by the Indiana Department of Environmental Management (IDEM) under 327 IAC 2-1.
- Indiana Isolated Wetland Law - This requires issuance of permits for wetland activities in state regulated wetlands under 327 IAC 17 (IC 13-18-22).
- Indiana Flood Control Act – The Indiana Department of Natural Resources (IDNR) regulates development activities located within the 100-year floodway of any waterway (IC 14-28-11).

Because of the importance of these aquatic ecosystems, federal policy maintains there should be “no net loss of wetlands.” For every acre of wetland that is filled as part of this project, compensatory mitigation will be completed to replace the wetland losses at prescribed ratios.

National Wetland Inventory (NWI) Wetlands

According to the Indiana Wetland Conservation Plan (1996), the NWI database is the most extensive collection of information on wetland resources in the State of Indiana. In 1974, an inventory of all wetlands in the United States was designed and implemented by USFWS. This



inventory was conducted to map the extent and types of wetlands in the country. NWI wetlands were drawn by reviewing existing aerial maps and noting specific areas that appeared to contain wetland characteristics such as dark soil color, ponded water, and/or wetland vegetation. In most cases, these wetlands were not field verified using site-specific delineation protocol.

Specific to Indiana, IDNR, Division of Fish and Wildlife (DFW) entered into a cooperative agreement with USFWS in 1985 to share the cost of mapping Indiana's wetlands. Indiana's NWI maps were produced primarily from interpretation of high-altitude color infrared aerial photographs (scale of 1:58,000) taken from 1980 to 1987 during the spring and fall of each year.

In spring 2016, the NWI maps for the contiguous 48 states and American Samoa were updated as and now include small linear wetland features that were excluded from the original mapping conventions due to the limitation of historical mapping techniques. These data are derived from spatial analysis of high-altitude aerial imagery and topographic maps (USFWS, 2016).

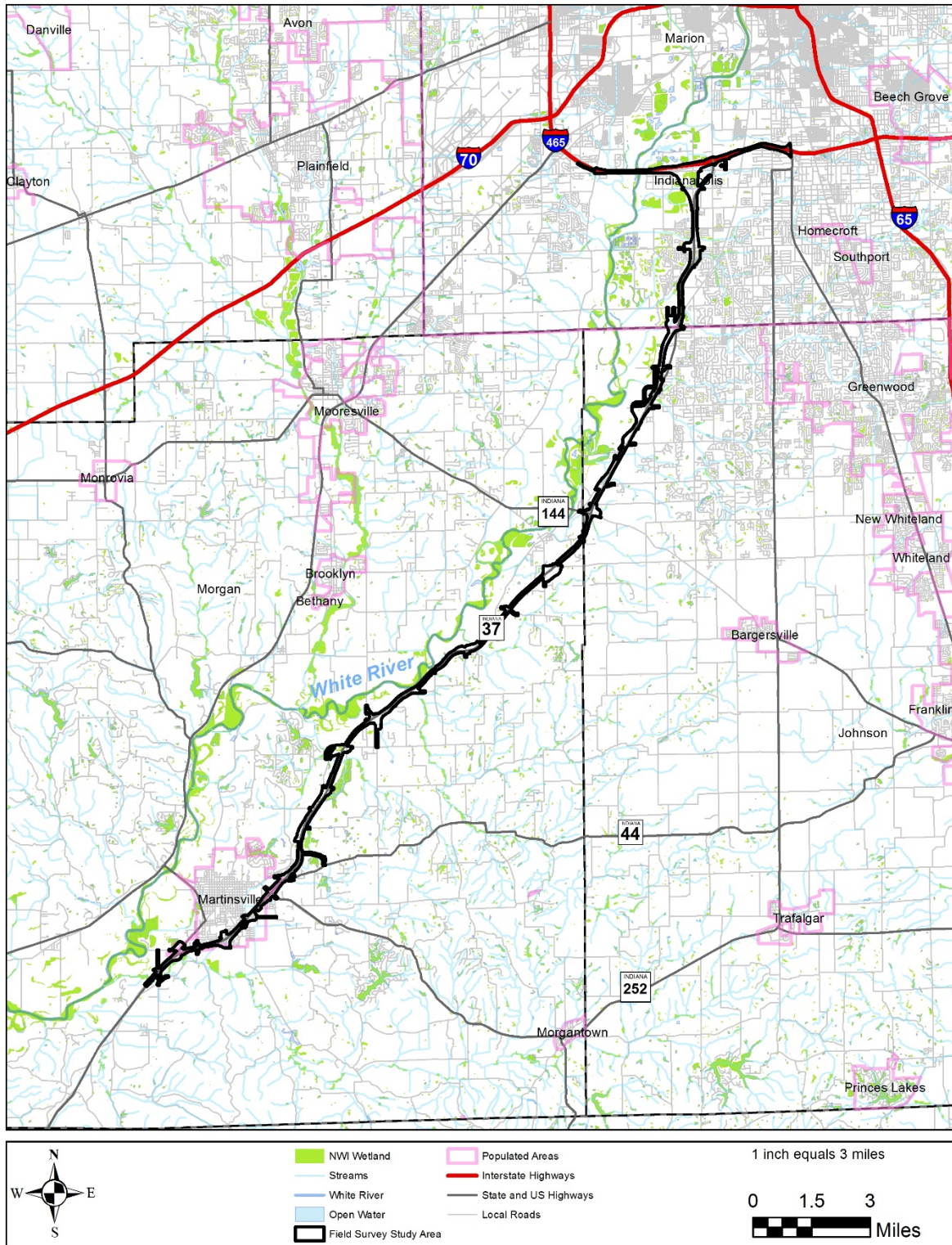
The classification system used within the NWI mapping is defined in Classification of Wetlands and Deepwater Habitats of the United States (Cowardin *et al.*, 1979). This classification system was created to define ecological communities that have similar characteristics, to combine appropriately mapped wetlands to aid in resource management, to facilitate wetland area mapping, and to provide a uniform definition of mapped wetland communities. Five major systems are defined in this hierarchical classification program: marine, estuarine, riverine, lacustrine, and palustrine. These major systems are further defined by subsystem, class, subclass, and dominance type.

NWI Wetlands in I-69 Section 6

NWI GIS data was reviewed to determine if these wetlands are mapped within or near the I-69 Section 6 field survey study area. **Figure 4.3-7** shows the locations of the NWI mapped wetlands in the vicinity of I-69 Section 6. Wetlands within or near I-69 Section 6 fall into one of three systems: palustrine, lacustrine, or riverine. Lacustrine and riverine wetlands are classified into subsystems based on their hydrologic regime. Palustrine wetlands have no subsystem designation. Classes of wetlands are based on the general appearance of the wetland and substrate and/or dominant vegetation type. For, example, each palustrine wetland system is classified by the general appearance of the habitat (i.e., emergent, scrub/shrub, forested, unconsolidated bottom, or aquatic bed).

NWI mapping indicates approximately 116 acres of wetlands within the field survey study area, but many of these wetlands have been previously impacted by a variety of man-made disturbances, including SR 37, the local road network, urban growth, sand and gravel quarries, and agricultural practices. The wetlands identified during multiple site visits total approximately 97 acres. The breakdown of each wetland type identified within the I-69 Section 6 field survey study area is listed with the habitat type descriptions below. The identification, delineation, and analysis of wetlands in the corridor are discussed in detail in **Section 5.19.2**. The *Wetland Technical Report* for I-69 Section 6 is located in **Appendix E**.

Figure 4.3-7: NWI Wetlands





The NWI wetland types found in I-69 Section 6 are discussed below.

Riverine Wetlands

Riverine wetlands include all wetlands and deep water habitats contained within a channel. Notable exceptions include channelized wetlands that are dominated by trees, shrubs, persistent emergent or saline habitats associated with estuaries or marine environments. The White River is the sole riverine wetland that is included within the field survey study area.

Lacustrine Unconsolidated Bottom Wetlands

Lacustrine wetlands are wetlands and deep water habitats that are situated within a topographic depression or dammed river channel that are lacking trees, shrubs or persistent emergent or moss/lichen vegetation with greater than 30 percent cover. These habitats differ from palustrine wetlands in that they must either exceed 6 hectares (ha) or 2 meters (m) in depth. The lacustrine wetland habitats within the I-69 Section 6 field survey study area are all deep (limnetic), man-made, and associated with active and former sand and gravel quarries west and southwest of the existing I-465/SR 37 interchange. **Figure 4.3-8** shows an example of a Lacustrine Wetland from I-69 Section 6.

