

Appendix A. Environmental Overview

Environmental Overview for I-69 from Fulton to Eddyville

Introduction

This environmental overview covers the proposed I-69 corridor from the Kentucky–Tennessee state line in Fulton, Kentucky, to Knob Creek Bridge near Eddyville, Kentucky extending approximately 67 miles. The corridor lies within the Coastal Plain physiographic region (also known as the Jackson Purchase or Mississippi Embayment) which is dominated by flat, low plains dissected by a dendritic drainage network of low-gradient streams and small rivers flowing into the Mississippi and Tennessee Rivers. Uplands are underlain by sand, gravel, silt, and clay deposited by the last inland invasion of the seas more than 65 million years ago. It is part of the oldest northern extension of today's Coastal Plain of the southeastern United States. A silty mantle covers much of the region, but it is deepest along the Mississippi River where bluffs formed by this windblown material (loess).

Ecological

Potential ecological impacts were researched using available literature and internet-based searches. Some of the federal and state agencies from which information was sought were US Fish and Wildlife Service (USFWS), Kentucky Department of Fish and Wildlife Resources (KDFWR), Kentucky Division of Water (KDOW), Kentucky State Nature Preserve Commission (KSNPC), Kentucky Transportation Cabinet (KYTC), US Geological Service (USGS) topographical maps, and National Wetland Inventory (NWI) maps. Additional ecological information is located at the end of this overview.

Surface Waters

The USGS 7.5 minute topographic maps covering the project area were reviewed to determine the number and type of stream crossing. This is a partial list of all stream crossings since not all streams are labeled on topographical maps. Notable stream crossings include: Bayou du Chien and all its tributaries are Outstanding State Resource Waters because they are known habitat for the federally endangered relict darter; Panther Creek is a state Exceptional Quality and Reference Reach stream; Tennessee and Cumberland Rivers are Outstanding State Resource Water because they are known habitat for federally endangered mussel species; Clarks River because it is part of the Clarks River National Wildlife Refuge.

Number of blue-line streams crossed by county

Number of Blue-line Perennial	Number of Blue-line Intermittent	Lake	Rivers
27	52	1	4

Wetlands

Since much of the Lower Cumberland and Purchase area is alluvial floodplain with rich soils ideal for farming, agriculture is a large part of the local economy. The alluvial floodplains are also rich in wetlands. NWI maps show an abundance of wetlands scattered throughout and in proximity to the corridor. The following is a list of wetlands that the corridor bisects or is adjacent to as indicated by NWI mapping. The actual number of wetlands can only be determined by field reconnaissance.

Number of wetlands by type

Type of Wetland	Number of Occurrences
Emergent	5
Ponded Emergent	1
Ponded Scrub Shrub	1
Ponded Forested	10
Riverine	4
Lacustrine	1
Total	22

Threatened and Endangered Species

The 2008 USFWS list of threatened and endangered species was referenced for the counties involved. The KSNPC species database for each county was also referenced. Individual federally listed species and a quantitative listing of state species is presented by each county in project corridor. Notable species on the USFWS list are the Indiana bat, gray bat, relict darter, and mussels. Communications with USFWS and KSNPC will refine the number of listed species potentially affected by this project.

After reviewing USGS topographic maps, aerial maps, and field reconnaissance the several potential bat habitat and travel corridors were identified: creeks (Bayou du Chien, Mayfield, West Fork Clarks); rivers (Clarks, Tennessee, Cumberland); and wildlife management areas (Land Between the Lakes, Clarks River National Wildlife Refuge). Other natural features were determined throughout the project area as potential areas suitable for sustaining Indiana bats and gray bats.

The relict darter is endemic to Bayou du Chien drainage basin and because of this the Bayou du Chien and its tributaries are listed as Outstanding State Resource Waters by the KDOW. The current project bisects known relict darter habitat in the Bayou du Chien, roughly 5,200 feet downstream of the species' primary breeding area in Jackson Creek. Given the relict darter's limited distribution and apparent dependence on one spawning area (Jackson Creek), the relict darter is extremely vulnerable to anthropogenic activities (Warren et al. 1994).

The project corridor crosses the Tennessee and Cumberland Rivers, known habitat areas for federally and state endangered mussels. Little impact, if any, is anticipated because no known modifications are expected for bridges that cross these rivers.

Socioeconomic

Environmental Justice Populations

Based on the current level of information available, no significant adverse social or economic impacts are anticipated from proposed project; however, these preliminary findings will require validation through appropriate environmental Baseline studies required in subsequent project phases.

