

APPENDIX D



January 7, 2014

Ms. Annette Coffey, P.E.
Qk4
2225 Lawrenceburg Road, Building C, 2nd Floor
Frankfort, Kentucky 40601

**Subject: Ecological Assessment Overview
KY 107 and I-24 Interchange Justification Study
Christian County, Kentucky
KYTC Item No.: 2-8702.00
Redwing Project No.: 13-056**

Dear Ms. Coffey:

Redwing Ecological Services, Inc. (Redwing) is pleased to submit this overview of the ecological assessment of the proposed KY 107 and I-24 Interchange in Christian County, Kentucky. This overview is intended to identify significant ecological features in the vicinity of the proposed project, and to assist the Kentucky Transportation Cabinet in evaluating the environmental effects of the proposed roadway alignment alternatives. The overview presents methodology and results of potential terrestrial and aquatic features within the study area.

We appreciate the opportunity to work with you on this important project. If you have any questions regarding this overview, please do not hesitate to call Richard Clausen or Laura Darnell at (502) 625-3009.

Sincerely,

Laura A. Darnell
Project Biologist

Richard S. Clausen
Principal
Senior Ecologist

Enclosure: Ecological Assessment Overview – KY 107 and I-24 Interchange Justification Study



ECOLOGICAL ASSESSMENT OVERVIEW

KY 107 AND I-24 INTERCHANGE JUSTIFICATION STUDY CHRISTIAN COUNTY, KENTUCKY KYTC ITEM NO.: 2-8702.00

Prepared for:

KENTUCKY TRANSPORTATION CABINET

January 2014

ECOLOGICAL ASSESSMENT OVERVIEW

**KY 107 AND I-24 INTERCHANGE JUSTIFICATION STUDY
CHRISTIAN COUNTY, KENTUCKY
KYTC ITEM NO.: 2-8702.00**

Prepared for:

KENTUCKY TRANSPORTATION CABINET

Prepared by:

REDWING ECOLOGICAL SERVICES, INC.



**Laura A. Darnell
Project Biologist**



**Richard S. Clausen
Principal
Senior Ecologist**

January 7, 2014

EXECUTIVE SUMMARY

The Kentucky Highway 107 (KY 107) and Interstate 24 (I-24) Interchange Justification Study has been requested to assess the potential construction of an interchange between KY 107 and I-24 in southern Christian County, Kentucky. The project study area includes approximately 1,100 acres centered around the current KY 107 overpass of I-24, which is located approximately 1.2 miles northwest of the southern terminus of the Edward T. Breathitt Parkway. The purpose of this overview report is to identify significant ecological resources within the study area through a combination of agency correspondence, in-house research, and a field assessment.

The study area is dominated by open field habitats, which include crop fields, rural/residential development, and road right-of-way. Some upland woods habitat is present in a few scattered woodlots, wooded drains and sinkholes, and fencerows. The study area includes approximately 11,310 feet of ephemeral streams, six potential wetlands, four ponds, and numerous sinkholes. The Little River and one mapped spring are located just outside the western boundary of the study area. No caves or rockshelters were observed within the study area, but these features may be present due to karst geology underlying the area.

Based on coordination and review of available database information from the U.S. Fish and Wildlife Service (USFWS), the Kentucky Department of Fish and Wildlife Resources, and the Kentucky State Nature Preserves Commission, federally-listed species potentially occurring within the study area are limited to the Indiana bat (*Myotis sodalis*; federally endangered). Approximately 83 acres of potential Indiana bat summer roosting/maternity habitat was identified within the study area. The study area is not located in the vicinity of a known maternity roost or hibernacula for this species, as designated by the USFWS (2011). KYTC should refer to the 2012 Programmatic Consultation Agreement for recommendations regarding impacts to the Indiana bat.

The Little River, located immediately outside the study area, and its riparian corridor represent potential habitat for several rare species. These species include the gray bat (*Myotis grisescens*; federally endangered), southeastern myotis (*Myotis austroriparius*, federal species of management concern), smallscale darter (*Etheostoma microlepidum*, federal species of management concern), slabside pearlymussel (*Lexingtonia dolabelloides*, federally proposed endangered), and fluted kidneyshell (*Ptychobranthus subtentum*, federally proposed endangered).

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1.0 INTRODUCTION

This report presents an overview of significant ecological features in support of the KY 107 and I-24 Interchange Study in Christian County, Kentucky. This overview is based on correspondence with state and federal resource agencies, in-house research, and a field assessment of the study area. The assessment is intended to identify significant ecological features in the study area for use by the Kentucky Transportation Cabinet in evaluating the environmental effects of the proposed interchange construction. The study evaluated approximately 1,100 acres centered around the current KY 107 overpass of I-24, which is located approximately 1.2 miles northwest of the southern terminus of the Edward T. Breathitt Parkway (Figure 1).

2.0 CORRESPONDENCE WITH FEDERAL AND STATE AGENCIES

Federal and state agencies were contacted regarding the potential presence threatened/endangered species or their critical habitats, and other significant ecological resources that may occur within the study area. Agencies that were contacted include the U.S. Fish and Wildlife Service (USFWS), Kentucky Department of Fish and Wildlife Resources (KDFWR), Kentucky State Nature Preserves Commission (KSNPC), Kentucky Division of Water (KDOW), Kentucky Division of Forestry (KDOF), Kentucky Geological Survey (KGS), and Natural Resources Conservation Service (NRCS). The proposed project area is not located within a national forest or national park; therefore, consultation with the U.S. Forest Service or the National Park Service was not performed. Copies of correspondence letters to and from state/federal agencies are provided in the Appendix. Agency correspondence is summarized below.

2.1 United States Fish and Wildlife Service

A consultation letter was sent to the USFWS office in Frankfort, Kentucky, on August 6, 2013, requesting information regarding federally-listed species or their critical habitat in the study area. A response was received on August 14, 2013, in which the USFWS lists two federally endangered bat species, the gray bat (*Myotis grisescens*) and Indiana bat (*Myotis sodalis*), and four federally-listed mussel species, the fanshell (*Cyprogenia stegaria*, endangered), slabside pearlymussel (*Lexingtonia dolabelloides*, proposed endangered), ring pink (*Obovaria retusa*, endangered), and fluted kidneyshell (*Ptychobranthus subtentum*, proposed endangered) as having the potential to occur within the project vicinity.

Regarding the gray bat, the USFWS recommends that the project area be surveyed for caves, rock shelters, and underground mines that may provide habitat. Sediment best management practices

(BMPs) should be utilized and maintained to avoid impacts to streams which provide potential gray bat foraging habitat. Regarding the Indiana bat, the USFWS states that the project is within an area designated as “potential habitat” for the Indiana bat; therefore, wooded areas and caves within the study area may provide suitable habitat. KYTC should refer to the 2012 Programmatic Consultation Agreement for recommendations regarding impacts to the Indiana bat.

Regarding the identified mussel species, the USFWS states that the potential of the proposed project to impact federally-listed mussels, either directly or indirectly as a result of siltation/sedimentation and contamination, should be addressed when evaluating the proposed project.

2.2 Kentucky Department of Fish and Wildlife Resources

A consultation letter was sent to the KDFWR office in Frankfort, Kentucky, on August 6, 2013, requesting information regarding protected species, their critical habitat, or protected natural areas in the study area. In a reply dated August 28, 2013, the KDFWR stated that no federally-listed species, state-listed species, critical habitat, or protected natural areas are known to occur within the study area, and the project does not occur within known Indiana bat habitat. KDFWR also stated that erosion control measures will need to be installed prior to project commencement and maintained throughout the life of the project.

2.3 Kentucky State Nature Preserves Commission

A consultation letter and data request were sent to the KSNPC on August 6, 2013, requesting information regarding any documented occurrences of protected plant or animal species, or exemplary natural communities, within or in the vicinity of the study area. In a reply dated August 8, 2013, the KSNPC identified two records within one mile of the study area, one record for federally listed species within five miles of the study area, five records for aquatic species within five miles of the study area, and 13 records for mammals and birds within ten miles of the study area.

The KSNPC letter specifically identifies the smallscale darter (*Etheostoma microlepidum*) as occurring within one mile of the study area, and the gray bat (*Myotis grisescens*), Indiana bat (*Myotis sodalis*), and southeastern myotis (*Myotis austroriparius*) as having hibernacula and other records within ten miles of the study area. KSNPC also notes that the project is located within a karst landscape with numerous sinkholes, caves, and underground conduits, which are sensitive to groundwater contamination from pollutants or construction disturbance. Caves often contain sensitive ecosystems and rare or protected species that are heavily dependent on water quality.

KSNPC has also designated the Little River macrosite as having very high site significance for rare and protected species, and promotes the protection of this area.

KSNPC states that the project is located within an area of Kentucky designated as habitat for the copperbelly water snake (*Nerodia erythrogaster neglecta*), which is protected under the Copperbelly Water Snake Conservation Agreement. Land designated as habitat under the agreement is subject to certain conditions for land use approvals, which are overseen by the KDFWR and USFWS. Table 1 summarizes the records in the vicinity of the study area (those within a five-mile radius or specifically mentioned in the KSNPC letter).

2.4 Kentucky Division of Water

A consultation letter was sent to the KDOW, Water Quality Branch, on August 6, 2013, requesting information regarding significant aquatic resources occurring in the study area. A reply letter from the KDOW, dated August 9, 2013, stated that there are no Special Use Waters, which include Cold Water Aquatic Habitat, Exceptional Waters, Reference Reach Waters, Outstanding State Resource Waters, Outstanding National Resource Waters, State Wild Rivers, and Federal Wild and Scenic Rivers within the study area.

The study area contains several unnamed tributaries of the Little River. The Little River segment adjacent to, and immediately downstream, of the study area is listed as impaired for Warm Water Aquatic Habitat, and the identified pollutants of the river segment are: nutrients/biological indicators, organic enrichment (sewage) biological indicators, and sedimentation/siltation. The KDOW requests use of appropriate BMPs throughout construction and until the construction area is re-vegetated.

A consultation letter was also sent to the KDOW, Water Quality Branch – Ecological Support Section, on August 6, 2013, requesting information regarding water quality studies that have been performed within the study area. No reply has been received as of the completion of this report.

2.5 Kentucky Division of Forestry

A consultation letter was sent to the KDOF office in Madisonville, Kentucky on August 6, 2013, requesting information regarding occurrences of significant forestry resources and State Champion Trees in the study area. Mr. Kayo Maddox replied by telephone on August 22, 2013, stating that he had reviewed the project during a field visit. He did not observe, and does not know of, any significant forest resources within the study area. Wooded areas within the study area are limited to

two wooded drains, several wooded areas around sinkholes, and several landscape trees. KDOF does not foresee any significant issues concerning forest lands from the project.

2.6 Kentucky Geological Survey

Due to liability, the KGS cannot perform interpretive analyses of specific projects. The KGS has published the pertinent geologic and groundwater information to a variety of websites. These websites were reviewed by Redwing for information regarding groundwater and geologically significant areas, such as karst features or springs, within the study area.

Based on the records review, the study area is located within an area of very high karst potential (Figure 2, KGS, 2013a). Several sinkholes are scattered across the study area, with a large band of sinkholes across the southern portion of the study area.

The Kentucky Geologic Map Information Service (KGS, 2013a) identified one spring (“Interstate Spring”) just outside the study boundary around the confluence of Ephemeral Stream 1 and the Little River (Figure 2). Two domestic wells are mapped within the study area, including one located in Beverly just north of I-24 between KY 107 and Old Palmyra Road, and a second located within a crop field approximately 0.5 mile west of the intersection of KY 107 and Old Palmyra Road.

2.7 Natural Resources Conservation Service

A consultation letter was sent to the NRCS office in Hopkinsville, Kentucky, on August 6, 2013, requesting information regarding prior converted or farmed wetlands, or notable soils in the study area. In a letter dated August 13, 2013, the NRCS stated that there are no hydric soils, prior converted (PC) wetlands, or farmed wetlands (FW) within the study area. Of the land within the study area, approximately 81% is prime farmland, 18% is farmland of state importance, and 1% has no farmland designation. The prime farmland is generally located on flat land, and includes Elk silt loam 0-2% slopes (EIA), Elk silt loam 2-6% slopes (EIB), Lindside silt loam (Ln), Nolin silt loam (No), and Pembroke silt loam 2-6% slopes (PmB). The farmland of state importance lies on hillsides or within gentle valleys, and includes Hammack-Baxter complex 6-12% slopes (HbC), Nicholson silt loam 2-6% slopes (NhB), Pembroke silt loam 6-12% slopes (PmC), and Vertrees silty clay loam 6-12% slopes (VeC). Both prime farmland and farmland of state importance fall under the Farmland Protection Policy Act (FPPA). Soils considered highly erodible include all of the soils listed above as farmland of state importance, as well as Baxter cherty silt loam 12-20% slopes (BaD). Soil maps are included in the NRCS response letter (Appendix).

3.0 ENVIRONMENTAL SETTING

The general environmental setting of the study area is presented below in terms of climate, physiography, topography, geology, soils, watersheds, land use, and floral community.

3.1 Climate

Christian County has a temperate climate, with a growing season of approximately 194 days (Christian County Government, 2009). The Kentucky Climate Center (KCC, 2013) gives the average daily temperature for January as 34°F and for July at 79 °F. The average annual precipitation for the county is approximately 51 inches per year.

3.2 Physiography

The study area is located in the southwestern portion of Kentucky, in southern Christian County. This area of the state lies within the Pennyrile or Mississippian Plateau Physiographic Region (KGS, 2013b), which consists of a limestone plain characterized by abundant sinkholes, sinking streams, streamless valleys, springs, and caves. The study area lies within the Highland Rim Subregion, which is characterized by slightly rolling to undulating land with several eroded stream courses (USDA, 1914).

3.3 Topography

The topography of the study area is generally flat to gently sloping, with gentle stream valleys and numerous sinkholes. In general, stream valleys are more prevalent in the northern and western sections, while sinkholes are more prevalent in the southern and eastern sections. The 7.5-minute USGS topographic maps for the Church Hill and Herndon quadrangles indicate that elevations within the study area range from 550 feet above mean sea level (msl) on hill tops, to 470 feet above msl adjacent to the Little River.

