CHAPTER III
Affected Environment

This chapter describes the existing social, economic and environmental settings of the project area that may be affected by the reasonable strategies described in chapter II. The project area is 199 miles (320.3 km) long and approximately 10 miles (16.1 km) wide. Environmentally sensitive features discussed in this chapter, such as cemeteries, schools, rivers and wetlands are shown on Exhibit III-1 to Exhibit III-9.

A. Social and Economic Characteristics

1. EXISTING LAND USE

For the first tier environmental document, existing land use was divided into two categories: developed land and undeveloped land, which mainly consists of agricultural land. Developed land represents primarily the municipal limits of a community within the study corridor. Although areas within each city, town or village may be currently undeveloped, it is the implied intention of the community to develop within its boundaries. Although land development does occur outside of city limits, development characteristics are usually more dispersed outside municipal limits. The lack of densely located populations identifies greater opportunity for avoidance by an alternative with improvements outside of the existing I-70 right-of-way. Exhibit III-10 to Exhibit III-12 represents the developed areas within the study corridor.

Within a community's limits, general development patterns throughout the study area are such that commercial and industrial uses are primarily centered around nodes located at the I-70 interchanges and corridors associated with primary north/south routes. Residential development primarily occurs outside of these boundaries in clusters of development. Public spaces are dispersed throughout each community in a generally random manner. Community services are frequently located within the community they serve. Public services such as fire and police protection are located within the community's boundaries.

Outside of a community's limits, all kinds of land uses occur in a spread out manner. Land uses that can be found dispersed throughout the study area besides agricultural includes commercial, industrial, retail, residential and public. Public services such as social service agencies and farm service agencies are also usually spread outside community boundaries.

Land use within the study corridor is primarily rural in character. Agricultural uses, scattered residential and retail development, mining, forested and natural areas distinguish these areas. More dense and urbanized land uses occur within the cities located along the I-70 corridor. These include Columbia, Warrenton, Wright City and Wentzville. Smaller urbanized areas can be found at Boonville, Kingdom City and Higginsville. Eastern Jackson County and western St. Charles County are generally characterized by low-density, suburban development, and represent the outermost reaches of the Kansas City and St. Louis metropolitan areas, respectively.

a. Counties

The following section identifies land use characteristics for counties within the study corridor. County descriptions are presented from west to east in the study corridor.

Jackson County

Jackson County is located on the western side of the study area and has a land area of 391,000 acres (158,232 hectares). The study area comprises 93,987 acres (38,035 hectares) or 24 percent. The Kansas City metropolitan statistical area is located in Jackson County. Jackson County's economy represents a diverse mixture of industries. Based on the number of employees, the primary industries in the county are manufacturing, retail and services. Within the study area, 45 percent of the area is developed and 55 percent is undeveloped which includes agricultural land. There are 30 cemeteries, 20 churches, 49 schools and two hospitals located within the portion of Jackson County that falls within the study area.

Jackson County has a number of communities with a population over 100 persons within the study area. All of the communities listed below are located in the Kansas City metropolitan area and are part of the metropolitan planning organization, Mid-America Regional Council. Population statistics for the communities within the study area are listed below in Table III-1.

Table III-1: Population of Jackson County Communities

Community	1990	2000	Percent Change
Kansas City	341,242	441,545	29%
Independence	112,301	113,288	1%
Lee's Summit	45,985	70,700	54%
Blue Springs	40,103	48,080	20%
Grain Valley	1,901	5,160	171%
Oak Grove	4,575	5,535	21%

Source: US Census Bureau, 1990; 2000.

A portion of Kansas City is located in the study area. Kansas City does not have land adjacent to I-70, within the project's study area. Independence is adjacent to I-70 with the majority of the city located to the north. Access to Independence from I-70 is provided by I-470/M-291 (the western limit of the study area) and Woods Chapel Road. A portion of Lee's Summit is located in the study area but it does not have land adjacent to I-70. Primary access to Lee's Summit from I-70 is provided by I-470/M-291. As you proceed east on I-70, it bisects Blue Springs with approximately two-thirds of the community located to the south. Woods Chapel Road, Missouri Route 7 and Adams Dairy Parkway provide access to Blue Springs from I-70. Grain Valley is located adjacent to I-70 with the majority of the city located to the south. County Road BB provides service to Grain Valley from I-70. Oak Grove is located on the easternmost side of the county with the majority of the city located south of I-70. County Road F provides access from I-70 to Oak Grove.

Lafayette County

Lafayette County is immediately east of Jackson County and has a land area of 404,480 acres (163,688 hectares). The study area comprises 202,849 acres (82,090 hectares) or 50 percent of Lafayette County. Lafayette County's economy represents a diverse mixture of industries. Based on the number of employees, the primary industries in the county are manufacturing, retail, services and health services (agriculture is a major industry in Lafayette County but with few employees). Within the study area, two percent of the area is developed and 98 percent is undeveloped. Lafayette County is located in the Kansas City metropolitan statistical area.

There are 74 cemeteries, seven churches, 51 schools, and no hospitals located within the portion of Lafayette County that falls within the study area.

There are six communities with a population over 100 persons within the study area. Population statistics for the communities are listed in Table III-2.

Table III-2: Population of Lafayette County Communities

Community	1990	2000	Percent Change
Bates City	197	245	24%
Odessa	3,695	4,818	30%
Mayview	279	294	5%
Higginsville	4,693	4,682	0%
Concordia	2,160	2,360	9%
Emma	86	243	182%

Source: US Census Bureau, 1990; 2000.

Bates City is the first community you come to as you proceed east on I-70 through Lafayette County and is located adjacent to I-70 on the south side. Access from I-70 to Bates City is provided via County Road Z. Odessa is located adjacent to I-70 on the south side. Access to Odessa from I-70 is provided at two locations, Missouri Route 131 and a local road on the east side of town. Mayview is located approximately three miles north of I-70 in the central part of the county. Mayview does not have direct access to I-70 but can be reached via I-70 Exit 41 (County Roads M and O) or Exit 45 (County Roads H and MM). Higginsville, which has the highest population in the county, is located approximately four miles (6.4 kilometers) north of I-70. However, Higginsville has annexed land that extends along the Missouri Route 13 corridor and includes the area around the interchange of I-70 and Missouri Route 13. The primary access to Higginsville from I-70 is Missouri Route 13 but also includes County Road T (I-70 Exit 52). Concordia is bisected by I-70 and is provided access from I-70 via Missouri Route 23. Emma is located south of I-70 along County Road Y and is split between Lafayette County and Saline County (the next county through which I-70 passes).

Johnson County

Johnson County, located south of Lafayette County, has no land adjacent to I-70 although the study area does contain some of the county. Johnson County has a land area of 533,000 acres (215,698 hectares) of which only 11,072 acres (4,481 hectares) or two percent is contained in the I-70 study area. Johnson County's economy represents a diverse mixture of industries. Based on the number of employees, the primary industries in the county are manufacturing, retail, services and health services. There are six cemeteries, two churches, three schools, and no hospitals located within the portion of Johnson County that falls within the study area.

There are no communities with a population over 100 persons within the study area. The I-70 study area only clips a small segment of Johnson County. As a result, 100 percent of the land is undeveloped.

Interstate 70 does provide access to two communities in Johnson County outside the study area, Warrensburg and Knob Noster. Also, Whiteman Air Force Base and Knob Noster State Park are located adjacent to Knob Noster. Warrensburg is provided access from I-70 via Missouri Route 13. Knob Noster is provided access from I-70 via Missouri Route 23.

Saline County

Continuing east on I-70 we enter Saline County which has a land area of 483,000 acres (195,464 hectares) of which 112,433 acres (45,500 hectares) or 23 percent is contained in the

study area. Saline County's economy represents a diverse mixture of industries. Based on the number of employees, the primary industries in the county are manufacturing, retail and services. Within the study area, one percent is developed and 99 percent is undeveloped. There are 30 cemeteries, six churches, 25 schools and no hospitals located within the portion of Saline County that falls within the study area.

There are two communities with a population over 100 persons within the study area. Population statistics for Sweet Springs and Nelson are listed in Table III-3.

Table III-3: Population of Saline County Communities

Community	1990	2000	Percent Change
Sweet Springs	1,595	1,628	2%
Nelson	181	212	17%

Source: US Census Bureau, 1990; 2000.

Sweet Springs, with the largest population of the study-area communities within the county, is adjacent to I-70 on the south side of the interstate. Missouri Route 127 provides direct access from I-70 to Sweet Springs. Nelson is located north of I-70. County Road J (I-70 Exit 84) and County Road K (I-70 Exit 89) provide the most direct access from I-70 to Nelson. Marshall, the county seat of Saline County with a population of 12,000+, is not located in the study area, but is approximately two miles (3.2 km) north of the northern study area boundary. The town of Marshall's primary access to I-70 is via US 65.

Pettis County

Pettis County lies immediately south of Saline County but does not have any land adjacent to I-70, although some of its land area of 439,000 acres (177,657 hectares) is contained within the I-70 study area. The study area comprises 45,420 acres (18,381 hectares) or 10 percent of Pettis County. Pettis County's economy represents a diverse mixture of industries. Based on the number of employees, the primary industries in the county are manufacturing, retail and services. Within the study area, 100 percent of the land is undeveloped. There are six cemeteries, two churches, seven schools and no hospitals located within the portion of Pettis County that falls within the study area.

There is only one community with a population over 100 persons within the study area. Population statistics for Houstonia are listed in Table III-4.

Table III-4: Pettis County Population

Community	1990	2000	Percent Change
Houstonia	283	275	-3%

Source: US Census Bureau, 1990; 2000.

Houstonia is located south of I-70. Access to Houstonia from I-70 is provided via County Road K. Sedalia, the county seat of Pettis County with a population of 19,000+, lies 16 miles (25.7 km) south of I-70 and is accessed from I-70 by US 65.

Cooper County

Interstate 70 passes from Saline County into Cooper County, which is located in the central part of the study area and has a land area of 363,000 acres (146,901 hectares). The study area comprises 153,755 acres (62,223 hectares) or 17 percent. Cooper County's economy represents a diverse mixture of industries. Based on the number of employees, the primary industries in the county are manufacturing, retail, services and health services. Within the study area, three percent of the area is developed and 97 percent is undeveloped. There are 80

cemeteries, 12 churches, 41 schools and one hospital located within the portion of Cooper County that falls within the study area.

There are three communities located within the study area. Population statistics for Blackwater, Pilot Grove and Boonville are listed in Table III-5.

Table III-5: Population of Cooper County Communities

Community	1990	2000	Percent Change
Blackwater	221	199	-10%
Pilot Grove	714	723	1%
Boonville	7,095	8,202	16%

Source: US Census Bureau, 1990; 2000.

Blackwater, the smallest of the identified communities in the study area, is located north of I-70. County Road K provides the most direct connection from I-70 to Blackwater. Pilot Grove, the second largest community within the study area is located south of I-70. Missouri Route 135 provides the most direct connection from I-70 to Pilot Grove. Boonville has the largest population in the county. Boonville is located adjacent to and between I-70 and the Missouri River. Access from I-70 to Boonville is provided via US Route 40/Missouri Route 5, Exit 103 and Missouri Route 87.

Howard County

Howard County is located north of Cooper County and they share the Missouri River as a common boundary. Howard County has a land area of 297,000 acres (120,192 hectares). The study area comprises 25,541 acres (10,336 hectares) or nine percent. Howard County's economy represents a diverse mixture of industries. Based on the number of employees, the primary industries in the county are manufacturing, retail, services and health services. Within the study area, 100 percent of the land is undeveloped. There are four cemeteries, two churches, four schools and no hospitals located within the portion of Howard County that falls within the study area.

There are no communities with a population of 100 persons or greater within the study area. New Franklin with a population of 1,145 is located just outside of the study area boundary on the north side.

Boone County

Interstate 70 crosses the Missouri River east of Boonville and enters Boone County, which is located in the central part of the study area and has a land area of 440,000 acres (178,062 hectares). The study area comprises 134,620 acres (54,479 hectares) or 31 percent of the county. Boone County's economy represents a diverse mixture of industries. Based on the number of employees, the primary industries in the county are retail, services and health services. Within the study area, 21 percent of the area is developed and 79 percent is undeveloped. There are 36 cemeteries, nine churches, 47 schools and five hospitals located within the portion of Boone County that falls within the study area.

There are two communities in Boone County with a population of more than 100 located within the study area. Population statistics for Rocheport and Columbia are listed in Table III-6.

Table III-6: Population of Boone County Communities

Community	1990	2000	Percent Change
Rocheport	255	208	-18%
Columbia	69,133	84,531	22%

Source: US Census Bureau, 1990; 2000.

Rocheport is located north of I-70 and is accessed via County Route BB. Columbia has many access points along I-70. Interchanges that provide access from I-70 to Columbia include Missouri Route 740, Creasy Springs Road / West Boulevard, Missouri Route 163, Missouri Route 763, Business Loop I-70, US 63 and St. Charles Road. Two-thirds of the Columbia land area is located south of I-70. The Columbia metropolitan statistical area is located in Boone County. The University of Missouri, located in Columbia, is one of the primary land uses in the community.

Callaway County

Callaway County is the next county east of Boone County through which I-70 runs. Callaway County is one of the largest counties in Missouri with more four-lane highways than any other county outside the major metropolitan areas. Callaway County has 542,355 acres (219,484 hectares) of which 179,564 acres (72,667 hectares) or 33 percent are within the study area. Of this acreage, one percent of the area is developed and 99 percent is undeveloped. The county's economy is a diverse mixture of education, industry, agriculture and business. There are 41 cemeteries, 21 churches, 21 schools and no hospitals located within the portion of Callaway County that falls within the study area.

There are three communities in Callaway County with a population of 100 or more located within the study area. Population statistics for Auxvasse, Kingdom City and Fulton are listed in Table III-7.

Table III-7: Population of Callaway County Communities

Community	1990	2000	Percent Change
Auxvasse	821	901	10%
Kingdom City	112	121	8%
Fulton	10,033	12,128	21%

Source: US Census Bureau, 1990; 2000.

Auxvasse is located north of I-70 along US 54 and functions primarily to serve local agricultural interests. Kingdom City straddles I-70 and is located at the US 54 interchange. Most of the non-residential land uses in Kingdom City serve interstate traffic. These are primarily gas stations and restaurants. Fulton is located to the south of I-70, also along US 54. Fulton's diverse economy includes county government, several colleges and commercial industrial land uses. All of these communities are accessed from I-70 by US 54.

Montgomery County

Montgomery County borders Callaway County on the east and is located in the east-central portion of the state. Montgomery County has 346,701 acres (140,305 hectares) of which 115,281 acres (46,653 hectares) or 33 percent are within the study corridor. Of this acreage, two percent of the area is developed and 98 percent is undeveloped. The economy is a diverse mixture of manufacturing, agriculture, retail trade and construction. Montgomery County's zoning includes agricultural and floodplain, residential, rural village, commercial, industrial/manufacturing and recreational. There are 29 cemeteries, two churches, 19 schools, and no hospitals located within the portion of Montgomery County that falls within the study area.

There are four communities in Montgomery County located within the study area. Population statistics for Montgomery City, New Florence, High Hill and Jonesburg are listed in Table III-8.

Table III-8: Population of Montgomery County Communities

Community	1990	2000	Percent Change
Montgomery City	2,281	2,442	7%
New Florence	801	764	-5%
High Hill	204	231	13%
Jonesburg	630	695	10%

Source: US Census Bureau, 1990; 2000.

Montgomery City lies north of I-70 and is accessible from I-70 via Missouri Routes 161 and 19. New Florence, High Hill and Jonesburg are located along the existing I-70 corridor and are accessed from I-70 by Missouri Route 19 (north), County Route F (north) and County Route Y (south) respectively. Few businesses within these communities appear to directly serve interstate traffic.

Warren County

Interstate 70 upon leaving Montgomery County enters Warren County, which has an area of 280,095 acres (113,351 Hectares). Warren County has 121,983 acres (49,365 hectares) or 43 percent within the study area. Of this acreage, five percent of the area is developed and 95 percent is undeveloped. The county's economy is primarily a mixture of retail, construction and health services. A factory outlet mall located along I-70 dominates much of the local retail trade. There are 45 cemeteries, seven churches, 25 schools and no hospitals located within the portion of Warren County that falls within the study area.

There are three communities in Warren County with a population of 100 or more located within the study area. Population statistics for Warrenton, Truesdale and Wright City are listed in Table III-9.

Table III-9: Population of Warren County Communities

Community	1990	2000	Percent Change
Warrenton	3,962	5,281	33%
Truesdale	285	397	39%
Wright City	1,250	1,532	23%

Source: US Census Bureau, 1990; 2000.

Warrenton and Truesdale lie on the south side of I-70 and are accessed from I-70 by Missouri Route 47. Wright City is also on the south side of I-70 and is accessed from I-70 by County Route F.

Lincoln County

Lincoln County is located north of Warren County but has no land adjacent to I-70. Of its 490,830 acres (165,853 hectares), 8,916 acres (3,608 hectares) or only two percent lies within the study area. Of this acreage, none of the area is considered developed. Lincoln County's economy represents a mix of industries ranging from construction and manufacturing, to retail. There are three cemeteries, one church, two schools and no hospitals located within the portion of Lincoln County that falls within the study area.

There are no communities with a population of 100 persons or greater within the study area.

St. Charles County

St. Charles County lies at the east end of the I-70 study area. Of its 379,921 acres (153,749 hectares), 72,271 acres (29,247 hectares) or 19 percent lies within the study area. Of this

acreage, 25 percent of the area is developed and 75 percent is undeveloped. St. Charles County is one of the fastest growing counties in the state with a diversity of transportation systems including air, river, rail, trucking and intermodal transport systems. The county's economy is a diverse mixture of education, high-tech industry, agriculture and business. There are 33 cemeteries, two churches, 13 schools, and two hospitals located within the portion of St. Charles County that falls within the study area.

There are eight communities in St. Charles County with a population of 100 or more located within the study area. Population statistics for Foristell, Flint Hill, Wentzville, Josephville, Lake St. Louis, St. Paul, Dardenne Prairie and O'Fallon are listed in Table III-10.

Table III-10: Population of St. Charles County Communities

Community	1990	2000	Percent Change
Foristell*	130	331	155%
Flint Hill	229	379	66%
Wentzville	4,640	6,896	49%
Josephville	219	270	23%
Lake St. Louis	7,536	10,169	35%
St. Paul	1,124	1,634	45%
Dardenne Prairie	735	4,384	496%
O'Fallon	17,427	46,169	165%

Source: US Census Bureau, 1990; 2000.
** Foristell straddles the boundary between St. Charles and Warren Counties*

Several communities are located along the I-70 corridor and have economies that vary in their degree of dependence on the existing highway. These communities include Foristell (south – accessed from I-70 by County Route F), Wentzville (north – accessed from I-70 via US Route 61), Lake St. Louis (south – accessed from I-70 by US Routes 40 and 61 and County Route A), and O'Fallon (north – accessed from I-70 via County Route M). Several other communities are located within the study area, but have less proximity to the existing highway. These include Flint Hill, Josephville and St. Paul (north – accessed from I-70 by US Route 61 on the west and County Route M on the east) and Dardenne Prairie (south – accessed from I-70 by US Routes 40 and 61).

Lake St. Louis is a planned community. The community is primarily residential in character, with an expanding high-tech corridor, commercial areas and a variety of public and private amenities. Most of the businesses in Lake St. Louis are not highly dependent on through traffic along I-70.

O'Fallon is a fast growing community straddling I-70 with the majority of the city lying to the north. The city's land use plan emphasizes the continuation of existing viable uses, and the provision of adequate land for future residential, commercial, industrial, public and parks development. The plan calls for specific development opportunities along the I-70 corridor, including:

- Medium-density residential development immediately south of I-70 where existing infrastructure can accommodate higher densities.

- Community commercial (grocery stores, restaurants, service stations) development along the I-70 corridor.

- Creation of a high-tech corridor along US 40 and 61 between County Route K and I-70.

b. Urbanized Areas

The following section identifies land use characteristics for urban areas within the study area.

Columbia

Columbia is the largest urban area within the study area. Columbia has a current population of 84,531. The Columbia metropolitan planning area is established by the Columbia Area Transportation Study Organization as the designated metropolitan planning organization for Columbia and the Columbia metropolitan area. It is made up of representatives from the City of Columbia, Boone County and the Missouri Department of Transportation.

Columbia Metro 2020 Plan is a comprehensive plan which develops a long-range vision for land use, transportation and community appearance and design. Land-use planning and control is performed with zoning regulations within the Columbia city limits.

Warrenton

Warrenton is located along I-70, about 60 miles (96.6 km) west of St. Louis. Warrenton's 1990 population was 3,962, and is 5,281 persons in 2000, an increase of 33 percent. Land use consists of primarily single-family dwellings, with some multi-family housing. Non-residential land use primarily consists of retail trade, manufacturing and professional services.

Wentzville

Wentzville is located along I-70, about 40 miles (64.4 km) west of St. Louis. Wentzville's 1990 population was 4,640, and is 6,896 persons in 2000, an increase of 49 percent. Land use consists of primarily single-family dwellings, with some multi-family housing. Non-residential land use primarily consists of retail trade, manufacturing, and construction.

Fourth Class Cities

Oak Grove – Oak Grove, located in eastern Jackson County about 30 miles (48.3 km) from Kansas City, has a current population of 5,535 up from 4,575 in 1990. Recent development has been north of I-70 and east of the central commercial district. Land use consists of primarily single-family residential with some multi-family housing. Non-residential land use includes service oriented retail commercial and light manufacturing.

Higginsville – Higginsville, located about 50 miles (80.5 km) east of Kansas City has a current population of 4,682, a decline of 11 persons from 1990. It had the least population change of any city along the I-70 corridor. The city annexed a four-mile-long corridor to I-70 to capture some of the development that was occurring there, which includes commercial activities oriented to the motoring public.

Concordia – Concordia, located nearly 60 miles (96.6 km) from Kansas City, has a population of 2,360 persons, a nine percent increase from 1990. Development is also occurring on the north of I-70. Land use consists of single family residential, retail and service commercial and some manufacturing. A large cemetery is on the south side of I-70 east of Route 23.

Boonville – Boonville is located about 100 miles (161 km) east of Kansas City nearly 30 miles (48.3 km) west of Columbia. It is located on both the Missouri River and I-70. Boonville's population in 2000 is 8,202 persons, an increase of 16 percent form 1990. Boonville has three

interchanges on I-70, each supporting some development, generally highway oriented commercial. There is a new residential development south of I-70 at the Route 87 interchange

Wright City – Located along I-70, about 45 miles (72.4 km) west of St. Louis. Wright City's 1990 population was 1,250, and is estimated at 1,314 in 2000, an increase of 5.1 percent. It is classified as a fourth class city under the statutes of the State of Missouri, and uses the mayor and board of aldermen form of government. Land use consists primarily of single-family dwellings, with some multi-family housing. Non-residential land use primarily consists of retail trade, manufacturing and educational services.

2. DEMOGRAPHICS & SOCIAL CHARACTERISTICS

Demographic and social characteristics were developed for the study area based on data provided by Wessex Corporation. Wessex projected 1990 census data to 1997 and 2002. Results of these projections were interpolated to develop an estimated year 2000 value. For some of the tables, where 2000 census information was available, this has been included where appropriate.

Demographic and social census data are provided at the county and urban level in this first tier environmental study. As a result, census data is provided for areas inside and outside the study area boundaries for each county.

The study area encompasses a wide range of demographic and social characteristics. The characteristics and activities associated with the use and development of land are primary influences over the social and economic characteristics of an area.

a. Population

Demographic data within the I-70 Study Corridor reflect the generalized land use trends: populations are concentrated in the eastern Kansas City area (Jackson County), the western St. Louis area (St. Charles County) and in Columbia (Boone County). Outside of these metropolitan areas, Johnson, Callaway, Pettis and Lincoln counties are the most populated, as shown in Table III-11. Howard County is the least populated within the study corridor. The population data is reflected in the total number of households.

While each county has a similar number of its total population under age 18, Boone, Johnson and St. Charles Counties have a significantly larger number of their respective populations within the 18-64 cohort. In Boone County, this is explained by the presence of the University of Missouri-Columbia. In St. Charles County, the difference may be made clear by the fact that this county is the fastest growing county within the state, and therefore is reflective of a more youthful population migrating to the farthest reaches of the suburbs. Finally, Johnson County's predominance of under-65 population may be explained by the presence of Whiteman Air Force Base and Central Missouri State University, which would typically attract a working age population.

Within each of the counties, male and female population cohorts are evenly divided.

Municipal demographics within the study corridor reflect similar trends. Columbia is by far the largest city, at 84,531 people. Kingdom City is the smallest, with 121 people. Of the four municipalities, only Columbia contains the majority of its population within the 18-64 cohort. Warrenton, in particular, has a significantly higher number of age 65 and older population, and to a lesser degree, Wright City and Wentzville do as well.

b. Employment

While agricultural land uses dominate the study corridor, they are not strongly represented within the employment figures. This is because agriculture does not generally require a large number of people to function. Within Lafayette, Saline, Cooper and Howard counties however, agriculture remains as an important source of employment.