Figure 4.3-8: Lacustrine Wetland, I-69 Section 6



Cowardin et al. (1979) includes reservoirs and deep pit lakes within the lacustrine system. Sand and gravel pit lakes (resulting from excavation) generally fall into the unconsolidated bottom class having a dominant substrate of particles smaller than stones (6-7 cm) and a vegetative cover less than 30 percent. Three lacustrine unconsolidated bottom (LUB) wetlands totaling approximately 58 acres were identified on the NWI mapping within the field survey study area. Two wetlands within the field survey study area are identified as LUB wetlands. These resources total approximately 48 acres and range in size from 2 to 46 acres.

Palustrine Emergent Wetlands

Palustrine wetlands are defined as freshwater systems dominated by trees, shrubs, persistent emergent, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean derived salts is below 0.5 percent. Palustrine systems traditionally include marshes, fens, forested swamps, bogs, and wet prairies. Palustrine wetlands may be affected by extreme flood conditions and can be isolated areas surrounded by uplands or they can be found at the edge of lakes, rivers, and ponds. **Figure 4.3-9** and **Figure 4.3-10** show examples of Palustrine Wetlands (emergent and forested, respectively) located within I-69 Section 6.

Palustrine emergent (PEM) wetlands are characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens (Cowardin et al., 1979). The vegetation in emergent wetlands is present for most of the growing season in most years and is typically dominated by perennial plant species. All water regimes are included except subtidal and irregularly exposed (Cowardin et al., 1979). Characteristic plant species include cattails (*Typha spp.*), sedges (*Carex spp.*, *Scripus spp.*, and *Eleocharis spp.*), rushes (*Juncus spp.*), and wetland grass species including rice cutgrass (*Leersia oryzoides*), the invasive reed canary grass (*Phalaris arundinacea*), and common reed (*Phragmites australis*).

Figure 4.3-9: Emergent Wetland, I-69 Section 6

Nine PEM wetlands totaling approximately 8 acres were identified on the NWI mapping within the field survey study area. However, 39 PEM wetlands have been field verified within the field survey study area. These wetlands total approximately 16 acres ranging in size from less than 0.01 to over 5 acres.

Figure 4.3-10: Forested Wetland, I-69 Section 6

Palustrine Scrub-Shrub Wetlands

Palustrine scrub/shrub wetlands (PSS) are dominated by woody vegetation less than 20 feet (six meters) tall, including shrubs, young trees, and trees or shrubs that are small or stunted because of environmental conditions (Cowardin et al., 1979). All water regimes except subtidal are possible (Cowardin et al., 1979). Plant species associated with scrub/shrub wetlands include willows (*Salix spp.*), dogwoods (*Cornus spp.*), buttonbush (*Cephalanthus occidentalis*), and spicebush (*Lindera benzoin*).

PSS wetlands are the least common wetland type within the field survey study area. No PSS wetlands were identified on the NWI mapping. However, seven PSS wetlands were field verified. These wetlands total approximately 0.5 acre, ranging in size from 0.01 to 0.2 acre.



Palustrine Forested Wetlands

Palustrine forested wetlands (PFO) are typically located within stream floodplains, and consist of canopy tree species such as maples (*Acer spp.*), eastern cottonwood (*Populus deltoides*), American elm (*Ulmus americana*), pin oak (*Quercus palustris*), and green ash (*Fraxinus pennsylvanica*). Dominant shrubs and saplings in these wetlands include box elder (*Acer negundo*) and common elderberry (*Sambucus canadensis*). The herbaceous layer is often sparsely vegetated with species such as nettles (*Urtica spp.*), poison ivy (*Toxicodendron radicans*), and touch-me-nots (*Impatiens spp.*). Palustrine forested wetlands within the project area are generally ranked high for wildlife habitat using the Indiana Wetland Rapid Assessment Protocol (INWRAP) methodology (see **Section 5.19.2.2**). The INWRAP results are provided in **Section 5.19.2.3**.

Many of these forested wetlands, because of their location within the floodplain, also score high for flood and storm water storage. Twelve PFO wetlands were identified on the NWI mapping, totaling approximately 12 acres. However, 14 PFO wetlands were field verified. These wetlands total approximately 5 acres and range in size from 0.03 to over 1 acre.

Palustrine Unconsolidated Bottom

Cowardin et al. (1979) designates ponds as palustrine unconsolidated bottom (PUB) features. This resource type includes aquatic habitats with at least 25 percent cover of particles smaller than stones and a vegetative cover less than 30 percent. Water regimes are restricted to subtidal, permanently flooded, intermittently exposed and semi-permanently flooded. Unconsolidated bottoms are characterized by the lack of large stable surfaces for plant and animal attachment (Cowardin et al., 1979). Faunal productivity in these habitats is generally limited due to its unstable and/or lack of substrate needed for aquatic organisms to live, breed, and feed. Thirty-five PUB features were identified on the NWI mapping, within the field survey study area totaling approximately 36 acres. However, 25 PUB features were field verified. These features total approximately 27 acres, and range in size from 0.04 to 6 acres.

Palustrine Aquatic Bed

The palustrine aquatic bed (PAB) classification type includes wetlands and deep water habitats dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Water regimes include subtidal, irregularly exposed, regularly flooded, permanently flooded, intermittently exposed, semi-permanently flooded, and seasonally flooded.

Aquatic bed wetlands represent a diverse group of plant communities that require surface water for optimum growth and reproduction. They are best developed in relatively permanent water or under conditions of repeated flooding. The plants either are attached to the substrate or float freely in the water above the bottom or on the surface (Cowardin et al., 1979). Typical rooted plant species include water lilies (*Nymphaea* and *Nuphar spp.*), pondweed (*Potamogeton spp.*), and water knotweed (*Polygonum amphibium*). Common floating vascular plants include duckweeds (*Lemna spp.*) and coon's tail (*Ceratophyllum demersum*).



This resource type is considered significant to wildlife habitat, particularly amphibian habitat. Aquatic bed resources also provide flood storage and attenuation, and water quality protection. No PAB wetlands were identified on NWI mapping or field verified within the field survey study area.

Farmed Wetlands

According to the U.S. Department of Agriculture (USDA) National Food Security Act Manual, 3rd Edition, September 2000, farmed wetlands are “wetlands that were drained, dredged, filled, leveled, or otherwise manipulated before December 23, 1985, for the purpose of, or to have the effect of, making the production of an agricultural commodity possible, and continue to meet specific wetland hydrology criteria.”

All of these criteria must be met before an area can be considered “farmed wetland.” If an existing agricultural wetland is not cultivated, i.e., is left fallow, for five years or more, it becomes regulated as a wetland and farming cannot be reinitiated without the proper permits.

Farmed wetland is a term used by the USDA and not used by the USACE, the federal agency that regulates impacts to wetlands. The USEPA requested the analysis of farmed wetlands at the onset of Tier 2. Technically, only the USDA can complete a farmed wetland determination at the request of the property owner. In a meeting held on April 29, 2016, IDEM and USACE determined that the term “farmed wetland” will not be used in I-69 Section 6. Rather, it will be considered an atypical situation per the USACE wetlands delineation manual. The resource will still be analyzed, but it will be considered as an atypical situation wetland.

4.3.2.3 Rivers, Streams, and Watersheds

The United States is divided and sub-divided into successively smaller hydrologic units commonly referred to as “watersheds.” The hydrologic units are arranged, from the smallest (cataloging units) to the largest (regions). Each hydrologic unit is identified by a unique hydrologic unit code (HUC). I-69 Section 6 is located wholly within the White River watershed and is encompassed by one, 8-digit HUC watershed: Upper White River (05120201).⁴

Characteristics of the streams and their respective watersheds are dependent on their location within the study area. **Figure 4.3-11** and **Figure 4.3-12** provide a visual comparison of two of the streams crossed by I-69 Section 6. **Figure 4.3-13** identifies HUC 8 watersheds in the study area.

⁴ The U.S. Geological Survey (USGS) delineates watershed using a nationwide system based on surface hydrologic features. This system divides and subdivides the United States into successively smaller river basin/hydrologic units. A hierarchical hydrologic unit code (HUC) is used to identify any hydrologic area. The 8 digit units are generally referred to as sub-basins. The average size of an 8-digit unit is approximately 700 square miles.



Specifically, I-69 Section 6 crosses the watersheds of 12 named and unnamed White River tributaries: Lick Creek, Dollar Hide Creek, Little Buck Creek, Pleasant Run Creek, Turkey Pen Creek, Goose Creek, Sinking Creek, Crooked Creek, Stotts Creek, East Fork Clear Creek, Sand Creek, and Highland Creek. Each of these streams and many of their tributaries have been crossed by SR 37 or by connector routes that comprise the local road network. The Qualitative Habitat Evaluation Index (QHEI) and Headwater Habitat Evaluation Index (HHEI) have been completed on all streams as appropriate. The QHEI/HHEI data and maps are provided in **Appendix L**. The identification and analysis of streams in I-69 Section 6 are discussed in detail in **Section 5.19.2**.