3.4 Geology

The study area is underlain entirely by St. Genevieve Limestone, which is of Upper Mississippian origin (KGS, 2013a). The study area is mapped as having very high karst potential and contains numerous sinkholes (Figure 2). One spring ("Interstate Spring") is mapped just outside the study boundary near the confluence of Ephemeral Stream 1 and the Little River.

3.5 Soils

The Soil Survey Geographic Database for Christian County (2012a) maps the study area as being underlain mainly by Elk, Lindside, Nolin, and Pembroke soils on the flat areas, and by Baxter, Hammack-Baxter, Nicholson, Pembroke, and Vertrees soils in the valleys and sinkholes (Figure 3). These soils are generally deep and well drained to moderately well drained (USDA 2013). None of these soils are listed on the County Hydric Soils List as hydric or having potential hydric inclusions (USDA 2012b). Prime farmland and farmland of state importance are abundant, and are further described in the NRCS correspondence (Section 2.7 and Appendix A).

3.6 Watershed

The project area is located within the Lower Cumberland (0513-0205) 8-digit hydrologic unit code (HUC) watershed, and within the Little River (0513-0205-200) 11-digit HUC watershed (Figure 4). Streams within the study area drain westward to the Little River, which then flows northwest into Lake Barkley and the Cumberland River.

Surface water within the study area is collected within surface streams in the northern and western portions of the study area, and flows westward to the Little River. In the southern and eastern sections of the study area, water primarily flows into sinkholes. The National Hydrography Database maps the sinkholes in the southern portion of the project area as flowing westward through an underground conduit to the Little River (Figure 4).

Floodplain information was obtained from the Federal Emergency Management Agency's (FEMA) DFIRM flood data. A small amount of the study area at the western edge along the Little River is located within the 100-year floodplain (Figure 5).

3.7 Land Use

The study area includes approximately 1,100 acres. According to the 2005 Kentucky Land Cover Database, the majority of the study area (approximately 74%) consists of cultivated cropland (Figure 6). Other land uses include developed land (which includes road right-of-way), forest/shrub land, pasture/hay fields, open waters, and wetlands. The land uses are summarized in the following table.

Land Use	Area (acres)	%
Cultivated Crops	794	74%
Developed Land	162	15%
Forest/Shrub	72	7%
Pasture/Hay	38	4%
Open Water/Wetland	0.67	<1%
Total	1,067	100%

3.8 Floral Community

The floral community of the study area is defined in *Deciduous Forests of Eastern North America* (Braun, 1950) as part of the Mississippian Plateau section of the Western Mesophytic Forest region. This region extends from the western escarpment of the Cumberland and Allegheny Plateaus in the east to the loess bluffs of the Mississippi River in the west. The region extends north from northern Alabama and Mississippi; to the southern boundary of the Wisconsin glaciation in Ohio and Indiana; and to the southern boundary of the Illinoian glaciation farther west. The Western Mesophytic Forest region is typically a mosaic pattern of climax vegetation types compared to the single climax types of the Mixed Mesophytic Forest region to the east.

The Mississippian Plateau section extends from southwestern Kentucky through central Tennessee, and into northern Alabama. The topography within the Mississippian Plateau varies, but in the northwestern section where the project lies, it is generally hilly with common karst features such as sinkholes. Common tree species include white oak (*Quercus alba*), chinkapin oak (*Q. muhlenbergii*), northern red oak (*Q. rubra*), black oak (*Q. velutina*), sugar maple (*Acer saccharum*), beech (*Fagus grandifolia*), white ash (*Fraxinus americana*), tulip-poplar (*Liriodendron tulipifera*), black gum (*Nyssa sylvatica*), shagbark hickory (*Carya ovata*), and bitternut hickory (*C. cordiformis*) (Braun, 1950). Development within the study area has drastically altered the natural floral community.

4.0 TERRESTRIAL AND AQUATIC ECOLOGY OVERVIEW METHODOLOGY

Terrestrial and aquatic features within the study area were identified and characterized based on in-house research and a field reconnaissance of the study area on August 14, 2013. Potential wetland locations were obtained using the National Wetlands Inventory (NWI) Map for Kentucky. Potential stream locations were identified from the USGS 7.5-minute topographic quadrangle maps and the USGS/U.S. Environmental Protection Agency (USEPA) 24K National Hydrography Dataset (NHD). The presence of wetlands and streams identified from in-house resources were confirmed in the

field where access was available. Other potential streams, wetlands, and ponds in the study area were identified during the field assessment. A formal delineation of jurisdictional waters/wetlands within the study area was not performed.

5.0 TERRESTRIAL AND AQUATIC ECOLOGY OVERVIEW RESULTS

The results of the ecological overview of the survey area are presented below in terms of natural habitats, waters and wetlands, outstanding resource waters, and federally-listed species.

5.1 Natural Habitats

The study area is dominated by open field habitats (95%), which include crop fields, rural/residential development, and road rights-of-way. Upland woods habitat is present in a few scattered woodlots, drainageways, sinkholes, and fencerows. The following table summarizes habitats within the study area. The location of the areas of upland woods habitat is presented on Figure 8.

Habitat	Area (acres)
Open Field	1,017
Upland Woods	50
Total	1,067

5.2 Waters and Wetlands

The USGS topographic map (Figure 1) and NHD map (Figure 4) depict two unnamed intermittent (dashed-blue-line) streams within the study area, and the Little River just west of the study area. The field assessment found that both streams within the study area appear to have only ephemeral flow because the channels were dry or pooled despite 2 to 3 inches of rain in the week prior to the field reconnaissance. These observations are consistent with reports from local residents, who stated that the stream north of I-24 (Ephemeral Stream 1) flows only during wet weather. It appears that most surface features within the study area lose some flow to underground conduits. Circumstantially, one landowner stated that in-stream flows of Ephemeral Stream 1 have declined in recent years since the completion of the Breathitt Parkway. The field assessment identified a total of four ephemeral streams totaling 11,310 linear feet (Figure 8). One stream (Ephemeral Stream 3) has been re-routed through a fencerow, and no longer follows its original path depicted on the USGS map. A summary of streams within the study area is provided in Table 1.

In-house review of available materials identified several small ponds scattered through the northern and central portions of the study area, and several sinkholes located mainly in the southern portion of the corridor. The NWI map for the area depicts one large forested wetland (Wetland 1) and several small wetlands scattered throughout the study area (Figure 7). The field assessment identified six potential wetlands, four ponds, and several sinkholes (Figure 8). Several areas that are mapped as wetlands on the NWI map for the area were investigated, but were not found to be wetlands during the reconnaissance. Several of the potential wetlands and ponds appear to lie in isolated low spots, or drain to sinkholes, and therefore appear to be isolated from jurisdictional waters. Wetland 1, Wetland 3, and Pond 4 appear to be jurisdictional because they have surface channels connecting them to downstream waters. A formal delineation was not performed for the study area, and the jurisdictional status of waters will be determined by the U.S. Army Corps of Engineers. Table 1 provides a summary of ponds and wetlands within the study area.

A spring ("Interstate Spring") is mapped just outside the study area, near the confluence of Ephemeral Stream 1 and the Little River. A seep was found at the base of the I-24 bridge on the northeast side of the crossing, which appears to be consistent with the identified location of the spring.

5.3 Outstanding State Resource Waters

Based on a review of the Kentucky Division of Water's - Special Use Waters website there are no Outstanding State Resource Waters, Exceptional Waters, Reference Reach Waters, or Wild Rivers within the study area (KDOW, 2013). This was confirmed through coordination with the KDOW (Appendix).

5.4 Federally-listed Species

The USFWS, KDFWR, and KSNPC list eight federally-listed species as potentially occurring in the vicinity of the project. These species are summarized below.

Species	Common Name	Status	Habitat Present?	Species Observed?
Mammals				
<i>Myotis grisescens</i>	Gray Bat	E	No	No
<i>Myotis sodalis</i>	Indiana Bat	E	Yes	No
<i>Myotis austroriparius</i>	Southeastern Myotis	SOMC	No	No
Fish				
<i>Etheostoma microlepidum</i>	Smallscale Darter	SOMC	No	No
Mussels				
<i>Cyprogenia stegaria</i>	Fanshell	E	No	No
<i>Lexingtonia dolabelloides</i>	Slabside Pearlymussel	PE	No	No
<i>Obovaria retusa</i>	Ring Pink	E	No	No
<i>Ptychobranchus subtentum</i>	Fluted Kidneyshell	PE	No	No

E = Federally Endangered Species; T = Federally Threatened Species;
 PE = Proposed Federally Endangered Species; SOMC = Species of Management Concern

Indiana Bat: Winter habitat for the Indiana bat, which includes caves and abandoned mines, was not observed within the study area. However, the area is known to have karst activity and numerous sinkholes, and winter habitat may be present. A more detailed survey for potential winter habitat should be conducted during later field assessments. Potential summer maternity/roosting habitat for this species includes snags or live trees with exfoliating bark or cavities. Approximately 83 acres of potential summer habitat was identified within the study area in upland woods habitat and in many landscape trees around homes and businesses (Figure 8). The study area is not located in the vicinity of a known maternity roost or hibernacula for this species, as designated by the USFWS (Figure 9). KYTC should refer to the 2012 Programmatic Consultation Agreement for recommendations regarding impacts to the Indiana bat.

Gray Bat and Southeastern Myotis: The gray bat and southeastern myotis require caves or mines for winter hibernacula, and summer roost habitat such as caves, rock shelters, mine portals, highway overpasses, bridges, and/or hollow trees. Roost habitat for these species was not observed within the study area; however, a more detailed survey should be conducted during later field assessments to further assess karst features within the study area. Summer foraging habitat includes forested riparian corridors or areas over open bodies of water such as ponds, lakes, and rivers. It appears that the streams and wetlands within the study area do not have sufficient flow to provide potential summer foraging habitat for these species. Several ponds with wooded edges are located within the study area, but these appear too small and isolated from adjacent habitat to provide foraging habitat. Potential foraging habitat is present west of the study area along the Little River riparian corridor.

Smallscale Darter: The smallscale darter occurs in high-gradient creeks and small to medium-sized rivers. It may be found in clear, shallow gravel riffles of small rivers, or in deep, strongly flowing riffles with gravel, boulder, and coarse rubble substrates. The KSNPC identified a record for

the smallscale darter within one mile of the study area, in the Little River less than one mile downstream (southwest) of the I-24 bridge. Therefore, although the streams within the study area do not provide suitable habitat for the smallscale darter, it is likely present just outside and downstream of the study area. Activities that degrade water quality, such as construction disturbance, could impact the smallscale darter if proper controls are not utilized.

Mussels: The four federally-listed mussel species occur in habitats ranging from large creeks to large rivers. No streams within the study area provide potential habitat for these species; however, streams in the study area drain to the Little River, which represents potential habitat for these species. The ring pink and fanshell inhabit medium to large rivers, and slabside pearlymussel and fluted kidneyshell inhabit creeks to medium rivers (NatureServe 2013).

Other Species: A review of a standard occurrences report provided by the KSNPC indicated one record of federally-listed species within five miles of the study area, two records within one mile, six records of aquatic species within five miles, and 13 records of birds and mammals within 10 miles. Table 2 summarizes the occurrences identified by KSNPC (those within a five-mile radius and those specifically listed in the KSNPC letter) in the vicinity of the project.

No specific surveys for protected species have been performed at this time. More detailed surveys would need to be performed in order to determine potential impacts from this project to protected species.

6.0 SUMMARY

This report presents an overview of the ecological features identified within the study area for the KY 107 and I-24 Interchange Justification Study. Jurisdictional waters potentially occurring within the study area include four ephemeral streams, two potential wetlands, and one pond. The study area also contains four isolated potential wetlands and three isolated ponds. The study area has been identified as having very high karst potential, and it contains several sinkholes and has the potential to include caves. Potential habitat for federally-listed species within the proposed study area is limited to potential summer roosting/maternity habitat for the Indiana bat. Although no caves were observed in the study area, a more detailed assessment should be performed to ensure that winter habitat for the Indiana bat and roost habitat for the gray bat are not present. However, potential habitat for several additional rare species is present in the Little River corridor located just outside the study area. A more detailed survey would need to be completed once a formal design has been prepared in order to perform a comprehensive analysis of potential impacts to jurisdictional waters and/or threatened and endangered species.

7.0 REFERENCES

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TABLES

**Table 1: Water/Wetland Summary
 KY 107 and I-24 Interchange Justification Study
 Christian County, Kentucky
 KYTC Item No.: 2-8702.00**

Feature	Stream Length (ft)	Area (acres)	Status
Ephemeral Stream 1	8,760	0.80	Jurisdictional
Ephemeral Stream 2	480	0.02	Jurisdictional
Ephemeral Stream 3	1,590	0.07	Jurisdictional
Ephemeral Stream 4	480	0.02	Jurisdictional
Ephemeral Stream Total	11,310	0.91	
Potential Wetland 1	---	6.32	Jurisdictional
Potential Wetland 2	---	0.06	Isolated
Potential Wetland 3	---	1.09	Jurisdictional
Potential Wetland 4	---	0.40	Isolated
Potential Wetland 5	---	1.94	Isolated
Potential Wetland 6	---	0.22	Isolated
Wetland Total	---	10.03	
Pond 1	---	0.54	Isolated
Pond 2	---	0.09	Isolated
Pond 3	---	0.01	Isolated
Pond 4	---	0.34	Jurisdictional
Pond Total	---	0.98	
Jurisdictional Features Total	11,310	11.92	

Note:

Features based on in-house research and a field reconnaissance on August 14, 2013.