Table III-11: Population (Year 2000 Estimate)

Location	Population		Age			Sex	
	Total Population	Number of Households	Under 18	18-64	65 and Older	Male	Female
County							
Jackson	658,214	264,453	159,065	413,872	85,277	313,333	344,881
Lafayette	33,054	12,628	8,304	19,313	5,437	16,139	16,916
Johnson	48,666	17,175	11,730	32,353	4,583	24,592	24,074
Saline	22,861	97,106	5,459	13,150	4,253	11,008	11,853
Pettis	37,709	15,111	9,340	22,307	6,062	18,162	19,547
Cooper	16,573	5,868	3,878	9,766	2,929	8,440	8,133
Howard	9,831	3,659	2,336	5,616	1,879	4,742	5,089
Boone	132,534	51,248	29,343	91,963	11,228	64,302	68,233
Callaway	37,747	13,669	9,435	23,738	4,574	18,423	19,324
Montgomery	12,128	4,641	2,994	6,741	2,394	5,848	6,280
Warren	24,530	8,977	6,546	14,803	3,181	12,185	12,344
Lincoln	36,698	13,252	10,498	22,075	4,125	18,354	18,344
St. Charles	275,967	8,628	78,953	179,355	17,658	136,989	138,978
City							
Columbia	80,306	31,523	15,154	38,434	26,718	38,741	41,569
Warrenton	4,199	1,627	1,080	208	2,911	1,971	2,228
Wright City	1,314	544	334	280	700	628	686
Wentzville	5,861	2,063	1,781	1,262	2,819	2,754	3,106

Source: Wessex Corporation.

Within the study corridor counties, retail trade dominates as the employment category with the highest percentage of employees overall. This is followed closely by manufacturing, non-durable goods, health services and educational services. A few counties have an appreciably higher number of employees within specific categories. Ten percent of employees in Callaway County are employed within the public administration sector; over 11 percent of employees within Saline County are employed in the durable goods manufacturing sector; and approximately 10 percent of all employees in Lincoln and Warren Counties are employed in the construction trades. It is interesting to note that the two most urbanized counties (Jackson and St. Charles) do not have a corresponding increase in “professional” employees (such as transportation, communication, finance, personal services, public administration or other professional services). Although in a few sectors (most notably finance and other professional services), they do hold the highest percentage of employees within that category.

The four urban areas within the study corridor also have an appreciably higher number of employees within the retail trade sector. Within Warrenton, Wright City and Wentzville, an almost equally considerable number of employees work in the non-durable goods manufacturing sector. In addition, in Wentzville, over 11 percent of employees work in the construction sector. Also notable in Columbia is the higher percentages of employees in the educational services, health services and finance sectors. A sizeable portion of the workforce in Wright City is also employed in the educational services sector.

Table III-12: Employment by Industry (Year 2000 Estimate)

Location	Agriculture, Forestry, and Fisheries	Mining	Construction	Manufacturing, Nondurable Goods	Manufacturing, Durable Goods	Transportation	Communications and Other Public Utilities	Wholesale Trade	Retail Trade	Finance, Insurance and Real Estate	Business and Repair Services	Personal Services	Entertainment and Recreation Services	Health Services	Educational Services	Other Professional and Related Services	Public Administration
County																	
Jackson	2,192	192	16,946	23,486	18,371	17,051	10,142	15,328	54,410	27,500	20,141	11,258	4,454	33,626	22,324	27,525	19,119
Lafayette	1,041	22	1,041	1,476	1,035	909	314	695	2,395	666	621	328	164	1,548	1,106	926	536
Johnson	881	24	1,184	1,838	784	710	422	502	4,034	740	670	659	415	1,877	3,421	1,177	1,161
Saline	812	24	599	710	1,140	536	195	357	1,459	319	197	163	52	1,754	992	658	350
Pettis	947	32	1,071	2,283	1,053	696	301	710	2,995	827	814	516	155	1,683	1,362	1,052	503
Cooper	697	35	418	828	343	278	91	289	1,112	434	218	144	48	822	723	403	313
Howard	377	17	272	330	240	164	67	194	643	132	122	105	17	539	713	284	217
Boone	1,295	36	3,138	3,009	1,700	1,650	1,373	1,675	11,141	5,188	2,549	1,730	874	13,380	11,810	5,020	2,951
Callaway	664	52	1,094	1,042	1,018	700	903	383	2,561	687	807	483	126	2,795	1,929	928	1,814
Montgomery	443	12	401	697	465	362	44	232	827	182	222	123	38	407	356	217	178
Warren	388	26	1,119	1,974	613	540	271	419	2,053	427	421	305	96	983	640	697	380
Lincoln	976	28	1,717	2,919	918	923	377	550	2,608	737	654	483	122	1,468	1,124	879	438
St. Charles	1,543	181	9,883	24,125	6,629	9,155	4,089	7,116	26,307	9,242	8,763	3,652	1,498	12,691	9,973	8,490	4,212
City																	
Columbia	535	8	1,273	1,224	969	817	661	760	7,257	3,217	1,388	1,073	666	7,984	8,095	2,802	1,651
Warrenton	54	5	113	366	140	92	50	57	380	60	82	48	32	148	93	130	93
Wright City	14	1	50	87	46	25	19	15	123	17	19	15	7	52	65	26	19
Wentzville	46	5	278	403	100	78	162	85	503	104	149	65	43	177	159	102	43

Source: Wessex Corporation.

c. Income and Poverty

Table III-13 identifies income and poverty characteristics. As shown in the table, both Howard and Saline have the lowest median household income, which are both below $32,000 per year. Howard and Saline counties are both located north of I-70 on the west side of the study area. St. Charles County, located on the far east side of the study area, has the highest median household income at $62,017 per year.

The poverty level was calculated based on a weighted average poverty threshold for 1999, developed by the U.S. Census Bureau. An estimated poverty level of $12,500 per household was estimated based on a calculated size of family unit in the study area. As a result, Table III-13 shows the number and percent of households below the calculated poverty level for each county. Four counties (Pettis, Howard, Boone and Montgomery) all have a percent of household below poverty above six percent. These four counties represent the poorest areas along the study area. With the exception of Montgomery County, the other areas are all central to the study area. Warren and St. Charles Counties have the lowest percent of households

below the poverty level. Therefore, these counties represent the wealthier counties in the study area. These two counties are located on the east side of the study area.

Income and poverty characteristics were also calculated for the four primary urban areas. Little magnitude of difference for median household income and per capita income was noticed between each urban area. As shown in Table III-13, Columbia had a higher number of households below the poverty level than the other urban areas.

Table III-13: Income and Poverty (Year 2000 Estimate)

Location	Income		Poverty*	
	Median Household Income	Per Capita Income	# of Households below Poverty Level	% of Households below Poverty Level
County				
Jackson	$41,764	$18,899	33,625	5.1%
Lafayette	$36,316	$15,270	1,612	4.9%
Johnson	$34,293	$14,129	2,449	5.0%
Saline	$31,893	$14,460	1,227	5.4%
Pettis	$32,821	$14,767	2,311	6.1%
Cooper	$33,936	$13,368	863	5.2%
Howard	$31,871	$13,061	611	6.2%
Boone	$37,152	$17,494	8,133	6.1%
Callaway	$38,471	$14,807	1,659	4.4%
Montgomery	$32,790	$13,790	737	6.1%
Warren	$41,784	$15,891	949	3.9%
Lincoln	$41,905	$15,441	1,582	4.3%
St. Charles	$62,017	$21,914	4,775	1.7%
City				
Columbia	$32,769	$17,298	6,234	7.8%
Warrenton	$37,478	$15,553	192	4.6%
Wright City	$33,365	$14,271	81	6.2%
Wentzville	$44,749	$16,034	312	5.3%

*Poverty Level <$12,500/year Source: Wessex Corporation.

d. Minority Populations

Table III-14 identifies minority populations. On average, 10 percent of the population is non-white in the study counties. The counties that have the highest percent minority population are Jackson, Johnson, Cooper, Howard and Boone. These counties are located primarily in the western and central portions of the study area. The counties that have the lowest minority population are Lafayette, Montgomery, Warren and Lincoln. Except for Lafayette County, these counties are located primarily in the eastern portion of the study area.

Hispanic origins are a subset of all other populations, as reported by the Census Bureau.

Table III-14: Minority Demographics (Year 2000)

Location	Total Population	One Race	White	Black or African American	American Indian & Alaska Native	Asian	Native Hawaiian or Other Pacific Islander	Some Other Race	Two or More Races	Hispanic or Latino (of any race)
COUNTY										
Jackson	654,880	640,114	459,061	152,391	3,168	8,412	1,168	15,914	14,766	35,160
Lafayette	32,960	32,590	31,485	749	96	82	9	169	370	386
Johnson	48,258	47,270	43,491	2,089	314	692	61	623	988	1,407
Saline	23,756	23,371	21,387	1,280	73	84	50	497	385	1,050
Pettis	39,403	38,765	36,275	1,197	148	154	21	970	638	1,527
Howard	10,212	10,100	9,306	699	34	12	8	41	112	88
Cooper	16,670	16,485	14,844	1,493	60	39	3	46	185	143
Boone	135,454	132,841	115,714	11,572	567	4,015	42	931	2,613	2,413
Callaway	40,766	40,273	37,420	2,307	210	210	5	121	493	377
Montgomery	12,136	11,981	11,647	248	29	31	1	25	155	94
Lincoln	38,944	38,500	37,435	677	143	68	11	166	444	444
Warren	24,525	24,275	23,517	476	110	59	4	109	250	314
St. Charles	283,883	280,834	268,756	7,635	657	2,414	71	1,301	3,049	4,176
CITY										
Columbia	84,531	82,777	68,923	9,173	331	3,636	30	684	1,754	1,733
Warrenton	5,281	5,215	5,051	90	22	20	2	30	66	68
Wright City	1,532	1,510	1,360	96	11	1	0	42	22	95
Wentzville	6,896	6,754	5,836	829	11	38	4	36	142	103

[1]Source: U.S. Census Bureau, Census 2000 Redistricting Data (Public Law 94-171) Summary File, Matrices PL1, PL2, PL3 and PL4).

B. Natural Environment

1. AIR QUALITY

The Federal Clean Air Act Amendments of 1970 required the adoption of air quality standards. These were established in order to protect public health, safety and welfare from known or anticipated effects of sulfur dioxide (SO_2), particulates (PM-10, 10-micron and smaller; PM-2.5, 2.5-micron and smaller), carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3) and lead (Pb). In addition to these pollutants, the State of Missouri has established additional criteria for hydrogen sulfide (H_2S) and sulfuric acid (H_2SO_4). The Missouri and National Ambient Air Quality Standards for these pollutants are listed in Table III-15.

The CAAA of 1977 required all states to submit to the U.S. Environmental Protection Agency a list identifying those air quality control regions, or portions thereof, which meet or exceed the NAAQS or cannot be classified because of insufficient data. Portions of air quality control regions which are shown by monitored data or air quality modeling to exceed the NAAQS for any criteria pollutant are designated “nonattainment” areas for that pollutant.

The 1990 CAAA established procedures for determining the conformity of state implementation plans with the requirements of the federal regulations. These procedures are published in 40 CFR Parts 51 and 93.

The project falls within the Metropolitan Kansas City Interstate Air Quality Control Region (AQCR #94), the Southwest Missouri Intrastate Air Quality Control Region (AQCR #139), the Northern Missouri Intrastate Air Quality Control Region (AQCR #137) and the Metropolitan St. Louis Interstate Air Quality Control Region (AQCR #70). All of the AQCRs have a designation of better than national standards for TSP and SO_2, unclassifiable/attainment for CO, cannot be classified or better than national standards for NO_2, and no designation for Pb. The Metropolitan Kansas City Interstate Air Quality Control Region is classified as a maintenance area for O_3, while the Metropolitan St. Louis Interstate Air Quality Control Region is classified as non-attainment for O_3. The section of the project extending from exit 203 to the Lake Saint Louis interchange is also located in a non-attainment area, namely St. Charles County. The Missouri state implementation plan does not contain any transportation control measures for these AQCRs.

Table III-15: Missouri and National Ambient Air Quality Standards

Pollutant	Averaging Time	Concentration
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean: Primary Twenty-Four Hour(1): Primary Three Hour(1): Secondary	80 ug/m^3 (0.03 ppm) 365 ug/m^3 (0.14 ppm) 1300 ug/m^3 (0.50 ppm)
Particulate (PM-10)	Annual Arithmetic Mean: Primary & Secondary Twenty-Four Hour:(2) Primary & Secondary	50 ug/m^3 150 ug/m^3
Particulate (PM-2.5)	Annual Arithmetic Mean: Primary & Secondary Twenty-Four Hour:(2) Primary & Secondary	15 ug/m^3 65 ug/m^3
Carbon Monoxide (CO)	One Hour(1): Primary Eight Hour(1): Primary	40 mg/m^3 (35 ppm) 10 mg/m^3 (9 ppm)
Ozone (O_3)	Eight Hour(1): Primary & Secondary	157 ug/m^3 (0.08 ppm)
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean: Primary & Secondary	100 ug/m^3 (0.053 ppm)
Lead (Pb)	Calendar Quarter Arithmetic Mean: Primary & Secondary	1.5 ug/m^3
Hydrogen Sulfide (H_2S)	One-half Hour(3) One-half Hour(4)	70 ug/m^3 (0.05 ppm)(8) 42 ug/m^3 (0.03 ppm)(8)
Sulfuric Acid (H_2SO_4)	Twenty-Four Hour(5) One Hour(6)	10 ug/m^3(8) 30 ug/m^3(8)

(1) = Not to be exceeded more than once per year.
(2) = Statistically estimated number of days with exceedances is not to be more than 1 per year.
(3) = Not to be exceeded more than twice per year.
(4) = Not to be exceeded more than twice in any consecutive days.
(5) = Not to be exceeded more than once in any ninety consecutive days.
(6) = Not to be exceeded more than once in any two consecutive days.
(7) = Not more than one expected exceedance per year, on a three-year average.
(8) = Missouri Air Quality Standards.
ppm = Parts of pollutant per million parts of air (by volume) at 25°C.
ug/m^3 = Micrograms of pollutant per cubic meter of air.
Source: MDNR Division 10 - Air Conservation Commission.

2. NOISE

Noise is a form of vibration that causes pressure variations in elastic media such as air and water. The ear is sensitive to this pressure variation and perceives it as sound. The intensity of these pressure variations causes the ear to discern different levels of loudness. These pressure differences are most commonly measured in decibels.

The decibel is the unit of measurement for noise. The decibel scale audible to humans spans approximately 140 dB. A level of zero decibels corresponds to the lower limit of audibility, while 140 decibels produces a sensation more akin to pain than sound. The decibel scale is a logarithmic representation of the actual sound pressure variations. Therefore, a 26 percent

change in the energy level only changes the sound level one dB. The human ear would not detect this change except in an acoustical laboratory. A doubling of the energy level would result in a three-dB increase, which would be barely perceptible in the natural environment. A tripling in energy sound level would result in a clearly noticeable change of five-dB in the sound level. A change of 10 times the energy level would result in a 10-dB change in the sound level. This would be perceived as a doubling (or halving) of the apparent loudness.

Sound occurs over a wide range of frequencies. However, not all frequencies are detectable by the human ear; therefore, an adjustment is made to the high and low frequencies to approximate the way an average person hears sounds. This adjustment is called A-weighting and is expressed as "dBA". Table III-16 presents some familiar noise sources with their respective maximum noise levels.

Noise levels in the natural environment are constantly changing. In urban areas the changes can be very significant. In rural areas located away from common noise sources, the ambient noise level may remain rather constant. Noise levels adjacent to a major highway, may sound relatively constant, but are actually made up of many individual sounds varying in level by 10-20 decibels. Due to the time-varying characteristics of environmental noise, a single value is used to represent the average or equivalent sound level and is expressed as "$L_{eq}(h)$". The equivalent sound level, $L_{eq}(h)$, is defined as the steady state sound level, which, in a stated time period (usually one hour), contains the same sound energy as the actual time-varying sound.

Highway noise sources have been divided into five types of vehicles; automobiles, medium trucks, heavy trucks, buses and motorcycles. Each vehicle type is defined as follows:

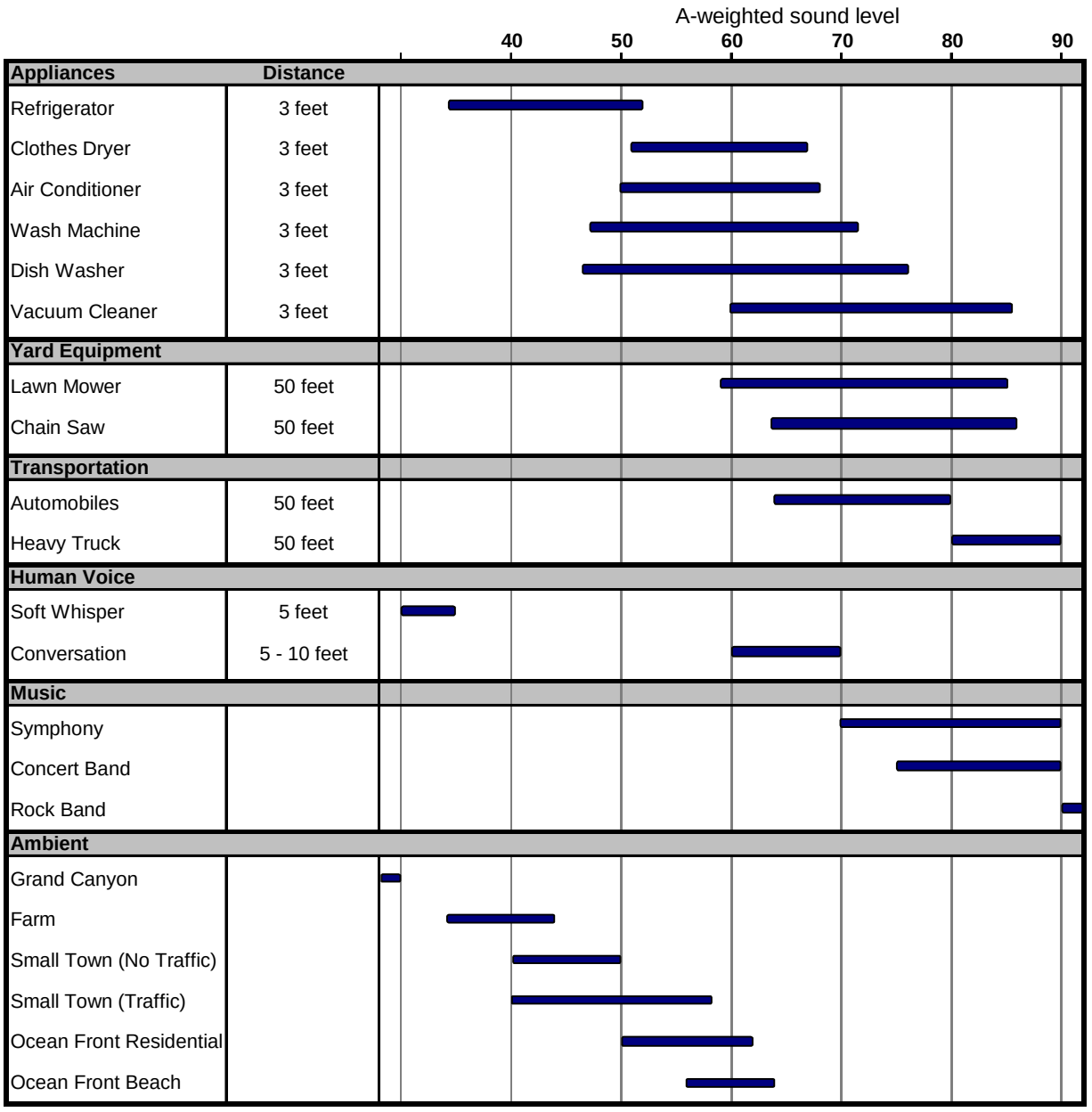
- Automobiles – all vehicles with two axles and four tires, includes passenger vehicles and light trucks, less than 9,900 pounds (4,490.6 kg);
- Medium trucks – all vehicles having two axles and six tires, vehicle weight between 9,900 and 26,400 pounds (4,490 and 11,974.8 kg);
- Heavy trucks – all vehicles having three or more axles, vehicle weight greater than 26,000 pounds (11,793.4 kg);
- Buses – all vehicles designed to carry more than nine passengers; and
- Motorcycles.

Noise levels produced by highway vehicles can be attributed to three major categories:

- Running gear and accessories (tires, drive train, fan and other auxiliary equipment)
- Engine (intake and exhaust noise, radiation from engine casing)
- Aerodynamic and body noise

Tires are the dominant noise source at speeds greater than 50 mph (80.5 km/h) for trucks and automobiles. Tire sound levels increase with vehicle speed but also depend upon road surface, vehicle weight, tread design and wear. Change in any of these can vary noise levels. At lower speeds, especially in trucks and buses, the dominant noise source is the engine and related accessories.

Table III- 16: Common Noise Levels



SOURCE: U.S. Report to the President and Congress on Noise, February, 1972.
Community Noise, U.S. EPA, December, 1971, p 18, Fig 7.
Transportation Noise & Noise From Equipment Powered by Internal Combustion Engines, U.S. EPA, December, 1971
Cyril M. Harris, Handbook of Noise Control, 2nd ed., McGraw-Hill, New York, 1979, p 2-10, Fig. 2.9.
Lyle F. Yerges, Sound, Noise and Vibration Control, 2nd ed.,Van Nostrand Reinhold, New York, 1978, p 8, Table 3.
Arnold P.G. Peterson, Handbook of Noise Measurement, 9th ed., GenRad, Concord, MA, 1980, p4, Fig. 2-1.

Ambient noise levels are controlled by regular activity in an area; industry, traffic, etc. Typically, ambient noise levels would vary substantially in a 10-mile (16.1 km) wide corridor. Noise levels in the low 40-dBA L_{eq} range are found in quite rural areas not exposed to regular traffic. Properties abutting the existing I-70 right-of-way are most likely experiencing L_{eq} noise levels during peak hour traffic in the mid 70 dBA range. Depending on local traffic conditions and the distance of homes from local roads, county highways and state highway, the L_{eq} noise levels adjacent to these roadways range from the 60 to 70 dBA.

3. PARKLANDS

Parklands within the study corridor include a number of municipal parks and recreational facilities, several conservation areas, two state parks, national forest land and a national wildlife refuge. These public lands were identified through early coordination and were mapped as control points to guide the early planning of the project.

Public parklands are important environmental control points because these lands have special status under the provisions of Section 4(f) of the Federal Aid Highway Act of 1968. Before any transportation project is allowed to proceed with an encroachment on an eligible public park, recreation area, or refuge, a specific evaluation must be conducted that tests all proposed alternatives. To enable the use of parkland, this evaluation must lead to a finding that there is no feasible and prudent alternative to the taking of that park and that all possible planning to minimize harm to the resource has been undertaken. During the early stages of a transportation project, parklands that appear to meet the basic purposes and intent of Section 4(f) are identified as prime candidates for avoidance.

Public lands that are managed as multiple-use property can have specific areas that meet the criteria for eligibility as Section 4(f) properties. However, these lands may also have areas that are not eligible as Section 4(f) resources. The Section 4(f) policy paper of FHWA states that the areas which would be subject to Section 4(f) are those portions of the multiple-use holdings which are designated by statute or identified in the management plans of the administering agency as being for park, recreation, or wildlife or waterfowl refuge purposes, and which are determined to be significant for such purposes. For example, several of the conservation areas owned by the Missouri Department of Conservation are managed for habitat conservation but also receive heavy recreational use. The recreational portions may meet the criteria as Section 4(f) eligible properties and, if impacted, would require additional evaluation.

The Land and Water Conservation Fund has been providing grants (known as Section 6(f) funds) for recreational land acquisition and development for many years. Several parks and recreation areas within the study corridor have been the recipient of these funds and would likely be subject to the provisions of Section 6(f) if they are impacted. Those provisions state that the impacted parkland must be replaced with land of at least equal recreational utility and monetary value and is subject to approval by the U.S. Department of the Interior. The parks and recreation areas that are subject to Section 6(f) provisions within the study corridor are noted as such in Tables III-17 and III-18. In addition, the acquisition of Lake St. Louis in St. Charles County was accomplished with funds from the LWCF program.

Schools can also be recipients of funds through the LWCF program for development of recreational facilities. Within the study corridor, the only school that has received 6(f) funding has been the Boonville R-1 School District for the development of tennis courts at the Boonville High School, located just north of I-70 on Ashley Road.

a. City and County Parks and Recreation Areas

The parks and recreation areas located in the cities and counties within the study corridor that are potential Section 4(f) properties were mapped as shown on the plan plates and are listed by county in Table III-17. Some may not be subject to Section 4(f) provisions, as the key to Section 4(f) eligibility is public ownership. Parks noted with a “CAP” (community assistance program sponsored by the MDC) have received fisheries management and assistance from the MDC for developing or upgrading their lakes or ponds on the property. In return for the MDC’s assistance, the local communities agree to maintain the areas and facilities and open them to the general public.