The New Castle Tills Plains and Drainageways physiographic division includes streams such as: Pleasant Run Creek, Little Buck Creek, Crooked Creek, and Stotts Creek. Notably, the distinguishing feature of this region is the number of tunnel valleys (long, U-shaped valleys carved by a receding glacier) that cross it. These tunnel valleys feed into the White River and the east fork of the White River across the relatively featureless plains of this region.

The southern one-quarter of I-69 Section 6 is within the Martinsville Hills and includes streams such as Clear Creek and Indian Creek. These streams are characterized by relatively flat and broad flood prone areas. Some of the tributaries of these streams have been straightened into agricultural drainage ways to facilitate agricultural development within these fertile floodplains.

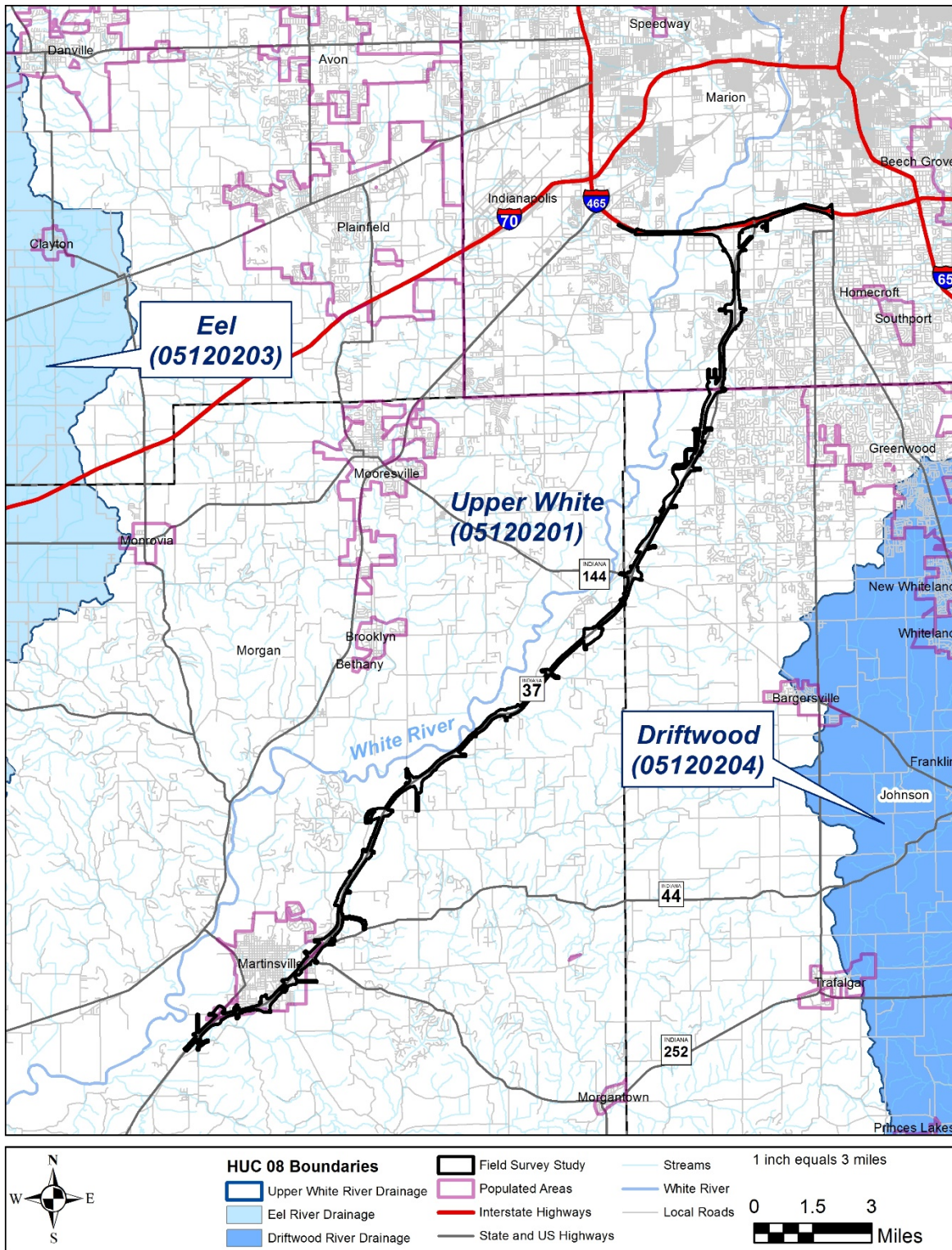
Figure 4.3-11: Pleasant Run Creek, I-69 Section 6



Figure 4.3-12: Crooked Creek, I-69 Section 6



Figure 4.3-13: HUC 8 Watersheds in I-69 Section 6





Surface Water Quality

The watersheds traversed by the study corridor have been previously impacted by a variety of manmade activities including SR 37, the local road network, commercial development, industrial development, single family dwellings, multiple family dwellings, and agricultural development.

The entirety of I-69 Section 6 is located within the Upper White River watershed. Predominant land uses include industrial, commercial, and residential. Industrial land use has had a direct effect on water quality within the watershed due to its legacy of industrial production, hazardous materials usage, solid and hazardous waste generation, and improper handling or disposal of such materials. Residential land use in I-69 Section 6 results in the many point sources for pollution in the Upper White River basin; homes within the Middle and West Fork of the White River (Martinsville area) are almost entirely on septic systems. The failure of many septic tanks is a known contaminant of *Escherichia coli* (*E. coli*) bacteria. *E. coli* impairment is thematic for rivers within the Upper White River watershed (IDNR, 2002).

Within the Upper White River watershed, contribution of Combined Sewer Overflow (CSO) waters into tributaries of the White River result in contamination by *E. coli*. The City of Indianapolis holds a National Pollution Discharge Elimination System (NPDES) permit from IDEM for numerous CSO discharges in the city limits (Permit No. IN0023183). Seventeen individual discharges of CSOs into the White River contribute to the impairment with *E. coli*, while 38, two, and one outflow(s) are reported for Pleasant Run, State Ditch, and Little Buck Creek, respectively.

Five streams that cross the project survey area are identified in the State of Indiana's revised 2014 CWA Section 303(d)⁵ List of Impaired Waterbodies: State Ditch (impaired for *E. coli* and an impaired biotic community), White River (impaired for mercury, polychlorinated biphenyls (PCBs) and an impaired biotic community), Pleasant Run (impaired for *E. coli*), Crooked Creek (impaired for *E. coli*), and Stotts Creek (impaired for *E. coli*).

Surface Water-Groundwater Interaction

Areas where surface water and groundwater interact have the greatest potential to serve as sources of groundwater contamination, particularly in losing streams, i.e., a section of a stream in which the water table adjacent to the stream is lower than the water surface in the stream. This causes infiltration from the stream channel, recharging the groundwater aquifer and decreasing the stream flow (Freeze and Cherry, 1979). The closer the static water level to the ground surface, the greater potential there is for groundwater contamination.

⁵ Section 303(d) of the Clean Water Act requires states to identify waters that do not or are not expected to meet applicable water quality standards with federal technology-based standards alone. States are also required to develop a priority ranking for these waters taking into account the severity of the pollution and the designated uses of the waters. Once this listing and ranking of waters is completed, the states are required to develop Total Maximum Daily Loads (TMDLs) for these waters in order to achieve compliance with the water quality standards.



Monitoring wells are often used to identify and document the interaction between surface water and groundwater. Without such documentation, it would be difficult to classify streams in a given locale as “gaining” or “losing” streams. Monitoring wells were not employed for the I-69 Section 6 Tier 2 study. In the absence of documentation, it is assumed that each stream has the potential to affect groundwater for purposes of evaluating impacts.

In the White River Basin, groundwater generally flows into streams through permeable sediments that line the stream channel. Although groundwater typically discharges to streams, the hydraulic gradient may be reversed in some situations and surface water may flow into the aquifer. Water levels in the White River can rise to a point at which gradients are reversed and surface water seeps into the adjacent sand and gravel aquifers (Schnoebelen et al., 1999).

4.3.2.4 Floodplains

Floodplains are low lands adjoining the channel of a river or stream that have been or may be inundated by floodwater. They are a critical component of the riparian ecosystem and should be considered an integral part of the stream corridor. The floodplain is considered part of the stream channel, differing from the main channel only in the amount of time it stores and conveys water. Undeveloped floodplains with intact riparian buffers can greatly improve water quality by trapping and storing excess sediment. Vegetated floodplains can effectively filter out impurities from runoff and process organic wastes before entering the river or stream.

A floodplain is defined as the area bordering a stream or river that is susceptible to inundation from any water source. The 100-year floodplain was analyzed for this project. This is the area that possesses a 1 percent probability (i.e., 1 out of 100) of being flooded in any given year.