**Table 2: Rare Species Occurrence Summary - KSNPC
 KY 107 and I-24 Interchange Justification Study
 Christian County, Kentucky
 KYTC Item No.: 2-8702.00**

	Scientific Name	Common Name	Federal Rank	State Rank	Habitat Present
WITHIN ONE MILE RADIUS	Birds				
	<i>Anas discors</i>	Blue-Winged Teal	N	T	Y
	Fish				
	<i>Etheostoma microlepidum</i>	Smallscale Darter	SOMC	E	N
WITHIN FIVE MILE RADIUS	Birds				
	<i>Anas clypeata</i>	Northern Shoveler	N	E	Y
	<i>Podilymbus podiceps</i>	Pied-Billed Grebe	N	E	Y
	Mussels				
	<i>Villosa vanuxemensis</i>	Mountain Creekshell	N	T	N
	Crustaceans				
	<i>Cambarus friaufi</i>	Hairy Crayfish	N	S	N
	Mammals				
<i>Myotis grisescens</i>	Gray Myotis	E	T	N	
WITHIN TEN MILE RADIUS	Mammals				
	<i>Myotis sodalis</i>	Indiana Bat	E	E	Y
	<i>Myotis austroriparius</i>	Southeastern Myotis	SOMC	E	N
WITHIN DESIGNATED HABITAT AREA	Reptiles				
	<i>Nerodia erythrogaster neglecta</i>	Copperbelly Water Snake	E	E	Y

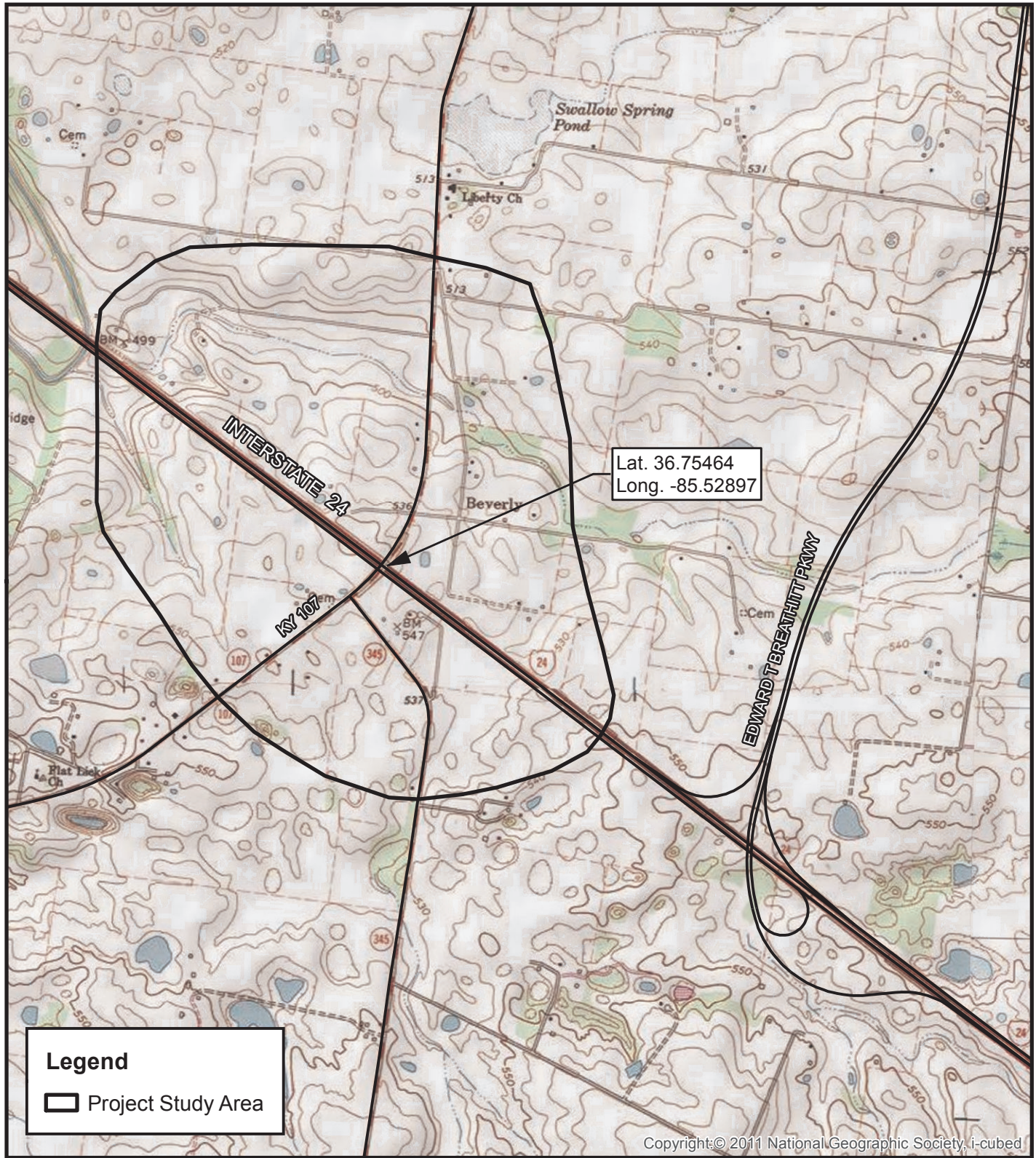
Notes:

Occurrences based on information provided by the KSNPC for one-mile and five-mile radii, and consultation letter (Appendix)

Federal Rank - SOMC (species of management concern), C (candidate), T (threatened), E (endangered), N (not listed)

State Rank - S (special concern), T (threatened), E (endangered)

FIGURES



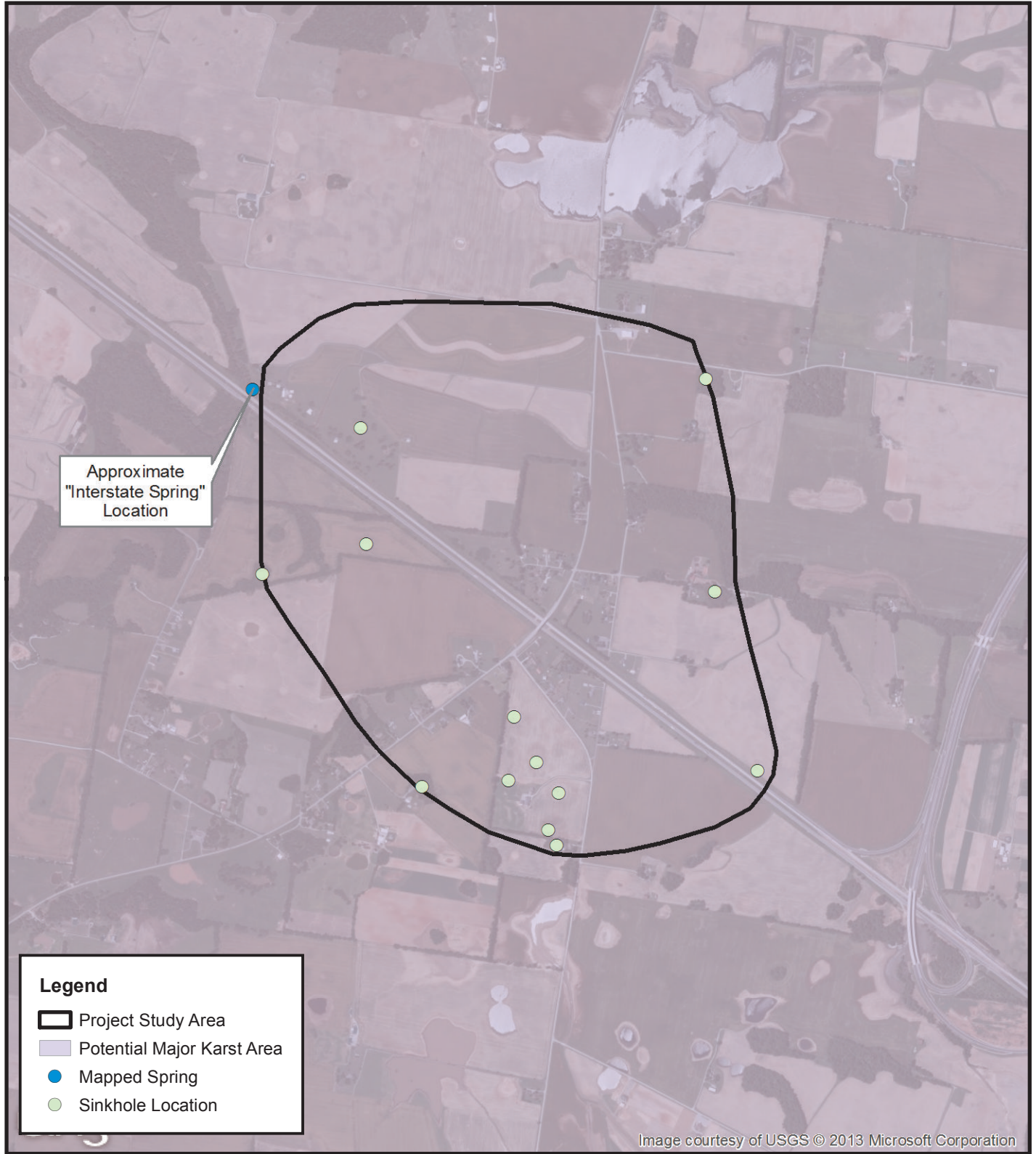
KY 107 AND I-24 INTERCHANGE
JUSTIFICATION STUDY
CHRISTIAN COUNTY, KENTUCKY
KYTC ITEM NO. 2-8702.00



KENTUCKY
TRANSPORTATION
CABINET



SITE LOCATION MAP



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Legend

- Project Study Area
- Potential Major Karst Area
- Mapped Spring
- Sinkhole Location

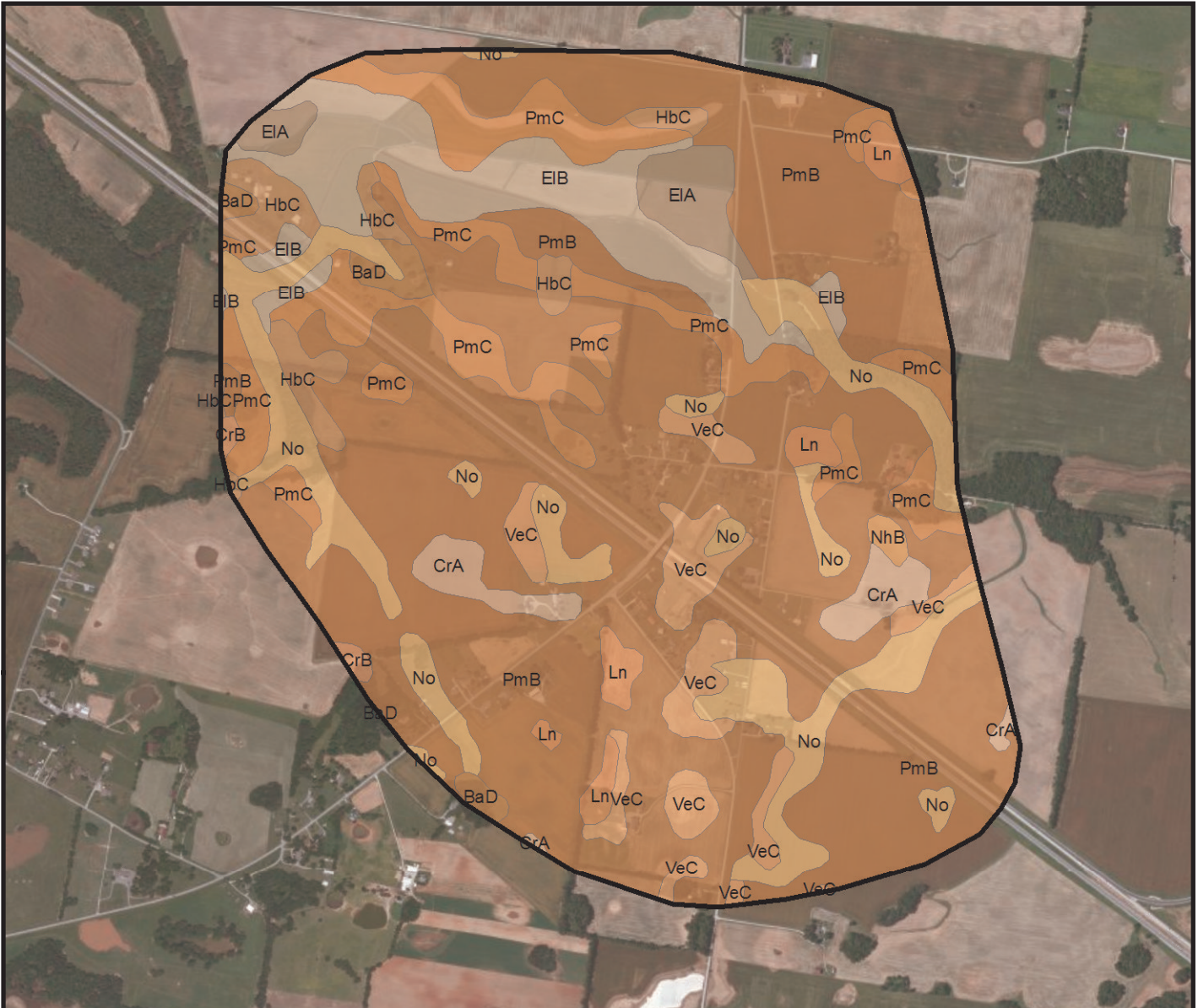
KY 107 AND I-24 INTERCHANGE
JUSTIFICATION STUDY
CHRISTIAN COUNTY, KENTUCKY
KYTC ITEM NO. 2-8702.00



MAJOR KARST
POTENTIAL MAP

REVISED DATE: 08-30-13 | DRAWN BY: LAD/EDB

FIGURE 2



Legend

- | | |
|--|--|
| Project Study Area | Ln - Lindside silt loam |
| BaD - Baxter cherty silt loam, 12 to 20 percent slopes | NhB - Nicholson silt loam, 2 to 6 percent slopes |
| CrA - Crider silt loam, 0 to 2 percent slopes | No - Nolin silt loam |
| CrB - Crider silt loam, 2 to 6 percent slopes | PmB - Pembroke silt loam, 2 to 6 percent slopes |
| EIA - Elk silt loam, 0 to 2 percent slopes | PmC - Pembroke silt loam, 6 to 12 percent slopes |
| EIB - Elk silt loam, 2 to 6 percent slopes | VeC - Vertrees silty clay loam, 6 to 12 percent slopes |
| HbC - Hammack-Baxter complex, 6 to 12 percent slopes | |