Table III-17: City and County Parks and Recreation Areas

ID NO.	COUNTY	JURISDICTION	NAME	NOTES
P-JA1	Jackson	Independence	Oak Ridge Memorial Gardens	
P-JA2	Jackson	Independence	George Owens Park	6(f) LWCF
P-JA3	Jackson	Independence	Little Blue Park	
P-JA4	Jackson	Independence	Blackburn School Park	
P-JA5	Jackson	Independence	Beckett Park	
P-JA6	Jackson	Independence	Glendale Park	6(f) LWCF
P-JA7	Jackson	Independence	Van Hook Park	6(f) LWCF
P-JA8	Jackson	Lee's Summit	Velie Area (undeveloped)	
P-JA9	Jackson	Lee's Summit	Howard Park	
P-JA10	Jackson	Jackson Co. P & R	Fleming Park - Lake Jacomo	6(f) LWCF
P-JA11	Jackson	Lee's Summit	Bowlin Area (undeveloped)	
P-JA12	Jackson	Jackson Co. P & R	Fleming Park - Blue Springs Lake	
P-JA13	Jackson	Blue Springs	Hidden Valley Park	
P-JA14	Jackson	Blue Springs	Valley View Park	
P-JA15	Jackson	Blue Springs	Woods Chapel Park	
P-JA16	Jackson	Blue Springs	Burrus Old Mill Park	
P-JA17	Jackson	Blue Springs	Ward Park	6(f) LWCF
P-JA18	Jackson	Blue Springs	Baumgardner Park	6(f) LWCF
P-JA19	Jackson	Blue Springs	Blue Springs Park	
P-JA20	Jackson	Blue Springs	Franklin Smith School Park	
P-JA21	Jackson	Blue Springs	Stonecreek Park	
P-JA22	Jackson	Blue Springs	Central Park	
P-JA23	Jackson	Blue Springs	Pink Hill Park	
P-JA24	Jackson	Blue Springs	Northeast Park	
P-JA25	Jackson	Blue Springs	St. Mary's Activity Center	
P-JA26	Jackson	Blue Springs	Rotary Park @ RR Lake	
P-JA27	Jackson	Blue Springs	James Walker School Park	
P-JA28	Jackson	Blue Springs	Keystone Park	6(f) LWCF
P-JA29	Jackson	Jackson Co. P & R	Landahl Park	
P-JA30	Jackson	Jackson Co. P & R	Wyatt Lake	CAP
P-JA31	Jackson	Blue Springs	Adams Dairy Lake	Undeveloped
P-JA32	Jackson	Blue Springs	Adams Pointe Golf Club	
P-JA33	Jackson	Blue Springs	Wilbur Young Park	6(f) LWCF
P-JA34	Jackson	Jackson County	Tarsney Lake	CAP
P-JA35	Jackson	Jackson County	Wood Lake	CAP
P-JA36	Jackson	Grain Valley	Armstrong Park	6(f) LWCF
P-JA37	Jackson	Jackson Co. P & R	Monkey Mountain Park	
P-JA38	Jackson	Oak Grove	Frick Park	
P-JA39	Jackson	Oak Grove	Civic Center & Pool	6(f) LWCF
P-JA40	Jackson	Oak Grove	Webb Park	
P-JA41	Jackson	Jackson Co. P & R	Little Blue Trace Park & Trail	6(f) LWCF
P-JA42	Jackson	Oak Grove	Bikeway	
P-LA1	Lafayette	Bates City	Bates City City Park	
P-LA2	Lafayette	Odessa	Odessa City Lakes	CAP
P-LA3	Lafayette	Odessa	Dyer Park	
P-LA4	Lafayette	Higginsville	Fairgrounds Park	
P-LA5	Lafayette	Higginsville	Tennis Courts	6(f) LWCF
P-LA6	Lafayette	Higginsville	Higginsville City Lake	CAP
P-LA7	Lafayette	Concordia	Edwin A. Pape Lake	CAP
P-LA8	Lafayette	Concordia	Ball Park Complex	
P-LA9	Lafayette	Concordia	Railroad Park	
P-LA10	Lafayette	Concordia	Concordia (Southside) Park	
P-LA11	Lafayette	Concordia	Central Park	
P-LA12	Lafayette	Concordia	Railroad Park	
P-LA13	Lafayette	Odessa	Railroad Park	
P-LA14	Lafayette	Odessa	Phillips Park	
P-LA15	Lafayette	Odessa	unnamed park	

ID NO.	COUNTY	JURISDICTION	NAME	NOTES
P-LA16	Lafayette	Odessa	Centennial Hills Park	
P-SA1	Saline	Sweet Springs	Sweet Springs City Park	6(f) LWCF
P-SA2	Saline	Nelson	Nelson City Park	
P-CO1	Cooper	Blackwater	Lions Club Park	
P-CO2	Cooper	Blackwater Preservation Society	War Memorial (Gazebo) Park	
P-CO3	Cooper	Pilot Grove	Pilot Grove City Park	
P-CO4	Cooper	Cooper County	Cooper County Fairgrounds	
P-CO5	Cooper	Boonville	Harley Park	
P-CO6	Cooper	Boonville	Rolling Hills Park	
P-CO7	Cooper	Boonville	Boonville Fishing Ponds	
P-CO8	Cooper	Boonville	Cobble Stone Park	
P-CO9	Cooper	Boonville	Morgan Street Park	
P-CO10	Cooper	Boonville	Riverside Park	
P-CO11	Cooper	Boonville	Bell's View Park	
P-CO12	Cooper	Boonville	Veteran's Park	
P-CO13	Cooper	Boonville	Lion's Park	6(f) LWCF
P-CO14	Cooper	Boonville R-1 Sch. Dist.	Boonville H.S. Tennis Courts	6(f) LWCF
P-BO1	Boone	Rocheport	Welbern Park	6(f) LWCF
P-BO2	Boone	U. of Missouri	Dairy Farm Lakes	CAP
P-BO3	Boone	Columbia	Dublin Avenue Park	
P-BO4	Boone	Columbia	Rothwell Park	
P-BO5	Boone	Columbia	Fairview Park-School	6(f) LWCF
P-BO6	Boone	Columbia	Twin Lakes Rec. Area	6(f) LWCF CAP
P-BO7	Boone	Columbia	Valleyview Park	6(f) LWCF
P-BO8	Boone	Columbia	Cosmo Rec. Area & Golf Course	6(f) LWCF CAP
P-BO9	Boone	Columbia	Kiwanis Park-School	
P-BO10	Boone	Columbia	Westwinds Park	
P-BO11	Boone	Columbia	Oakwood Hills Park	6(f) LWCF
P-BO12	Boone	Columbia	Rock Bridge Neighborhood Park	6(f) LWCF
P-BO13	Boone	Columbia	Cosmo-Bethel Park	6(f) LWCF CAP
P-BO14	Boone	Columbia	Proctor Park	
P-BO15	Boone	Columbia	Parkade Park-School	
P-BO16	Boone	Columbia	Boxer Park	
P-BO17	Boone	Columbia	Hickman Municipal Pool, tennis	
P-BO18	Boone	Columbia	Highpointe Park	
P-BO19	Boone	Columbia	Grindstone Nature Area	6(f) LWCF
P-BO20	Boone	Columbia	Rock Quarry Park	
P-BO21	Boone	Columbia	Bear Creek Park	
P-BO22	Boone	Columbia	Albert-Oakland Park	6(f) LWCF
P-BO23	Boone	Columbia	Kyd Park	
P-BO24	Boone	Columbia	Shepard Blvd. Park-School	6(f) LWCF
P-BO25	Boone	Columbia	Nifong Park	6(f) LWCF CAP
P-BO26	Boone	Columbia	Unnamed Park	Planned
P-BO27	Boone	Columbia	Woodridge Park	6(f) LWCF
P-BO28	Boone	Columbia	Jeff Smith Property	Planned
P-BO29	Boone	Columbia	Brown Station Park	6(f) LWCF
P-BO30	Boone	Columbia	South Farm R-1 Lake	CAP
P-BO31	Boone	Boone County	El Chaparral Park	6(f) LWCF
P-BO32	Boone	Columbia	American Legion Park	
P-BO33	Boone	Columbia	McKee Street Park	
P-BO34	Boone	Columbia	Indian Hills Park	6(f) LWCF
P-BO35	Boone	Columbia	Lake of the Woods Recreation Area	6(f) LWCF CAP
P-BO36	Boone	Univ. of Missouri	Turkey Farm Lake	CAP
P-BO37	Boone	Boone County	Katy (MKT) Trail	
P-BO38	Boone	Columbia	MKT Nature/Fitness Trail	
P-BO39	Boone	Columbia	Harmony Creek Greenway	Planned

ID NO.	COUNTY	JURISDICTION	NAME	NOTES
P-BO40a	Boone	Columbia	Bear Creek Greenway	
P-BO40b	Boone	Columbia	Bear Creek Greenway	Planned
P-BO41	Boone	Columbia	MKT Trail Extension (potential)	Planned
P-BO42	Boone	Columbia	Hinkson Creek Greenway	Planned
P-BO43	Boone	Columbia	Hominy Branch Greenway	Planned
P-B044	Boone	Boone County	Boone County Fairgrounds	
P-CA1	Callaway	Univ. of Missouri	McCredie Farm Lake	CAP
P-CA2	Callaway	Auxvasse	Domann Memorial Park	6(f) LWCF
P-CA3	Callaway	Auxvasse	Montazz Memorial Park	
P-CA4	Callaway	Fulton	Oestreich Swimming Complex	6(f) LWCF
P-CA5	Callaway	Fulton	Future park	Potential
P-CA6	Callaway	Fulton	Future park	Potential
P-MO1	Montgomery	Montgomery City	Norwood Park	6(f) LWCF
P-MO2	Montgomery	Montgomery City	Wabash Park	6(f) LWCF
P-MO3	Montgomery	Montgomery City	Colbert Park	
P-MO4	Montgomery	New Florence	Ball Park	
P-WA1	Warren	Wright City	Diekroeger Brothers Park	
P-WA2	Warren	Wright City	Corwin Ruge Memorial Park	6(f) LWCF
P-WA3	Warren	Warrenton	Dyer Park	
P-WA4	Warren	Warrenton	Warrenton Park	6(f) LWCF
P-WA5	Warren	Warrenton	City Park	
P-WA6	Warren	Warrenton	Binkley Park / City Pool	
P-WA7	Warren	Warrenton	Neighborhood Park	
P-SC1	St. Charles	Wentzville	Rotary Park / Comm. Club Lake	CAP
P-SC2	St. Charles	St Charles County	Quail Ridge Park (formerly Orchard Farm County Park)	6(f) LWCF
P-SC3	St. Charles	Wentzville	Memorial Park	6(f) LWCF
P-SC4	St. Charles	Wentzville	Progress Park	
P-SC5	St. Charles	Josephville	Josephville Park	
P-SC6	St. Charles	Lake St. Louis	Founders Park	
P-SC7	St. Charles	Lake St. Louis	Boulevard Park	

b. State Parks

The two state parks within the study corridor are the Katy Trail State Park and Graham Cave State Park, both of which are owned and managed by the Missouri Department of Natural Resources. The Katy Trail State Park is a hiking and biking facility that traverses the Missouri from near St. Charles to Clinton, and is eligible as a Section 4(f) resource. The trail follows the original route of the Missouri Kansas & Texas (MKT, a.k.a. Katy) Railroad, and the depot at Boonville is listed on the National Register of Historic Places. It has been designated as a part of the Lewis & Clark Trail and the American Discovery Trail by the National Park Service, and has also been designated as a Legacy Millennium Trail by the White House Millennium Council. The Katy Trail offers the recreational user a wide variety of experiences through a mix of urban, suburban, rural and natural landscapes. It travels through the study corridor in Cooper, Howard and Boone counties, going through Pilot Grove, Boonville, New Franklin and Rocheport, then following the Missouri River west of Columbia.

The Graham Cave State Park, which borders the Loutre River, is approximately 357 acres (144 hectares) and is located in west Montgomery County on the north side of I-70. The main feature, Graham Cave, was inhabited by humans as much as 10,000 years ago and is designated as a national landmark. There are special requirements for protecting national landmarks under Section 106 of the National Historic Preservation Act. Other special features

within the park include glades, savannas and sandstone bluffs with over-hangs and waterfalls. The park offers picnic areas, playgrounds, campgrounds and hiking trails, and is also subject to the provisions of Sections 4(f) and 6(f).

c. Conservation Areas

Most of the conservation areas in the study corridor are owned by the Missouri Department of Conservation, and are managed as multiple-use public land. The Nature Conservancy owns two natural areas in the city of Columbia: the Zahorsky Woods area and the Hinkson Valley area. In addition, the U.S. Army Corps of Engineers purchased several tracts of land in the floodplain of the Missouri River, located in Cooper and Moniteau Counties, after the floods of 1993 and 1995. Known as the Overton Bottoms, the land is to be a conservation area and a wildlife refuge, and managed by the MDC and the U.S. Fish and Wildlife Service. Tucker Prairie, located on the south side of I-70, west of Kingdom City, is a research property owned by the University of Missouri. The above mentioned areas are located on the plan plates and are listed by county in Table III-18.

Table III-18: Conservation Areas

ID NUMBER	COUNTY	NAME	DESCRIPTION	OWNER	NOTES
CA-JA1	Jackson	Burr Oak Woods CA	Nature Center, natural areas	MDC	
CA-JA2	Jackson	Jim Bridger Urban CA	Educational activities	MDC	
CA-LA1	Lafayette	Sni-A-Bar CA		MDC	
CA-LA2	Lafayette	Ferguson-Harold CA		MDC	
CA-LA3	Lafayette	Odessa Radio Facility		MDC	
CA-LA4	Lafayette	Maple Leaf Lake CA	Fishing	MDC	
CA-LA5	Lafayette	Cecil G. Grove CA	Forestland & old pastures	MDC	
CA-JO1	Johnson	Ralph & Martha Perry CA	Fishing ponds, firearms range	MDC	
CA-SA1	Saline	Blind Pony Lake CA	Hatchery, fishing, picnic	MDC	6(f)
CA-SA2	Saline	McAllister Springs Access	Boat ramp, forestland	MDC	
CA-SA3	Saline	Marshall Junction CA	Forestland, old fields	MDC	
CA-SA4	Saline	Blue Lick CA	Several saline & mineral springs	MDC	
CA-PE1	Pettis	Ralph & Martha Perry CA	Fishing ponds, firearms range	MDC	
CA-CO1	Cooper	Blackwater Bridge Access	Boat ramp	MDC	6(f)
CA-CO2	Cooper	Roberts Bluff Access	Boat ramp on Lamine River	MDC	
CA-CO3	Cooper	Harriman Hill Access	Boat ramp on Lamine River	MDC	6(f)
CA-CO4	Cooper	de Bourgmont Access	Boat ramp on Lamine River	MDC	
CA-CO5	Cooper	Woolridge Access	Area at Petite-Saline Creek	MDC	
CA-CO6	Cooper	Taylor's Landing Access	Access to Missouri R.	MDC	6(f)
CA-CO7	Cooper-Moniteau	Overton Bottoms	Wetlands, refuge	USACE	
CA-HO1	Howard	Franklin Island CA	Missouri River & Bonne Femme Creek.	MDC	
CA-HO2	Howard	Davidsdale CA	Loess hills, ponds, trail, bottoms	MDC	
CA-HO3	Howard	Diana Bend CA		MDC	
CA-HO4	Howard	Diana Bend CA		MDC	

ID NUMBER	COUNTY	NAME	DESCRIPTION	OWNER	NOTES
CA-BO1	Boone	Hinkson Woods CA	Riparian woods, creek bluffs	MDC	
CA-BO2	Boone	Zahorsky Woods		NC	
CA-BO3	Boone	Fish & Wildlife Research Center		MDC	
CA-BO4	Boone	Hinkson Valley		NC	
CA-BO5	Boone	Waters & Moss Memorial Wildlife Area	Hiking, bat house, limestone bluff	MDC	
CA-CA1	Callaway	Little Dixie Lake CA	Fishing, hiking, picnic, boat ramp	MDC	
CA-CA2	Callaway	Tucker Prairie	Research Property	U of MO	
CA-CA3	Callaway	Moore's Hill Access	Fishing access	MDC	
CA-CA4	Callaway	Prairie Fork Creek CA		MDC	
CA-CA5	Callaway	Whetstone Creek CA	Fishing, forests, old pastures	MDC	
CA-MO1	Montgomery	Loutre Lick Access	Boat ramp on Loutre River	MDC	
CA-MO2	Montgomery	Danville CA	Fishing ponds, hiking, glades	MDC	
CA-WA1	Warren	Daniel Boone CA	Forestland, ponds, picnic	MDC	6(f)
CA-WA2	Warren	Little Lost Creek CA	Forestland	MDC	
CA-WA3	Warren	Warrenton Towersite	Forestland	MDC	
CA-WA4	Warren	Frank Reifsnider State Forest	Forestland, claypits, picnic, hiking	MDC	

d. Big Muddy National Fish and Wildlife Refuge (Overton Bottoms)

The Big Muddy National Fish and Wildlife Refuge is located in Cooper County. It currently consists of two areas separated by a strip of privately owned land. It is possible that this privately owned land might someday be purchased to make the refuge area contiguous.

The larger tract of the refuge is immediately adjacent to I-70 on the northwest side. Part of this portion is owned and managed by the U.S. Fish and Wildlife Service, and part of it is owned by the U.S. Army Corps of Engineers, but managed by the U.S. Fish and Wildlife Service. The smaller tract lies on the south side of the Missouri River, east of the Franklin Island Conservation Area and west of the Diana Bend Conservation Area. This portion of the refuge is both owned and managed by the U.S. Fish and Wildlife Service. As national wildlife refuge land, these areas are subject to the provisions of Section 4(f).

e. Mark Twain National Forest

The boundary of the Mark Twain National Forest lies within the south half of the study corridor in Boone and Callaway Counties. There are four tracts of forestland that are actually owned by the U.S. Forest Service, however, the other portions within the forest boundary are privately owned.

4. PRIME FARMLAND SOILS

a. Definition

Prime farmland is one of several kinds of important farmlands defined by the U.S. Department of Agriculture. It is of major importance in providing the nation’s short and long-range needs for food and fiber. The supply of high quality farmland is limited. The U.S. Department of

Agriculture recognizes that responsible levels of government, as well as individuals, must encourage and facilitate the use of our nation's prime farmland.

The USDA defines prime farmland as the best land for producing food, feed, forage, fiber and oilseed crops. This land has the soil quality, growing season and moisture supply needed to economically produce a sustained high yield of crops when it is treated and managed with acceptable farming methods. Prime farmland produces the highest yields with minimal inputs of energy and economic resources, and farming it results in the least damage to the environment. It does not include urban or built-up land or water areas. It must either be used for producing food or fiber or be available for these uses.

Prime farmland has few or no rocks and is permeable to water and air. The slope ranges mostly from zero to six percent. It is not excessively erodible or saturated with water for long periods, and is not frequently flooded during the growing season. Some soils are considered prime farmland only if they are drained or protected from flooding. For this study, it is assumed that measures have been taken to provide drainage and protection from flooding in those areas where prime farmland soils would be poorly drained or frequently flooded.

b. Extent of Prime Farmland

The tables in the following text provide an estimate of the area of prime farmland within the 10-mile wide I-70 Study Corridor on a county-by-county basis. The estimated acres (hectares) are based on the percent of prime farmland within each general soil association. These percentages were derived from information contained in the Natural Resources Conservation Service Soil Survey report of each county. The extent of prime farmland throughout the study corridor is presented in Exhibit III-13. Subsequent analysis of alternate I-70 improvement strategies will allow a determination of the estimated area of prime farmland impacted by each alternate strategy within each county.

Jackson County

Approximately 81,720 acres (33,071 hectares) or 21 percent of the total area of Jackson County meets the soil requirements for prime farmland. Corn, soybeans and wheat are the main crops in the county. More than 15 percent of the prime farmland in the county has been lost to industrial and urban uses.

Approximately 44 percent of the area or a total of 41,424 acres (16,764 hectares) of prime farmland are estimated to be within the I-70 Study Corridor (Table III-19).

Table III-19: Jackson County Prime Farmland

Soil Group Classification	Area of Soil Group Within I-70 Study Corridor – ac. (ha)	Percent of Soil Group Area Prime Farmland	Estimated Area of Prime Farmland Within I-70 Study Corridor – ac (ha)
Knox-Sibley-Urban Land Association	4,674 (1,891)	0%	0
Higginsville-Sibley-Sharpsburg Association	31,832 (12,882)	46%	14,643 (5,926)
Snead-Menfro-Oska Association	39,683 (16,059)	28%	11,111 (4,496)
Macksburg-Sharpsburg-Sampsel Association	3,913 (1,583)	64%	2,504 (1,013)
Kennebec-Colo-Bremer Association	13,166 (5,328)	100%	13,166 (5,328)
Total	**93,268 (37,744)**	**44.4%**	**41,424 (16,764)**

Lafayette County

Approximately 125,290 acres (50,703 hectares) or 31 percent of the total area of Lafayette County meets the soil requirements for prime farmland. Corn, soybeans, grain sorghum and small grains are the main crops in the county.

Approximately 31 percent of the area or a total of 62,347 acres (25,231 hectares) of prime farmland are estimated to be within the I-70 Study Corridor (Table III-20).

Table III-20: Lafayette County Prime Farmland

Soil Group Classification	Area of Soil Group Within I-70 Study Corridor – ac. (ha)	Percent of Soil Group Area Prime Farmland	Estimated Area of Prime Farmland Within I-70 Study Corridor – ac (ha)
Knox-Marshall Association	3,194 (1,293)	18%	575 (233)
Marshall-Higginsville Association	121,672 (49,239)	26%	31,635 (12,802)
Blackoar-Otter-Nodaway Association	9,964 (4,032)	85%	8,464 (3,425)
Winfield-Sampsel Association	67,727 (27,408)	32%	21,673 (8,771)
Total	**202,556 (81,972)**	**30.8%**	**62,347 (25,231)**

Johnson County

Approximately 137,446 acres (55,623 hectares) or 26 percent of the total area of Johnson County meets the soil requirements for prime farmland. Corn, soybeans, grain sorghum and winter wheat are the main crops in the county.

Approximately 42 percent of the area or a total of 4,685 acres (1,896 hectares) of prime farmland are estimated to be within the I-70 Study Corridor (Table III-21).

Table III-21: Johnson County Prime Farmland

Soil Group Classification	Area of Soil Group Within I-70 Study Corridor – ac. (ha)	Percent of Soil Group Area Prime Farmland	Estimated Area of Prime Farmland Within I-70 Study Corridor – ac (ha)
Macksburg-Sampsel Association	2,200 (890)	68%	1,496 (605)
Sampsel-Snead-Polo Association	8,119 (3,286)	30%	2,436 (986)
Zook-Dockery-Blackoar Association	753 (305)	100%	753 (305)
Total	**11,072 (4,481)**	**42.3%**	**4,685 (1,896)**

Saline County

Approximately 177,000 acres (71,629 hectares) or 36 percent of the total area of Saline County meets the soil requirements for prime farmland. Corn and soybeans are the main crops in the county.

Approximately 53 percent of the area or a total of 59,621 acres (24,128 hectares) of prime farmland are estimated to be within the I-70 Study Corridor (Table III-22).

Table III-22: Saline County Prime Farmland

Soil Group Classification	Area of Soil Group Within I-70 Study Corridor – ac. (ha)	Percent of Soil Group Area Prime Farmland	Estimated Area of Prime Farmland Within I-70 Study Corridor – ac (ha)
Knox-Menfro-Sibley Association	9,817 (3,973)	11%	1,080 (437)
Dockery-Colo Association	17,869 (7,231)	100%	17,869 (7,231)
Macksburg-Arispe Association	51,055 (20,661)	60%	30,633 (12,397)
Weller-Winfield-Goss Association	33,693 (13,635)	33%	11,119 (4,500)
Total	**112,433 (45,500)**	**53%**	**59,621 (24,128)**

Pettis County

Approximately 254,829 acres (103,126 hectares) or 58 percent of the total area of Pettis County meets the soil requirements for prime farmland. Corn, soybeans, grain sorghum and winter wheat are the main crops in the County.

Approximately 45 percent of the area or a total of 20,669 acres (8,364 hectares) of prime farmland are estimated to be within the I-70 Study Corridor (Table III-23).

Table III-23: Pettis County Prime Farmland

Soil Group Classification	Area of Soil Group Within I-70 Study Corridor – ac. (ha)	Percent of Soil Group Area Prime Farmland	Estimated Area of Prime Farmland Within I-70 Study Corridor – ac (ha)
Dockery-Tanglenook-Lamine Association	1,295 (524)	100%	1,295 (524)
Pershing-Greenton-Dockery Association	8,696 (3,519)	61%	5,305 (2,147)
Bluelick-Goss-Pembroke Association	19,596 (7,930)	42%	8,230 (3,331)
Arispe-Macksburg-Greenton Association	15,834 (6,408)	67%	10,609 (4,293)
Total	**45,420 (18,381)**	**45.5%**	**20,669 (8,364)**

Cooper County

Approximately 72,840 acres (29,477 hectares) or 20 percent of the total area of Cooper County meets the soil requirements for prime farmland. Corn and soybeans are the main crops in the county.

Approximately 38 percent of the area or a total of 57,011 acres (23,072 hectares) of prime farmland are estimated to be within the I-70 Study Corridor (Table III-24).