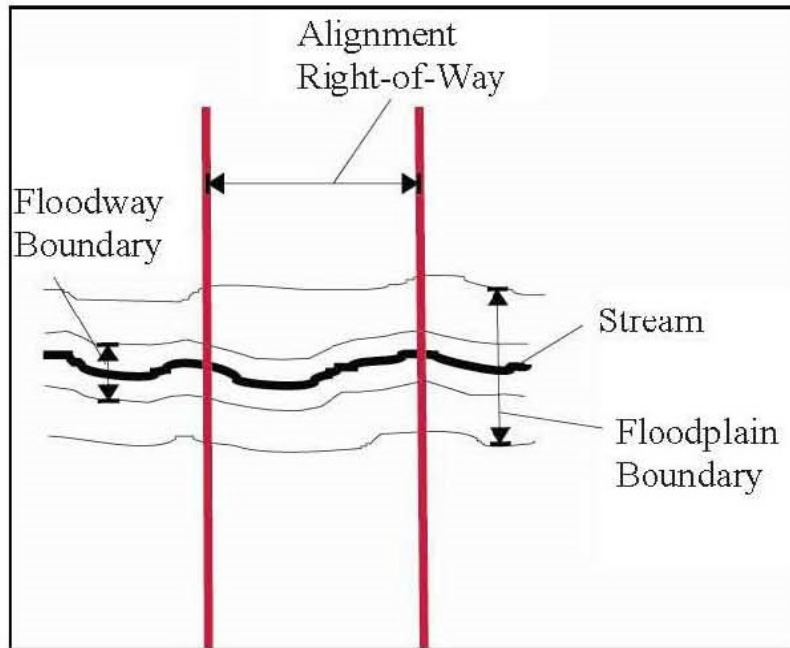
Projects that directly cross or are adjacent to a stream or river may impact floodplains to some degree. When a project crosses a stream or river in a perpendicular orientation, it is referred to as a transverse floodplain encroachment. Likewise, when a project is located adjacent to a stream or river it is referred to as a longitudinal floodplain encroachment. See **Figure 4.3-14** for examples of transverse and longitudinal floodplain encroachments.

I-69 Section 6 crosses several 100-year floodplains. These mapped floodplains are located on Federal Emergency Management Agency's (FEMA) recently updated Flood Insurance Rate Maps. Floodplains along I-69 Section 6 are listed in **Table 4.3-2** and are shown on **Figure 4.3-15**.

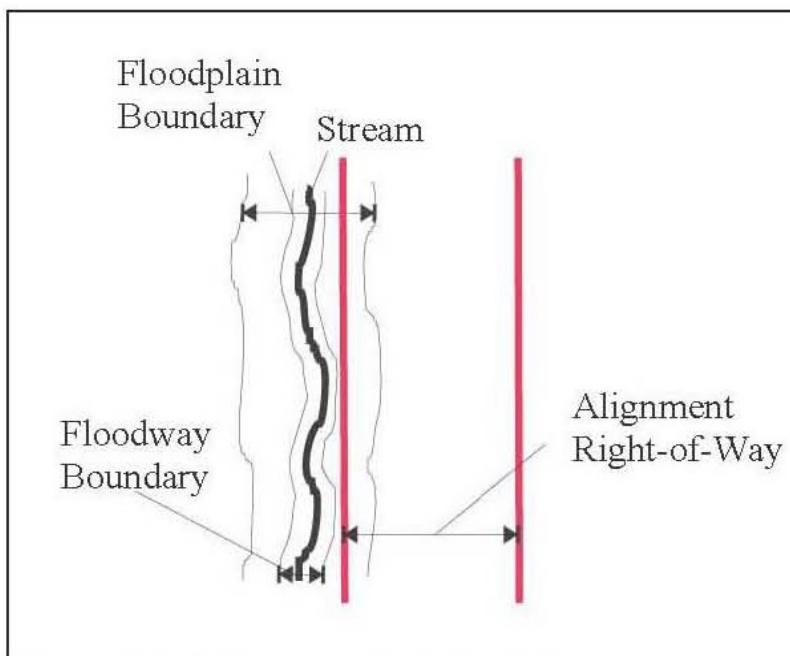
In addition to the FEMA mapped floodplains, other drainage features may have jurisdictional floodplains requiring special design considerations relating to flooding. Impacts to floodplains require various permits, which are described in **Section 5.23**.



Figure 4.3-14: Types of Floodplain Encroachment



Transverse Floodplain Encroachment



Longitudinal Floodplain Encroachment

Figure 4.3-15: I-69 Section 6 Floodplains

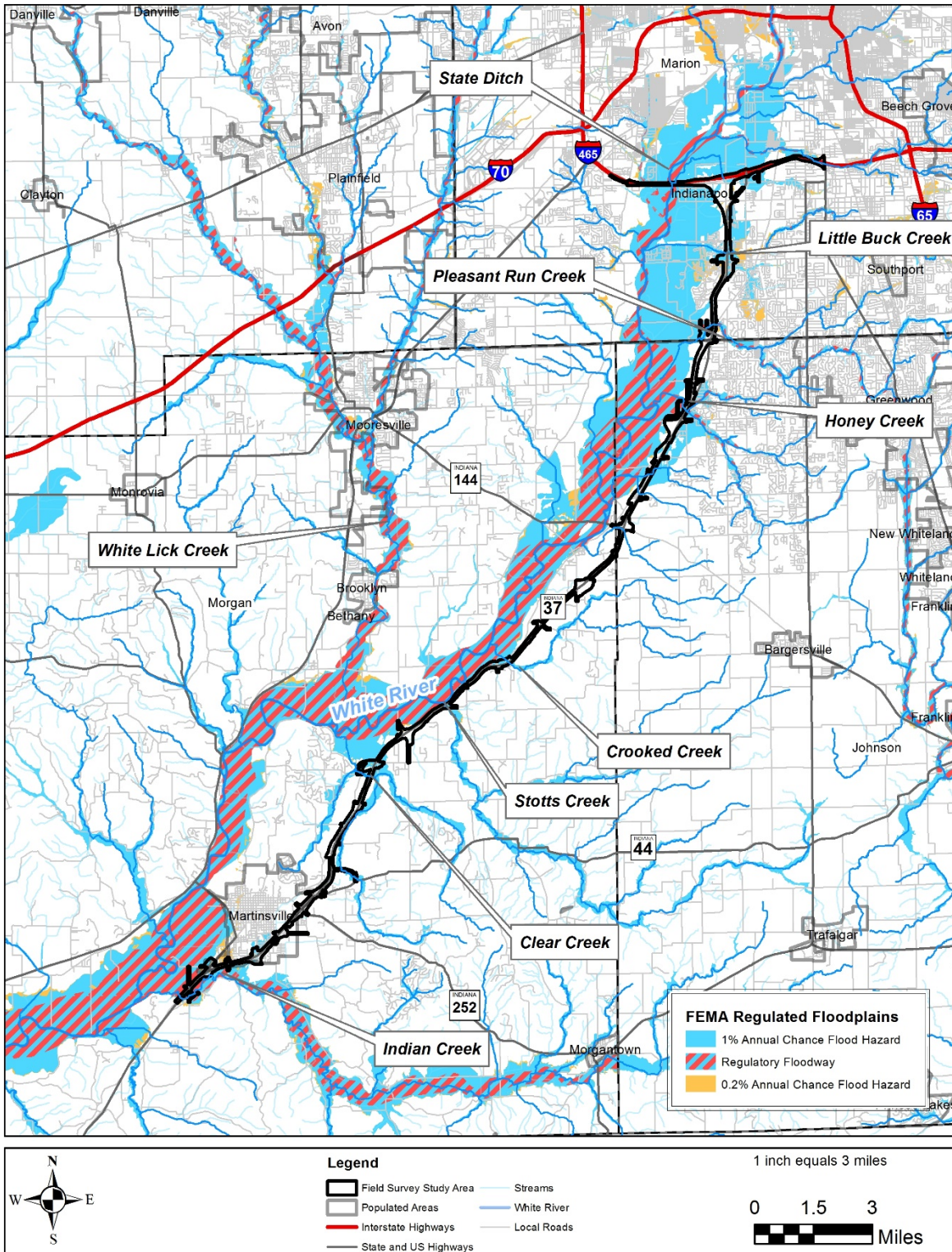




Table 4.3-2: Summary of 100-Year Floodplains in I-69 Section 6 (from north to south)

FEMA Map Panel #	Floodplain of Stream	Type of Crossing
18097C0228F	White River	Transverse and longitudinal
18097C0229F	White River floodplain	Transverse and longitudinal
18097C0233F	White River Floodplain and confluence with Lick Creek	Transverse and longitudinal
18097C240G	White River and confluence with Little Buck Creek and Pleasant Run Creek	Transverse and longitudinal
18081C0105D	White River Floodplain, crossing Honey Creek Floodplain	Transverse
181909C0170E	White River and confluence with Crooked Creek	Transverse
18109C0165E	White River Floodplain and confluence with Stotts Creek	Longitudinal – White River, Transverse – Stotts Creek
18109C0280E	White River Floodplain and confluence with Clear Creek	Longitudinal – White River
18109C0259E	Clear Creek	Longitudinal – Clear Creek
18109C0266E	Indian Creek	Transverse and Longitudinal

4.3.3 Ecosystems

I-69 Section 6 passes through the Central Till Plains – Tipton Till Plains Section and the Highland Rim Natural Region – Brown County Hills Section.