Image courtesy of USGS © 2013 Microsoft Corporation



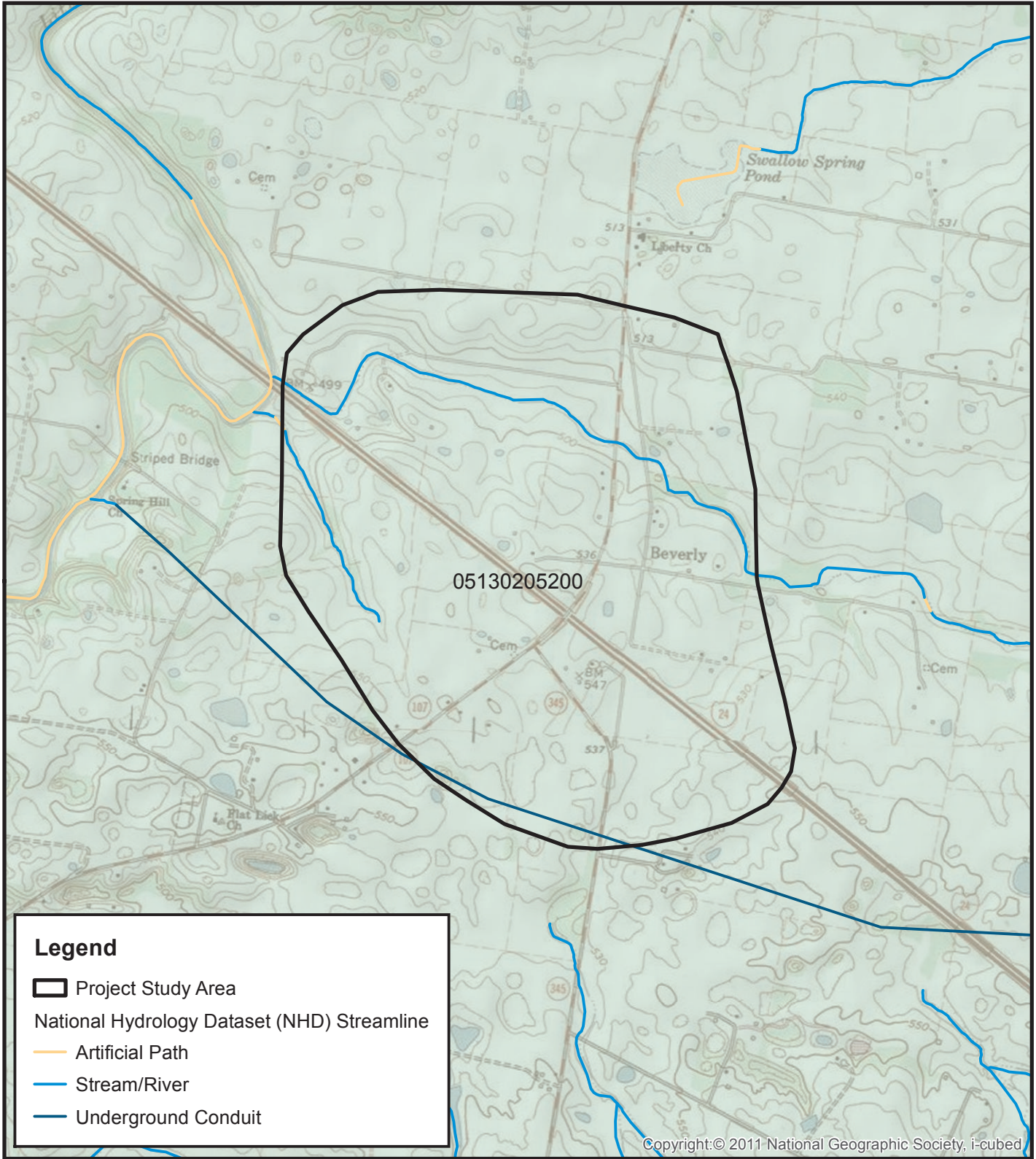
KY 107 AND I-24 INTERCHANGE
JUSTIFICATION STUDY
CHRISTIAN COUNTY, KENTUCKY
KYTC ITEM NO. 2-8702.00



KENTUCKY
TRANSPORTATION
CABINET







SOIL SURVEY MAP



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Legend

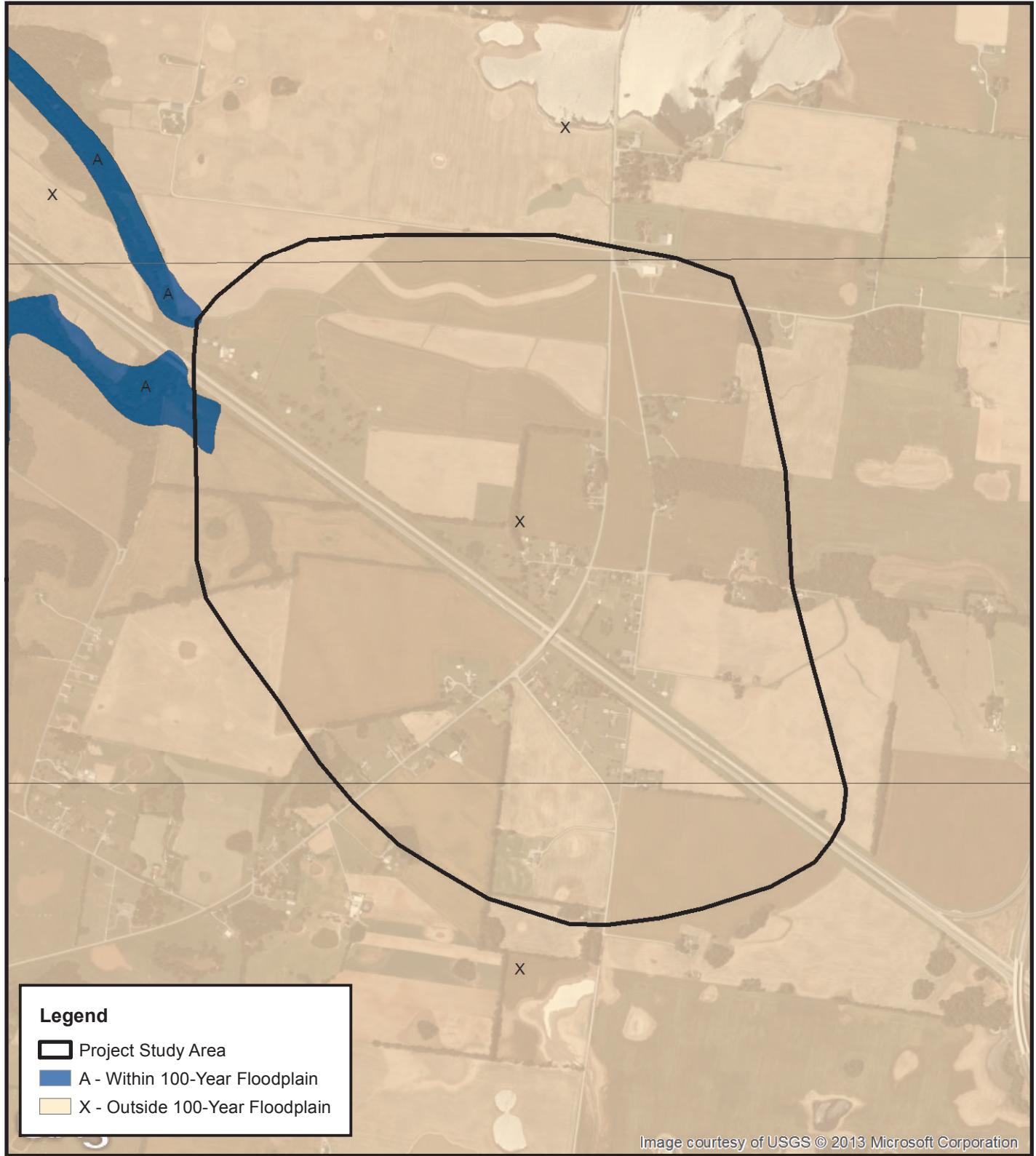
-  Project Study Area
- National Hydrology Dataset (NHD) Streamline
-  Artificial Path
-  Stream/River
-  Underground Conduit