Howard County

Approximately 78,042 acres (31,583 hectares) or 26 percent of the total area of Howard County meets the soil requirements for prime farmland. Corn, soybeans, grain sorghum, wheat and hay are the main crops in the County.

Approximately 70 percent of the area or a total of 18,007 acres (7,287 hectares) of prime farmland are estimated to be within the I-70 Study Corridor (Table III-25).

Table III-24: Cooper County Prime Farmland

Soil Group Classification	Area of Soil Group Within I-70 Study Corridor – ac. (ha)	Percent of Soil Group Area Prime Farmland	Estimated Area of Prime Farmland Within I-70 Study Corridor – ac (ha)
Haynie-Waldron-Leta Association	9,135 (3,697)	90%	8,222 (3,327)
Menfro Association	91,098 (36,866)	10%	9,110 (3,687)
Dockery-Speed-Moniteau Association	26,198 (10,602)	100%	26,198 (10,602)
Arisburg Association	6,973 (2,822)	61%	4,253 (1,721)
Clafork-Leslie-Crestmeade Association	8,291 (3,355)	76%	6,301 (2,550)
Goss-Wrengart-Bluelick Association	9,443 (3821)	31%	2,927 (1,185)
Total	**151,138 (61,163)**	**37.7%**	**57,011 (23,072)**

Table III-25: Howard County Prime Farmland

Soil Group Classification	Area of Soil Group Within I-70 Study Corridor – ac. (ha)	Percent of Soil Group Area Prime Farmland	Estimated Area of Prime Farmland Within I-70 Study Corridor – ac (ha)
Winfield-Lindley-Mandeville Association	2,061 (834)	17%	350 (142)
Menfro-Lindley-Norris Association	3,046 (1,233)	15%	457 (185)
Leta-Haynie-Hodge Association	19,025 (7,699)	83%	15,791 (6,390)
Nodaway-Fatima-Bremer Association	1,409 (570)	100%	1,409 (570)
Total	**25,541 (10,336)**	**70.5%**	**18,007 (7,287)**

Boone County

Approximately 78,680 acres (31,841 hectares) or 18 percent of the total area of Boone County meets the soil requirements for prime farmland. Corn, soybeans, wheat and alfalfa are the main crops in the county.

Approximately 40 percent of the area or a total of 53,057 acres (21,471 hectares) of prime farmland are estimated to be within the I-70 Study Corridor (Table III-26).

Table III-26: Boone County Prime Farmland

Soil Group Classification	Area of Soil Group Within I-70 Study Corridor – ac. (ha)	Percent of Soil Group Area Prime Farmland	Estimated Area of Prime Farmland Within I-70 Study Corridor – ac (ha)
Putnam-Mexico Association	32,693 (13,230)	100%	32,693 (13,230)
Seymour Association	4,101 (1,660)	70%	2,871 (1,162)
Lindley-Hatton Association	32,233 (13,044)	23%	7,414 (3,000)
Gara Association	3,985 (1,613)	5%	199 (81)
Weldon-Union Association	34,921 (14,132)	10%	3,492 (1,413)
Winfield Association	11,385 (4,607)	0%	0
Menfro Association	7,384 (2,988)	5%	369 (149)
Onawa-Ray-Sharon Association	7,081 (2,866)	85%	6,019 (2,436)
Total	**133,781 (54,139)**	**39.6%**	**53,057 (21,471)**

Moniteau County

Approximately 110,470 acres (44,706 hectares) or 41 percent of the total area of Moniteau County meets the soil requirements for prime farmland. Corn, soybeans, wheat and alfalfa are the main crops in the county.

Approximately 34 percent of the area or a total of 466 acres (189 hectares) of prime farmland are estimated to be within the I-70 Study Corridor (Table III-27).

Table III-27: Moniteau County Prime Farmland

Soil Group Classification	Area of Soil Group Within I-70 Study Corridor – ac. (ha)	Percent of Soil Group Area Prime Farmland	Estimated Area of Prime Farmland Within I-70 Study Corridor – ac (ha)
Winfield Association	273 (110)	10%	27 (11)
Onawa-Sarpy-Huntington-Lindside Association	1,097 (444)	40%	439 (178)
Total	**1,371 (555)**	**34%**	**466 (189)**

Callaway County

Approximately 181,650 acres (73,511 hectares) or 33.7 percent of the total area of Callaway County meets the soil requirements for prime farmland. Soybeans, grain sorghum and winter wheat are the main crops in the county.

Approximately 46 percent of the area or a total of 82,285 acres (33,300 hectares) of prime farmland are estimated to be within the I-70 Study Corridor (Table III-28).

Table III-28: Callaway County Prime Farmland

Soil Group Classification	Area of Soil Group Within I-70 Study Corridor – ac. (ha)	Percent of Soil Group Area Prime Farmland	Estimated Area of Prime Farmland Within I-70 Study Corridor – ac (ha)
Mexico-Armstrong Association	86,823 (35,136)	79%	68,590 (27,757)
Keswick-Lindley-Gorin Association	73,581 (29,777)	17%	12,509 (5,062)
Goss-Gasconade Association	19,758 (7,996)	6%	1,186 (480)
Total	**180,162 (72,909)**	**45.7%**	**82,285 (33,300)**

Montgomery County

Approximately 164,200 acres (66,449 hectares) or 48.2 percent of the total area of Montgomery County meets the soil requirements for prime farmland. Corn, soybeans, and wheat are the main crops.

Approximately 41 percent of the area or a total of 48,138 acres (19,481 hectares) of prime farmland are estimated to lie within the I-70 Study Corridor (Table III-29).

Warren County

Approximately 76,100 acres (30,797 hectares) or 27.8 percent of the total area of Warren County meets the soil requirements for prime farmland. Corn, soybeans and wheat are the main crops.

Approximately 39 percent of the area or a total of 35,405 acres (14,328 hectares) of prime farmland are estimated to lie within the I-70 Study Corridor (Table III-30).

Table III-29: Montgomery County Prime Farmland

Soil Group Classification	Area of Soil Group Within I-70 Study Corridor – ac. (ha)	Percent of Soil Group Area Prime Farmland	Estimated Area of Prime Farmland Within I-70 Study Corridor – ac (ha)
Mexico-Armster-Putnam Association	62,448 (25,272)	64%	39,967 (16,174)
Goss-Gasconade-Chilhowie Association	48,263 (19,531)	5%	2,413 (977)
Nodaway-Moniteau-Dockery Association	5,758 (2,330)	100%	5,758 (2,330)
Total	**116,469 (47,133)**	**41.3%**	**48,138 (19,481)**

Table III-30: Warren County Prime Farmland

Soil Group Classification	Area of Soil Group Within I-70 Study Corridor – ac. (ha)	Percent of Soil Group Area Prime Farmland	Estimated Area of Prime Farmland Within I-70 Study Corridor – ac (ha)
Mexico-Armster-Putnam Association	53,361 (21,594)	60%	32,017 (12,957)
Goss-Gasconade-Chilhowie Association	37,758 (15,280)	5%	3,388 (1,371)
Total	**91,119 (36,875)**	**38.9%**	**35,405 (14,328)**

Lincoln County

Approximately 165,000 acres (66,773 hectares) or 41 percent of the total area of Lincoln County meets the soil requirements for prime farmland. The main crops grown on the land are corn and soybeans.

Approximately 16 percent of the area or a total of 1,558 acres (631 hectares) of prime farmland are estimated to lie within the I-70 Study Corridor (Table III-31).

Table III-31: Lincoln County Prime Farmland

Soil Group Classification	Area of Soil Group Within I-70 Study Corridor – ac. (ha)	Percent of Soil Group Area Prime Farmland	Estimated Area of Prime Farmland Within I-70 Study Corridor – ac (ha)
Goss-Gasconade-Brussels Association	9,755 (3,948)	15%	1,463 (592)
Menfro-Crider Association	193 (78)	49%	95 (38)
Total	**9,948 (4,026)**	**15.7%**	**1,558 (631)**

St. Charles County

Approximately 173,000 acres (70,011 hectares) or nearly 48 percent of St. Charles County's total acreage meet the soil requirements for prime farmland. Areas are scattered throughout the County, but most are in the northern half. Corn and soybeans are the main crops.

Approximately 21 percent of the area or a total of 15,470 acres (6,260 hectares) of prime farmland are estimated to lie within the I-70 Study Corridor (Table III-32).

Table III-32: St. Charles County Prime Farmland

Soil Group Classification	Area of Soil Group Within I-70 Study Corridor – ac. (ha)	Percent of Soil Group Area Prime Farmland	Estimated Area of Prime Farmland Within I-70 Study Corridor – ac (ha)
Armster-Mexico-Hatton Association	61,924 (25,060)	21%	13,004 (5,263)
Menfro-Harvester-Weller Association	7,639 (3,091)	14%	1,069 (433)
Goss-Crider-Gaterwood Association	1,752 (709)	10%	175 (71)
Dockery-Haymond-Sensabaugh Association	1,851 (749)	66%	1,222 (495)
Total	**73,166 (29,609)**	**21.1%**	**15,470 (6,260)**

Table III-33 presents a summary of the estimated area of prime farmland within the I-70 Study Corridor for each county. Throughout most of the study corridor there is minimal variation between the north half and the south half in regard to extent of prime farmland soils (see Exhibit III-13). However, there are exceptions that occur in Callaway and Montgomery Counties where the north half of the study corridor contains more prime farmland than the south half. This is due to the steeper terrain and extensive forested areas that occur south of I-70 in those two counties.

Table III-33: Summary of Estimated Prime Farmland

County	Estimated Area acres (hectares)
Jackson	41,424 (16,764)
Lafayette	62,347 (25,231)
Johnson	4,685 (1,896)
Saline	59,621 (24,128)
Pettis	20,669 (8,364)
Cooper	57,011 (23,072)
Howard	18,007 (7,287)

County	Estimated Area acres (hectares)
Moniteau	466 (189)
Boone	53,057 (21,471)
Callaway	82,285 (33,300)
Montgomery	48,138 (19,481)
Warren	35,405 (14,328)
Lincoln	1,558 (631)
St. Charles	15,470 (6,260)

5. WATER QUALITY

Water quality of the lakes, rivers, and streams are discussed within this section, as well as some of the factors that can influence the quality of water. Groundwater quality, floodplains and the wetland resources within the study area are also described.

It is important to characterize water quality by comparing conditions to standards designed to prevent harmful constituents from degrading the resource. Missouri Safe Drinking Water Law (RSMo 640.100-640.140) designates maximum contaminant levels of organic, inorganic, bacteriological and radiological constituents for public drinking water supplies. These maximum contaminant levels provide a good basis for determination of water quality, and will be used as criteria for surface water, as well as groundwater.

Missouri Clean Water Commission's Water Quality Standards (10 CSR 20-7) identify beneficial uses of waters, and lists criteria designed to protect each of those uses. A companion rule lists effluent regulations which set forth limits for various pollutants that are discharged to waters of the state, and define the anti-degradation policy. Water quality standards are revised at least every three years and comply with the latest changes to the Federal Clean Water Act. Both the

drinking water standards and the clean water law standards will be used in this report for comparison of water quality.

Section 303(d) of the Clean Water Act requires a state to list those waters not expected to meet state water quality standards even after application of conventional technology-based controls for which the total maximum daily load studies have not yet been completed.

The 1996 Missouri Water Quality Report lists several streams and lakes within the project corridor having one or more contamination problems. These pollutants include sewage, atrazine, chlordane, sediments and pH altered runoff from abandoned mine lands.

a. Lakes, Rivers and Streams

Virtually all of the I-70 Study Corridor is drained by the Missouri River, the exception being the Cuivre River Basin which flows into the upper Mississippi River. There are a number of major watersheds that flow into the Missouri that are crossed by I-70. The Missouri River drains just over one half of the state. The I-70 corridor crosses the Missouri River between Boonville and Columbia, about midway through the state. Generally the major streams in the study area have a meandering character in the western half of the state. As the topography becomes sharper in the eastern half, the streams tend to follow a more north and south direction, instead of the general easterly flow exhibited by many of the prairie streams of the western half of the state.

The United States has been subdivided by the U.S. Geological Survey into hydrologic units for analysis purposes. These are called regions, sub-regions, accounting units and cataloging units. Each has a unique hydrologic unit code or number associated with it, consisting of two to eight digits. The smallest, the cataloging unit, is also referred to as a watershed. The watersheds or water basins within the study area are listed below, and the hydrologic unit code for the watershed is included in parentheses.

The water basins that are in the project area include the following.

- Lower Missouri-Crooked (USGS HUC10300101)
- Blackwater (USGS HUC 10300104)
- Lamine (USGS HUC 10300103)
- Lower Missouri-Moreau (USGS HUC 10300102)
- Lower Missouri (USGS HUC 10300200)
- Cuivre (USGS HUC 0711008)

A generalized description of the basins is as follows:

- The Lower Missouri-Crooked watershed includes portions of two states and all or part of 13 counties both north and south of the Missouri River.
- The Blackwater watershed includes all or part of five counties, both north and south of I-70.
- The Lamine watershed includes portions of eight counties, both north and south of I-70.
- The Lower Missouri-Moreau watershed contains all or portions of 14 counties both north and south of the Missouri River.
- The Lower Missouri watershed contains all or portions of eight counties, both north and south of the Missouri River.

- The Cuivre watershed contains portions of seven counties all north of the Missouri River and flows into the upper Mississippi River.

Based on a review of the rules of Department of Natural Resources water quality report, it should be noted that none of the streams in the study area have been designated for cold-water sports fishery or outstanding national resource waters. Six streams have been designated outstanding state resource waters and are listed in the following sections.

The aquatic faunal regions and divisions of Missouri are as follows:

- Primarily Prairie Region, mostly Lower Missouri Division
- Big River Region, Missouri River Division
- One area of Ozark Region, Missouri Division as it is north of the Missouri River

Prairie Region streams occupy relative broad valleys, meandering in a natural configuration, typically with high alluvial banks. The stream pools tend to be quite long, the riffle sections may be poorly defined in some streams. Few of the streams have large springs and tend to be intermittent or have low base flow.

The Missouri River in the Big River Region has been altered from a braided channel river with a highly fluctuating flow to one with a relatively swift current and single narrow channel with few backwaters.

The Ozark Region, which is present in the eastern portion of the corridor, north of the Missouri River, is characterized by hilly topography and deeply dissected drainages with stream varying gradients.

The major water bodies found within the corridor include the following.

Jackson County

Water bodies that are crossed by I-70 or are within the study area include: Little Blue River, Sni-A-Bar Creek, Lake Jacomo and the Blue Springs Reservoir

Little Blue River – It drains about 225 square miles (582.7 km^2) of Jackson and Cass Counties, although flows have been substantially altered by the construction of several large reservoirs, including Lake Jacomo and Blue Spring Reservoir. The entire length of the Little Blue River is a metropolitan no-discharge stream. Discharges have been rerouted directly to the Missouri River. The Little Blue River has 33 miles (53 km) that have been contaminated by chlordane, due to urban runoff. Generally, urban and suburban development can and do affect water quality by sedimentation, channelization or alteration of the stream, erosion from construction sites and both fertilizer and pesticide use in agriculture and residential areas.

Sni-A-Bar Creek – It and its tributary, East Fork Sni-A-Bar Creek, drain both eastern Jackson and western Lafayette Counties. Sni-A-Bar creek is 32 miles (51.5 km) long and maintains a permanent flow even in droughts.

Lafayette County

Within Lafayette County I-70 crosses Horseshoe Creek, Little Horseshoe Creek, East Fork Sni-A-Bar Creek, Davis Creek and Mulkey Branch. Other notable water bodies near I-70 are the Tabo Creek watershed area and Concordia Lake on the north side of I-70, Odessa City Lake, Maple Leaf Lake and Edwin A. Pape Lake all of which lie on the south side of I-70.

The Odessa City Lake and Concordia Lake, totaling 354 acres (143.3 hectares), were contaminated by atrazine from corn and sorghum production. These lakes are listed as Section 303(d) waters not supporting public drinking water supply use.

Maple Leaf Lake – It lies immediately south of I-70 and two miles west of Missouri Route 13. The Maple Leaf Conservation Area contains 826 acres (334.3 hectares), and the lake covers 188 acres (76.1 hectares). Being at the upper limits of its watershed, a tributary of Davis Creek, water quality is influenced by adjacent land uses rather than stream inflow.

Davis Creek – It drains an extensive area, generally north of I-70 in Lafayette County before joining the Blackwater River in Saline County. Davis Creek has two reaches. The lower reach is 25 miles (40.2 km) long and maintains permanent flow even in droughts. The upper reach is 11.4 miles (18.3 km) long and does go dry in droughts but maintains permanent pools. Davis Creek is crossed by I-70 one mile east of Missouri Route 13. Davis Creek has a one mile reach that has been contaminated by sewage from the Odessa SE lagoon, which is listed as a Section 303(d) water body.

Saline County

In Saline County within the I-70 study area is located Davis Creek, Copperas Creek, Long Branch, Blackwater River, Salt Pond Creek, Heaths Creek and Blind Pony Lake.

Blackwater River – It is a major tributary of the Lamine River, draining almost 60 percent of the Lamine River watershed. The Blackwater River has been channelized in some areas and extensively altered in others. It is located within the Osage Plains region. Water quality is generally poor due to saline springs discharging into it, especially during periods of low flow. The Blackwater River also has excessive sediments, resulting from runoff from agricultural fields. In the Lafayette County portion of the basin (Davis Creek), detectable levels of atrazine have been found. The Blackwater River is 76 miles (122.3 km) long originating in Johnson County and flowing northeasterly on the south side of I-70 through the northwest corner of Pettis County and then passing under I-70 one mile (1.6 km) west of US 65 in Saline County. It maintains permanent flow even in droughts.

Cooper County

The main bodies of water in Cooper County that effect the I-70 study area are the Blackwater and Lamine Rivers, Petite Saline Creek, Chouteau Creek and the Missouri River which forms the northern boundary of Cooper County.

Lamine River - The Lamine River drains a 2,640 square-mile area (6,837.6 km^2) and includes portions of five counties in the study area, these are Johnson, Lafayette, Saline, Pettis and Cooper Counties. That portion of the watershed not drained by the Blackwater River/Davis Creek is within the Ozarks Plateau region. Water quality is good and generally better than the Blackwater River due to the absence of the saline springs. The Lamine River is 54 miles (86.9 km) long originating in Pettis County flowing northeast and north through the northwest corner of Morgan County before entering Cooper County and passing under I-70 west of Boonville. It maintains permanent flow even in drought.

Petite Saline Creek – It drains 182 square miles (471.4 km^2) in northern Moniteau and Cooper Counties and joins the Missouri River just upstream of the Eagle Bluffs Conservation Area. The lower reach of the Petite Saline Creek is 17 miles (27.4 km) long and maintains a permanent flow even in droughts while the upper 24 miles (38.6 km) may go dry in droughts but does maintain permanent pools.

Boone County

After crossing the Missouri River and entering Boone County, I-70 crosses Moniteau Creek, Perche Creek, Bear Creek, Hinkson Creek, Hominy Creek, North Fork Grindstone Creek, Little Cedar Creek and Cedar Creek which forms the east boundary of Boone County.

Perche Creek – It drains a small area of southern Randolph and northeastern Howard counties, but primarily it drains Boone County. Perche Creek discharges into the Missouri River near McBaine. Two tributaries of Perche Creek, Bear Creek and Kelly Branch, are currently included on the state's list for impaired waters for adverse effects from municipal wastewater treatment effluent. Perche Creek has three reaches: the first reach is 11 miles (17.7 km) long and is the standing water reach; the second reach is 17 miles (27.4 km) long and it maintains a permanent flow; the third reach is 21 miles (33.8 km) long and may go dry in droughts but does maintain permanent pools.

Perche Creek has a 0.5-mile (0.8 km) stretch that is polluted by sewage from Columbia. The Kelly Branch of Perche Creek has two miles of its length with pH problems from the coal abandoned mine lands. Neither of these waters is listed as Section 303(d) water.

Hinkson Creek – It is a tributary of Perche Creek, draining about 45 square miles (116.4 km^2) from north of Columbia to the south along the east side of the city. The creek has two reaches, the first reach is eight miles (12.9 km) long and maintains a permanent flow while the upper reach of 18 miles (29 km) may go dry but maintains permanent pools. Major tributaries include Mill Creek, Meredith and Goodin Branches, County House Branch, Flat Branch, Grindstone Creek, Hominy Branch and Nelson Creek. Most of this watershed is within the urban development of the City of Columbia.

Little Cedar Creek/Cedar Creek – Little Cedar Creek is a tributary of Cedar Creek, flowing from the north to its confluence with Cedar Creek, west of Millersburg. Since the closed or abandoned strip mine areas have been reclaimed, the water quality has steadily improved. A five-mile (8 km) stretch of Cedar Creek is still listed as being affected by acid mine drainage. Quarterly data from a USGS water-quality station on Cedar Creek near Columbia shows excessive concentrations of sulfate, iron, manganese and total dissolved solids, which is reflective of contamination due to acid mine drainage. Little Cedar Creek has one reach of six miles (9.7 km) that maintains permanent flow. Cedar Creek has two reaches, the first reach is 14 miles (22.5 km) long with permanent flow while the upper reach of 33 miles (53.1 km) may go dry in droughts but maintains permanent pools.

Losing Streams – There are a number of losing streams in Boone County, these include tributaries to Little Bonne Femme, Clear Creek, Gan's Creek, Jamerson Creek, Bonne Femme Creek, and Fowler Creek as well as Bass Creek, Fox Hollow Creek and Slate Creek.

Outstanding State Resource Waters – It should be noted that there are a number of streams in Boone County that have been classed as outstanding state resource waters and these include:

- One mile (1.6 km) of Bass Creek in Three Creeks Conservation Area.
- Two miles (3.2 km) of Bonne Femme Creek in Three Creeks Conservation Area.
- One-and-a-half miles (2.4 km) of Devil's Ice Box Cave Branch in Rock Bridge State Park.
- Three miles (4.8 km) of Gans Creek in Rock Bridge State Park.
- Four-and-six-tenths miles (7.4 km) of Turkey Creek in Three Creeks Conservation Area.

Callaway County

Callaway County's portion of the I-70 study area is home to Little Dixie Lake and is crossed by Maddox Branch, Auxvasse Creek and Whetstone Creek.

Auxvasse Creek – Bynum Creek, an Auxvasse Creek tributary, has 0.3 miles (0.5 km) contaminated by sediments from the Auxvasse Stone Company.

Whetstone Creek – Five-and-one-tenth miles (8.2 km) of Whetstone Creek in the Whetstone Creek Conservation Area is considered as being outstanding state resource waters.

Montgomery County

The Loutre River is crossed by I-70 in Montgomery County and the Golden Eagle and Pinnacle Lakes are to be found in the I-70 study area. None of the streams or lakes of the study area are listed in the 1996 MWQR.

Loutre River – It flows generally southeast and south to its confluence with the Missouri River near Hermann. It has a drainage area of approximately 270 square miles (570 km^2). The Loutre River has two reaches, the first being approximately 36 miles (57 km) long which maintains perennial flow while the upper reach of 13.5 miles (21.7 km) maintains permanent pools. The Loutre River runs along the western boundary of the Graham Cave State Park, which lies just north of I-70 in the western part of the County.

Warren County

Some of the water bodies to be found in the I-70 study area in Warren County are Massie Creek, Lost Creek, Camp Branch, Big Creek, Indian Camp Creek, Peruque Creek and Charrette Creek. None of the streams or lakes of the study area, in this county, are listed in the 1996 MWQR.

Massie Creek – It flows southwest from Jonesburg to a confluence with the Loutre River near Case. The lower section of the creek is approximately seven miles (11.2 km) long and maintains permanent flow while the upper section is four miles (6.4 km) long and maintains permanent pools.

Lost Creek – It flows south from the vicinity of the Warren County Lake, west of Warrenton, and then flows south to the Loutre River at its confluence with the Missouri River. The two reaches are the same as Massie Creek.

Charrette Creek – It drains most of eastern Warren County. It commences southeast of Warrenton and flows southward to its confluence with the Missouri River, north of Washington. It has three reaches, of which the first two have permanent flow and are 16.5 miles (26.5 km) long, the upper reach of the Charrette Creek is five miles (8 km) long.

St. Charles County

Peruque Creek, Lake St. Louis and McCoy Creek are water bodies that can be found within the I-70 study area.

Peruque Creek – It flows eastward from Wright City in Warren County, paralleling I-70, passing south of Wentzville in St. Charles County and, for the study area, terminating at Lake St. Louis.

The first four miles (6.4 km) above Lake St. Louis has permanent flow. The second reach some 8.5 miles (13.7 km) long maintains permanent pools.

b. Groundwater

Groundwater of varying quality and source is an important resource in the study corridor. The groundwater in the area from Independence to Boonville is classified as saline, containing high percentages of dissolved solids and is considered unusable. This groundwater province contains water with 1,000 ppm or greater dissolved solids.

The groundwater quality increases slightly from Boonville to St. Charles; dissolved solids average approximately 300 to 500 ppm, yielding ratings from good to poor.

Large amounts of high quality groundwater are available in the alluvium of the Missouri River and its large tributaries. Since the study corridor roughly parallels the Missouri River, most public water supplies are taken from either wells in the alluvium or directly from intakes located in the river.