Relocations

Based on the current level of information available, no residential, commercial, or non-profit organization relocations are anticipated from the proposed project; however, these preliminary findings will require validation through appropriate environmental Baseline studies required in subsequent project phases.

Cultural Historic Resources

Historic Architectural Resources

If the project advances using federal funds, a historical baseline analysis will be required. Since a reconstruction project has the potential to have adverse impacts to historic resources, Section 106 of the National Historic Preservation Act of 1966 initiation would begin once the environmental documentation and design of any future project started.

Archaeological Resources

Even though a low potential for intact archaeological sites has been projected, the project area has not been subjected to a Phase I archeological investigation, and the presence of currently unidentified archaeological sites within the project area are possible.

Air

The U. S. Environmental Protection Agency (EPA) has identified seven air pollutants of national concern, including carbon monoxide (CO), nitrogen oxides (NO_x), ozone (O₃), particulate matter (PM₁₀ and PM_{2.5}), sulfur oxides (SO_x), and lead (Pb). FHWA requires, by the development of air quality base studies, the modeling of CO, if needed, to determine and compare calculated existing and future concentrations with the National Ambient Air Quality Standards (NAAQS) and, if required, a qualitative hot spot analysis for PM_{2.5}. A CO analysis will not be required because traffic projections will not exceed the 80,000 average daily traffic (ADT) Jefferson County is currently designated by the U.S. Environmental Protection Agency (EPA) to be in maintenance for O₃. Carbon Monoxide is not considered a concern for this project. Projects within Jefferson County increasing roadway capacity will be required to comply with the fine particulate, PM_{2.5}, hotspot consideration requirements. In addition, a Mobile Source Air Toxics (MSATs) analysis will be required for the proposed project.

A project-specific air quality impact assessment will be required for this undertaking as a part of the NEPA-phase project activities. This will be necessary in order to insure that the selected alternative does not adversely affect air quality programs currently in place and maintains conformity with the Transportation Improvement Program (TIP). This assessment will take into consideration the affects of local climate and topography and include a microscale dispersion analysis. Project impacts on future air quality conditions through air quality modeling will be used to compare the relative effects of each project alternative and to determine whether or not CO emissions attributable to the project would cause or contribute to an exceedance of the NAAQS. Since the project area consists of residential and commercial land uses, representative air quality receptors will need to be identified in conjunction with the existing facility and with specific alignment alternatives and considered as a part of the assessment. Depending on the results of the assessment, air quality impacts may be important in determining the constructability of the various alternatives and in selecting a preference among them.

Construction-period air quality impacts will need to be evaluated to expose the potential short-term effects of site preparation, demolition, material storage, construction actions, and to determine if any appropriate mitigation commitments will be incorporated into the project plans.

Noise

To determine potential noise impacts from construction and operation of the proposed project, each representative noise-sensitive land use will need to be identified in conjunction with specific alignment alternatives and existing measured ambient noise levels. The procedure for conducting

field monitoring will be based on FHWA requirements and KYTC Noise Abatement Policy. Noise levels will be measured in terms of L_{eq} , which reflects the average equivalent steady state sound level; in a stated time period, usually one hour, it would contain the same acoustic energy as the time-varying sound level during the same time period. For future noise level predictions, FHWA TNM (Traffic Noise Model) 2.5 will be used for noise impact analysis.

Given the location of the project area, the vehicle mix, patterns and volumes of traffic, and the general absence of sensitive receptors, highway noise impacts are not expected to influence project feasibility or location decisions; however, a project-specific noise impact analysis will be required to verify noise impact conditions.

Fulton County - There are no federal or state natural areas

USFWS

Group	Species	Common Name	Legal Status	Occurrence
Mammals	<i>Myotis sodalis</i>	Indiana bat	Endangered	Potential
Mussels	<i>Potamilus capax</i>	Fat pocketbook	Endangered	Potential
Fishes	<i>Scaphirhynchus albus</i>	Pallid sturgeon	Endangered	Potential
	<i>Etheostoma chienense</i>	Relict darter	Endangered	Potential
Birds	<i>Sterna antillarum</i>	Interior least tern	Endangered	Known
	<i>Haliaeetus leucociphalus</i>	Bald eagle	Delisted	Known

KSNPC

Group		Total number of species in each group	Number of state endangered species	Number of state threatened species	Number of state Special Concern species
Terrestrial	Vascular Plants	26	7	14	5
	Snail	1		1	
	Insects	2		1	1
	Birds	16	6	5	5
	Mammals	3	1		2
	Reptiles	6	2	2	2
Aquatic	Amphibians	3	1		2
	Fishes	20	8	6	6
	Crustaceans	3	1	1	1
	Mussels	3	2		1
Totals		83	28	30	25

Natural communities in need of protection include: Bottomland hardwood forest, Bottomland marsh, Coastal plain slough, and Cypress (tupelo) swamp

Hickman County – Obion Creek State Nature Preserve is a 1,601 acre scientific research facility protecting a mosaic of wetland communities, upland slopes, and Murphy's Pond. It is located in the Obion River watershed and is part of one of the largest remaining tracts of wetland in Kentucky. This nature preserve is located approximately 8 miles east of the corridor. BMP to prevent siltation downstream will have to be in place to protect this resource.