The Tipton Till Plains Section is characterized by relatively flat relief, with distinct drainage valleys that feed into the White River within the undulating plain of glacial till. The region includes commercial and residential development and agricultural land use along SR 37. Forests are scattered throughout as distinct woodlots and forest fragments. Historically, uplands were dominated by oak-hickory forests with bottomlands dominated by elm-ash-cottonwood. Current conditions within the Tipton Till Plains within I-69 Section 6 are summarized by post-settlement fragmentation and clearing for agriculture, industrial, and residential purposes. Forested areas/fragments are typified by hedgerows and generally consist of weedy invasive species and/or fast-growing “windbreak” species such as bush honeysuckle (*Lonicera spp.*) and mulberry (*Morus alba*).

The Brown County Hills Section is characterized by deeply dissected uplands, underlain by siltstone, shale, and sandstone. This landscape is noted for having bedrock near the surface with a thin layer of well drained acid silt loam with minor amounts of loess. The uplands are dominated by oak-hickory forest and the ravines by mesic species (beech, white oak, sugar maple, and white ash). The terrain is fed by small high gradient ephemeral streams draining from the uplands and medium to low gradient streams in the ravines.

Classification of natural communities into habitat types was completed for I-69 Section 6 to facilitate the evaluation of impacts. The habitat types were classified according to the vegetative characteristics of each community, as documented during the field investigations conducted during the fall of 2015 and spring of 2016. **Section 4.3.3.1** summarizes the general characteristics of these habitat types, and **Section 4.3.3.2** identifies the wildlife species that typically rely on these habitat types for food and shelter.

4.3.3.1 Habitat Types

The basic characteristics of the ten habitat types within the I-69 Section 6 field survey study area are described below. These natural habitat types are typical of the Tipton Till Plain and Brown County Hills sections.

- **Old Field** habitat types (**Figure 4.3-16**) are agricultural lands that, following managed use, lay fallow for several years, eventually reverting to an assemblage of various native and naturalized grasses and forbs. These areas are in transition from bare ground to forest. At this stage, they are overgrown with herbaceous and shrub species. This habitat typically supports a variety of species.
- **Early- to Mid-Successional Forest.** Over time, an old field is invaded by shrubs and saplings as succession moves toward a forested habitat. These communities resemble a later stage of Old Field and habitats usually consist of between 10 percent and 50 percent woody plants (seedlings or saplings). See **Figure 4.3-17**.
- **Forest Fragment** habitat types are generally located between agricultural fields and consist of fencerows, shrubby ditches, and partially forested waterways that lack a floodplain (**Figure 4.3-19**). Given the scale and extent of most agricultural landscapes, forest fragments are often the only refuge readily available to wildlife. They represent a unique and valuable habitat type. Because these tree-covered

Figure 4.3-16: Old Field



Figure 4.3-17: Early- to Mid-Successional Forest



Section 6—Final Environmental Impact Statement

areas are too narrow or too small to meet the USDA definition of forest, they are not considered as upland forest in the analysis of forest impacts in **Section 5.20**.

- **Mesic Upland Forests** are often characterized by dense canopy and an understory of shade-tolerant species (**Figure 4.3-18**). Mesic Upland Forests are typically found on north-facing slopes and level ground with moderately moist soils through which water moves slowly, but does not saturate the soil for significant periods of time. These forests, where extensive, assist in regional climate moderation, as the dense canopy shades forested wetlands and associated creeks and ephemeral streams.

Approximately 21 percent of the field survey study area is agricultural land. Agricultural areas are not included as a specific habitat type, as these areas typically occur within a matrix of other habitat types and provide little habitat when isolated. Additionally, depending on management intensity or cultivation method, agricultural habitat may vary substantially in structure annually; cultivated agricultural lands are typified by periods of bare soil and harvest as pastures are mowed, hayed, or grazed one or more times during the growing season.

Due to the urban and suburban development and the existing SR 37 highway, approximately 8 percent of the field survey study area is forested, and four of the 10 wildlife habitat types identified are a type of forest habitat. Habitat reduction and fragmentation can affect animal populations that depend on the habitat to such an extent that species diversity can be impaired by isolation and inbreeding and, ultimately, species survival can be threatened. Detailed analysis of forest and wildlife habitat impacts, as well as measures to minimize impacts to forests and wildlife habitat are provided in **Section 5.18**, **Section 5.20**, and **Section 7.3**.

4.3.3.2 Wildlife

The general characteristics of wildlife species common to the habitat types occurring in I-69 Section 6 are identified below.

Figure 4.3-18: Forest Fragment



Figure 4.3-19: Mesic Upland Forest





(1) **Old Field** plant variety provides natural food plots, nesting areas, and shelter for a wide variety of birds, butterflies, and mammals. Forage is available for seed eating birds such as mourning dove and finches; and insects attract wild turkey, eastern meadowlark, and other birds. Rodents feed on the green vegetation and seeds. Predatory birds and snakes, in turn, feed on the rodents. Various grasses and forbs dominate the vegetation: brome grass, orchard grass, foxtail, Queen Anne’s lace, goldenrods, milkweeds, teasel, yarrow, and asters.

(2) **Early- to Mid-Successional Forest** communities have an abundance of berry-producing shrubs and brushy cover that provide food and shelter for several species that include white-tailed deer, northern mockingbird, catbird, field sparrow, opossum, cottontail rabbit, and wild turkey.

(3) **Forest Fragments** harbor a variety of plant species and are typically weedy and shrubby. Wildlife species that commonly use forest fragments include cottontail rabbit, Virginia opossum, raccoon, white-tailed deer, white-footed mouse, gray squirrel, American robin, blue jay, brown-headed cowbird, and grackle.

(4) **Mesic Upland Forests** are associated with an oak-hickory forest cover type and provide food chain support for many different wildlife species. For example, many bird species such as blue jay and downy woodpecker use these areas and associated wetlands as a source of food, water, nesting material, and shelter. Mammals such as woodchuck, striped skunk, red fox, and white-tailed deer are also common to this habitat type.

(5) **Dry-Mesic Forests** are often dominated by maples and beech. They provide an abundance of food for wildlife. This diverse plant system also provides habitat for many different species of birds, mammals, and amphibians. Typical species using this habitat type include white-tailed deer, gray squirrels, raccoons, Eastern box turtles, skinks, and wild turkeys.

(6) **Mesic Floodplain Forests** provide valuable habitat for birds, mammals, amphibians, reptiles, and insects. The dense herbaceous cover provides nesting grounds for waterfowl. Tree snags and cottonwoods provide food and shelter for many species of songbirds (Sullivan, 1995). In addition, common to this habitat are the northern cardinal, gray catbird, house wren, eastern mole, raccoon, common muskrat, white-tailed deer, and turtles (Sullivan, 1995).

(7) **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, and various beneficial insects and their larvae.

(8) **Scrub-Shrub Wetlands** are characterized by low, multi-stemmed woody vegetation in young or stunted stages of growth, and can be dense and impenetrable or can consist of a mosaic of low woody cover interspersed in herbaceous cover. The low cover provides



habitat for eastern cottontail rabbit, muskrat, snakes, frogs, turtles, and insects and their larvae.

(9) Forested Wetlands are often seasonally inundated, which provides an ideal habitat for emergence of spring aquatic life. Representative wildlife dependent upon forested wetlands includes wood ducks, great blue heron, green-backed heron, and swamp sparrow; and other wildlife such as turtles, salamanders, frogs, snakes, mammals, and a variety of insects.

(10) Open Water can provide breeding, foraging, and resting habitat for a variety of wildlife species including amphibians, birds, mammals, fish, and insects. Naturalized open water habitats provide spawning sites, nursery areas, feeding sites, and cover for various species of fish. Maintained open water areas (e.g. stock and detention ponds, flooded gravel pits) do not provide suitable habitat for certain species of fish or other aquatic species.

4.3.3.3 Threatened and Endangered Species

Threatened and Endangered Species (TES) are recognized by federal and state agencies as being in danger of extinction or being sufficiently compromised to potentially become endangered at either the local or national level. The assessment of TES is concerned with the preservation and conservation of such species and their sustainability.