Municipalities from Independence to Boonville obtain water from either wells in the alluvium, river intakes, or surface water impoundments. Otherwise, municipalities from Boonville (Columbia, New Florence, Wright City, Warrenton and Wentzville) to St. Charles rely on wells in the deeper Ordovician and Cambrian Ozark Aquifer for water.

c. Floodplains

As part of the National Flood Insurance Program, many communities and counties have performed flood insurance studies to identify flood hazards for floodplain management and flood insurance purposes. The administration of the National Flood Insurance Program, performed by the Federal Emergency Management Agency, entails detailed studies of flood-prone streams and rivers for the determination of flood boundaries and flood hazards. The level of detail for the studies varies depending on the severity of the flooding hazards and other factors. The floodplains of the regulatory streams within the I-70 Study Corridor are included on Exhibits III-1 to III-9.

The data used to create the floodplain map was derived from flood insurance studies, flood boundary and floodway maps, flood insurance rate maps, and flood hazard boundary maps, published by FEMA. Some of the data was acquired from GIS data available on the Internet, FEMA Q3 flood data. The specifications for the horizontal control of Q3 flood data files are consistent with those required for mapping at a scale of 1:24,000. The Q3 flood data are developed by electronically scanning the current effective map panels of existing paper flood insurance rate maps. Certain key features are digitally captured and then converted into area features (floodplain boundaries, flood insurance zones, political boundaries).

Floodplain Descriptions

The Missouri River and several of its major tributary watersheds are the dominant features of the I-70 corridor. The western section of the corridor generally parallels the Missouri's southern bank. The river crosses through the corridor where Cooper, Howard and Boone Counties adjoin, west of Columbia. The eastern section of the corridor parallels the northern bank of the Missouri River.

The soil beneath the floodplain of the Missouri River is composed primarily of Quaternary alluvial sand and gravel. These deposits are generally less than 100 feet (30.5 m) thick and

consist primarily of fine- to medium-grained sand and fine-grained gravel inter-layered with lesser amounts of silt and clay. In some areas, deposits associated with glacial activity occur beneath the more recent river deposits; these mostly consist of clay-rich glacial till and fine- to coarse-grained sediments washed out of glaciers and/or alluvium.

In 1993, record precipitation caused flooding along the Missouri River floodplain. The flood was an unprecedented event exceeding 100-year flood predictions for the lower Missouri River. The force of flood waters moving downstream breached levees, eroded the adjacent land (creating large depressions), and deposited silt and sand throughout the floodplain. Reportedly, the flood affected several areas of existing I-70, however the grade has been raised in most of the problem areas. There are a few places where water reached the shoulder of the highway, but these areas were easily controlled with sandbagging. The problematic areas that remain are: Davis Creek in Saline County, one mile (1.6 km) west of Sweet Springs; the Blackwater River in Saline County, one mile (1.6 km) west of US 65; the Missouri River Bottom in Cooper County; Loutre River in Montgomery County; and Dardenne and Spencer Creeks in St. Charles County.

Little Blue River – In Jackson County the corridor is impacted by the Missouri River, immediately to the north. Two major tributaries, Little Blue River and Sni-A-Bar Creek, cross the study area. The Little Blue River watershed generally covers the study corridor south to north, through dense urban development, including Kansas City, Lee's Summit and Independence. At existing I-70, the drainage area is nearly 200 square miles (518 km^2). The floodplain is 0.78 miles (1.26 km) wide at its widest point, north of existing I-70, and 0.28 miles (0.45 km) wide south of I-70. In Blue Springs, to the north of existing I-70, Burr Oak Branch has a defined floodplain of 250 feet (76 m) and a regulatory floodway of 160 feet (49 m). In the southern part of the corridor, there are lakes on several of the Little Blue River tributaries---most notably Lake Jacomo, Lakewood Lakes, Blue Springs Lake and Lake Tapawingo.

Urban development within the floodplain of the Little Blue River has contributed to considerable flood damage potential. There has been an ongoing channel-improvement project and the construction of flood-control reservoirs (Longview Lake and Blue Springs Lake) in this watershed.

Sni-A-Bar Creek – Sni-A-Bar Creek, about nine miles (14.5 km) to the east of the Little Blue River, has a floodplain that is generally 0.56 miles (0.90 km) wide, and a drainage area of approximately 100 square miles (259 km^2) at the I-70 crossing. The watershed covers the study area from south to north.

Grain Valley and Oak Grove are immediately south of the existing I-70 alignment, to the west and east of Sni-A-Bar Creek. Just east of Grain Valley, after crossing I-70, the stream parallels the highway about a mile to the north for nearly four miles (6.4 km) before turning northeast to join the Missouri River.

Horseshoe Creek, a tributary of Sni-A-Bar Creek, with a drainage area of 13.2 square miles (34.2 km^2), impacts the southern two-thirds of the corridor along the Jackson-Lafayette County Line.

Sni-A-Bar Creek is a recognized flooding source, and its tributaries can experience flooding caused by locally intense rainfall. The watershed is mainly farmland with some suburban development; the most prominent obstructions within floodplains in this watershed are road fills and bridges.

East Fork Sni-A-Bar Creek – Approximately 4.25 miles (6.80 km) east of the Jackson-Lafayette County Line, East Fork Sni-A-Bar Creek flows south to north across the study corridor, with a drainage area of about 40 square miles (104 km^2) at existing I-70. The floodplain is generally 0.28-0.45 miles (0.45-0.72 km) wide. The land use in this watershed is generally agricultural.

Blackwater River – The Blackwater River enters the corridor near its southern limit, at the Lafayette-Saline County Line. It flows northeast before being joined by Davis Creek, then eastward through the corridor another 13 miles (21 km), into Cooper County---where it joins the Lamine River. The southern edge of the corridor, near the Lafayette-Johnson County Line, is dominated by the floodplains of several major Blackwater tributaries: The Mulkey, Peavine, Panther, Goose and Copper Creeks; Harpers Brook; and Long Branch.

The Blackwater River watershed (major component of the Lamine River watershed) covers the corridor area in the eastern half of Lafayette County, western Pettis County, and Saline County. This watershed covers nearly 1,550 square miles (4,014 km^2) of farm and pastureland, and is the major component of the Lamine River watershed.

Davis Creek – Davis Creek, with a drainage area of over 250 square miles (647 km^2), is a main tributary to the Blackwater River. This stream flows west to east through the center of the I-70 corridor for nearly 30 miles (47.5 km), to its confluence with the Blackwater River just east of the Lafayette-Saline County Line.

Lamine River – The Lamine River enters the study corridor, flowing from the southwest, near the Pettis-Cooper County Line. Heaths Creek, a major tributary with a drainage area of approximately 65 square miles (168 km^2), flows eastward along the Saline-Pettis County Line for more than 10 miles (16 km) and into Cooper County, to its confluence with the Lamine River. The river then parallels existing I-70 immediately to the south of the roadway for four miles (6.4 km) before crossing to the north. In this area, the Lamine floodplain is about 0.5 miles (0.81 km) wide. North of the highway, the floodplain widens to nearly one mile (1.61 km) and the river flows to the east for another four miles (6.4 km), parallel to the highway, before turning north toward its confluence with the Missouri River---a distance of 4.5 miles (7.2 km). The Lamine River drains approximately 1,090 square miles (2,823 km^2) of agricultural land.

The Lamine River (41 percent of the watershed) and the Blackwater River (59 percent of the watershed) combine to form the Lamine River watershed. This watershed encompasses all of Pettis County, most of Johnson and Saline Counties, portions of Lafayette and Cooper Counties within the corridor, and portions of Benton, Morgan and Moniteau Counties outside the study area.

Missouri River – East of the Lamine River watershed, the Missouri River is included in the study area---flowing generally west to east in the northern half of the corridor for a distance of 16.5 miles (26.6 km). The Missouri River floodplain is 2.23-2.80 miles (3.6-4.5 km) wide along this section. As the river angles to the southeast, crossing through the corridor and flowing along the Cooper-Boone County Line, the floodplain is generally confined to two miles (3.2 km). The floodway width is one mile (1.6 km). The floodplain is defined by high bluffs, which are especially prominent to both the north and the east. A levee system protects farmlands between the bluffs. However, in the floods of 1993 and 1995, many of the levees failed and the floodplain was completely inundated, as well as lower areas behind the bluffs. The Missouri River has a drainage area of over 500,000 square miles (1,294,994 km^2) at the Rocheport Bridge.

Petite Saline Creek – Draining a total of 250 square miles (647 km^2), Petite Saline Creek dominates the southern half of the corridor in this section, as it flows 16.5 miles (26.6 km) west to east, south of I-70, to join the Missouri River. Its floodplain is typically 0.34 miles (0.54 km) wide.

Perche Creek – The Perche Creek watershed impacts the study area for about 13.4 miles (21.6 km), east of the Cooper-Boone County Line. Perche Creek flows north to south across the corridor, to join the Missouri River at the southern edge of the study area. Callahan Creek, Barclay Branch and Rocky Fork Creek are major tributaries from the north; Sugar and Midway Branches join from the west; and Hinkson Creek, Bear Creek, Cow Branch and Harmony Creek flow east to west to join Perche Creek.

The watershed covers 390 square miles (1,010 km^2) in Boone County. Within the corridor, the floodplain is generally 0.56 miles (0.90 km) wide, with a 0.4 mile (0.61 km) floodway.

Hinkson Creek – Hinkson Creek, the main Perche Creek tributary, crosses the corridor at the east city limits of Columbia, then turns to flow westward south of existing I-70, to their confluence. Hinkson Creek drains 88 square miles (228 km^2), has a floodplain that varies from 0.09 miles (0.14 km) to 0.2 miles (0.32 km) in width, and a defined floodway from 0.03-0.15 miles (0.05-0.24 km). Major tributaries include Mill Creek, Meredith and Goodin Branches, County House Branch, Flat Branch, Grindstone Creek, Hominy Branch and Nelson Creek.

Most of the Hinkson Creek watershed is within the urban development of the City of Columbia, and portions of the floodplain have been urbanized. Within Columbia, portions of the floodplain are impacted by levees.

Cedar Creek – Cedar Creek flows north to south across the corridor and defines the Boone-Callaway County Line. Its floodplain is 0.13 miles (0.22 km) wide. The Cedar Creek watershed, covering approximately 200 square miles (518 km^2) of agricultural and pasture land, is roughly 7.5 miles (12.0 km) wide in this area. Within this watershed, Little Cedar Creek, 1.3 miles (2.2 km) to the west, has a 0.17-mile (0.27-km) wide floodplain. It joins Cedar Creek toward the southern limit of the study area.

Auxvasse Creek – Auxvasse Creek drains most of eastern Callaway County and the southwest corner of Audrain County. This is a 220 square-mile (570 km^2) area. Within the watershed are two notable tributaries, Bynum Creek and Stinson Creek. The floodplain of this system ranges in the corridor from 0.07 miles (0.11 km) to 0.21 miles (0.34 km) wide.

Loutre River – Loutre River is approximately 35 miles (56 km) in length and includes several small tributaries. The watershed drains parts of Audrain, Callaway, Montgomery and Warren Counties, a total of approximately 270 square miles (700 km^2). At existing I-70, the floodplain is near its widest point of 0.83 miles (1.33 km). The northern portion and tributaries are narrower.

Cuivre River – Cuivre River is the only major river basin included in the corridor that does not drain into the Missouri River. The Cuivre River is the southernmost major river basin on the upper Mississippi River. It is 60 miles (96.56 km) long and 40 miles (64.37 km) wide, but only a small portion of this is included in the study. The river drains the easternmost 170 square miles (440 km^2) of the northern half of the corridor, including portions of Lincoln, Montgomery, Warren and St. Charles Counties. The river also drains portions of Audrain and Pike Counties not included in the corridor. Notable tributaries in the study area are Elkhorn Creek and Indian Camp Creek. The floodplain is widest near the border of the study area on the Cuivre River at 0.21 miles (0.34 km) and decreases as it nears the highway.

Other Watersheds – There are two small creeks that drain into the Mississippi River, the Peruque Creek and the Dardenne Creek. There is very little information available for these smaller streams and their watersheds. These creeks are located on the eastern edge of the corridor in St. Charles County. The Peruque Creek is 10 miles (16 km) in length and the Dardenne Creek is 13 miles (20.92 km) in length. Within the corridor, they each drain an approximate 35 square miles (90.6 km^2) of land.

d. Wetlands

Executive Order 11990, "Protection of Wetlands", requires federal agencies to avoid to the extent practicable, long- and short-term impacts associated with the destruction or modification of wetlands. More specifically, it directs federal agencies to avoid new construction in wetlands unless there is no practical alternative. It further states that, where wetlands cannot be avoided, the proposed action must include all practical measures to minimize harm to the wetlands.

The Clean Water Act of 1973 is the regulatory authority over all activities in "Waters of the U.S. Section 404 of the act regulates discharges of dredged or fill materials, into "Waters of the United States," which includes jurisdictional wetlands and other special aquatic sites.

The regulatory definition of wetlands, as adopted by the EPA and the U.S. Army Corps of Engineers to administer the Section 404 permit program, is as follows:

> *(Wetlands are) those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, bogs, and similar areas (EPA, 40 CFR 239.2 and CE, 33 CFR 328.3).*

As in definitions by other agencies, such as the U.S. Fish and Wildlife Service, this definition recognizes and emphasizes the fact that wetlands must possess three essential characteristics: hydric soils, a prevalence of hydrophytic vegetation, and a persistent wetland hydrology. Hydrology is considered the driving force behind the creation of all wetlands. These three characteristics are the mandatory technical criteria required for wetland determination. Areas must meet all three of these criteria before a positive determination of a wetland can be made.

Wetlands are usually classified according to a system developed by the U.S. Fish and Wildlife Service. This system is often referred to as the Cowardin System after its principal author (Cowardin et al, 1979). This classification system also includes deepwater habitats, or permanently flooded lands lying below the deepwater boundaries of wetlands. This classification system is used on the U.S. Fish and Wildlife Service's national wetlands inventory maps and is useful for establishing the type of ecosystem being inventoried. However, jurisdictional wetland determinations performed for regulatory purposes are not dependent on this classification system, but on the three mandatory criteria previously mentioned.

Study Corridor Wetlands/Aquatic Sites

After a review of the national wetlands inventory data, it was determined that the palustrine, riverine, and lacustrine Cowardin wetland systems and deepwater aquatic habitats are represented in the study corridor. For manageable inventory purposes in this study, these systems were categorized into four groups of Cowardin wetland classifications as follows:

- ***Palustrine Vegetated Wetlands –*** This palustrine system includes all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens. The types of Cowardin classifications in this category include aquatic bed, emergent, scrub-

shrub and forested. These are predominantly located in low-lying, level areas adjacent to streams. The wetlands classified as PAB are small, and relatively very few occur within the study corridor.

- ***Palustrine Upland Ponds –*** The types of Cowardin classifications in this category include unconsolidated bottom and unconsolidated shore. These are mainly upland ponds with open water. Most of them are man-made and are distributed evenly throughout the study corridor.
- ***Riverine Wetlands –*** The riverine system includes all wetlands and deepwater habitats contained within a channel. The types of Cowardin classifications in this category include lower perennial, upper perennial and intermittent. These are the major streams and rivers throughout the study corridor.
- ***Lacustrine Wetlands –*** The lacustrine system includes wetlands and deepwater habitats situated in a topographic depression or a dammed stream channel, with minimal vegetative growth. The types of Cowardin classifications in this category include limnetic and littoral. These are the lakes, or deepwater habitats with large areas of open water, that occur throughout the study corridor.

Table III-34 presents totals in acres (hectares), within the study corridor, of each wetland category for each county according to the mapped national wetlands inventory wetland types. Approximately 53 percent of the sites mapped in the study corridor are of the palustrine vegetative category, comprised of the palustrine emergent, scrub-scrub, and forested wetlands and those that are classified as palustrine aquatic bottom. The palustrine upland ponds, consisting of the unconsolidated bottom or unconsolidated shore classification, account for approximately 25 percent of the total areas. The riverine perennial and riverine intermittent category accounts for approximately 13 percent of the total sites mapped in the study corridor, and the lacustrine category comprises approximately 9 percent of the total.

Table III-34: Potential Wetland Areas in acres (hectares)

COUNTY	NWI MAPPED WETLAND TYPES acres (hectares)				TOTAL WETLAND AREA acres (hectares)
	Palustrine Vegetated Wetlands (PAB, PEM, PSS, PFO)	**Palustrine Upland Ponds** (PUB, PUS)	**Riverine** (R2, R3, R4)	**Lacustrine** (L1, L2)	
Jackson	1961 (794)	802 (325)	55 (22)	1082 (438)	3900 (1578)
Lafayette	1903 (770)	1892 (766)	96 (39)	697 (282)	4588 (1857)
Johnson	201 (81)	86 (35)	1 (0.4)	0	288 (117)
Saline	4819 (1950)	691 (280)	121 (49)	169 (68)	5800 (2347)
Pettis	1381 (559)	182 (74)	59 (24)	0	1622 (656)
Cooper	3218 (1302)	859 (348)	2440 (987)	46 (19)	6563 (2656)
Howard	1670 (676)	85 (34)	1466 (593)	0	3221 (1303)
Moniteau	123 (50)	1 (0.4)	166 (67)	0	290 (117)
Boone	1881 (761)	1534 (621)	720 (291)	147 (59)	4282 (1733)
Callaway	2241 (907)	1462 (592)	349 (141)	509 (206)	4561 (1846)
Montgomery	2216 (897)	955 (386)	287 (116)	287 (116)	3745 (1516)
Lincoln	176 (71)	84 (34)	53 (21)	0	313 (127)
Warren	1073 (434)	1587 (642)	97 (39)	543 (220)	3300 (1335)
St. Charles	799 (323)	627 (254)	24 (10)	600 (243)	2050 (830)
Total	**23,662 (9576)**	**10,847 (4390)**	**5934 (2401)**	**4080 (1651)**	**44,523 (18,018)**

The text that follows discusses the extent of the mapped Cowardin wetland categories on a county by county basis within the study corridor. The category containing the unconsolidated bottom and unconsolidated shore types of classifications consists of numerous upland ponds distributed evenly throughout the study corridor. Their extent is similar in each county and on each side of I-70. Most, if any, wetland areas associated with these ponds would most likely be minimal areas of emergent vegetation on the fringe. If fringe wetlands are not present at a pond, it may or may not be subject to regulation as "Waters of the U.S." depending upon its location in the uplands.

In addition, there are several intermittent streams, the extent of which is relatively similar in each county. Although there may be no mapped national wetlands inventory wetlands adjacent to these streams, the presence of an ordinary high-water mark makes them subject to regulation as "Waters of the U.S." by the Corps of Engineers. The lakes in the study corridor are also regulated as "Waters of the U.S."

Jackson County

Palustrine Vegetated Wetlands (PAB, PEM, PSS, PFO) – Approximately 50 percent of the mapped NWI wetlands within the study corridor in this county fall into this category. These types of potential wetland areas are mapped adjacent to the Little Blue River and along its tributaries. On the south side of I-70 the course of the Little Blue River is mapped as palustrine forested. The East Fork of the Little Blue River north of Blue Springs Lake has adjacent areas mapped as palustrine forested, including a large area just north of I-70. Sni-A-Bar Creek is mapped as palustrine forested and has extensive palustrine forested areas mapped adjacent to it, with some emergent and scrub-shrub areas. The larger concentrations of these areas occur just north of Oak Grove. Some of the tributaries of Sni-A-Bar Creek are also mapped as palustrine forested.

Palustrine Upland Ponds (PUB, PUS) – Approximately 21 percent of the mapped NWI wetlands within the study corridor in this County fall into this category.

Riverine Wetlands (R) – Approximately one percent of the mapped NWI wetlands within the study corridor in this county fall into this category. The Little Blue River is mapped as a riverine lower perennial stream north of I-70.

Lacustrine Wetlands (L) – Approximately 28 percent of the mapped NWI wetlands within the study corridor in this county fall into this category. The larger lakes in the study corridor of this county include Lake Tapawingo in Blue Springs, Blue Springs Lake and Lake Jacomo. There are also a few smaller lakes scattered throughout the study corridor in the county.

Lafayette County

Palustrine Vegetated Wetlands (PAB, PEM, PSS, PFO) – Approximately 42 percent of the mapped NWI wetlands within the study corridor in this county fall into this category. Sni-A-Bar Creek is mapped as palustrine forested and has extensive palustrine forested areas mapped adjacent to it, with some emergent and scrub-shrub areas. The east fork of Sni-A-Bar Creek is also mapped as palustrine forested. Tabo Creek and Brush Creek each have some portions mapped as palustrine forested or adjacent areas mapped as such, with a few areas of emergent and scrub-shrub. Davis Creek north of I-70 has concentrated adjacent palustrine forested areas and a few small emergent wetland areas northeast of Aullville and northeast of Concordia. Panther Creek in the far southeast corner of Lafayette County contains adjacent areas of palustrine forested wetlands and some small emergent and scrub-shrub areas.

Palustrine Upland Ponds (PUB, PUS) – Approximately 41 percent of the mapped NWI wetlands within the study corridor in this county fall into this category.

Riverine Wetlands (R) – Approximately two percent of the mapped NWI wetlands within the study corridor in this county fall into this category. Most of Davis Creek north of I-70 is mapped as a riverine lower perennial stream.

Lacustrine Wetlands (L) – Approximately 15 percent of the mapped NWI wetlands within the study corridor in this county fall into this category. The larger lakes in the study corridor of this county include Higginsville City Lake, Maple Leaf Lake, Edwin A. Pape Lake, two lakes southwest of Odessa, and one 3.5 miles (5.6 km) west of Mayview. There are also a few smaller lakes scattered throughout the study corridor in the county.

Johnson County

Palustrine Vegetated Wetlands (PAB, PEM, PSS, PFO) – Approximately 70 percent of the mapped NWI wetlands within the study corridor in this county fall into this category. The Blackwater River in the far northeast corner of the county has a concentrated area of palustrine forested, emergent and scrub-shrub areas adjacent to the river.

Palustrine Upland Ponds (PUB, PUS) – Approximately 30 percent of the mapped NWI wetlands within the study corridor in this county fall into this category.

Riverine Wetlands (R) – Approximately 0.1 percent of the mapped NWI wetlands within the study corridor in this county fall into this category. The Blackwater River in the far northeast corner of the county is mapped as a riverine lower perennial stream.

Lacustrine Wetlands (L) – There are no lacustrine wetlands mapped in the portion of the county that lies in the study corridor.

Saline County

Palustrine Vegetated Wetlands (PAB, PEM, PSS, PFO) – Approximately 83 percent of the mapped NWI wetlands within the study corridor in this county fall into this category. The Blackwater River runs from west to east through the study corridor of this county and has several adjacent areas of palustrine forested wetlands mapped, with a few emergent and scrub-shrub areas. The larger concentrations of these areas occur around and to the west of Sweet Springs, and near the crossings of I-70 and US 65. There is also a concentrated area of palustrine forested wetlands adjacent to Davis Creek and Salt Pond Creek located west and northwest of Sweet Springs. There are palustrine forested and palustrine emergent wetland areas at Davis Creek on the south side of I-70 that are also in the wetland reserve program of the Natural Resources Conservation Service. The other tributaries of the Blackwater River, such as Crooked Creek, North Fork, Salt Fork and Flat Creek are mapped as palustrine forested wetlands with small adjacent emergent and scrub-shrub areas.

Palustrine Upland Ponds (PUB, PUS) – Approximately 12 percent of the mapped NWI wetlands within the study corridor in this county fall into this category.

Riverine Wetlands (R) – Approximately two percent of the mapped NWI wetlands within the study corridor in this County fall into this category. Much of the Blackwater River in the study corridor of this County is mapped as a riverine lower perennial stream.

Lacustrine Wetlands (L) – Approximately 3% of the mapped NWI wetlands within the study corridor in this county fall into this category. The largest lake in the study corridor of this county

is Blind Pony Lake located 3.5 miles (5.6 km) northeast of Sweet Springs. There is also a smaller lake in the far southwest corner of the county located at the edge of the Ralph and Martha Perry Conservation Area.

Pettis County

Palustrine Vegetated Wetlands (PAB, PEM, PSS, PFO) – Approximately 85 percent of the mapped NWI wetlands within the study corridor in this county fall into this category. In the far northwest corner of the county, the Blackwater River and its south fork have large concentrations of mapped palustrine forested wetlands along with some smaller emergent and scrub-shrub areas. Most of Heath's Creek, located in the northeast portion of the county, is mapped as palustrine forested with some occasional occurrences of emergent and scrub-shrub wetlands.

Palustrine Upland Ponds (PUB, PUS) – Approximately 11 percent of the mapped NWI wetlands within the study corridor in this county fall into this category.

Riverine Wetlands (R) – Approximately four percent of the mapped NWI wetlands within the study corridor in this county fall into this category. The Blackwater River in this part of the study corridor is mapped as a riverine lower perennial stream.

Lacustrine Wetlands (L) – There are no lacustrine wetlands mapped in the portion of the county that lies in the study corridor.