USFWS

Group	Species	Common Name	Legal Status	Occurrence
Mammals	<i>Myotis sodalis</i>	Indiana bat	Endangered	Known
Mussels	<i>Potamilus capax</i>	Fat pocketbook	Endangered	Potential
	<i>Lampsilis abrupt</i>	Pink mucket	Endangered	Known
Fishes	<i>Scaphirhynchus albus</i>	Pallid sturgeon	Endangered	Known
	<i>Etheostoma chienense</i>	Relict darter	Endangered	Known
Birds	<i>Sterna antillarum</i>	Interior least tern	Endangered	Known
	<i>Haliaeetus leucociphalus</i>	Bald eagle	Delisted	Known

KSNPC

Group		Total number of species in each group	Number of state endangered species	Number of state threatened species	Number of state Special Concern species
Terrestrial	Vascular Plants	24	7	10	7
	Snail	1		1	
	Insects	2		2	
	Birds	11	3	3	5
	Mammals	4	2		2
	Reptiles	5	1	1	3
Aquatic	Amphibians	4	1		3
	Fishes	17	9	5	3
	Crustaceans	4	2	1	1
	Mussels	4	3		1
Totals		46	28	23	25

Natural communities in need of protection include: Bottomland hardwood forest, Shrub swamp, Coastal plain slough, and Cypress (tupelo) swamp

Graves County – Bayou du Chien River Drainage (Hickman and Graves Counties) – The relict darter is endemic to this drainage and is listed as endangered by the USFWS. The current project bisects known relict darter habitat in the Bayou du Chien, roughly 5,200 feet downstream of the primary breeding area, Jackson Creek, for the species. Given the relict darter's limited distribution and apparent dependence on one spawning area (Jackson Creek), the relict darter is extremely vulnerable to anthropogenic activities (Warren et al. 1994). This entire drainage is listed as sensitive waters by the KYTC. **Panther Creek** is listed as a sensitive water area. Panther Creek is considered an exceptional water and reference reach for Graves County.

USFWS

Group	Species	Common Name	Legal Status	Occurrence
Mammals	<i>Myotis sodalis</i>	Indiana bat	Endangered	Potential
Fishes	<i>Etheostoma chienense</i>	Relict darter	Endangered	Known

KSNPC

Group		Total number of species in each group	Number of state endangered species	Number of state threatened species	Number of state Special Concern species
Terrestrial	Vascular Plants	13	4	3	6
	Insects	2	1	1	
	Birds	3	2		1
	Mammals	2	1		1
	Reptiles	4		2	2
Aquatic	Amphibians	4		1	3
	Fishes	17	12	4	1
	Crustaceans	3	2	1	
	Mussels	2	1		1
Totals		50	23	12	15

No natural communities in need of protection include:

Marshall County – Clarks River National Wildlife Refuge is located along the Clarks River north of Benton. It is the first national refuge established wholly within the state. The majority of this refuge is located west of the corridor but there is a small tract of land located in the corridor at the Clarks River Bridge crossing.

USFWS

Group	Species	Common Name	Legal Status	Occurrence
Mammals	<i>Myotis sodalis</i>	Indiana bat	Endangered	Potential
	<i>Myotis grisescens</i>	Gray bat	Endangered	Potential
Mussels	<i>Pleurobema clava</i>	Clubshell	Endangered	Known
	<i>Lampsilis abrupt</i>	Pink mucket	Endangered	Known
	<i>Plethobasus cooperianus</i>	Orangefoot pimpleback	Endangered	Known
	<i>Obovaria retusa</i>	Ring pink	Endangered	Known
	<i>Cumberlandia monodonta</i>	Spectaclecase	Candidate	Potential
	<i>Plethobasus cyphus</i>	Sheepnose	Candidate	Potential
	<i>Cyprogenia stegaria</i>	Fanshell	Endangered	Potential
Plants	<i>Apios priceana</i>	Price's potato-bean	Threatened	Potential
Birds	<i>Sterna antillarum</i>	Interior least tern	Endangered	Known
	<i>Haliaeetus leucociphalus</i>	Bald eagle	Delisted	Known