KY 107 AND I-24 INTERCHANGE
JUSTIFICATION STUDY
CHRISTIAN COUNTY, KENTUCKY
KYTC ITEM NO. 2-8702.00



11-DIGIT WATERSHED
AND NHD STREAM MAP



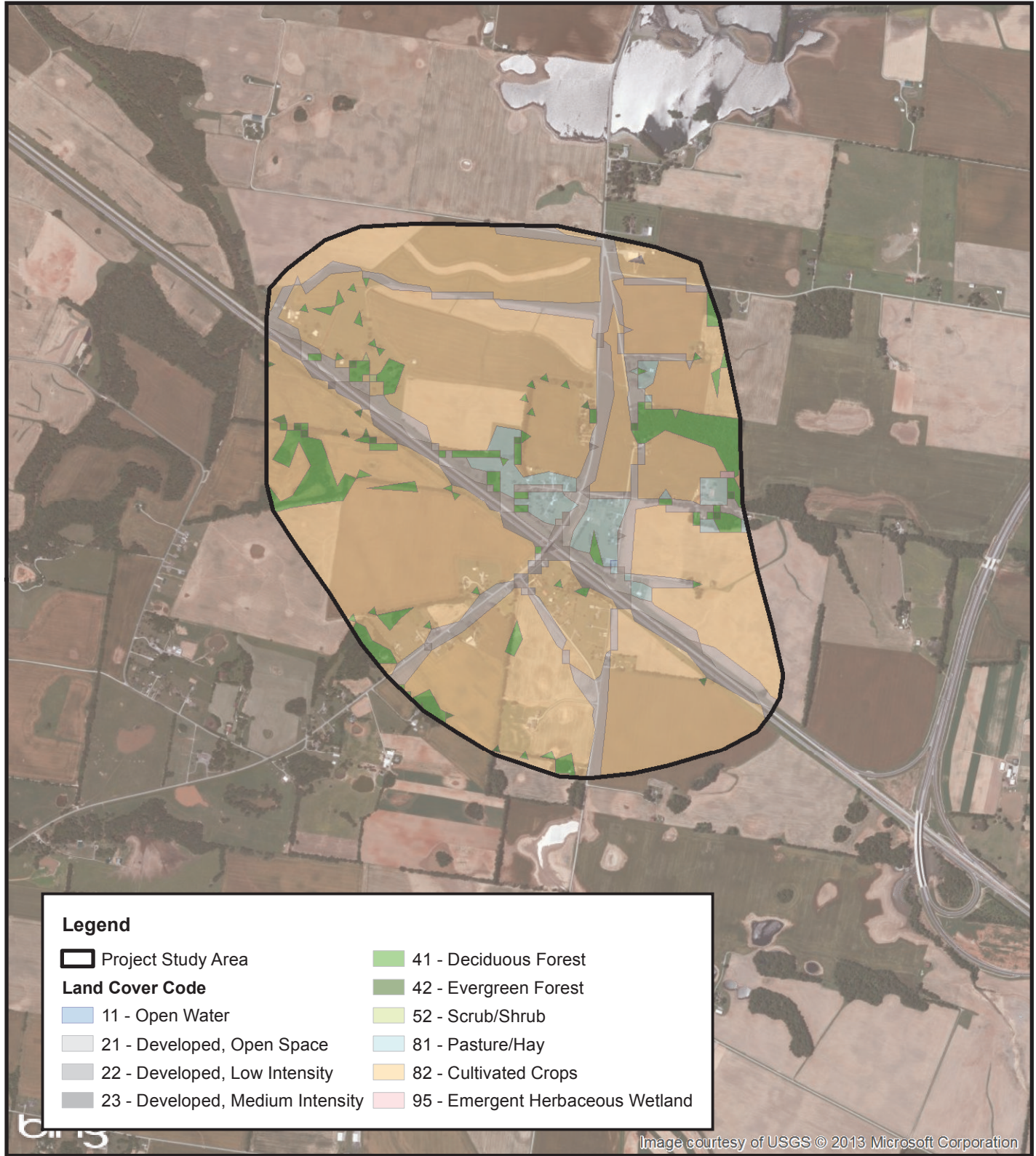
0 2,000 4,000 6,000 8,000 Feet



KY 107 AND I-24 INTERCHANGE
JUSTIFICATION STUDY
CHRISTIAN COUNTY, KENTUCKY
KYTC ITEM NO. 2-8702.00



FEMA FLOODPLAIN MAP



Legend

Project Study Area

Land Cover Code

11 - Open Water

21 - Developed, Open Space

22 - Developed, Low Intensity

23 - Developed, Medium Intensity

41 - Deciduous Forest

42 - Evergreen Forest

52 - Scrub/Shrub

81 - Pasture/Hay

82 - Cultivated Crops

95 - Emergent Herbaceous Wetland

Image courtesy of USGS © 2013 Microsoft Corporation



KY 107 AND I-24 INTERCHANGE
JUSTIFICATION STUDY
CHRISTIAN COUNTY, KENTUCKY
KYTC ITEM NO. 2-8702.00

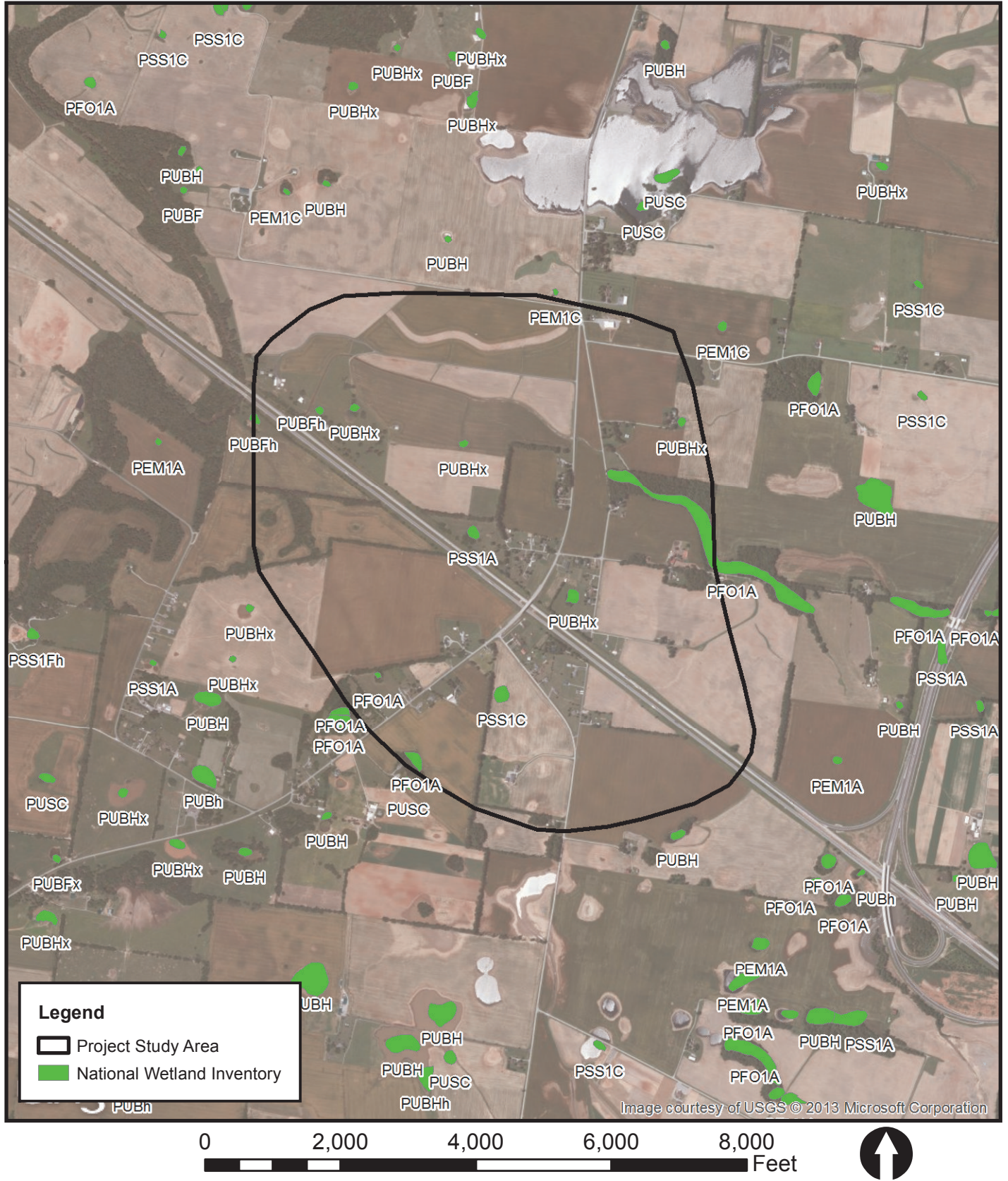


KENTUCKY
TRANSPORTATION
CABINET



REDWING
ECOLOGICAL SERVICES, INC.

LAND USE MAP



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KY 107 AND I-24 INTERCHANGE
JUSTIFICATION STUDY
CHRISTIAN COUNTY, KENTUCKY
KYTC ITEM NO. 2-8702.00



KENTUCKY
TRANSPORTATION
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NATIONAL WETLANDS
INVENTORY MAP

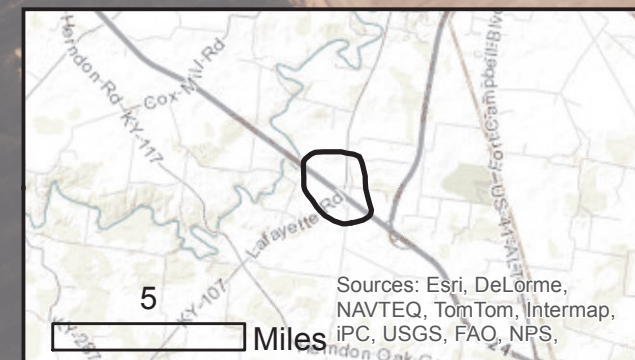
REVISED DATE: 08-30-13

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FIGURE 7

Legend

-  Project Study Area
-  Indiana Bat Habitat
-  Upland Woods Habitat
-  Ephemeral Stream
-  Isolated Pond
-  Jurisdictional Pond
-  Potential Isolated Wetland
-  Potential Jurisdictional Wetland
-  Sinkhole Location



MATCHLINE SHEET 1
MATCHLINE SHEET 2



KY 107 AND I-24 INTERCHANGE
JUSTIFICATION STUDY
CHRISTIAN COUNTY, KENTUCKY
KYTC ITEM NO. 2-8702.00

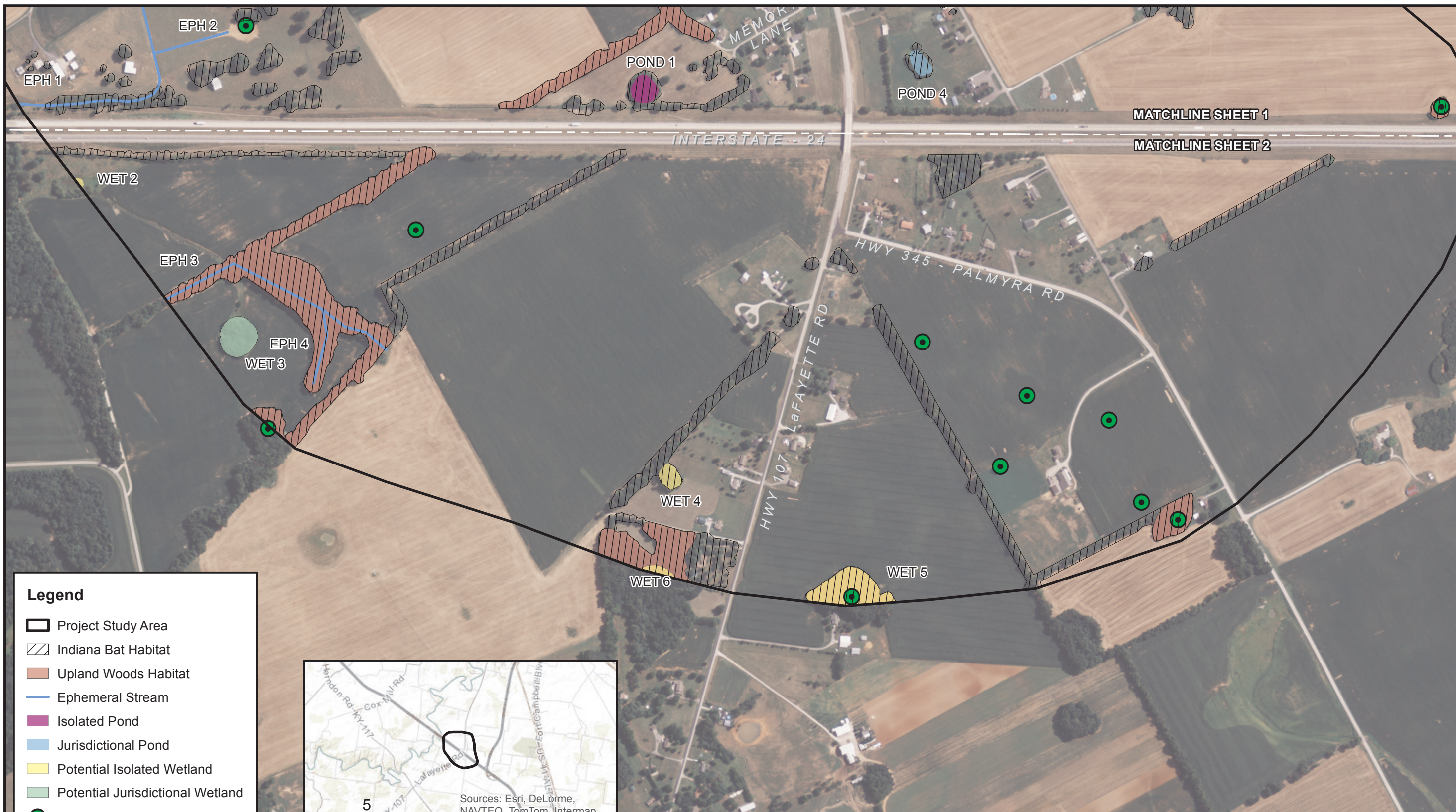
REVISED DATE: 08-30-13 DRAWN BY: EDB



ECOLOGICAL FEATURES
MAP

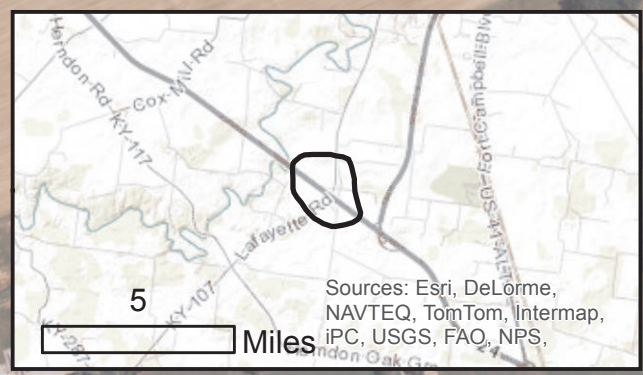
FIGURE 8
SHEET 1 of 2

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Legend

- Project Study Area
- Indiana Bat Habitat
- Upland Woods Habitat
- Ephemeral Stream
- Isolated Pond
- Jurisdictional Pond
- Potential Isolated Wetland
- Potential Jurisdictional Wetland
- Sinkhole Location



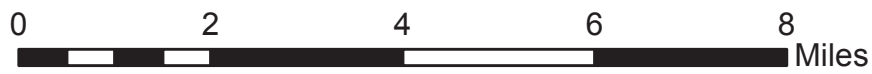
KY 107 AND I-24 INTERCHANGE
JUSTIFICATION STUDY
CHRISTIAN COUNTY, KENTUCKY
KYTC ITEM NO. 2-8702.00

REVISED DATE: 08-30-13 DRAWN BY: EDB



ECOLOGICAL FEATURES
MAP

FIGURE 8
SHEET 2 of 2



KY 107 AND I-24 INTERCHANGE
JUSTIFICATION STUDY
CHRISTIAN COUNTY, KENTUCKY
KYTC ITEM NO. 2-8702.00



KENTUCKY
TRANSPORTATION
CABINET



REDWING
ECOLOGICAL SERVICES, INC.

KNOWN INDIANA BAT
HABITAT MAP

PHOTOGRAPHS



Photograph 1: View of typical agricultural land in the northwest portion of the study area. This area is characterized by minimal surface channels with assumed underground flow. August 14, 2013.



Photograph 2: View of typical agricultural land in the eastern portion of the study area. This area is characterized by sinkhole terrain with few to no surface channels. The small clump of trees in the field likely contains a sinkhole. August 14, 2013.



Photograph 3: View of typical upland woods habitat in the northeastern portion of the study area. Most upland woods habitat within the study area consists of small woodlots, drainageways, or sinkholes, and fencerows. August 14, 2013.



Photograph 4: View of Ephemeral Stream 1, facing downstream (west) from Old Palmyra Road. The stream was dry or pooled despite two to three inches of rain in the previous week. August 14, 2013.



Photograph 5: View of Ephemeral Stream 1, facing upstream (east) from near the western edge of the study area. The stream was dry during the field survey. A spring, "Interstate Spring", is mapped as occurring in this area. August 14, 2013.



Photograph 6: View of Ephemeral Stream 3, facing upstream (east) just outside the corridor near G. E. Hill Lane. It appears that the stream was re-routed through a fencerow, so it no longer flows as depicted on the USGS map. August 14, 2013.



Photograph 7: View of the Little River, facing upstream (northwest) from near the Interstate 24 bridge. The Little River is located just outside the study area on its western side. August 14, 2013.



Photograph 8: View of Potential Wetland 2, located in a breached pond basin in the southwestern portion of the study area. August 14, 2013.



Photograph 9: View of Pond 3, located just north of Memory Lane in the northeastern portion of the study area. It appears that the pond overflows across the road after heavy rains, and flows into a sinkhole. August 14, 2013.



Photograph 10: View of Potential Wetland 1, which is mapped as a Palustrine Forested wetland on the National Wetlands Inventory map. This potential wetland is located adjacent to Ephemeral Stream 1. August 14, 2013.



Photograph 11: View of Pond 4, located between KY 107 and Old Palmyra Road just north of Interstate 24. This pond lies in a topographical depression, and is surrounded by trees and brush. August 14, 2013.



Photograph 12 View of Interstate 24 at the proposed new interchange, looking west from the KY 107 overpass. August 14, 2013.

APPENDIX

AGENCY CORRESPONDENCE



August 6, 2013

Mr. Phil DeGarmo
U.S. Fish and Wildlife Service
JC Watts Federal Building, Room 265
330 West Broadway
Frankfort, Kentucky 40601

Subject: **Request for Information
KY 107 and I-24 Interchange Justification Study
Christian County, Kentucky
KYTC Item No.: 2-8702.00
Redwing Project No.: 13-056**

Dear Mr. DeGarmo:

Redwing Ecological Services, Inc., on behalf of the Kentucky Transportation Cabinet, respectfully requests information regarding federally-listed species and their critical habitat, including caves and portals, and protected natural areas located within the study area for the KY 107 and I-24 Interchange Justification Study in Christian County, Kentucky. The proposed project is located on the Church Hill and Herndon USGS topographic quadrangle maps (Figure 1).

The study is being performed to assess the potential construction of an interchange between Kentucky Highway 107 (KY 107) and Interstate 24 (I-24). The study area includes approximately 1,100 acres centered around the current KY 107 overpass of I-24, which is located approximately 1.2 miles northwest of the southern terminus of the Edward T. Breathitt Parkway. The study area is dominated by agricultural land, with some residential development and a small amount of woodland.

Any specific comments or concerns that you may have about this project would be appreciated. If you have any questions or need additional information, please feel free to contact Laura Darnell or Richard Clausen at (502) 625-3009. Thank you very much for your assistance.