Cooper County

Palustrine Vegetated Wetlands (PAB, PEM, PSS, PFO) – Approximately 49 percent of the mapped NWI wetlands within the study corridor in this county fall into this category. The largest water resource in the study corridor of Cooper County is the Missouri River located at the northern boundary of the county. Adjacent to it, on the south side of the river, is some relatively small scattered areas mapped as a mix of palustrine emergent, scrub-shrub and forested wetlands. However, there is a large concentration of mostly palustrine emergent and scrub-shrub wetlands mapped adjacent to the Missouri River on the southeast side of I-70. The Lamine River and the Blackwater River on the west side of the county's study corridor each have narrow bands of palustrine forested wetlands mapped, with a few emergent and scrub-shrub areas. At the I-70 crossing of Chouteau Creek west of Boonville, there are palustrine emergent and palustrine forested wetland areas on both sides of I-70 that are also in the wetland reserve program of the Natural Resources Conservation Service. The Petite Saline Creek, located in the south half of the study corridor, and its tributaries are mapped as narrow scattered bands of predominantly palustrine forested wetlands.

Palustrine Upland Ponds (PUB, PUS) – Approximately 13 percent of the mapped NWI wetlands within the study corridor in this county fall into this category.

Riverine Wetlands (R) – Approximately 37 percent of the mapped NWI wetlands within the study corridor in this county fall into this category. The Missouri River, the Lamine River and the Blackwater River within the study corridor are mapped as riverine lower perennial streams. In addition, a five-mile (8 km) stretch of the Petite Saline Creek is mapped as a riverine lower perennial stream to the Missouri River.

Lacustrine Wetlands (L) – Approximately one percent of the mapped NWI wetlands within the study corridor in this county fall into this category. There is one small lake located six miles (9.7 km) west of Pilot Grove, and one located outside of Boonville north of I-70.

Howard County

Palustrine Vegetated Wetlands (PAB, PEM, PSS, PFO) – Approximately 52 percent of the mapped NWI wetlands within the study corridor in this county fall into this category. The largest water resource in the study corridor of Howard County is the Missouri River located at the southern boundary of the county. Adjacent to it, on the north side of the river, are several areas mapped as palustrine emergent and scrub-shrub wetlands, with a few forested wetlands. The largest concentrations of these are located in the floodplain on the north side of the river, from Boonville west to the north boundary of the study corridor. Two other concentrated areas are located on the north side of the Missouri River. One is at the east end of the Franklin Island Conservation Area, and the other one is just north of the Diana Bend Conservation Areas. Moniteau Creek is mapped as a narrow band of palustrine forested wetland up to the eastern county line.

Palustrine Upland Ponds (PUB, PUS) – Approximately three percent of the mapped NWI wetlands within the study corridor in this county fall into this category.

Riverine Wetlands (R) – Approximately 46 percent of the mapped NWI wetlands within the study corridor in this county fall into this category. The Missouri River is mapped as a riverine lower perennial stream. In addition, Bonne Femme Creek, located on the north side of the Franklin Island Conservation Area, is mapped as a riverine lower perennial stream, as is Moniteau Creek where it runs along the eastern county line.

Lacustrine Wetlands (L) – There are no lacustrine wetlands mapped in the portion of the County that lies in the study corridor.

Boone County

Palustrine Vegetated Wetlands (PAB, PEM, PSS, PFO) – Approximately 44 percent of the mapped NWI wetlands within the study corridor in this county fall into this category. The north side of the Missouri River has some relatively narrow areas mapped as palustrine forested wetlands located southeast of I-70. Perche Creek and its smaller tributaries, located west of Columbia, have several narrow bands mapped as palustrine forested wetlands, with a few scattered emergent and scrub-shrub areas. There is also a concentration of mapped wetlands adjacent to Callahan Creek, and one located below the confluence of Callahan Creek and the Barclay Branch, northwest of Columbia. Cedar Creek located on the east county line, and Little Cedar Creek are both mapped as narrow palustrine forested wetlands, with smaller occurrences of emergent and scrub-shrub wetlands. Cedar Creek also has a concentrated area of mapped wetlands in the north quarter of the study corridor.

Palustrine Upland Ponds (PUB, PUS) – Approximately 36 percent of the mapped NWI wetlands within the study corridor in this county fall into this category.

Riverine Wetlands (R) – Approximately 17 percent of the mapped NWI wetlands within the study corridor in this county fall into this category. The Missouri River is mapped as a riverine lower perennial stream. Perche Creek is mapped as a riverine lower perennial stream for approximately two miles (3.2 km) at the south end of the study corridor and two miles (3.2 km) at the north end of the study corridor. Hinkson Creek runs through Columbia and is mapped as a lower perennial stream. Cedar Creek is mapped as a lower perennial stream in the south half of the study corridor.

Lacustrine Wetlands (L) – Approximately three percent of the mapped NWI wetlands within the study corridor in this county fall into this category. There are only a few small lakes scattered throughout the study corridor of the County.

Moniteau County

Palustrine Vegetated Wetlands (PAB, PEM, PSS, PFO) – Approximately 42 percent of the mapped NWI wetlands within the study corridor in this county fall into this category. The south side of the Missouri River at the north corner of the county has mapped wetland areas located in the floodplain and classified as palustrine forested, emergent and scrub-shrub.

Palustrine Upland Ponds (PUB, PUS) – Less than one percent of the mapped NWI wetlands within the study corridor in this county fall into this category.

Riverine Wetlands (R) – Approximately 57 percent of the mapped NWI wetlands within the study corridor in this county fall into this category. The Missouri River and the Petite Saline Creek are both mapped as riverine lower perennial streams.

Lacustrine Wetlands (L) – There are no lacustrine wetlands mapped in the portion of the county that lies in the study corridor.

Callaway County

Palustrine Vegetated Wetlands (PAB, PEM, PSS, PFO) – Approximately 49 percent of the mapped NWI wetlands within the study corridor fall into this category. Along the west side of the county, substantial areas of palustrine forested wetlands and some palustrine emergent and scrub-shrub wetlands are mapped along Cedar Creek, a tributary of the Missouri River. Palustrine forested and emergent wetlands occur along a tributary that extends east from the creek towards Hereford. Other tributaries of Cedar Creek that include mapped areas of palustrine forested, emergent and scrub-shrub wetlands are Monicle Creek, north of I-70, and Owl Creek and Millers Creek, south of I-70.

Palustrine forested and some emergent wetlands are mapped along the Middle River, another tributary of the Missouri River at its headwaters and, to the east, Stinson Creek and other tributaries within the Auxvasse Creek watershed, including Maddox Branch and McKinney Creek. Richland Creek, also situated within the Auxvasse Creek drainage basin, includes palustrine forested wetlands, with some small areas of palustrine scrub-shrub and emergent wetlands. Downstream of the confluence of Richland Creek, Maddox Branch, and McKinney Creek, Crows Fork Creek and another of its tributaries, Dyers Branch, include mapped areas of palustrine forested wetlands.

Palustrine forested wetlands are mapped along the length of Auxvasse Creek, which transects the study area. Auxvasse Creek and some of its tributaries also include some small areas of palustrine emergent and scrub-shrub wetlands. Areas of palustrine forested wetlands are mapped along tributaries that include Leeper Branch, Bynum Creek and Harrison Branch north of I-70 and Pinch Creek south of I-70. Small areas of palustrine emergent wetlands are also mapped along tributaries that include Fourmile Branch, Rocky Branch, Harrison Branch and Pinch Creek. Some areas of palustrine scrub-shrub wetlands also occur along tributaries such as Bynum Creek, Harrison Branch and Yates Branch.

Whetstone Creek, a tributary of the Loutre River, extends parallel to and north of I-70 and includes palustrine forested wetlands with some small areas of palustrine scrub-shrub and emergent wetlands. Palustrine forested wetlands are also mapped along tributaries that include Clarks Branch and Heat String Creek which originates from the northwest near Bachelor. North of the confluence with Whetstone Creek, palustrine forested wetlands extend along the Loutre River and its other tributaries, Dog Branch, and Bachelor Creek, which also includes some areas of palustrine emergent wetlands.

South of I-70, another tributary of the Loutre River, Prairie Fork includes extensive mapped areas of palustrine forested wetlands, with some small areas of palustrine scrub-shrub and emergent wetlands. Its tributaries include areas of palustrine forested wetlands. A tributary near the headwaters of Prairie Fork also includes small areas of palustrine emergent wetlands and more extensive areas of palustrine emergent and scrub-shrub wetlands are mapped along the Fonso Branch to the north.

Palustrine Upland Ponds (PUB, PUS) – Approximately 32 percent of the mapped NWI wetlands within the study corridor fall into this category.

Riverine Wetlands (R) – Approximately eight percent of the mapped NWI wetlands within the study corridor fall into this category. Lower perennial riverine wetlands are mapped along portions of Cedar Creek and along its tributaries, Owl Creek and an unnamed stream that flows west from areas near Hereford. Stinson Creek includes small areas of lower perennial riverine wetlands. Lower perennial riverine wetlands are mapped along Crows Fork Creek and its tributaries, Richland Creek, Maddox Branch and McKinney Creek. Lower perennial riverine wetlands extend along the length of Auxvasse Creek, and its tributary, Harrison Branch, includes some small areas of lower perennial riverine wetlands. Areas of lower perennial riverine wetlands are also present along the Loutre River and its tributary, Whetstone Creek, and along Prairie Fork south of I-70. Dog Branch along the Loutre River, the Fonso Branch of Prairie Fork and other tributaries of Prairie Fork include some small areas of riverine intermittent wetlands.

Lacustrine Wetlands (L) – Approximately 11 percent of the mapped NWI wetlands within the study corridor fall into this category. Lacustrine limnetic wetlands are mapped along Monicle Creek, which is a tributary of Cedar Creek. South of I-70, lacustrine wetlands are present at Little Dixie Lake along another tributary, Owl Creek, and at the headwaters of the Smith Branch along Stinson Creek. North of I-70, lacustrine wetlands are mapped at the headwaters of both Sallees Branch and McKinney Creek within the Crows Fork drainage system. Lacustrine wetlands occur along a tributary at two adjoining areas extending south of Auxvasse Creek. South of I-70, lacustrine wetlands are mapped along Auxvasse Creek at Leisure Lake, and along Bragg Branch and a tributary south of Pinch Creek.

South of Whetstone Creek, lacustrine limnetic wetlands occur within the Whetstone Creek Conservation Area. Lacustrine limnetic wetlands are also mapped along an unnamed tributary of Prairie Fork south of I-70.

Montgomery County

Palustrine Vegetated Wetlands (PAB, PEM, PSS, PFO) – Approximately 59 percent of the mapped NWI wetlands within the study corridor fall into this category. Extensive areas of palustrine forested and emergent wetlands, with some scrub-shrub wetlands, are mapped along the Loutre River and the Prairie Fork and its tributary, Cole Creek, south of I-70. North of I-70, Clear Fork includes palustrine forested wetlands with some scrub-shrub and emergent wetlands. Its tributaries, which include Bates Branch, Rumbo Branch and Smith Branch, include predominantly palustrine forested wetlands with some isolated small areas of palustrine emergent wetlands. Palustrine forested wetlands are also mapped along other tributaries of the Loutre River, such as Little Loutre Creek, Lick Branch, Whetstone Creek and Marsey Branch located north of I-70, and Simpson Branch, Sallee Branch, Pinch Creek, Dishwater Creek, Clear Creek and Whippoorwill Creek south of I-70. Whetstone Creek, Clear Creek and Dishwater Creek also include some small areas of palustrine emergent wetlands, and some areas of palustrine scrub-shrub wetlands are present along Sallee Branch. In the southeast portion of

Montgomery County in the study area, Pinnacle Creek within the Loutre River drainage system also includes some areas of palustrine forested wetlands.

North of I-70, Elkhorn Creek, a tributary of Elkhorn Creek that flows north from areas near New Florence, and Bear Creek, which all discharge into the Cuivre River system within the Mississippi River basin, include extensive areas of palustrine forested wetlands and some small areas of scrub-shrub and emergent wetlands. Areas of palustrine forested and emergent wetlands are also mapped along a tributary of Bear Creek flowing north from High Hill. To the east, smaller areas of palustrine forested and some emergent wetlands are mapped along other tributaries within the Cuivre River basin—Prices Branch, Poor Branch, Little Bear Creek, and Camp Creek—that flow north from areas in the vicinity of I-70. Some small areas of scrub-shrub wetlands also occur along Prices Branch, Camp Creek and at the headwaters of Poor Branch.

Palustrine Upland Ponds (PUB, PUS) – Approximately 26 percent of the mapped NWI wetlands within the study corridor fall into this category.

Riverine Wetlands (R) – Approximately eight percent of the mapped NWI wetlands within the study corridor fall into this category. Lower perennial riverine wetlands are mapped along the Loutre River, Little Loutre Creek, Whetstone Creek and Prairie Fork, and its tributary, Cole Creek. Other tributaries of the Loutre River, such as Sallee Branch, Pinch Creek, Dishwater Creek and Pinnacle Creek, include small areas of riverine intermittent wetlands. Lower perennial and intermittent riverine wetlands occur along Clear Fork, Fonso Branch, Clear Creek and Whippoorwill Creek.

Lacustrine Wetlands (L) – Approximately eight percent of the mapped NWI wetlands within the study corridor fall into this category. Lacustrine limnetic wetlands are mapped along Cole Creek and at Pinnacle Lake along Pinnacle Creek within the Missouri River watershed. Lacustrine limnetic wetlands are also mapped at Golden Eagle Lake and Heron Lake north of I-70 and at the headwaters of Prices Branch within the Cuivre River watershed.

Warren County

Palustrine Vegetated Wetlands (PAB, PEM, PSS, PFO) – Approximately 33 percent of the mapped NWI wetlands within the study corridor fall into this category. Palustrine forested wetlands and some scrub-shrub wetlands are mapped along tributaries of the Loutre River, Bear Creek and its tributary, Millam Creek. Some small areas of palustrine forested wetlands are mapped along another tributary, Pinnacle Creek. To the east, another tributary of the Loutre River, Massie Creek, includes small areas of palustrine forested and emergent wetlands, with some palustrine forested and scrub-shrub wetlands along its tributaries. To the east, Lost Creek, and its tributaries, including Little Lost Creek, include small areas of palustrine forested wetlands. A tributary to Lost Creek that flows through Turner Hollow also includes some areas of palustrine emergent and scrub-shrub wetlands.

South of I-70, palustrine forested wetlands are mapped along tributaries of Charrette Creek, including Dry Fork and North Fork Charrette Creek. Charrette Creek and an unnamed tributary near its headwaters include palustrine forested wetlands and small areas of emergent wetlands. South of I-70, Peruque Creek, and its tributaries include several areas of palustrine forested wetlands.

Within the Cuivre River watershed north of I-70, Camp Branch, which flows into Camp Creek, and its tributaries include significant areas of palustrine forested wetland with some small areas of palustrine emergent wetlands. To the east, Big Creek and its tributaries Yeater Branch and Schlanker Branch include areas of palustrine forested wetlands, with some small areas of

palustrine emergent wetlands. Another tributary of Big Creek to the east, Hickory Lick Creek, includes palustrine forested wetlands with small areas of palustrine scrub-shrub and emergent wetlands. Indian Camp Creek and its tributaries include areas of palustrine forested wetlands, with small areas of palustrine emergent and scrub-shrub wetlands along the main creek.

Palustrine Upland Ponds (PUB, PUS) – Approximately 48 percent of the mapped NWI wetlands within the study corridor fall into this category.

Riverine Wetlands (R) – Approximately three percent of the mapped NWI wetlands within the study corridor fall into this category. Lower perennial and intermittent riverine wetlands are mapped within the Loutre River watershed along Bear Creek and its tributary, Millam Creek, and along Massie Creek. Another tributary, Pinnacle Creek, includes small areas of intermittent riverine wetlands. Lost Creek, another tributary of the Missouri River includes areas of lower perennial and intermittent riverine wetlands, and its tributary, Little Lost Creek includes small intermittent riverine wetlands. Charrette Creek and the North Fork Charrette Creek includes small areas of lower perennial riverine wetlands, and another tributary, Dry Fork, includes intermittent riverine wetlands.

To the north and south of I-70, Peruque Creek within the Mississippi River watershed includes small areas of lower perennial riverine wetlands.

Within the Cuivre River watershed, which also discharges to the Mississippi River, Big Creek and its tributaries Yeater Branch, Schlanker Branch, Hickory Lick Creek and Indian Camp Creek include areas of lower perennial riverine wetlands. The Camp Branch of Camp Creek includes some small areas of intermittent riverine wetlands.

Lacustrine Wetlands (L) – Approximately 16 percent of the mapped NWI wetlands within the study corridor fall into this category. Lacustrine limnetic wetlands are mapped along an eastern tributary of Massie Creek and a western tributary of Little Lost Creek to the east. Lacustrine limnetic wetlands are mapped along Dry Fork, a tributary of Charrette Creek, and several areas of lacustrine limnetic wetlands occur along Charrette Creek and along two other tributaries adjoining the creek near its headwaters.

South of I-70, lacustrine limnetic wetlands are mapped along the Indian Camp Creek system, draining north towards Big Creek. North of I-70, two other areas of lacustrine wetlands are mapped within the Indian Camp drainage system, along the main stem of the creek on the eastern end of the county and at Forest Lake along a tributary to the south.

Lincoln County

Palustrine Vegetated Wetlands (PAB, PEM, PSS, PFO) – Approximately 56 percent of the mapped NWI wetlands within the study corridor fall into this category. Big Creek includes palustrine forested, emergent, and scrub-shrub wetlands in the southern part of the county that extends within the study area. Palustrine forested wetlands extend along its tributaries, Hickory Lick Creek and another tributary to the south.

Palustrine Upland Ponds (PUB, PUS) – Approximately 27 percent of the mapped NWI wetlands within the study corridor fall into this category.

Riverine Wetlands (R) – Approximately 17 percent of the mapped NWI wetlands within the study corridor fall into this category. Extensive areas of lower perennial riverine wetlands are mapped along Big Creek, and small areas of lower perennial riverine wetlands are mapped along Hickory Lick Creek.

Lacustrine Wetlands (L) – There are no lacustrine wetlands mapped in the portion of the county that lies in the study corridor.

St. Charles County

Palustrine Vegetated Wetlands (PAB, PEM, PSS, PFO) – Approximately 39 percent of the mapped NWI wetlands within the study corridor fall into this category. Indian Camp Creek includes several areas of palustrine scrub-shrub wetlands, with some small areas of palustrine forested and emergent wetlands. The small portion of Big Creek that extends within the study area also includes palustrine forested and scrub-shrub wetlands. McCoy Creek includes palustrine forested wetlands and small areas of palustrine emergent and scrub-shrub wetlands. Small areas of palustrine forested wetlands also extend along its tributary, Dry Branch, and a small tributary of Big Creek that flows north from the vicinity of Josephville.

Peruque Creek extends south of and along I-70 through most of the study area, crossing to the north at the east end. Peruque Creek and its tributary, Sams Creek, include several areas of palustrine forested wetlands, with some small areas of palustrine scrub-shrub wetlands. Small areas of palustrine forested wetlands are also mapped along other smaller tributaries of Peruque Creek. Near the US 61 crossing and along Lake St. Louis, Peruque Creek also includes some small areas of palustrine emergent wetlands. To the south, palustrine forested wetlands are mapped along another tributary of the Mississippi River, Dardenne Creek and its tributaries, including Little Dardenne Creek.

Palustrine Upland Ponds (PUB, PUS) – Approximately 31 percent of the mapped NWI wetlands within the study corridor fall into this category.

Riverine Wetlands (R) – Approximately one percent of the mapped NWI wetlands within the study corridor fall into this category. Lower perennial wetlands are mapped along several waterways within the Mississippi River watershed—Indian Camp Creek, Big Creek, McCoy Creek, Peruque Creek and Dardenne Creek.

Lacustrine Wetlands (L) – Approximately 29 percent of the mapped NWI wetlands within the study corridor fall into this category. Extensive areas of lacustrine wetlands are mapped in St. Charles County. These include an area that extends along Indian Camp Creek at the west end of the county and an area extending along a small tributary to the south. On the east end of the study area, Peruque Creek includes a large area of lacustrine wetlands at Lake St. Louis.

6. PHYSIOGRAPHY AND TOPOGRAPHY

The physiography of the I-70 corridor from west to east is as follows – from the western study limit to just west of Boonville, I-70 is situated on the border of the Dissected Till Plains (north) and the Osage Plains Sections (south) of the Central Lowland Province. Generally, I-70 lies on the southern limit of continental glaciation. Both the Dissected Till Plains and Osage Plains are characterized by rolling plains of low relief and thin glacial or residual soil types.

From west of Boonville to Columbia, I-70 traverses the far northern node of the Salem Plateau of the Ozark Physiographic Province; an area characterized by slightly steeper relief and long narrow ridges flanked by moderate slopes leading to narrow valleys. From Columbia to St. Charles, I-70 returns to the Dissected Till Plains. The major physiographic feature and natural barrier encountered in the study is the Missouri River and flood plain. The width of the river is generally 1,000 feet (304.8 m) and the valley 10,000 feet (3,408 m).

Topography across the entire state is very similar with nearly constant elevations for the 200-mile (321.9 km) corridor varying approximately 400 feet (121.9 m). The elevation at Blue Springs is approximately 950 feet (289.6 m) above sea level and the elevation at Lake St. Louis is approximately 550 feet (167.6 m).

a. Geology

The geology of the area is also largely similar for the 200-mile (321.9 km) corridor. The section in Jackson County is underlain by Middle Pennsylvanian strata of mostly horizontal limestone beds with lesser layers of shale. As the rock layers dip very slightly to the west, the limestones form broad general north-south ridges along their eastern terminating outcrops. From Jackson County to Sweet Springs, the geology is influenced by thick layers of lower Pennsylvanian shale with minor amounts of sandstone. Broad, rather level plains, are more characteristic of this area. From Sweet Springs to Columbia, the area is underlain by thick Mississippian Age carbonate limestones and dolomites. In selected areas, and in particular the area near Rocheport, these carbonates have been subjected to solutioning. The area near Rocheport displays a heavily Karstic landscape of sinkholes and an undeveloped surface drainage pattern. Several caves are located in this area.

The area from Columbia to Kingdom City is again underlain by thick lower Pennsylvanian shales and sandstones and is represented as a nearly level, featureless plain. From Kingdom City to New Florence, the bedrock varies from older, Ordovician dolomites back up to Pennsylvanian shales. Then, from New Florence to St. Charles the corridor again is underlain by Mississippian carbonate strata.

Since much of I-70 parallels the Missouri River and the southern glacial limit, much of the surficial soil materials consist of loess, and soils of glacial origin with lesser amounts of residual soils derived from the weathering of bedrock. Generally, the soils can be classified as prairie silt loam. The thickness of the soil mantle is generally five to 15 feet (4.6 m) with extreme cases of loess deposits up to 100 feet (30.5 m). The alluvial valley of the Missouri River near Rocheport is approximately two miles wide. Alluvial sediments in the valley are expected to be approximately 100 feet (30.5 m) thick, overlying Mississippian carbonate bedrock.

b. Mining

Very few presently economically important mineral deposits are located in the study corridor. Surface quarries supplying construction aggregate are frequent and located in areas where dolomite and limestone crop out.

Given the geology of the study area, coal beds can be found throughout. Coal resources range from insignificant scattered thin beds to beds several feet (~0.9 m) thick. The coal resources are high in sulfur content and no longer used for power production. Although no current mining is taking place, coal layers located in the lower Pennsylvanian strata have been mined in the past, mostly small operations dating from the late 1800s to 1940s. These mines supplied the railroads, steam ships, residential and commercial users. Shafts related to coal mining may be encountered north of the Columbia area.

c. Caves

Caves in Missouri are generally found in carbonate rocks from the Mississippian to Cambrian. In the study area, only the geology in Cooper and Boone Counties is most favorable for cave development. Lesser cave development is found in the carbonate rocks in Callaway,

Montgomery, Warren and St. Charles Counties. Caves are very unlikely in Jackson, Lafayette and Saline Counties.

The largest karst area of the study is located in the area near Rocheport in Boone County, on the east bank of the Missouri River. This karst region covers an area of approximately 10 square miles (25.9 km^2) and is marked with caves and sinkholes with little defined surface drainage. Rocheport (aka Boone) Cave is located in this area. The cave was developed previously as a tourist attraction (now closed) and is documented to contain both Indiana and Gray Bats.

The following is a summary of the caves located within the study corridor.