The Endangered Species Act of 1973 (ESA) (7 U.S.C. §136; 16 U.S.C. §460 et seq.) provides a nationwide program for the conservation of threatened and endangered plants and animals and the habitats in which they are found. This act prohibits any action, administrative or real, that will result in the taking of a listed species or adversely affect its critical habitat. In addition, the ESA prohibits any import, export, interstate, or foreign commerce of listed species. Specifically, federally listed species are protected under Section 7 of the ESA, which directs all federal agencies to use their existing authorities to conserve TES.

The ESA defines an endangered species as any species (other than certain pest insects) which is in danger of extinction throughout all or a significant portion of its range. The ESA defines a threatened species as any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

As previously noted, the ESA prohibits any action that results in the taking of a listed species unless the appropriate permit has been acquired. The term "take," according to the ESA, means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.

Section 8 of the ESA designates management and scientific authority to the USDOJ, with each authority's function to be carried out through the USFWS. The USFWS maintains the list of 497 endangered faunal species, 732 endangered floral species, 202 threatened faunal species, and 166 threatened floral species as of June 25, 2016. Faunal species include birds, insects, fish, reptiles,



amphibians, mammals, and crustaceans, while floral species include trees, shrubs, vines, and herbaceous plants such as grasses and forbs (wildflowers).

In addition to the federal law protecting endangered species, many states have enacted similar laws to protect species on a state level. The IDNR has the authority to protect and properly manage the fish and wildlife resources of Indiana (IC 14-22-1-1). Under this section, an endangered species is defined as any species or subspecies of wildlife whose prospects of survival or recruitment within Indiana are in jeopardy or are likely within the foreseeable future to become so due to: the destruction, drastic modification, or severe curtailment of the habitat of the wildlife; the over-use of the wildlife for scientific, commercial, or sporting purposes; the effect on the wildlife of disease, pollution, or predation; other natural or manmade factors affecting the prospects of survival or recruitment within Indiana; or any combination of these factors. This definition also includes any species or subspecies of fish or wildlife appearing on the United States list of endangered native fish and wildlife (50 CFR Part 17, Appendix D) or any species or subspecies of fish and wildlife appearing on the United States list of endangered foreign fish and wildlife (50 CFR Part 17, Appendix A).

The Indiana Code (IC 14-22-34-5) defines “take” as harassing, hunting, capturing, killing, or any attempt to harass, hunt, capture, or kill wildlife. In addition, IC 14-22-34-10 provides the IDNR authority to prepare a list of those species and subspecies of wildlife indigenous to Indiana that are determined to be endangered in Indiana.

In addition to protections provided by the federal and state endangered species legislation noted above, the Migratory Bird Treaty Act (MBTA) makes it illegal for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit issued pursuant to federal regulations (USFWS, 2003). The specific migratory bird species protected by the MBTA can be found in 50 CFR §10.13.

In a final rule issued on July 9, 2007, the USFWS removed the bald eagle from the list of threatened and endangered species established under the ESA. The bald eagle continues to be protected under the Bald and Golden Eagle Protection Act (16 U.S.C. §§668-668d) and the MBTA (16 U.S.C. §§703-712). In particular, the Bald and Golden Eagle Protection Act prohibits the incidental taking of a bald eagle except as allowed by a permit granted by the USFWS.

An evaluation of impacts on federally listed species has been carried out in consultation with USFWS under Section 7 of the ESA. In Section 7 consultation during the preparation of the Tier 1 EIS, USFWS initially identified six species in the 26-county study area that required evaluation. Of the six species evaluated in the Tier 1 DEIS, USFWS identified three species that may be present in the Action Area for Preferred Alternative 3C. Those three species were the Indiana bat, the bald eagle, and the eastern fanshell mussel.

Coordination with USFWS during Tier 2 resulted in the re-initiation of Tier 1 formal consultation for the Indiana bat. Additional information provided by Tier 2 bat surveys prompted USFWS to re-examine the effects of the project as a whole on this species. The USFWS



concluded the project 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.”

Current information shows no eastern fanshell mussels within the corridor. Thus, there has been no re-initiation of formal consultation for the eastern fanshell. Because the bald eagle has been delisted, no formal consultation under the ESA would be necessary.

Subsequent to the Tier 1 EIS and Section 7 consultation, the northern long-eared bat⁶ was listed as threatened and the rusty patched bumble bee⁷ was listed as endangered by the USFWS. Tier 1 Section 7 consultation with USFWS was re-initiated for the northern long-eared bat in October 2014, prior to its formal listing and for the rusty patch bumble bee.

The Tier 2 biological fieldwork conducted in I-69 Section 6 included a pedestrian walkover; fish, unionid (freshwater mussel), and crayfish survey; and mist netting for bats. Mist netting for bats was completed in 2004, 2005 and 2015 in I-69 Section 6.

A total of 10 Indiana bats were captured from eight mist net sites during the 2004 survey. Four Indiana bat roost trees were identified. The closest was approximately 800 feet east of SR 37. Emergence counts ranged from one bat to 109 bats depending upon the roost. A total of 21 northern long-eared bats were captured during the 2004 survey, from 11 mist net sites. Northern long-eared bats were not tracked to roost trees during this survey. In addition, the undersides of 18 bridges were inspected during the night to identify night-roosting bats. No Indiana bats or northern long-eared bats were identified under any of these bridges.

Additional mist netting surveys were completed during the summer of 2005. The 2005 surveys focused around the location of Indiana bat captures where no primary roost trees were identified in 2004. Three female Indiana bats were captured from three mist net sites in I-69 Section 6. The Indiana bats were successfully tracked to six roost trees. The closest roost tree was approximately 2,300 feet from SR 37. Six northern long-eared bats were captured during the 2005 survey in I-69 Section 6 from four mist net sites. Northern long-eared bats were not tracked to roost trees during this survey.

Mist netting surveys were conducted again during the summer of 2015. A total of three Indiana bats were captured. One Indiana bat was successfully tracked to two roost trees. The closest roost was approximate 1.5 miles from SR 37. Emergence counts for the two roosts ranged from seven to 35. A total of three northern long-eared bats were captured. One northern long-eared bat roost tree was identified, approximately 1.2 miles from SR 37. Emergence counts for the two roosts ranged from three to six bats.

⁶ The northern long-eared bat (*Myotis septentrionalis*) was listed as federally threatened on May 4, 2015

⁷ *Endangered and Threatened Wildlife and Plants; Endangered Species Status for Rusty Patched Bumble Bee*, Federal Register, Vol. 82, No. 7, January 11, 2017. On March 21, 2017, the listing of the rusty patched bumble bee (*Bombus affinis*) as endangered under the Endangered Species Act became effective.



Recently, the USFWS developed “high potential” zones around each current (2007-2016) rusty patched bumble bee record, and concluded that the bee is only likely to be present within these specific areas. There are three such zones in Indiana. Although not of uniform size, they have discrete boundaries that are being used by USFWS field offices to help action agencies determine when consultation under the ESA section 7(a)(2) may be necessary. One zone is in northern Marion County. It is not near the I69 project area (IPaC, <https://ecos.fws.gov/ipac/>). Based on the project location and action area, consultation for the rusty patched bumble bee under section 7(a)(2) for the I69 Section 6 project is not required.

Based on the fish, unionid mussel, and crayfish survey conducted in 2004 and 2005, 30 species of fish representing six families were observed in the main streams crossed by I-69 Section 6. One species of crayfish was collected. No live mussels or fresh dead shells were identified. No state or federally listed species were observed. The prevalent species found during this survey are moderately tolerant to tolerant of lower-quality aquatic habitats.

The field surveys completed for wetlands, streams, forest, and wildlife habitat encountered no state or federally listed plants, animals, or habitats.

A description of the methods and results of the surveys conducted for Tier 2 I-69 Section 6 are included in **Section 5.17**.

4.3.3.4 Managed Lands/Natural Areas

Managed lands and natural areas include forests, recreation areas, natural areas, nature preserves and other federal and state lands that are managed for conservation, recreation, resource extraction, or other purposes. Some private lands are also considered “managed lands,” such as those owned by the Central Indiana Land Trust, Inc. (CILTI) non-profit group. These areas may also be designated as high quality natural areas or for another specific purpose where they are not necessarily actively managed. These lands may be managed for timber production, wildlife habitat, recreation, education, or other purposes. Federal and state interests exist with many of these lands, including cost-sharing agreements, purchased easements, or property tax reductions. Federal and state funds have been or are being expended on many of these properties.

Federal or state owned managed lands in southern Indiana include Crane Naval Surface Warfare Center, Hoosier National Forest, Morgan-Monroe State Forest, and the Cikana State Fish Hatchery. The Cikana State Fish Hatchery is located in Morgan County within the I-69 Section 6 study area.

Privately-owned managed lands include land enrolled in government cost share programs such as the USDA Conservation Reserve Program, the IDNR Classified Forest and Wildlands Program, the USFWS Partners for Fish and Wildlife Program, and others.