Sincerely,

Laura A. Darnell
Project Biologist

Richard S. Clausen
Principal
Senior Ecologist

Attachment: Figure 1 – Site Location Map



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Kentucky Ecological Services Field Office
330 West Broadway, Suite 265
Frankfort, Kentucky 40601
(502) 695-0468

August 14, 2013

Ms. Laura A. Darnell
Mr. Richard S. Clausen
Redwing Ecological Services, Inc.
1139 South Fourth Street
Louisville, KY 40203

Re: FWS 2013-B-0662; Redwing Project No.: 13-056; KYTC Item No.: 2-8702.00; KY 107 and I-24 Interchange Justification Study; located in Christian County, Kentucky

Dear Ms. Darnell and Mr. Clausen:

Thank you for the opportunity to provide comments on the above-referenced project. The U.S. Fish and Wildlife Service (Service) has reviewed this proposed project and offers the following comments in accordance with the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*). This is not a concurrence letter. Please read carefully, as further consultation with the Service may be required.

In accordance to section 7 of the ESA, the Service must also consider the effects of actions interrelated and interdependent to the proposed project. "Interrelated actions" are those that are caused by the proposed action and are later in time, but still are reasonable certain to occur and "interdependent actions" are those that have no independent utility apart from the action under consideration. Please inform us of any future actions and/or projects (*i.e.*; subdivisions, commercial development) that would reasonably occur as a result of the proposed project so that we may adequately analyze those effects.

In order to assist you in determining if the proposed project has the potential to impact protected species we have searched our records for occurrences of listed species within the vicinity of the proposed project. Based upon the information provided to us and according to our databases, we believe that the following federally listed species have the potential to occur within the project vicinity. The listed species are:

Group	Species	Common name	Legal* Status
Mammals	<i>Myotis grisescens</i>	gray bat	E
	<i>Myotis sodalis</i>	Indiana bat	E
Mussels	<i>Cyprogenia stegaria</i>	fanshell	E
	<i>Lexingtonia dolabelloides</i>	slabside pearlymussel	P
	<i>Obovaria retusa</i>	ring pink	E
	<i>Ptychobranhus subtentum</i>	fluted kidneyshell	P

* Key to notations: E = Endangered, T = Threatened, C = Candidate, P = Proposed, CH = Critical Habitat

We must advise you that collection records available to the Service may not be all-inclusive. Our database is a compilation of collection records made available by various individuals and resource agencies. This information is seldom based on comprehensive surveys of all potential habitats and thus does not necessarily provide conclusive evidence that protected species are present or absent at a specific locality.

Gray bat

Gray bats roost, breed, rear young, and hibernate in caves year round. They migrate between summer and winter caves and will use transient or stopover caves along the way. Gray bats eat a variety of flying aquatic and terrestrial insects present along streams, rivers, and lakes. Low-flow streams produce an abundance of insects and are especially valuable to the gray bat as foraging habitat. For hibernation, the roost site must have an average temperature of 42 to 52 degrees F. Most of the caves used by gray bats for hibernation have deep vertical passages with large rooms that function as cold air traps. Summer caves must be warm, between 57 and 77 degrees F, or have small rooms or domes that can trap the body heat of roosting bats. Summer caves are normally located close to rivers or lakes where the bats feed. Gray bats have been known to fly as far as 12 miles from their colony to feed.

Because we have concerns relating to the gray bat on this project, we have the following recommendations:

- The proposed project area is located in a region identified by the Kentucky Geological Survey's 2002 *Karst Occurrence in Kentucky* map as an area "underlain by bedrock with high potential for karst development." Karst features, rock shelters, and abandoned underground mines could provide winter/summer habitat for gray bats. Therefore, we would recommend that the project proponent survey the action area of the proposed project area for caves, rock shelters, and underground mines, identify any such habitats that may exist on-site, and evaluate potential impacts to those sites pending an analysis of their suitability as gray bat habitat by this office.
- Sediment Best Management Practices (BMPs) should be utilized and maintained to minimize siltation of the streams located within and in the vicinity of the project area, as these streams represent potential foraging habitat for the gray bat.

Indiana bat

The proposed project site is located within habitat designated as "potential habitat" for the Indiana bat and we believe that: (1) forested areas in the vicinity of and on the project area may potentially provide suitable summer roosting and foraging habitat for the Indiana bat; and (2) caves, rockshelters, and abandoned underground mines in the vicinity of and on the project area may potentially provide suitable wintering habitat for the Indiana bat. Our belief that potentially suitable habitat may be present is based on the information provided in your correspondence, the fact that much of the project site and/or surrounding areas contain forested habitats that are within the natural range of this species, and our knowledge of the life history characteristics of the species.

The Indiana bat utilizes a wide array of forested habitats, including riparian forests, bottomlands, and uplands for both summer foraging and roosting habitat. Indiana bats typically roost under exfoliating bark, in cavities of dead and live trees, and in snags (*i.e.*, dead trees or dead portions of live trees). Trees in excess of 16 inches diameter at breast height (DBH) are considered optimal for maternity

colony roosts, but trees in excess of 9 inches DBH appear to provide suitable maternity roosting habitat. Male Indiana bats have been observed roosting in trees as small as 5 inches DBH.

Prior to hibernation, Indiana bats utilize the forest habitat around the hibernacula (*i.e.* cave) to feed and roost until temperatures drop to a point that forces them into hibernation. This "swarming" period is dependent upon weather conditions and lasts from about September 15 to about November 15. This is a critical time for Indiana bats, since they are acquiring additional fat reserves and mating prior to hibernation. Research has shown that bats exhibiting this "swarming" behavior will range up to five miles from chosen hibernacula during this time. For hibernation, the Indiana bat prefers limestone caves, sandstone rockshelters, and abandoned underground mines with stable temperatures of 39 to 46 degrees F and humidity above 74 percent but below saturation.

Because we have concerns relating to the Indiana bat on this project and due to the lack of occurrence information available on this species relative to the proposed project area, we have the following recommendations relative to Indiana bats:

- The proposed project area is located in a region identified by the Kentucky Geological Survey's 2002 *Karst Occurrence in Kentucky* map as an area "underlain by bedrock with high potential for karst development." Karst features and abandoned underground mines could provide additional winter habitat for Indiana bats. Therefore, we would recommend that the project proponent survey the action area of the proposed project area for caves and underground mines, identify any such habitats that may exist on-site, and evaluate potential impacts to those sites pending an analysis of their suitability as Indiana bat habitat by this office.
- KYTC should address the impacts to the Indiana bat through adherence to the September 6, 2012 Indiana bat Programmatic Agreement between KYTC, FHWA, and the Service.

Federally listed mussels

Freshwater mussels are one of the most imperiled groups of animals in North America. Reservoir construction, siltation, channelization, and water pollution are all factors that have contributed to the decline of our native mussel populations. The runoff from urban areas has degraded the quality of water and the substrate of many streams. As filter feeders, mussels are sensitive to contaminants and function as indicators of problems with water quality. Several species of federally listed mussels have the potential to exist in Christian County. The potential of the proposed project to impact federally listed mussel species, either directly or indirectly as a result of siltation/sedimentation and contamination, should be addressed when evaluating the proposed project.

Thank you again for your request. Your concern for the protection of endangered and threatened species is greatly appreciated. If you have any questions regarding the information that we have provided, please contact Jessi Miller at (502) 695-0468 extension 104.

Sincerely,



Virgil Lee Andrews, Jr.
Field Supervisor



August 6, 2013

Mr. Mike Hardin
Kentucky Dept. of Fish and Wildlife Resources
#1 Sportsman's Lane
Frankfort, Kentucky 40601

Subject: **Request for Information
KY 107 and I-24 Interchange Justification Study
Christian County, Kentucky
KYTC Item No.: 2-8702.00
Redwing Project No.: 13-056**

Dear Mr. Hardin:

Redwing Ecological Services, Inc., on behalf of the Kentucky Transportation Cabinet, respectfully requests information regarding federally-listed species, critical habitat, and protected natural areas located within the study area for the KY 107 and I-24 Interchange Justification Study in Christian County, Kentucky. The proposed project is located on the Church Hill and Herndon USGS topographic quadrangle maps (Figure 1).

The study is being performed to assess the potential construction of an interchange between Kentucky Highway 107 (KY 107) and Interstate 24 (I-24). The study area includes approximately 1,100 acres centered around the current KY 107 overpass of I-24, which is located approximately 1.2 miles northwest of the southern terminus of the Edward T. Breathitt Parkway. The study area is dominated by agricultural land, with some residential development and a small amount of woodland.

Any specific comments or concerns that you may have about this project would be appreciated. If you have any questions or need additional information, please feel free to contact Laura Darnell or Richard Clausen at (502) 625-3009. Thank you very much for your assistance.

Sincerely,

Laura A. Darnell
Project Biologist

Richard S. Clausen
Principal
Senior Ecologist

Attachment: Figure 1 – Site Location Map



**TOURISM, ARTS AND HERITAGE CABINET
KENTUCKY DEPARTMENT OF FISH & WILDLIFE RESOURCES**

Steven L. Beshear
Governor

#1 Sportsman's Lane
Frankfort, Kentucky 40601
Phone (502) 564-3400
1-800-858-1549
Fax (502) 564-0506
fw.ky.gov

Bob Stewart
Secretary

Dr. Jonathan W. Gasset
Commissioner

28 August 2013

Redwing Ecological Services, Inc.
Attn: Laura A. Darnell
1139 South Fourth Street
Louisville, KY 40203

RE: Request for Information
KY 107 and I-24 Interchange Justification Study
Christian County, Kentucky
KYTC Item No.: 2-8702.00
Redwing Project No.: 13-056

Dear Ms. Darnell:

The Kentucky Department of Fish and Wildlife Resources (KDFWR) has received your request for information pertaining to the subject project. The Kentucky Fish and Wildlife Information System indicates that no federally – or state-listed species, critical habitat, or protected natural areas are known to occur within the Environmental Study Area outlined in the project proposal. This project does not occur within known Indiana bat habitat according to the U.S. Fish and Wildlife Service Kentucky Field Office. Please be aware that our database system is a dynamic one that only represents our current knowledge of various species distributions.

Erosion control measures, as mentioned in the proposal, will need to be installed prior to project commencement, and maintained throughout the life of the project. I hope this information is helpful to you, and if you have questions or require additional information, please call me at (502) 564-7109 extension 4453.

Sincerely,

A handwritten signature in blue ink that reads "Dan Stoelb".

Dan Stoelb
Wildlife Biologist

Cc: Environmental Section File

KSNPC Data Request

Your request has been submitted! Thank You!

Here is the information you sent.

Contact Information

Name: Laura Darnell
Company/Organization: Redwing Ecological Services, Inc.
Email: ldarnell@redwingeco.com
Phone Number: 502-625-3009
Address: 1139 South Fourth Street, Louisville, KY,40203

Project Information

Project Title: KY 107 and I-24 Interchange Justification Study
Project Description: The proposed project has been requested to study the potential construction of an interchange between Kentucky Highway 107 (KY 107) and Interstate 24 (I-24). The project area includes approximately 1,100 acres centered around the current KY 107 overpass of I-24, which is located approximately 1.2 miles northwest of the southern terminus of the Edward T. Breathitt Parkway.
Search Area: Will send shapefile

Services Requested and Desired Format

You have stated that you need the report (No Date Given).
You have requested One-Week Service(minimum fee \$112.50) .
You have selected Email, as a mode of delivery.
You have selected Word, Excel as your desired report format.

We will contact you to confirm that we have received your request using the phone or email listed above.

If the information is incorrect, or if you have not heard from us within 24 hours of submission, please contact KSNPC at (502) 573-2886

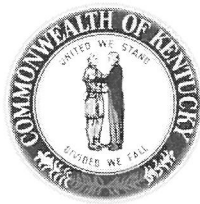
To enter another request [Click Here](#)

Kentucky State Nature Preserves Commission

801 Schenkel Lane
Frankfort, KY 40601
Phone: (502) 573-2886
Fax: (502) 573-2355
Feedback: [Email](#)

[Privacy](#) | [Disclaimer](#) | [Individuals with Disabilities](#) | [Resources](#)

Steven L. Beshear
Governor



Leonard K. Peters
Secretary
Energy and Environment Cabinet

Commonwealth of Kentucky
Kentucky State Nature Preserves Commission
801 Schenkel Lane
Frankfort, Kentucky 40601-1403
502-573-2886 Voice
502-573-2355 Fax

Donald S. Dott, Jr.
Director

August 8, 2013

Laura Darnell
Redwing Ecological Services, Inc.
1139 South Fourth Street
Louisville, KY 40203

Data Request 14-017

Dear Ms. Darnell:

This letter is in response to your data request of August 6, 2013 for the KY 107 and I-24 Interchange Justification Study Project (Christian County) project. We have reviewed our Natural Heritage Program Database to determine if any of the endangered, threatened, or special concern plants and animals or exemplary natural communities monitored by the Kentucky State Nature Preserves Commission occur near the project area on the Church Hill and Herndon USGS Quadrangles, as shown on the map provided. Please see the attached reports for more information, which reflect analysis of the project area with three buffers applied:

- 1-mile for all records – 2 records
- 5-mile for aquatic records – 6 records
- 5-mile for federally listed species – 1 record
- 10-mile for mammals and birds – 13 records

The site is located within a karst landscape characterized by numerous sinkholes, underground conduits, or caves. Construction disturbance or release of pollutants within the specified area could easily cause contamination of groundwater. Caves are often associated with sensitive ecosystems and may provide habitat for a number of rare or endangered species. Cave organisms are heavily dependent on water quality, and steps should be taken to avoid introducing contaminants into the water system.

You should be aware that Christian County lies within that portion of Kentucky designated as habitat for the Copperbelly water snake (*Nerodia erythrogaster neglecta*, KSNPC Special Concern). This region is subject to conditions outlined in the Copperbelly Water Snake Conservation Agreement and is being overseen in Kentucky by the Department of Fish and

Wildlife Resources in cooperation with the U.S. Fish and Wildlife Service. The project sponsor should contact Mr. Mike Hardin, Wildlife Division, KDFWR to coordinate measures that will assess potential impacts to the Copperbelly water snake and opportunities for mitigative measures to improve habitat for the snake.