- **Jackson County** – None
- **Lafayette County** – None
- **Saline County** – None
- **Pettis County** – None
- **Cooper County**
  Eldred Well – No data
  Cave Creek Cave – Small room 50 feet (15.2 m) long
  Onyx Pit – sinkhole 40 feet (12.2 m) deep
  Cave Spring Cave – 200 feet (61.0 m) long
  Dual Opening Cave – No data
- **Boone County**
  Boone Cave aka – Rocheport Cave – Significant (geologically & historically) reported to be home to both Indiana and Gray bats. Land ownership by MDC.
  Allen Pit – Small pit with passageways
  Bridge Shelter – No data
  Little Spring Cave – 75 foot (22.9 m) length
  Lewis and Clark Cave – Significant –1 mile (1.6 km) long – Indiana and Gray bats
  Kirby Cave – Significant – Bats
  Holton Cave – 8,000-foot (2,438.4 m) length – bats
  Holtons Sink Cave – Pit and passageway
  Head Cave – 15 foot (4.6 m) length
  Gaping Shelter – No data
  Fox Cave – 115 foot (35.1 m) length
  Drooling Cave – No data
  Yeager Pit – No data
  Wolf Bone Cave – No data
  Vine Cave – No data
  Skylight Pit – 50 foot (15.2 m) deep pit
  Rocky Fork Lookout Cave – 20 foot (6.1 m) length
  Rocky Fork Cave – 600 foot (182.9 m) length
  Possum Pit – No data
  Pond Drain Pit – Pit and 30 foot (9.1 m) long passageway
- **Callaway County** – None

- **Montgomery County**
  Graham Cave – Significant – State park – artifacts

- **Warren County**
  Wagon Shelter – No data
  Upper Notch Shelter – No data
  St. Peter Shelter – Possible artifacts
  Notch Shelter – No data
  Massie Creek Shelter – No data
  Hollman Cave – Several hundred feet (~91 m) in length
  Eagle Cave – 20 foot (6.1 m) length
  Cobblestone Shelter – No data
  Buzzard Nest Cave – Single 40 foot (12.2 m) long passage

- **Lincoln County**
  Hedeman Spring Cave – Shelter – No data
  Green Arrow Cave – 200 feet (61.0 m) in length
  Little Spring Cave – No data

7. TERRESTRIAL AND AQUATIC COMMUNITIES

a. Significant Terrestrial and Aquatic Communities

The State of Missouri has been classified into major regions, based on natural features such as geologic history, soils, topography and plant and animal distribution. The project area covers two natural divisions of Missouri: the Eastern Glaciated Plains and the Missouri River Natural Divisions (Thom and Wilson, 1980).

The terrestrial communities in the project area include the forests, prairies, glades, shrublands and farmlands of the Eastern Glaciated Plains and Missouri River natural divisions. Glades are very dry lands with thin soils situated on open, rocky hillsides. Six types of glades are found in Missouri that are differentiated by the underlying bedrock type, with bases consisting of limestone, dolomite, chert, sandstone, shale and igneous rocks. Prairies are open tracts of grasslands within the Mississippi River Valley, typically characterized by tall grasses, deep soil cover and few trees.

The gentle terrain and deep soils of the Glaciated Plains made this terrain ideal for agriculture. This terrain was characterized by the presence of deciduous forests, prairie grasslands and oak savannas in pre-settlement times. Development has removed most of the original prairielands, although some small remnants remain. The Missouri River and its associated bottomlands, once covered by chutes, sloughs, islands, sand and mud bars, marshes, prairies and forests, have also been extensively altered by channel modifications, construction of levies, locks and dams and agriculture activities.

In an effort to preserve the remaining natural areas of Missouri, the State of Missouri has initiated several programs for the protection of significant aquatic and wildlife habitats on publicly owned lands. Natural areas to be protected and managed to preserve their natural qualities are designated by the Missouri Natural Areas Committee. These are defined as biological communities or geological sites that preserve and are managed to perpetuate the natural character, diversity and ecological processes of Missouri's native landscapes. Conservation areas are managed by the Department of Conservation under a multiple use concept but will often include natural areas. These areas have been listed below:

Burr Oak Woods Conservation Area in Jackson County

The area, just north of I-70 and west of Missouri Route 7, includes 1,071 acres (433.4 hectares) of land. The Burr Oak Woods Natural Area is an old growth upland forest. Burr Oak Creek flows through the area for 2.4 miles (3.9 km).

Blue Lick Conservation Area in Saline County

The 390-acre (157.8 hectares) area has numerous saline and mineral springs. It is located three miles north of !-70 and west of US 65.

Ralph and Martha Perry Memorial Conservation Area in Pettis County

This area contains over 4,000 acres (1618.7 hectares) in Johnson and Pettis Counties. Five miles (8.0 km) of the Blackwater River flows through the conservation area and there are extensive wetlands and bottomland hardwood forest areas.

Overton Bottoms in Cooper County

This extensive bottomland area is within the floodplain of the Missouri River and contains USFWS Big Muddy National Wildlife Refuge.

Three Creeks Conservation Area in Boone County

This 1,277-acre (516.8 hectares) area contains stretches of Turkey, Bass and Bonne Femme Creeks. A 2.7-mile (4.3 km) natural trail winds through the area. Natural areas include Hunters' Cave and Tumbling Cave Spring. Also of note are the Running Buffalo clover test plots.

Whetstone Creek Natural Area in Callaway County

This is an aquatic natural area along 1.8 miles (2.9 km) of Whetstone Creek along with a 100-yard (91.4 m) buffer strip on each side of the creek. The site is located about five miles (8.0 km) northwest of Williamsburg. Whetstone Creek is a small, highly productive stream with well-defined riffles and long, deep pools. The creek supports a diverse fish population of 34 species, including the blacknose shiner, which is classified by the state as a rare species. The stream is bordered on one side by steep, wooded bluffs.

The Missouri Department of Conservation has also acquired several tracts of remaining prairielands for preservation purposes. Activities at all public prairies are regulated by the department in order to protect wildlife. The project area includes one of these areas, Tucker Prairie.

Tucker Prairie – It is located on the south side of I-70 in Callaway County and is owned by the University of Missouri. The natural features at this site include a flat, upland prairie over silt loam soils derived from loess. Some 224 plant species and varieties have been recorded in the area. University of Missouri faculty and students conduct the research, including investigation of haying and burning techniques.

Danville Glades Natural Area in Montgomery County

This natural area occupies 48-acres (19.4 hectares) within the Danville Conservation Area. Natural features include about six acres (2.4 hectares) of limestone glades with characteristic plants and animals. The remainder of the natural area is woodland dominated by white oak,

post oak, chinquapin oak, sugar maple and red cedar. The dominant trees are about 90 to 120 years old. Danville Glades is owned by the Missouri Department of Conservation.

Graham Cave Glades Natural Area in Montgomery County

This natural area is located within Graham Cave State Park on 82 acres (33.2 hectares) about two miles (3.2 km) west of Danville. The natural features in the area include sandstone and limestone glades, dry sandstone forest and dry sandstone cliffs and a small headwaters valley surrounded by cliffs and rocky hills. The proximity of some of the limestone and sandstone glades allows some dolomite glade species to occur alongside sandstone glade species. Graham Cave Glades is owned and managed by the Missouri Department of Natural Resources.

Reifsnider Forest Natural Area in Warren County

This natural area occupies 22 acres (8.9 hectares) within Frank Reifsnider State Forest. Natural features include a mature white oak upland forest, with trees from 100 to 120 years old.

Weldon Spring Hollow Natural Area in St. Charles County

This natural area occupies 385 acres (155.8 hectares) within the Weldon Spring Conservation Area. Natural features include upland and bottomland forests, high limestone cliffs, intermittent streams and rugged river break topography. The area includes many species of trees, wildflowers and characteristic forest wildlife. The cliffs are used as nesting sites by Canada geese. The Missouri Department of Conservation owns the area.

b. Wildlife and Aquatic Species

The counties within the project area host a variety of birds, mammals, amphibian, reptile and aquatic species. Species listings by county were obtained from the Missouri Fish and Wildlife Information System database compiled by the Missouri Department of Conservation. The types of these wildlife species documented to occur in the counties in the project area are summarized below.

Birds

A large variety of migrants, waterfowl, and residents have been identified within the counties in the project area. The avian species common to all the counties include red-winged blackbird (*Agelaius phoenicus*), eastern bluebird (*Sialia sialis*), indigo bunting (*Passerina cyanea*), black-capped chickadee (*Parus atricapillus*), northern cardinal (*Cardinalis cardinalis*), mourning dove (*Zenaida macroura carolinensis*), northern flicker (*Calptes auratus*), eastern kingbird (*Tyrannus tyrannus*), lark sparrow (*Chondestes grammacus*), Bell's vireo (*Vireo bellii*), cedar waxwing (*Bombycilla cedrorum*) and downy woodpecker (*Picoides pubescens*). All project area counties provide habitat for waterfowl species. Species common to all counties include American black duck (*Anas rubripes*), blue-winged teal (*Anas discors*), Canada goose (*Branta canadensis*) and great blue heron (*Ardea Herodias*). Predators such as American kestrel (*Falco sparverius*), red-tailed hawk (*Buteo jamaicensis borealis*) and great horned owl (*Bubo virginianus*) have also been documented in all the project area counties.

Amphibians and Reptiles

The Missouri Fish and Wildlife Information System database identifies 21 to 22 species of amphibians in each of the counties in the project area. The amphibian species common to all counties are bullfrog (*Rana catesbeiana*), Blanchard's cricket frog (*Acris crepitans blanchardi*), plains leopard frog (*Rana blairi*) and southern leopard frog (*Rana utricularia*), .

In the counties, between 18 to 35 species of reptiles have been identified. The reptilian species common to all counties in the project area are northern fence lizard (*Sceloporus undulatus hyacinthinus*), eastern yellowbelly racer (*Coluber constrictor flaviventris*), five-lined skink (*Eumeces fasciatus*), prairie ringneck snake (*Diadophis punctatus arnyi*) and three-toed box turtle (*Terrapene carolina triunguis*).

Mammals

The Missouri Fish and Wildlife Information System identifies between 22 and 30 species of mammals in each of the counties in the project area. Many of the species identified are habitat generalists that have adapted to living near humans. Those species common to each county that can occupy agricultural and urban areas include white-tailed deer (*Odocoileus virginianus*), house mouse (*Mus musculus domesticus*), eastern cottontail rabbit (*Sylvilagus floridanus alacer*), coyote (*Canis latrans frustror*), raccoon (*Procyon lotor hirtus*), Norway rat (*Rattus norvegicus*), gray squirrel (*Sciurus carolinensis*) and Virginia opposum (*Didelphis virginiana*). Other species common to all counties are badger (*Taxidea taxus*), beaver (*Castor canadensis carolinensis*), red fox (*Vulpes fulva*), gray fox (*Urocyon cinereoargenteus*), muskrat (*Ondatra zibethicus*), river otter (*Lutra canadensis lataxina*), striped skunk (*Mephitis avia*), fox squirrel (*Sciurus niger rufiventer*) and southern flying squirrel (*Glaucomys volans*)

Aquatic Species

Information on fisheries in project area counties was obtained from the Missouri Fish and Wildlife Information System. No records for aquatic mussels were available for these areas.

A variety of fish species were documented in project area counties, including common carp (*Cyrinus carpio*), speckled chub (*Macrhybopsis aestivalis*), quillback (*Carpiodes cyprinus*) and brook silverside (*Labidesthes sicculus*). All project area counties host populations of warmwater species such as largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), channel catfish (*Ictalurus puncatatus*), black crappie (*Pomoxis nigromaculatus*), black bullhead (*Ameiurus melas*), yellow bullhead (*Ameiurus natalis*), red shiner (*Cyprinella lutrensis*) and green sunfish (*Lepomis cyanellus*).

c. Threatened and Endangered Species

Under the U.S. Endangered Species Act, the U.S. Fish and Wildlife Service has primary responsibility in the protection of federally endangered and threatened species and designation of critical habitat areas for these species. Endangered species are those that are in danger of extinction throughout all or a significant portion of their range, and threatened species are those that are likely to become endangered within the foreseeable future.

In Missouri, all federally endangered and threatened plants and animals are protected by the Endangered Species Act of 1973 (ESA) and the Missouri State Endangered Law. The Missouri Department of Conservation determines species status in Missouri under constitutional authority (3CSR10-4.111 Endangered Species.) Species that are listed in the Wildlife Code under 3CSR10-4.111 are protected. Annually, the MDC publishes the Missouri Species of Conservation Concern Checklist. Some of the plants and animals in the checklist also appear in the Wildlife Code and are afforded special legal protection. It should be noted that all species in the State of Missouri are protected as biological diversity elements unless a legal harvest method is described in the Wildlife Code. The director of the MDC may establish refuges to provide essential protection to endangered species. These refuges are not to exceed one square mile (2.6 km^2) in size and for a period of time not exceed 60 days.

The information obtained from the U.S. Fish and Wildlife Service and the Missouri Fish and Wildlife Information System on those species that are listed as federally endangered, threatened, or candidate, and state-endangered within project area counties are presented in the table below.

Table III-35: Federal and State - Endangered and Threatened Species

Common Name	Scientific Name	Status*	County Occurrence
Gray Myotis	*Myotis grisescens*	FE, SE	Boone, Callaway, Lincoln
Indiana Myotis	*Myotis sodalis*	FE, SE	Boone,
Interior Least Tern	*Sterna antillarum athalassos*	FE, SE	Boone, Jackson, St. Charles
Pallid Sturgeon	*Scaphirhynchus albus*	FE, SE	Boone, Callaway, Jackson,
Bald Eagle	*Haliaeetus leucocephalus alascensis*	FT, SE	Boone, Callaway, Cooper, Howard, Jackson, Lafayette, Lincoln, Montgomery, Saline, St. Charles, Warren
Black-tailed Jackrabbit	*Lepus californicus melanotis*	SE	Cooper, Jackson, Lafayette, Pettis, Saline,
Plains Spotted Skunk	*Spilogale putoriius interrupta*	SE	Boone, Jackson,
Peregrine Falcon	*Falco peregrinus tundrius*	SE	Boone, Jackson, Lincoln, St. Charles
American Bittern	*Botaurus lentiginosus*	SE	Boone, Callaway, Jackson, Lafayette, Lincoln, Saline, St. Charles
Northern Harrier	*Circus cyaneus*	SE	Boone, Callaway, Cooper, Jackson, Lafayette, Lincoln, Montgomery, Pettis, St. Charles
King Rail	*Rallus elegans*	SE	Lincoln, Saline, St. Charles
Barn Owl	*Tyto alba*	SE	Boone, Callaway, Jackson, Lafayette, Pettis, Saline, St. Charles
Snowy Egret	*Egretta thula*	SE	Jackson, St. Charles
Bachman's Sparrow	*Aimophila aestivalis Illinoensis*	SE	St. Charles
Flathead Chub	*Platygobio gracilis*	SE	Boone, Callaway, Cooper, Howard, Lafayette, Montgomery, Saline, St. Charles, Warren
Lake Sturgeon	*Acipenser fulvescens*	SE	Boone, Callaway, Lafayette, Lincoln, Montgomery, Saline, Warren
Topeka Shiner	*Notropis topeka*	FE,SE	Boone, Callaway, Cooper, Pettis
Western Fox Snake	*Elaphe vulpina*	SE	Lincoln, St. Charles
Eastern Massasauga	*Sistrurus catenatus*	SE	Jackson, Saline, St. Charles, Warren
Blanding's Turtle	*Emydoidea blandingii*	SE	St. Charles
Sicklefin Chub	*Macrhybopsis Meeki*	C	Boone, St. Charles
Sturgeon Chub	*Macrhybopsis Gelida*	C	Boone, St. Charles

*FE=federally endangered
FT=federally threatened
SE=state-endangered
C=federal candidate

The endangered species list, from 3CSR10-4.111, also lists plant species that are endangered by the State of Missouri, these include the following:

- Small Whorled Pogonia (Isoteria medeloides)
- Mead's Milkweed (Asclepias Meadii)
- Decurrent False Aster (Boltonia decurrens)
- Missouri Bladderpod (Lesquerella filliformis)
- Geocarpon (Geocarpon minimum)
- Running Buffalo Clover (Trifolium stoloniferum)
- Pondberry (Lindera messifolium)
- Eastern Prairie Fringed Orchid (Planthera leucophacea)
- Western Prairie Fringed Orchid (Planthera praeclara)

8. HISTORIC AND ARCHEOLOGICAL RESOURCES

This report presents a preliminary assessment of the cultural resources within the I-70 study area. Specifically this study included an area approximately five miles to either side of the existing interstate. Cultural resources evaluated at this time include properties on the National Register of Historic Places and recorded historic cemeteries.

a. National Register of Historic Places

A list of national register properties as of February 2000 was provided by Jeff Patridge of the Historic Preservation Program, Missouri Department of Natural Resources in Jefferson City. Properties within the study area were identified and the national register nomination forms for each property was examined. These forms are on file at the MDNR Historic Preservation Program. Basic information on each property was obtained such as its name, location, why the site was significant and its period of significance. This information was then summarized in a table and the locations of the properties placed on the appropriate USGS quadrangles.

A total of 76 properties were identified within the study area. The number of properties per county include:

Jackson:	1	Boone:	28
Lafayette:	2	Montgomery:	6
Saline:	3	Warren:	2
Cooper:	30	St.Charles:	1
Howard:	3		

The greater number of properties within Boone and Cooper Counties does not reflect a greater number of significant cultural resources in that area. It is due instead to the proximity of the University of Missouri in Columbia. Researchers from that institution were more likely to document resources in the surrounding region. For example, over half of these properties (16) are within the city of limits of Columbia alone.

The national register properties included both prehistoric and historic resources. A total of eight prehistoric properties were identified within the study area. The prehistoric sites consisted of districts having burial mounds and associated villages, most dating to the Middle Woodland Period (200 BC - AD 300) such as the Imhoff and Mellor Archaeological Districts in Cooper County. A petroglyph (or rock carving) site - Moniteau Petroglyph site - was reported on the Missouri River bluffs near where I-70 crosses the Missouri River in western Boone County. Most of the remaining national register places (N=66) consisted of architectural properties or historic districts. These dated from the early 19th to mid 20th century. In addition, a cobblestone street in Boonville and Sanborn field (one of the oldest experimental agricultural fields in the U.S.) in Columbia have also been placed on the register.

Other than the clustering of national register sites near the City of Columbia, these properties generally tend to be scattered across the study area.

In the Mineola Hill area one of the more important cultural resources is the Graham Cave. It is located to the north of the existing highway and the Graham farmstead on the south side. Graham Cave contained stratified cultural deposits dating from the use as a shelter by some of the region's earliest residents (Dalton Period 8500 - 7900 BC) and lasting to the 19th century with the procurement of saltpeter. The Graham family, who resided at the farmstead to the south, were some of the first American settlers of this region. Local folklore further suggests that African-American slaves were sold from the large rock formation in the median of I-70. This

portion of the Loutre valley certainly has important cultural significance. It would be difficult to widen the interstate at this location without disturbing these resources.

b. Historic Cemeteries

In order to prevent the inadvertent destruction of human remains and to prevent costly construction delays where these remains are encountered, an attempt was made to record as many documented cemeteries as possible. Burial ground locations were determined by identifying marked cemeteries on the USGS quadrangles. Additional cemeteries were identified by examining 1870s - 1920s county atlases at the Missouri Historical Society in Columbia. Many of these graveyards may no longer be visible on the surface and others were supposedly moved, the bodies being reburied at a newer cemetery. However, it should be noted that bodies were often overlooked or left behind. Thus it is important to identify these burial places prior to construction. Additional information on graves was obtained from cultural resource studies on file at the MDNR Historic Preservation Program in Jefferson City and at the Archaeological Survey of Missouri in Columbia. Once a grave was identified, its location was recorded on the USGS quadrangle and general location information was obtained so that this data could be used with the GIS system being developed for this project. In addition to cemeteries, churches were also documented even if an associated burial ground was not shown. Such a burial area was common, especially near rural churches of the late 19th and early 20th centuries. These graveyards are not always marked and the potential presence of graves will need to be field-verified in the future.

The archival search resulted in identification of 367 cemeteries and another 141 churches, which could have an associated graveyard. By county these cemeteries include:

Jackson:	24 (17)*	Moniteau:	1
Lafayette:	52 (38)	Boone:	38 (9)
Johnson:	3 (1)	Callaway:	43 (10)
Saline:	33 (5)	Montgomery:	26 (12)
Pettis:	7 (1)	Warren:	32 (14)
Cooper:	67 (25)	Lincoln:	8
Howard:	3	St. Charles:	30 (9)

* 00= number of cemeteries, (0) number of churches with no cemeteries shown

Although the number of cemeteries increased near urban areas, there are numerous small family plots scattered throughout the study area. Some are very near existing I-70. For example, two cemeteries occur just north of the interstate in Lafayette County within Township 49 North, Range 26 West, Section 22. Overall, these burials are small and widely scattered.

c. Interstate 70

As early as 1938 consideration was given by the federal government to an interstate highway network. A report resulting from the Federal Highway Act of that year recommended construction of a 26,000-mile (41,843 km) inter-regional system consisting of two- or four-lane highways, some with controlled access. The plan remained dormant until the Federal Highway Act of 1944 authorized the designation of select existing highways as part of an interstate system. The act called for improvement of these designated roads, but made no provision for increased federal funding. Lack of money and uniform design standards slowed progress on the project over the following years. Although funding increased with the Federal Highway Act of 1952, only 6,000 miles (9,656 km) of highway had been completed by 1953 (Weingroff 1996).

In an address prepared for a governors conference in 1954, President Dwight Eisenhower declared that the highway system then in place was totally inadequate, causing needless death and injury, creating delay in the transportation of goods, and placing the nation at risk in the event of major disaster or war. He called for federal and state cooperation in the creation of a modern interstate network, paid for by a revamped system of financing that would avoid debt. Installed over a period of 10 years, the highway program would, according to Eisenhower, cost $50 billion. A presidential advisory committee headed by General Lucius Clay subsequently determined that modernization of 36,402 miles (58,583 km) of designated highway could be achieved in 10 years at a cost of $27 billion (Weingroff 1996).

The Federal Highway Act of 1956 substantially enacted Eisenhower's proposal and initiated the current interstate highway system. The act instituted construction on a network 39,600 miles (63,730 km) in extent and authorized $25 billion for the project, to be spent over the period 1957 to 1969. Existing toll roads meeting system standards could be integrated into the interstate system. Inherent in the terms of the act was the idea that the interstate system should evolve and improve over time and that initial construction would be altered or replaced in the future as need arose. The original act permitted two-lane interstate segments with at-grade intersections in low traffic rural areas, but called for the adoption of minimum standards aimed at the eventual elimination of these segments. Legislation passed in 1966 ultimately did require all interstates to be at least four lanes and have no at-grade intersections. According to the 1956 act, interstates were to be constructed according to standards accommodating traffic forecasted for 1975. Subsequent legislation amended this requirement so that highway design would tolerate traffic estimates for a maximum of 20 years (Federal Highway Administration 1976:476; Weingroff 1996).

The 1956 act started a public works project that was the most expensive and wide-scale in United States history, surpassing any program undertaken during the New Deal era, with approximately 75 percent of the new interstate system constructed on new right-of-way (Lewis 1997:126). Yet is was endorsed by fiscally conservative members of the Eisenhower cabinet, men including Secretary of the Treasury George M. Humphrey who argued that "America lives on wheels, and we have to provide the highways to keep…the kind and form of life we want" (Davies 1975:4). Initial construction of the interstate system was greeted with wide-ranging support. It was not until the 1960s that significant opposition to the program mounted, with criticisms centering on the displacement of residents and the destruction of urban neighborhoods caused by highway construction (Seely 1987:232).

Missouri is sometimes credited as the first state to initiate interstate highway construction, breaking ground on a 2.6-mile (4.2 km) section of Interstate 70 in St. Charles County, after the state signed the first contracts under the new interstate program on Aug. 2, 1956. Claiming the same distinction, however, are Kansas and Pennsylvania with other segments of the same interstate. It would appear that the claim of all three states can be disputed, since first construction in each involved improvement to or redesignation of previously existing highways. Included within I-70 was a portion of the Pennsylvania Turnpike, opened in October, 1940, the first limited-access, divided highway in the United States (L.B.J. Library 2001). Kansas lays claim to opening the first segment of I-70 completed under the terms of the 1956 legislation, dedicating a six-mile (9.7 km) portion of the route outside Topeka, Kan., on Nov. 14, 1956 (Lewis 1997:126).

Beginning in 1956, construction of I-70 across Missouri took nine years to complete. Work on the last sections, in Jackson and Lafayette counties, was completed in August of 1965. Extending 251 miles (403.9 km), the Missouri segment was designed to meet the 20-year tolerance standard established by federal legislation. When finished, I-70 extended from

Baltimore, MD, through the Alleghenies of Pennsylvania, and across the Ohio River at Wheeling, W.Va. From there it passed through Indianapolis, St. Louis and Kansas City, toward its original western terminus at Denver. In 1957 it was decided to extend I-70 west from Denver to a junction with I-15 in south central Utah. Completion of this extension involved several engineering feats, including the design of the Eisenhower Tunnel, crossing the Continental Divide in Colorado. The 13-year tunnel construction project, completed in 1979, cost the lives of three workers. Another difficult portion of the extension was subsequently finished through Glenwood Canyon in Colorado, its design reflecting growing concern about the environmental impact of highway construction (Lewis 1997:126, 254, 256).

As one of the interstates built in the immediate aftermath of the Federal Highway Act of 1956, I-70 was designated by federal legislation in 1990 as part of the Dwight D. Eisenhower System of Interstate and Defense Highways. In February, 1994, this system was named by the American Society of Civil Engineers as one of the "Seven Wonders of the United States", along with other notable engineering accomplishments including the Golden Gate Bridge, the Panama Canal and Hoover Dam (Weingroff).