Table 4.3-3 provides a summary of managed lands located along or in the vicinity of I-69 Section 6 that could be affected by the project. **Figure 4.3-20** illustrates the location of these managed lands. Some overlap of properties and boundaries may exist across managed lands.



Impacts to the privately-owned, managed land as a result of the project are described in **Section 5.22**.

Table 4.3-3: Summary of Managed Lands in or near I-69 Section 6

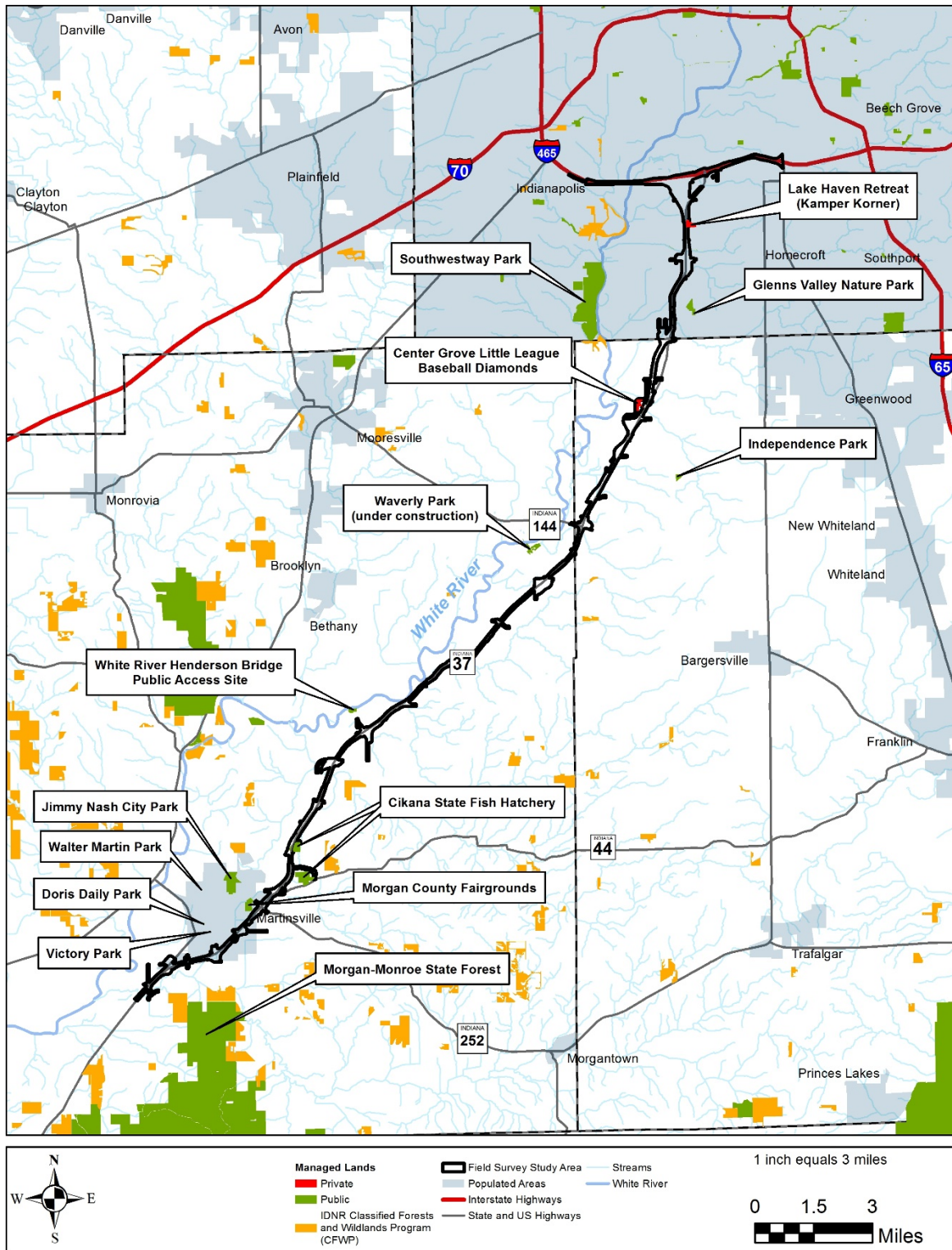
Resource Name	Resource Class (Ownership)	Total Acreage of Resource
Cikana State Fish Hatchery	Public	118
Southwestway Park	Public	587
Glenns Valley Nature Park	Public	30
Millard Sutton / Amos Butler Audubon Sanctuary Nature Preserve (not mapped)	Private	76
Jimmy Nash City Park	Public	113
Doris Daily Park	Public	<1
Walter Martin Park	Public	<1
Victory Park	Public	<1
Morgan County Fairgrounds	Public	40
White River Henderson Bridge / Public Access Site	Public	13
Waverly Park (under construction)	Public	55
Independence Park	Public	13.5
Center Grove Little League Baseball Diamonds	Private	18.3
Lake Haven Retreat (Kamper Korner)	Private	22
Morgan-Monroe State Forest	Public	25,545

Cikana State Fish Hatchery

The Cikana State Fish Hatchery is located within the I-69 Section 6 field survey study area. The hatchery is divided into two units. The north unit is located adjacent to SR 37, one mile north of SR 44. The east unit is located adjacent to SR 44, one mile east of SR 37. The east unit is a 78-acre property containing 22 earthen ponds with a total water surface area of 21 acres. The east unit also includes a culture building, a service building, and a small barn. The north unit is a 40-acre property containing 13 earthen ponds with a total water surface area of 7.4 acres. The north unit also includes the assistant manager’s residence, a barn, and a pole building.

The Cikana State Fish Hatchery was purchased by the state in 1966 to boost the production of warm-water species during a time when new public fishing waters were being created. The hatchery uses modern intensive and extensive fish culture techniques. The primary species raised at the hatchery include walleye, saugeye (a hybrid cross between a female walleye and male sauger), channel catfish, and smallmouth bass. The fish produced at the hatchery are stocked in state-managed waters throughout Indiana. Fish are not for sale to the public (IDNR, 2016).

Figure 4.3-20: Managed Lands in I-69 Section 6





Morgan-Monroe State Forest

The Morgan-Monroe State Forest is located approximately 0.8 mile southeast of I-69 Section 6. It encompasses over 25,000 acres in Morgan and Monroe counties. The State Forest was designated in 1929 and is comprised of forested ridges and valleys. The forest offers various family-oriented outdoor activities including picnic shelters, hiking trails, three fishing lakes, primitive camping, and hunting for white tail deer, ruffed grouse, turkey, squirrel, fox, and raccoon during appropriate seasons. Most of the area under State Forest management is listed as multi-use which can include recreational activities and various timber and wildlife harvesting activities.

Millard Sutton/Amos Butler Audubon Sanctuary Nature Preserve

The Millard Sutton/Amos Butler Audubon Sanctuary Nature Preserve is located near I-69 Section 6. The nature preserve is a 76-acre forested floodplain located west of the White River approximately 0.7 mile west of SR 37 in Johnson County (Amos Butler Audubon, 2016). The nature preserve is privately owned by CILTI and was purchased with funding from the Amos W. Butler Audubon Society, the Indianapolis Audubon chapter. The property is also included in the IDNR Classified Forest and Wildlands Program. The nature preserve is the largest known great blue heron (*Ardeea herodias*) nesting site in Indiana with more than 500 great blue heron nests (IDNR (3), 2016). To protect the nesting herons, the nature preserve is not open to the public.

Southwestway Park

Southwestway Park is located near I-69 Section 6. Southwestway Park is a 587-acre regional park owned by Indy Parks and Recreation that includes natural and cultural landscapes (Center for Earth and Environmental Science IUPUI, 2016). The park is located approximately two miles west of SR 37 on Southport Road, approximately 10 miles south of downtown Indianapolis, and adjacent to the White River. Park amenities include a trail system used for hiking, running, mountain biking, and horseback riding. The park also contains soccer fields, baseball diamonds, and the Winding River Golf Course (Indy Parks and Recreation (2), 2016).

Natural communities within Southwestway Park include mesic-dry upland forest, mesic floodplain forest, wet-mesic floodplain forest, wet floodplain forest, and several wetland communities including sedge meadow, circumneutral seep, and marsh (Center for Earth and Environmental Science IUPUI, 2016). In addition, two conservation easements are located adjacent to the north and south boundaries of the park. These conservation easements are owned by Indy Parks and Recreation and include natural oxbow lakes and wetlands, wooded riverine wetlands, and woodlands. These properties help to increase acreage for habitat restoration and passive recreation adjacent to the park (Polston, 2005).



Glenns Valley Nature Park

Glenns Valley Nature Park is a 30-acre park located approximately 0.4 mile east of SR 37 in Marion County. The park property was deeded to the City of Indianapolis in 1992. Part of the property has been converted into a nature area and is being maintained to encourage the growth of native Indiana plants. The park includes trails, a picnic area, a playground, and building rentals (Indy Parks and Recreation, 2016).