Myotis austroriparius (Southeastern myotis, federal species of management concern, KSNPC endangered), *Myotis grisescens* (Gray myotis, federally listed endangered, KSNPC threatened), and *Myotis sodalis* (Indiana myotis, federally listed endangered, KSNPC endangered) are known to have hibernaculum and other types of records within ten miles of the proposed project. In order to avoid impacts to bats, bottomland forests and riparian corridors, particularly near caves, should not be disturbed.

Etheostoma microlepidum (Smallscale darter, KSNPC endangered, federal species of management concern) occurs within one mile of the project area. The Smallscale darter occurs in a very limited range, the lower Cumberland River drainage, in the Little River, and the Red River in western Kentucky. The only other state this fish occurs in is north central Tennessee.

Several other aquatic organisms are known from the Little River. To secure the continued availability of high-quality habitat for the rare aquatic species and bats, the Little River Macrosite has been designated as an area with a very high site significance in our program, to help provide a framework for the protection of this area.

I would like to take this opportunity to remind you of the terms of the data request license, which you agreed upon in order to submit your request. The license agreement states "Data and data products received from the Kentucky State Nature Preserves Commission, including any portion thereof, may not be reproduced in any form or by any means without the express written authorization of the Kentucky State Nature Preserves Commission." The exact location of plants, animals, and natural communities, if released by the Kentucky State Nature Preserves Commission, may not be released in any document or correspondence. These products are provided on a temporary basis for the express project (described above) of the requester, and may not be redistributed, resold or copied without the written permission of the Kentucky State Nature Preserves Commission's Data Manager (801 Schenkel Lane, Frankfort, KY, 40601. Phone: (502) 573-2886).

Please note that the quantity and quality of data collected by the Kentucky Natural Heritage Program are dependent on the research and observations of many individuals and organizations. In most cases, this information is not the result of comprehensive or site-specific field surveys; many natural areas in Kentucky have never been thoroughly surveyed, and new plants and animals are still being discovered. For these reasons, the Kentucky Natural Heritage Program cannot provide a definitive statement on the presence, absence, or condition of biological elements in any part of Kentucky. Heritage reports summarize the existing information known to the Kentucky Natural Heritage Program at the time of the request regarding the biological elements or locations in question. They should never be regarded as final statements on the elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments. We would greatly appreciate receiving any pertinent information obtained as a result of on-site surveys.

Data Request 14-017

August 8, 2013

Page 3

If you have any questions or if I can be of further assistance, please do not hesitate to contact me.

Sincerely,

Sara Hines
Data Manager

SLD/SGH

Enclosures: Data Report and Interpretation Key



August 6, 2013

Mr. Randall Payne
Kentucky Division of Water
Water Quality Branch
200 Fair Oaks Lane – 4th Floor
Frankfort, Kentucky 40601

Subject: **Request for Information
KY 107 and I-24 Interchange Justification Study
Christian County, Kentucky
KYTC Item No.: 2-8702.00
Redwing Project No.: 13-056**

Dear Mr. Payne:

Redwing Ecological Services, Inc., on behalf of the Kentucky Transportation Cabinet, respectfully requests information regarding significant aquatic resources, such as Wild and Scenic Rivers, special use waters, municipal water intakes, karst aquifers, toxic pollutants, and surface water quality information located within the study area for the KY 107 and I-24 Interchange Justification Study in Christian County, Kentucky. The proposed project is located on the Church Hill and Herndon USGS topographic quadrangle maps (Figure 1).

The study is being performed to assess the potential construction of an interchange between Kentucky Highway 107 (KY 107) and Interstate 24 (I-24). The study area includes approximately 1,100 acres centered around the current KY 107 overpass of I-24, which is located approximately 1.2 miles northwest of the southern terminus of the Edward T. Breathitt Parkway. The study area is dominated by agricultural land, with some residential development and a small amount of woodland.

Any specific comments or concerns that you may have about this project would be appreciated. If you have any questions or need additional information, please feel free to contact Laura Darnell or Richard Clausen at (502) 625-3009. Thank you very much for your assistance.

Sincerely,

Laura A. Darnell
Project Biologist

Richard S. Clausen
Principal
Senior Ecologist

Attachment: Figure 1 – Site Location Map



STEVEN L. BESHEAR
GOVERNOR

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER
200 FAIR OAKS LANE
FRANKFORT, KENTUCKY 40601
www.kentucky.gov

LEONARD K. PETERS
SECRETARY

August 9, 2013

Ms. Laura A. Darnell/Mr. Richard S. Clausen
Redwing Ecological Services, Inc.
1139 South Fourth Street
Louisville, Kentucky 40203

RE: Information Request on Significant Aquatic Resources
KY 107 and I-24 Interchange Justification Study
Christian County, Kentucky
KYTC Item No.: 2-8702.00
Redwing Project No.: 13-056

Dear Ms. Darnell/Mr. Clausen:

In reviewing the maps supplied with your letter on this subject dated August 6, 2013 there are no "Special Waters" located in the project area. The area of interest crosses several unnamed tributaries of Little River. The Little River segment within the study boundary and immediately downstream is listed as impaired for Warm Water Aquatic Habitat. The identified pollutants of that river segment are: Nutrients/Eutrophication Biological Indicators; Organic Enrichment (Sewage) Biological Indicators; and Sedimentation/Siltation; the remaining designated uses are not assessed for this segment. Those unnamed tributaries are not assessed; therefore, considered high quality waters by default.

The Division of Water requests the appropriate BMPs be installed and maintained until the construction is complete and the area is re-vegetated. The BMPs installed should impede stormwater runoff and contain strips to aid in absorption/adsorption of runoff that may escape the primary silt barriers; ongoing maintenance is required for project duration effectiveness.

If you have any further questions please contact me at (502) 564-3410. Thank you for the opportunity to comment on specific aquatic resources in this project area.

Sincerely,

Randall G. Payne
Environmental Scientist

RP: file



REDWING
ECOLOGICAL SERVICES, INC.

1139 South Fourth Street • Louisville, KY 40203 • Phone 502.625.3009 • Fax 502.625.3077

August 6, 2013

Mr. Mike Mills
Water Quality Branch – Ecological Support Section
Kentucky Division of Water
200 Fair Oaks Lane
Frankfort, Kentucky 40601

Subject: **Request for Information
KY 107 and I-24 Interchange Justification Study
Christian County, Kentucky
KYTC Item No.: 2-8702.00
Redwing Project No.: 13-056**

Dear Mr. Mills:

Redwing Ecological Services, Inc., on behalf of the Kentucky Transportation Cabinet, respectfully requests information regarding water quality studies, including fish and macroinvertebrate assessments, that have been performed within the study area for the KY 107 and I-24 Interchange Justification Study in Christian County, Kentucky. The proposed project is located on the Church Hill and Herndon USGS topographic quadrangle maps (Figure 1).

The study is being performed to assess the potential construction of an interchange between Kentucky Highway 107 (KY 107) and Interstate 24 (I-24). The study area includes approximately 1,100 acres centered around the current KY 107 overpass of I-24, which is located approximately 1.2 miles northwest of the southern terminus of the Edward T. Breathitt Parkway. The study area is dominated by agricultural land, with some residential development and a small amount of woodland.

Any specific comments or concerns that you may have about this project would be appreciated. If you have any questions or need additional information, please feel free to contact Laura Darnell or Richard Clausen at (502) 625-3009. Thank you very much for your assistance.

Sincerely,

Laura A. Darnell
Project Biologist

Richard S. Clausen
Principal
Senior Ecologist

Attachment: Figure 1 – Site Location Map



August 6, 2013

Mr. Kayo Maddox
Kentucky Division of Forestry – West Region
P.O. Box 465
Madisonville, Kentucky 42431

Subject: **Request for Information
KY 107 and I-24 Interchange Justification Study
Christian County, Kentucky
KYTC Item No.: 2-8702.00
Redwing Project No.: 13-056**

Dear Mr. Maddox:

Redwing Ecological Services, Inc., on behalf of the Kentucky Transportation Cabinet, respectfully requests information regarding significant forestry resources, including Champion trees and state forests, located within the study area for the KY 107 and I-24 Interchange Justification Study in Christian County, Kentucky. The proposed project is located on the Church Hill and Herndon USGS topographic quadrangle maps (Figure 1).

The study is being performed to assess the potential construction of an interchange between Kentucky Highway 107 (KY 107) and Interstate 24 (I-24). The study area includes approximately 1,100 acres centered around the current KY 107 overpass of I-24, which is located approximately 1.2 miles northwest of the southern terminus of the Edward T. Breathitt Parkway. The study area is dominated by agricultural land, with some residential development and a small amount of woodland.

Any specific comments or concerns that you may have about this project would be appreciated. If you have any questions or need additional information, please feel free to contact Laura Darnell or Richard Clausen at (502) 625-3009. Thank you very much for your assistance.

Sincerely,

Laura A. Darnell
Project Biologist

Richard S. Clausen
Principal
Senior Ecologist

Attachment: Figure 1 – Site Location Map



REDWING
ECOLOGICAL SERVICES, INC.

1139 South Fourth Street • Louisville, KY 40203 • Phone 502.625.3009 • Fax 502.625.3077

August 6, 2013

Mr. Joshua Richardson
Lead Soil Conservationist
Hopkinsville Service Center
3237 Eagle Way
Hopkinsville, Kentucky 42240-1361

Subject: **Request for Information**
 KY 107 and I-24 Interchange Justification Study
 Christian County, Kentucky
 KYTC Item No.: 2-8702.00
 Redwing Project No.: 13-056

Dear Mr. Richardson:

Redwing Ecological Services, Inc., on behalf of the Kentucky Transportation Cabinet, respectfully requests information regarding hydric soils, prior converted cropland, farmed wetlands, highly erodible soils, and prime farmland located within the study area for the KY 107 and I-24 Interchange Justification Study in Christian County, Kentucky. The proposed project is located on the Church Hill and Herndon USGS topographic quadrangle maps (Figure 1).

The study is being performed to assess the potential construction of an interchange between Kentucky Highway 107 (KY 107) and Interstate 24 (I-24). The study area includes approximately 1,100 acres centered around the current KY 107 overpass of I-24, which is located approximately 1.2 miles northwest of the southern terminus of the Edward T. Breathitt Parkway. The study area is dominated by agricultural land, with some residential development and a small amount of woodland.

Any specific comments or concerns that you may have about this project would be appreciated. If you have any questions or need additional information, please feel free to contact Laura Darnell or Richard Clausen at (502) 625-3009. Thank you very much for your assistance.

Sincerely,

Laura A. Darnell
Project Biologist

Richard S. Clausen
Principal
Senior Ecologist

Attachment: Figure 1 – Site Location Map



Natural Resources Conservation Service
Mayfield Service Center
1000 Commonwealth Drive
Mayfield, KY 42066

August 13, 2013

Laura Darnell & Richard Clausen
Redwing Ecological Services, Inc
1139 South Fourth Street
Louisville, KY 40203

Dear Ms. Darnell & Mr. Clausen,

Enclosed is the requested information regarding hydric soils, prior converted wetlands, farmed wetlands, highly erodible land, and prime farmland within the study area for the proposed KY Highway 107/I-24 interchange in Christian County, KY. A summary of this information is:

<u>Category</u>	<u>Acres (±)</u>
HYDRIC SOILS	0
PRIOR CONVERTED WETLAND (PC)	0
FARMED WETLANDS (FW)	0
HIGHLY ERODIBLE LAND (HEL)	205.8
PRIME FARMLAND	871.0
LAND OF STATEWIDE IMPORTANCE	191.6

Should anything further be needed, do not hesitate to contact either me or Josh Richardson, NRCS Lead District Conservationist located at the USDA Service Center in Hopkinsville.

JERRY E. MCINTOSH
Soil Scientist
jerry.mcintosh@ky.usda.gov

Enclosures

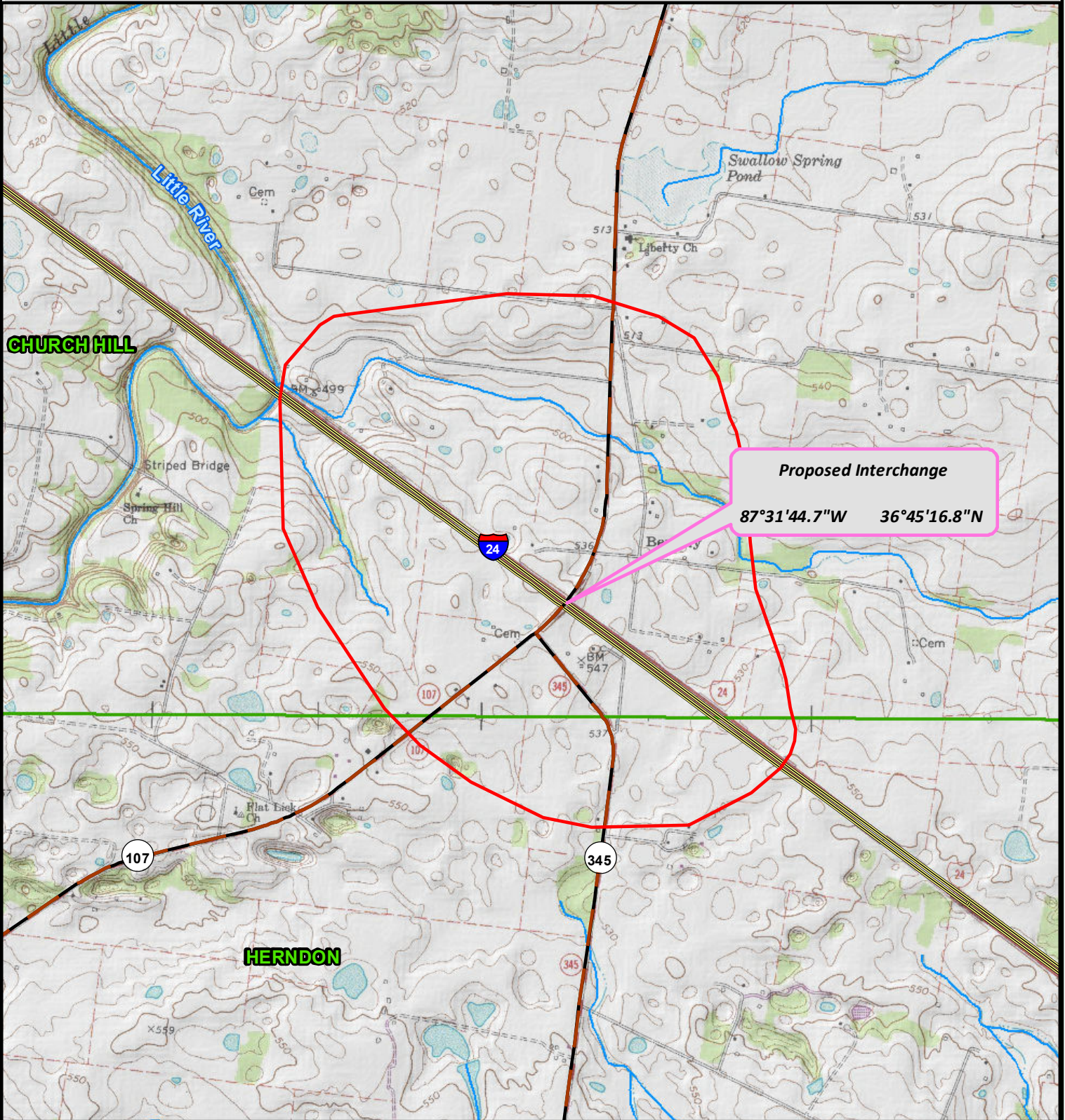
KY 107 - I24 Proposed Interchange Study Area