KSNPC

Group		Total number of species in each group	Number of state endangered species	Number of state threatened species	Number of state Special Concern species
Terrestrial	Vascular Plants	22	9	7	6
	Insects				
	Birds	10	3	3	4
	Mammals	2	1		1
	Reptiles	5		2	3
Aquatic	Amphibians	4			4
	Fishes	11	4	4	3
	Snail	3			3
	Crustaceans	1		1	
	Mussels	12	10	1	1
Totals		60	24	15	21

Natural communities in need of protection include: Bottomland hardwood forest, Acidid sub-xeric forest, and Xerophydric flatwoods

Livingston County – Land Between the Lake Natural Recreational Area is located on each side of the I-24 corridor.

USFWS

Group	Species	Common Name	Legal Status	Occurrence
Mammals	<i>Myotis sodalis</i>	Indiana bat	Endangered	Known
	<i>Myotis grisescens</i>	Gray bat	Endangered	Known
Mussels	<i>Pleurobema clava</i>	Clubshell	Endangered	Known
	<i>Lampsilis abrupt</i>	Pink mucket	Endangered	Potential
	<i>Plethobasus cooperianus</i>	Orangefoot pimpleback	Endangered	Known
	<i>Obovaria retusa</i>	Ring pink	Endangered	Known
	<i>Cumberlandia monodonta</i>	Spectaclecase	Candidate	Potential
	<i>Plethobasus cyphus</i>	Sheepnose	Candidate	Potential
	<i>Potamilus capax</i>	Fat pocketbook	Endangered	Known
	<i>Pleurobema plenum</i>	Rough pigtoe	Endangered	Potential
Plants	<i>Apios priceana</i>	Price's potato-bean	Threatened	Known
Birds	<i>Sterna antillarum</i>	Interior least tern	Endangered	Known
	<i>Haliaeetus leucociphalus</i>	Bald eagle	Delisted	Known
Reptiles		Copperbelly water snake	SCA	

SCA = Species covered by a State Conservation Agreement

KSNPC

Group		Total number of species in each group	Number of state endangered species	Number of state threatened species	Number of state Special Concern species
Terrestrial	Vascular Plants	27	13	7	7
	Non-vascular plant	1	1		
	Insects	1		1	
	Birds	11	1	3	7
	Mammals	3	2	1	
	Reptiles	4		1	3
Aquatic	Amphibians	4			4
	Fishes	12	4	4	4
	Snail	4			4
	Crustaceans	3	1	2	
	Mussels	14	11	2	1
Totals		84	33	21	30

Natural communities in need of protection include: Limestone slope glade, Sandstone barrens (open woodland), and Shawnee Hills sandstone glade

Lyon County

USFWS

Group	Species	Common Name	Legal Status	Occurrence
Mammals	<i>Myotis sodalis</i>	Indiana bat	Endangered	Potential
	<i>Myotis grisescens</i>	Gray bat	Endangered	Potential
Mussels	<i>Pleurobema clava</i>	Clubshell	Endangered	Known
	<i>Lampsilis abrupt</i>	Pink mucket	Endangered	Known
	<i>Plethobasus cooperianus</i>	Orangefoot pimpleback	Endangered	Known
	<i>Obovaria retusa</i>	Ring pink	Endangered	Known
	<i>Plethobasus cyphyus</i>	Sheepnose	Candidate	Potential
	<i>Cyprogenia stegaria</i>	Fanshell	Endangered	Known
Plants	<i>Apios priceana</i>	Price's potato-bean	Threatened	Known
Birds	<i>Sterna antillarum</i>	Interior least tern	Endangered	Known
	<i>Haliaeetus leucociphalus</i>	Bald eagle	Delisted	Known
Insects	<i>Nicrophorus americanus</i>	American burying beetle	Endangered	Considered extirpated

SCA = Species covered by a State Conservation Agreement

KSNPC

Group		Total number of species in each group	Number of state endangered species	Number of state threatened species	Number of state Special Concern species
Terrestrial	Vascular Plants	24	9	8	7
	Insects	1	1 extirpated		
	Birds	11	4	3	4
	Mammals	1			1
	Reptiles	5		1	4
Aquatic	Amphibians	1			1
	Fishes	5	1	1	3
	Snail	1			1
	Mussels	11	10	1	
Totals		60	24	14	21

No natural communities in need of protection