Local Community Parks and Open Space

Eight community parks, open spaces, and public access sites are located within or near I-69 Section 6. Owners of these public properties include the City of Martinsville, Morgan County, Johnson County, Marion County, and the IDNR. In addition, two recreational properties that are privately owned are also located near I-69 Section 6. These properties provide opportunities for outdoor recreation, habitat conservation, and environmental education.

Four City of Martinsville parks are located near I-69 Section 6. The Jimmy Nash City Park, Martinsville's largest park, is a 113-acre property containing a fishing pond, pool, walking and hiking trails, shelters, tennis courts, playground, basketball goals, and a family pavilion. It is located on the north side of Martinsville approximately one mile west of SR 37. The Doris Daily Park, located approximately 0.85 mile northwest of SR 37, includes just less than one acre of green space with large trees, a gazebo, and picnic area. The Walter Martin Park is a small neighborhood park with a playground, basketball goals, and picnic area. It is located on North Mulberry Street approximately 1.5 miles northwest of SR 37. Victory Park is a small neighborhood green space located at the intersection of South Street and Sycamore Street, approximately 0.5 mile northwest of SR 37 (City of Martinsville, 2016).

The Morgan County Fairgrounds are located approximately 0.2 mile northwest of SR 37 on Hospital Drive. The Morgan County Fairgrounds host the annual Morgan County Fair as well as other special events and contests, such as pageants and youth talent contests. The Morgan County Fair includes a midway with amusement rides, livestock competitions, concerts, and other activities (Morgan County Fair, 2016).

The Henderson Ford White River public access site is located approximately 4.5 miles north of Martinsville and 0.7 mile north of SR 37 on Henderson Ford Road (IDNR (5), 2016). The public access site provides opportunities for recreational activities on the White River, such as canoeing, kayaking, and fishing. The public access program was initiated in 1953 by IDNR - DFW to provide free access to Indiana waters for anglers and boaters. The program is part of a broader statewide access initiative. To date, the program has funded portions of the acquisition, development, and maintenance of approximately 366 public access sites (IDNR (4), 2016).

Morgan County Parks and Recreation is currently in the design and early construction phase for Waverly Park. The planned park is located at the intersection of Whetzel Street and Old SR 37 adjacent to the White River in the community of Waverly. It is approximately 0.7 mile northwest of I-69 Section 6. The 55-acre park will be located in a floodplain at the site of historic



downtown Waverly. In 2008, severe flooding destroyed many structures on the site. FEMA provided Morgan County with grant funds to clear the site of unusable structures for preparation as a future public park. The Waverly County Park plans currently include a recreation of the town square, wetlands, community gardens, event space, boardwalk paths, trails, a gazebo, a storm water swale, a boat launch, and a covered bridge over the White River (Morgan County Parks and Recreation, 2016).

Independence Park is a 13.5-acre park located approximately 1.8 miles east of SR 37 in Johnson County. The park is owned by Johnson County Parks and Recreation. The park was developed in 2000 and included Indiana's first all-accessible playground area for persons with disabilities. Independence Park is the only publicly owned, green space park located in White River Township (Johnson County Parks and Recreation, 2016).

The Center Grove Little League baseball diamonds are located northwest of the SR 37 and Smith Valley Road intersection and southwest of Honey Creek. The park includes nine baseball diamonds, parking, and concession stands. The park is privately owned and provides youth baseball facilities to anyone who lives within the White River Township boundaries or has been approved to play via waiver if living outside the White River Township boundary (Center Grove Youth Baseball, 2016).

Lake Haven Retreat, also known as Kamper Korner, is a 22-acre recreational vehicle (RV) campground located approximately two miles south of Indianapolis at the intersection of SR 37 and Edgewood Avenue. The campground provides a 5-acre stocked lake used for fishing, RV camping sites, tent camping sites, an event hall, and paddle boat rental. Lake Haven Retreat is privately owned (Lake Haven Retreat, 2016).

USDA-NRCS Farm Bill Programs

The USDA-Natural Resources Conservation Service (NRCS) offers voluntary programs to eligible landowners and agricultural producers to provide financial and technical assistance to help manage natural resources in a sustainable manner. Through these programs, the agency approves contracts to provide financial assistance to help plan and implement conservation practices that address natural resource concerns or opportunities to help save energy, improve soil, water, plant, air, animal, and related resources on agricultural lands and non-industrial private forest land. In Indiana, these programs are administered by the USDA-NRCS Farm Service Agency (FSA) Indiana Office. Two of the programs that the USDA-NRCS offers are the Conservation Reserve Program (CRP) and the Environmental Qualities Incentives Program (EQIP).

The CRP is administered through the FSA. Program support is provided by NRCS, Cooperative State Research and Education Extension Service, state forestry agencies, and local Soil and Water Conservation Districts. CRP is a voluntary program for agricultural landowners, through which property owners can receive cost-share assistance to establish long-term, resource-



conserving covers on eligible farmland. Participants enroll in CRP for 10 to 15 years. The I-69 Section 6 field survey study area includes two properties enrolled in the CRP.⁸

The EQIP addresses locally identified problems with natural resources. High priority is given to assistance where agricultural improvements will help meet water quality objectives. EQIP offers contracts that provide incentive payments and cost sharing for conservation practices, such as manure management systems, pest management, erosion control, and other practices to improve and maintain the health of natural resources. No EQIP resources are located within the I-69 Section 6 field survey study area.

IDNR Classified Forest and Wildlands

The Classified Forest and Wildlands Program (CFWP) encourages timber production, watershed protection, and wildlife habitat management on private lands in Indiana. It is administrated by the IDNR. This program is available to landowners with at least 10 contiguous acres supporting a growth of native or planted trees, native or planted grasslands, wetlands, or other acceptable types of land cover that have been set aside and managed for the production of timber, wildlife habitat, and watershed protection. In return for meeting program guidelines, landowners receive property tax breaks, forestry literature, and periodic free inspections by a professional forester while the forest is enrolled in the program.

The lands are eligible for assessment at \$1.00 per acre and taxes are paid on that assessment. The owner of Classified Forest and Wildlands does not relinquish ownership or control of his property and the IDNR Division of Forestry does not become connected in any way with ownership of the land.

Part or all the Classified Forest and Wildlands can be withdrawn from classification at any time by completing and recording the withdrawal forms provided by the district forester upon request. When a part of classified forest is withdrawn, the remaining area must be a minimum of 10 acres. If the remaining area is less than 10 acres, the whole tract must be withdrawn. The state forester may also withdraw the land from classification if the requirements of the law are not being met. When withdrawing land from classification, the owner must go to the county assessor and have the assessor complete a report on the real property taxes that would have been paid had the property not been classified (IDNR (2), 2016).

If IDNR Classified Forest and Wildlands are acquired for the I-69 project, the INDOT appraiser will consider any liability the property owner may have for back taxes and/or penalties as a factor in the appraisal process. No IDNR Classified Forest and Wildlands are located within the I-69 Section 6 field survey study area.

⁸ The FSA cannot provide the location of CRP properties; however, they were able to provide the number of properties within the I-69 Section 6 field survey study area.

**USFWS Partners for Fish and Wildlife**

The USFWS Partners for Fish and Wildlife Program (Partners Program) provides expert technical assistance and cost-share incentives to private landowners to restore fish and wildlife habitats through voluntary agreements. The Partners Program was established in 1987 with an initial purpose of wetland restoration on private lands. However, the program has grown into a larger and more diversified habitat restoration program that assists thousands of private land owners.

The core mission of the Partners Program includes the conservation and management of Federal Trust Species, including migratory birds, threatened and endangered species, inter-jurisdictional fish, certain marine mammals, and species of international concern. It is estimated that 73 percent of land in the United States is privately owned. Therefore, the habitat needs of all Federal Trust Species cannot be met solely on public lands. The Partners Program provides technical and financial assistance to private landowners and Tribes who are willing to work with the USFWS on a voluntary basis to help meet these habitat needs (USFWS, 2016).

The Partners Program can assist with projects in all habitat types which conserve or restore native vegetation, hydrology, and soils associated with imperiled ecosystems such as longleaf pine, bottomland hardwoods, tropical forests, native prairies, marshes, rivers and streams, or otherwise provide an important habitat requisite for a rare, declining, or protected species. Locally based field biologists work individually with private landowners and other partners to plan, implement, and monitor their projects. Field staff assists landowners with finding sources of funding and navigating the permitting process.

Two projects that have received funding as part of the USFWS Partners for Fish and Wildlife Program are located near I-69 Section 6. Both are located in publicly owned managed lands discussed above. These projects are the Southwestway Park prairie and bottomland hardwood restoration and the Waverly Park reforestation project, which is currently under construction.