Christian County, KY

Graphic Scale

1:24,000

0 1,000 2,000 Feet



7.5' SERIES (TOPO) CHURCH HILL & HERNDON QUADRANGLE

KENTUCKY - CHRISTIAN COUNTY

 Study Area (approximate)

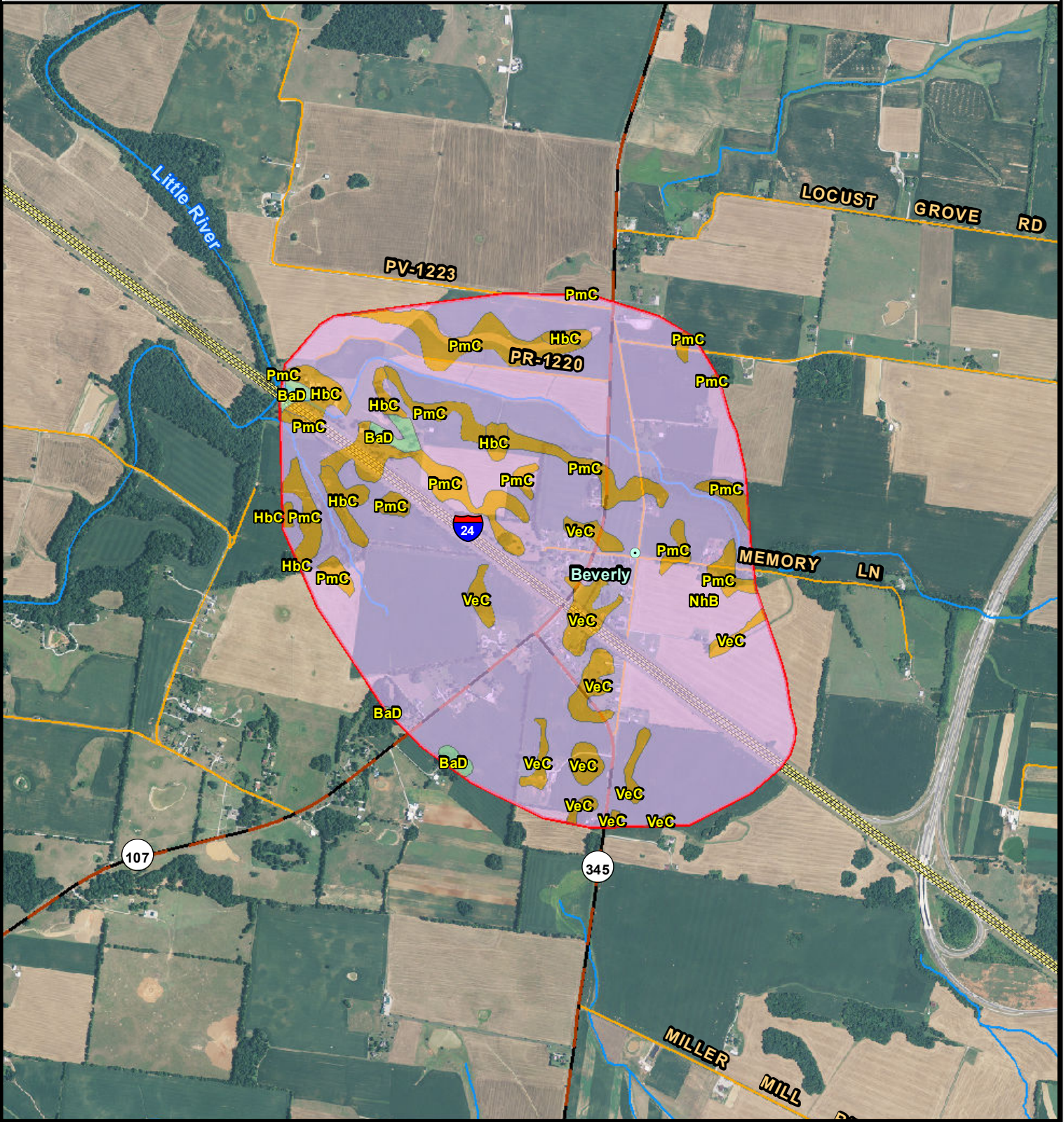
KY 107 - I24 Proposed Interchange Study Area

Christian County, KY





Graphic Scale

1:24,000

0 1,000 2,000 Feet



Legend

-  Prime farmland (± 871.0 acres)
-  Farmland of statewide importance (± 191.6 acres)
-  Not prime farmland (± 11.5 acres)
-  Study Area (approximate)

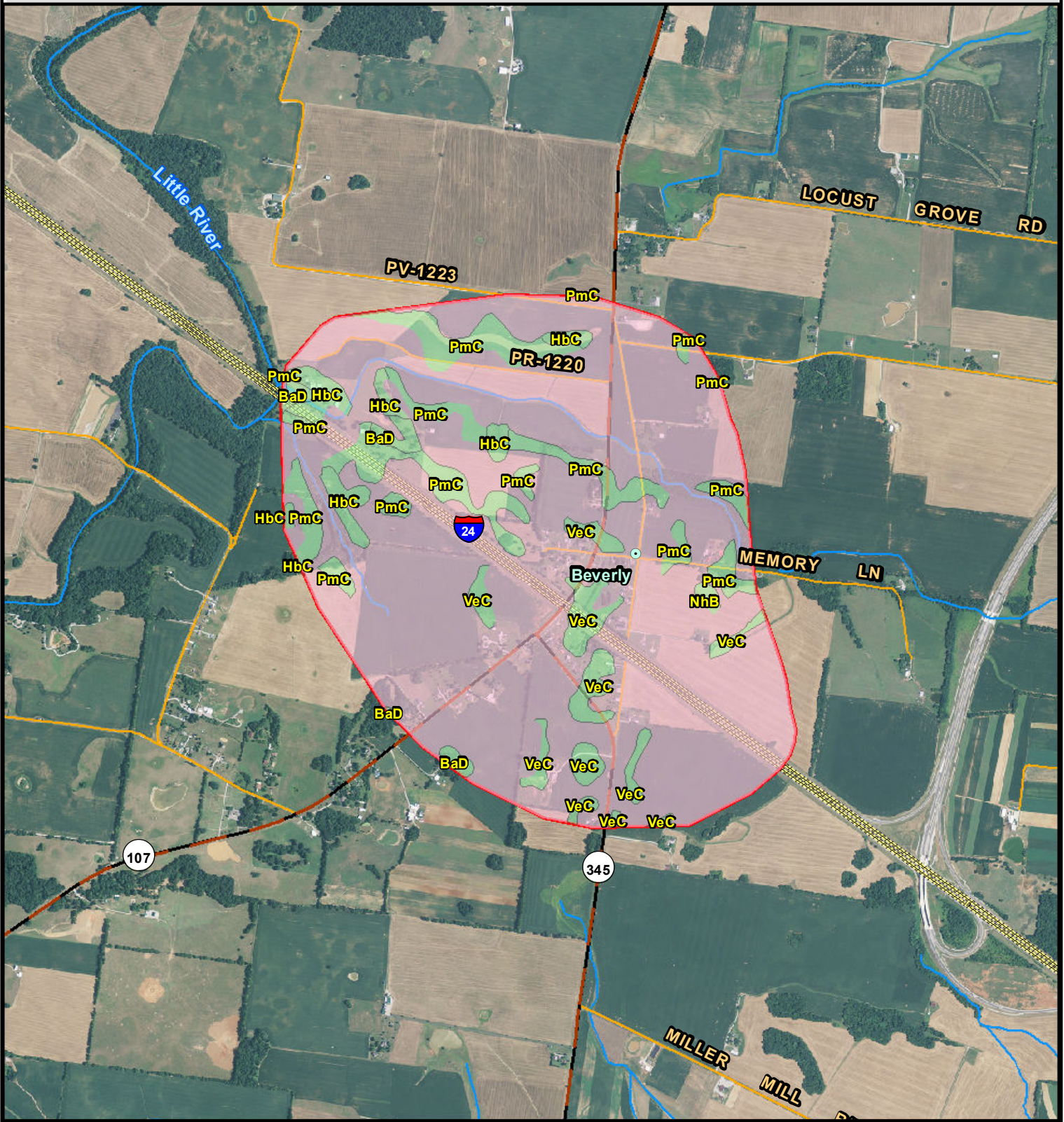
KY 107 - I24 Proposed Interchange Study Area

Christian County, KY




Graphic Scale

1:24,000

0 1,000 2,000 Feet



Legend

-  Highly erodible land (± 205.8 acres)
-  Not highly erodible land (± 868.4 acres)
-  Study Area (approximate)

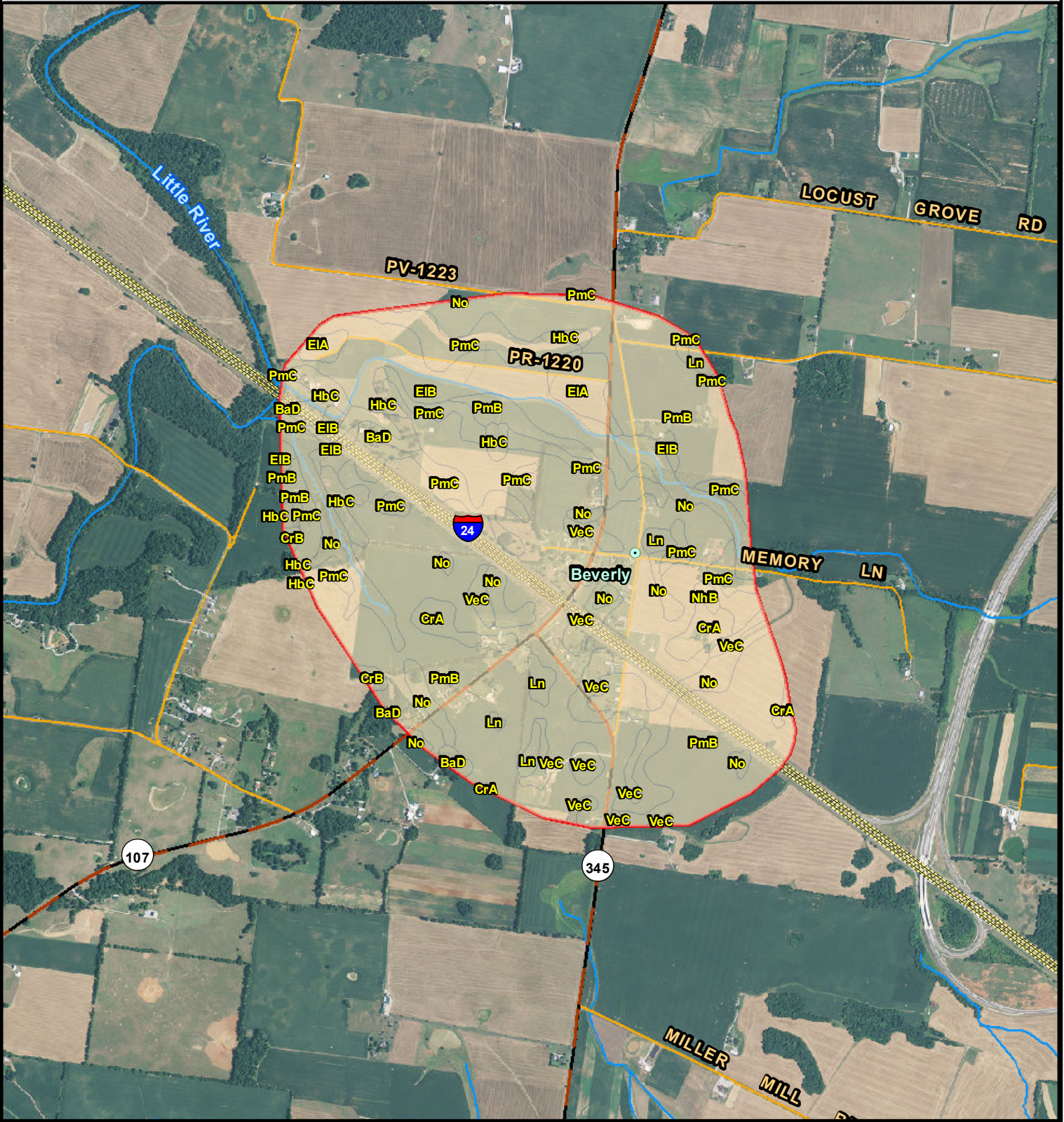
KY 107 - I24 Proposed Interchange Study Area

Christian County, KY

Graphic Scale


1:24,000

0 1,000 2,000 Feet



Legend

HYDRIC CLASS

 Not hydric

 Study Area (approximate)