9. HAZARDOUS WASTE SITES

a. Survey Methodology

A hazardous material screening was conducted for the I-70 corridor. The purpose of the screening was to identify major sites within the corridor that are contaminated, or potentially contaminated with hazardous materials or waste that would have a high potential to impact the location of a transportation facility. Particular attention was given to the location of landfills and superfund-level type of sites. Some of the landfills listed are not technically considered hazardous, since they are sanitary landfills that did not accept hazardous waste. Lesser sites such as service stations (underground storage tanks) and generators of designated regulated material were not included in the screening.

For the purposes of this screening, hazardous wastes and materials are defined as products or wastes regulated by the U.S. Environmental Protection Agency or the Missouri Department of Natural Resources. These include substances and sites regulated under the Comprehensive Emergency Response, Compensation, and Liability Act.

The hazardous waste assessment for the I-70 corridor involved data collection efforts, including review of numerous government agency lists and files, as well as a limited field reconnaissance of the corridor. A review of regulatory databases was conducted by Vista Information Solutions Inc. Their findings were provided in a report with mapped locations dated February 7, 2000. The Vista report is not included as a part of this document.

The databases searched by VISTA include:

- NPL – National Priorities List detail EPA sites identified for remedial actions under the Superfund program.
- SPL – State Priority List – MDNR Superfund Section.
- CERCLIS – EPA's list of sites which are either proposed to be on the NPL list or sites which are in the process of assessment for possible inclusion on the NPL.

- NFRAP – CERCLIS sites for which, following an investigation, no contamination was found, contamination was quickly removed, or contamination was not serious enough to require Superfund action.

- CORRACTS – RCRA facilities undergoing corrective action.

- RCRA – TSD – facilities which transport, store or dispose of hazardous waste.

- SWLF – MDNR Solid Waste Landfills.

County governments involved in the study were also contacted for information regarding operating or closed landfills. The Missouri Department of Natural Resources was also contacted to identify both unregistered and recorded major hazardous material and landfill sites.

b. Potential Sites

In all, 21 sites were identified within the study corridor as having the high potential to impact the location of a transportation facility. High impact is defined as a site that would require extensive time and cost to assess and remediate. A few of the sites are large, working industrial plants which are in the study area and are included for regulatory reasons, but assumed to be avoided for other reasons.

In general, these sites can be characterized as follows: one NPL Superfund site, 12 landfills, six CERCLIS sites, six TSD sites and nine SHWS sites. The variance in number of sites listed compared to total sites is due to individual sites being on multiple lists.

A summary of the sites are:

1. R & E Sanitary Landfill, Hoff and Kemmar Rds, O'Fallon, MO – Landfill, CERCLIS
2. PPG Industries, 1495 E. Pierce Blvd. Wentzville, MO – TSD
3. GM Wentzville, 1500 E. Hwy A, Wentzville, MO – CERCLIS, TSD
4. Bobs Home Service, (Zykan) Muenze and Vaughn Rds, Wright City, MO – Landfill, 11SHWS, TSD
5. JZ Disposal (Zykan), Godt Rd, Wright City, MO – Landfill, SHWS, TSD
6. Bobs Home Service (Zykan), Godt Rd., Wright City, MO, Landfill, SHWS, TSD.
7. JZ Disposal (Zykan), Godt Rd. Wright City, MO – Landfill, SHWS, TSD
8. Montgomery City Landfill, Hwy 161, Montgomery City, MO, Landfill, SHWS
9. Bethel Residence, 409 Old Cedar Ave., Danville, MO SHWS
10. Big Spring Quarry, Big Spring Quarry Rd., Big Spring, MO – SHWS
11. UMC McCredie Research Farm, County Rd. 145, Kingdom City, MO – SHWS
12. UMC Solid Waste Landfill, Columbia, MO Landfill
13. Columbia Coal Gas, Ash and Orr Sts., Columbia, MO – CERCLIS
14. VA Med Center, 800 Hospital Dr., Columbia, MO – CERCLIS
15. Boonville FMGP, 301 2nd St., Boonville, MO – CERCLIS
16. Boonville Sanitary Landfill, Morgan St. East of Main, Boonville, MO – Landfill
17. Lake City Army Ammunition Plant, M-7 and M-78, Independence, MO – NPL (Superfund), CERCLIS, SHWS
18. Woods Chapel Sanitary Landfill, Woods Chapel and R.D. Mize Roads, Blue Springs, MO – Landfill
19. Lafayette County Landfill No. 1, 3 miles (4.8 km) west of I-70 and Missouri Route 13, Higginsville, MO – Landfill

20. Lafayette County Landfill No. 2, 2.5 miles (4.0 km) east of I-70 and Missouri Route 13, Higginsville, MO – Landfill
21. UMC South Farm, Rolling Springs Road, Columbia, MO – Landfill

10. VISUAL QUALITY

a. Regional Visual Environment

The study corridor, which is located between Kansas City and St. Louis, travels through several physiographic regions of north-central Missouri. The western portion of the study corridor is located in the Western Glaciated Plains, consisting of gentle to moderate slopes with rolling hills. Much of this area has been cleared for use as agricultural cropland and pastureland.

The middle portion of the corridor includes the Lower Missouri River and the adjacent Ozark Border. The Lower Missouri River region consists of level river bottoms in a wide floodplain area, most of which has been cleared and is used for agricultural cropland. Some areas remain as wetlands and riparian forests. The Ozark Border is characteristically rugged with forested hilly terrain of steep to moderately steep slopes and narrow valleys. Some of this area has remained forested.

The eastern portion of the study corridor is located in both the Eastern Glaciated Plains and the Ozark Border adjacent to the Missouri River. The Eastern Glaciated Plains consist of gentle to moderate slopes with rolling hills, most of which has been cleared for agricultural use. The Ozark Border is characterized by hilly terrain similar to that of the middle portion of the corridor, however, there is much more remaining forested land in Callaway, Montgomery and Warren Counties, between Kingdom City and Wright City, especially in the area south of I-70.

In addition to the Missouri River valley, the study corridor includes several other perennial and intermittent stream valleys. Each of these provides a unique visual environment, which is composed of water, trees and rocks or bluffs.

The majority of the built environment is concentrated within the larger towns and cities such as the east side of the Kansas City metropolitan area, the west side of the St. Louis metropolitan area and the city of Columbia. At these areas, there is a sharp contrast between the built environment and the natural environment. In most cases, the edges of these urbanized or built-up areas tend to include highway corridors with adjacent commercial and industrial uses that seem to lack harmonious or cohesive aesthetic relationships. In contrast, the smaller towns within the study corridor are less intrusive, and can be more aesthetically pleasing, depending upon architectural styles and maintenance practices.

b. Visual Quality Rating

The visual impacts of a project may be quite varied in different areas of a project corridor because the areas themselves can be visually distinct, can exhibit unique and consistent visual characteristics and can possess varying degrees of visual quality. The study corridor can be divided into separate areas or units within which there are consistent visual characteristics and a uniform visual experience. These units have direct relationships to physiography and land use and can be thought of as “outdoor rooms”. The boundaries of these visual environments occur where there is a change in visual character. The strongest determinations of the visual boundaries are *topography* and *landscape components.*

- ***Topography -*** Topography influences many natural systems such as drainage, vegetation, geology, aspect, etc. These natural systems often have distinct and variable characteristics with visual consequences.

- ***Landscape Components -*** Landscape components are distinct elements in the visual environment. Natural land-cover elements such as trees, water, rocks and open areas; developed land uses such as roads, bridges and buildings; and identifiable patterns such as power line corridors and agricultural crops, constitute landscape components.

To determine a visual quality rating, the different visually distinct areas of the study corridor were defined and separated into visual assessment units. The visual assessment units were determined by analyzing the topography of the study corridor, studying the major landscape components and studying aerial photography. The quality of the visual environment can be collectively defined using the attributes of *vividness*, *intactness* and *unity*. *Vividness* is the relative strength of the seen image; *intactness* is the visual integrity of the natural or man-made landscape and its freedom from encroaching elements; and *unity* is the overall visual harmony of a composition and the degree to which the various elements combine in a coherent way.

The identified visual assessment units present within the study corridor and the relative existing visual quality rating of each is presented in Table III-36.

Table III-36: Visual Quality of Visual Assessment Units

Visual Assessment Units	Visual Quality Rating
Agricultural Land	Moderate
River and Stream Valleys	High
Forested Areas	High
Large Towns & Cities	Moderate to Low
Small Towns	Moderate to High

c. Visual Resources

Within the study corridor, there are several visual resources that are noteworthy and that contribute to the visual identity of the environment, such as stream-related riparian environments, lakes and forested areas. One of the most notable scenic areas within the corridor is the Missouri River valley. Although much of this large floodplain area is currently used as agricultural cropland, there are still some remaining areas of riparian forests, emergent wetlands, and limestone bluffs. Most of the Missouri River floodplain area in Cooper and Moniteau Counties, known as Overton Bottoms, is no longer being cultivated. It is being rehabilitated and reverted back to natural wetland areas which will enhance the visual experiences in this part of the study corridor.

Another notable visual resource in the corridor is the Mineola Hill area. This scenic area contains the Loutre River and its wooded riparian environment, the forests and bluffs of Graham Cave State Park, an historic farmstead and a natural rock formation in the median of I-70.

Other notable visual resources located throughout the study corridor include rivers, lakes, designated conservation areas (see Table III-18 in B. Natural Environment section 3. Parklands in this chapter) and forested areas of the Ozark Border physiographic region between Kingdom City and Wright City in the eastern portion of the study corridor.

d. Viewers

Visual impact is determined by change in the visual environment as related to viewer response. For the purpose of highway project assessment, there are two distinct categories of viewer response to be considered: viewers who are users of the project facility (views *from* the road),

and people who can observe the roadway from an adjacent vantage point (views *of* the road). The best potential for the most vivid landscape views *from* the road occurs on the ridges at the higher elevations of the corridor (for distant views), and at stream and valley crossings where bridges or elevated fill areas provide opportunities for views of scenic riparian environments. Currently, the most notable view *from* the road occurs at the Missouri River bridge crossing. The quality of views *from* the road, as analyzed for each general visual assessment unit encountered within the corridor, is presented in Table III-37.

Individuals that have the potential for undesirable views *of* the road are referred to in this discussion as "Sensitive Visual Receptors". The relative concentration of sensitive visual receptors is high in the towns and cities, and low in the remainder of the study corridor. This information is also presented in Table III-37.

Table III-37: Views and Visual Receptors

Visual Environment	Quality of Views from the Road	Relative Concentration of Sensitive Visual Receptors
Agricultural Land	Moderate	Low
River and Stream Valleys	High	Low
Forested Areas	High	Low
Large Towns & Cities	Moderate to Low	High
Small Towns	Moderate to High	High

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Jackson

Lafayette

Independence

Blue Springs

Lee's Summit

Unity Village

Grain Valley

Oak Grove

Bates City

Exit 14

Exit 18

Exit 20

Exit 21

Exit 24

Exit 26

Exit 31

Sheet Number

Kansas City

Columbia

St. Louis

1 2 3 4 5 6 7 8 9

MoDOT

IMPROVEMENT STUDY

Scale: 1"=8000'

LEGEND

T & E Species Sites
NRHP Archaeological Sites
NRHP Structure Sites
Hazardous Material Locations
Churches
Cemeteries
Hospitals
Schools
I-70 Corridor
City Limits
Natural Features Sites
Historical Sites
City/County Parks
City/County Parks
Conservation Areas
DNR State Parks
Katy Trail (DNR State Park)
Mark Twain Forest Properties
Mark Twain Forest Boundary
National Wildlife Refuge
Floodplains
Wetland Areas
Lakes
Rivers

EXHIBIT III-1
Environmentally Sensitive Features

Mayview
Higginsville
Odessa
Aullville
Lafayette
Johnson
Exit 37
Exit 38
Exit 41
Exit 45
Exit 49
Exit 52
Tabo Creek
Davis Creek
Blackjack Creek
Higginsville City Lake
Cecil G. Gross Conservation Area
Maple Leaf Lake Conservation Area
Dyer Park

Sheet Number
Kansas City
Columbia
St. Louis
1 2 3 4 5 6 7 8 9

MoDOT
IMPROVEMENT STUDY

Scale: 1"=8000'

LEGEND
T & E Species Sites
NRHP Archaeological Sites
NRHP Structure Sites
Hazardous Material Locations
Churches
Cemeteries
Hospitals
Schools
I-70 Corridor
City Limits
Natural Features Sites
Historical Sites
City/County Parks
City/County Parks
Conservation Areas
DNR State Parks
Katy Trail (DNR State Park)
Mark Twain Forest Properties
Mark Twain Forest Boundary
National Wildlife Refuge
Floodplains
Wetland Areas
Lakes
Rivers

EXHIBIT III-2
Environmentally Sensitive Features

Saline

Lafayette

Johnson

Pettis

Concordia

Sweet Springs

Houstonia

Exit 58

Exit 62

Exit 66

Exit 71

Exit 74

Exit 78

Blind Pony Lake Conservation Area

Ralph & Martha Perry Conservation Area

Marshall Junction Conservation Area

Blue Lick Conservation Area

McAllister Springs Access

Edwin A. Pape Lake

Davis Creek

Brushy Creek

Jordan Creek

Salt Pond Creek

Crooked Creek

N. Fork

Blackwater River

South Fork

Panther Creek

Sheet Number

Kansas City

Columbia

St. Louis

1 2 3 4 5 6 7 8 9

MoDOT

IMPROVEMENT STUDY

Scale: 1"=8000'

LEGEND

- T & E Species Sites
- NRHP Archaeological Sites
- NRHP Structure Sites
- Hazardous Material Locations
- Churches
- Cemeteries
- Hospitals
- Schools
- I-70 Corridor
- City Limits
- Natural Features Sites
- Historical Sites
- City/County Parks
- City/County Parks
- Conservation Areas
- DNR State Parks
- Katy Trail (DNR State Park)
- Mark Twain Forest Properties
- Mark Twain Forest Boundary
- National Wildlife Refuge
- Floodplains
- Wetland Areas
- Lakes
- Rivers

EXHIBIT III-3
Environmentally Sensitive Features

Cooper

Howard

Saline

Pettis

Blackwater River

Nelson

Blackwater

MISSOURI RIVER

Lamine River

Exit 84

Exit 89

Exit 98

Boonville

Pilot Grove

Katy Trail State Park

Sheet Number

Kansas City

Columbia

St. Louis

1 2 3 4 5 6 7 8 9

MoDOT

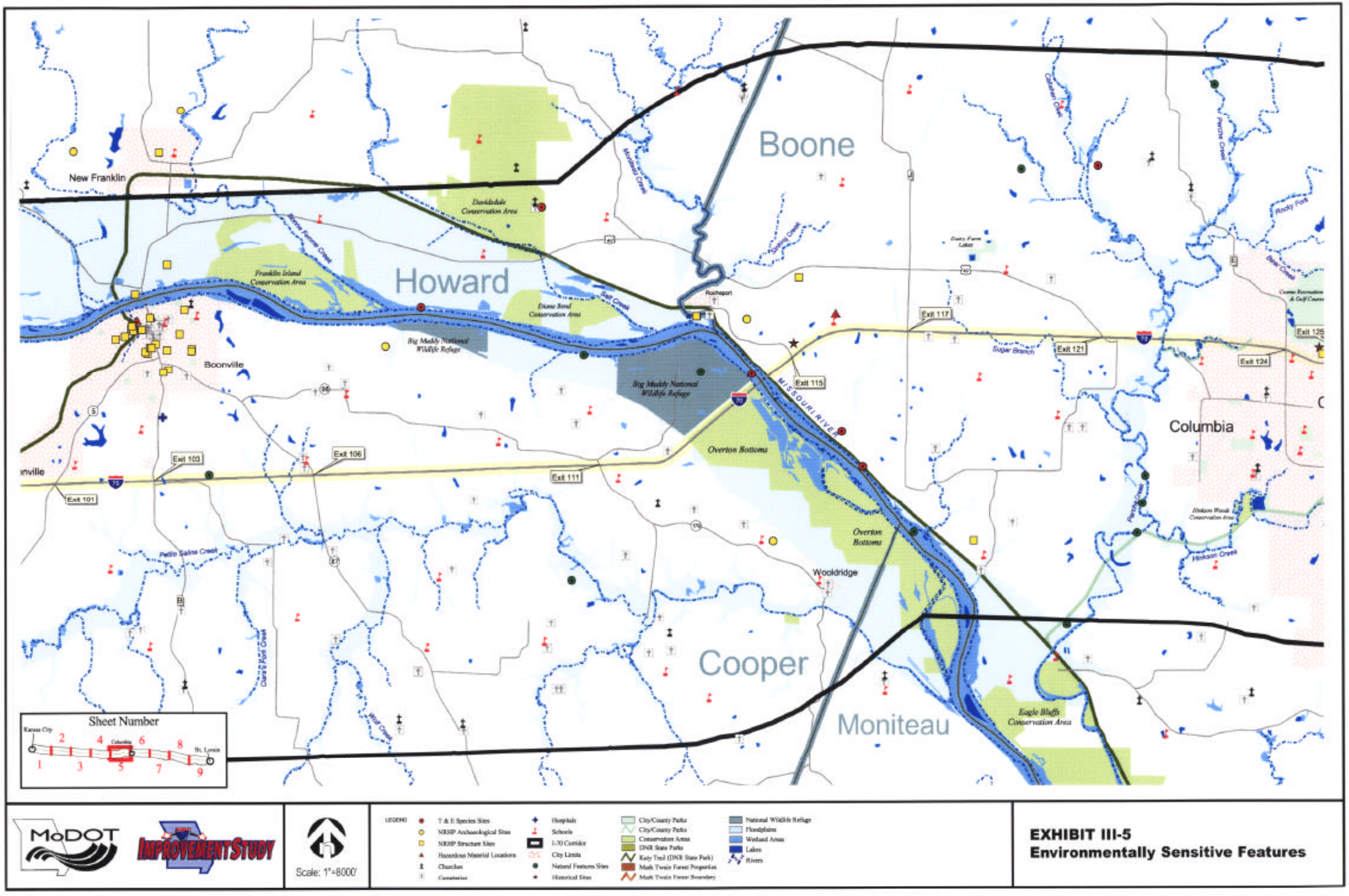
IMPROVEMENT STUDY

Scale: 1"=8000'

LEGEND

- T & E Species Sites
- NRHP Archaeological Sites
- NRHP Structure Sites
- Hazardous Material Locations
- Churches
- Cemeteries
- Hospitals
- Schools
- I-70 Corridor
- City Limits
- Natural Features Sites
- Historical Sites
- City/County Parks
- City/County Parks
- Conservation Areas
- DNR State Parks
- Katy Trail (DNR State Park)
- Mark Twain Forest Properties
- Mark Twain Forest Boundary
- National Wildlife Refuge
- Floodplains
- Wetland Areas
- Lakes
- Rivers

EXHIBIT III-4
Environmentally Sensitive Features



MoDOT IMPROVEMENT STUDY

EXHIBIT III-5
Environmentally Sensitive Features

Boone

Callaway

Columbia

Fulton

Exit 125

Exit 126

Exit 127

Exit 128

Exit 128A

Exit 131

Exit 133

Exit 137

Exit 144

Rocky Fork

Hinkson Creek

Bear Creek

Cosmo Recreation Area & Golf Course

Lake of the Woods Recreation Area

Little Cedar Creek

Cedar Creek

Auxvasse Creek

Hinkson Creek

North Fork

South Fork

Grays Creek

Mark Twain National Forest

MTNF Property

Little Dixie Lake Conservation Area

Millers Creek

Richland Creek

Stinson Creek

Tucker Prairie

Rock Bridge State Park

Sheet Number

Kansas City

Columbia

St. Louis

1 2 3 4 5 6 7 8 9

MoDOT

IMPROVEMENT STUDY

Scale: 1"=8000'

LEGEND

- T & E Species Sites
- NRHP Archaeological Sites
- NRHP Structure Sites
- Hazardous Material Locations
- Churches
- Cemeteries
- Hospitals
- Schools
- I-70 Corridor
- City Limits
- Natural Features Sites
- Historical Sites
- City/County Parks
- City/County Parks
- Conservation Areas
- DNR State Parks
- Katy Trail (DNR State Park)
- Mark Twain Forest Properties
- Mark Twain Forest Boundary
- National Wildlife Refuge
- Floodplains
- Wetland Areas
- Lakes
- Rivers

EXHIBIT III-6
Environmentally Sensitive Features

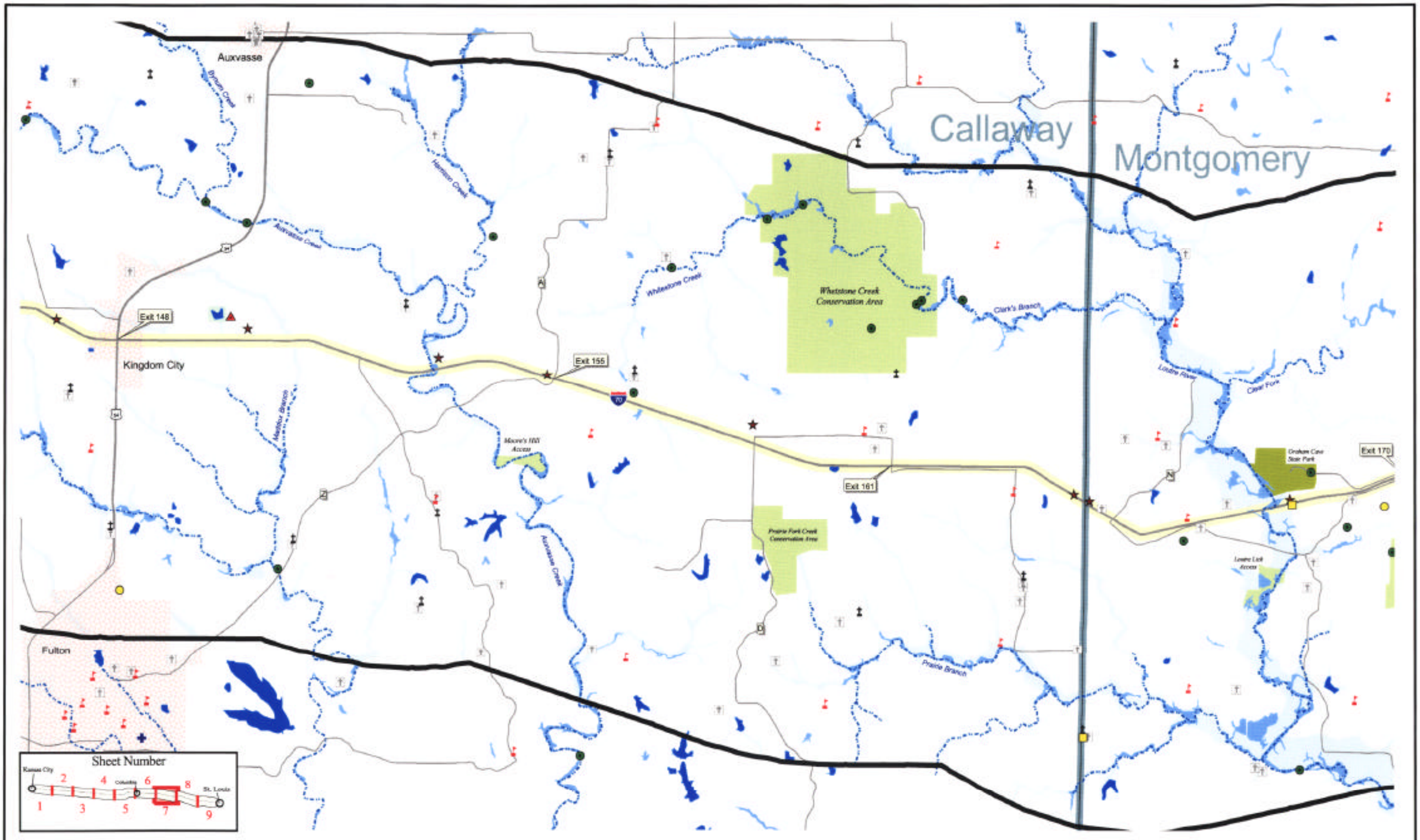


EXHIBIT III-7
Environmentally Sensitive Features

Lincoln

New Florence

Exit 170

Exit 175

Exit 179

High Hill

Exit 183

Jonesburg

Exit 188

Montgomery

Warren

Warrenton

Danville Conservation Area

Daniel Boone Conservation Area

Little Lost Creek Conservation Area

Bear Creek

Missile Creek

Big Creek

Sheet Number

Kansas City 1 2 3 4 Columbia 5 6 7 8 St. Louis 9

MoDOT

IMPROVEMENT STUDY

Scale: 1"=8000'

LEGEND

- T & E Species Sites
- NRHP Archaeological Sites
- NRHP Structure Sites
- Hazardous Material Locations
- Churches
- Cemeteries
- Hospitals
- Schools
- I-70 Corridor
- City Limits
- Natural Features Sites
- Historical Sites
- City/County Parks
- City/County Parks
- Conservation Areas
- DNR State Parks
- Katy Trail (DNR State Park)
- Mark Twain Forest Properties
- Mark Twain Forest Boundary
- National Wildlife Refuge
- Floodplains
- Wetland Areas
- Lakes
- Rivers

EXHIBIT III-8
Environmentally Sensitive Features

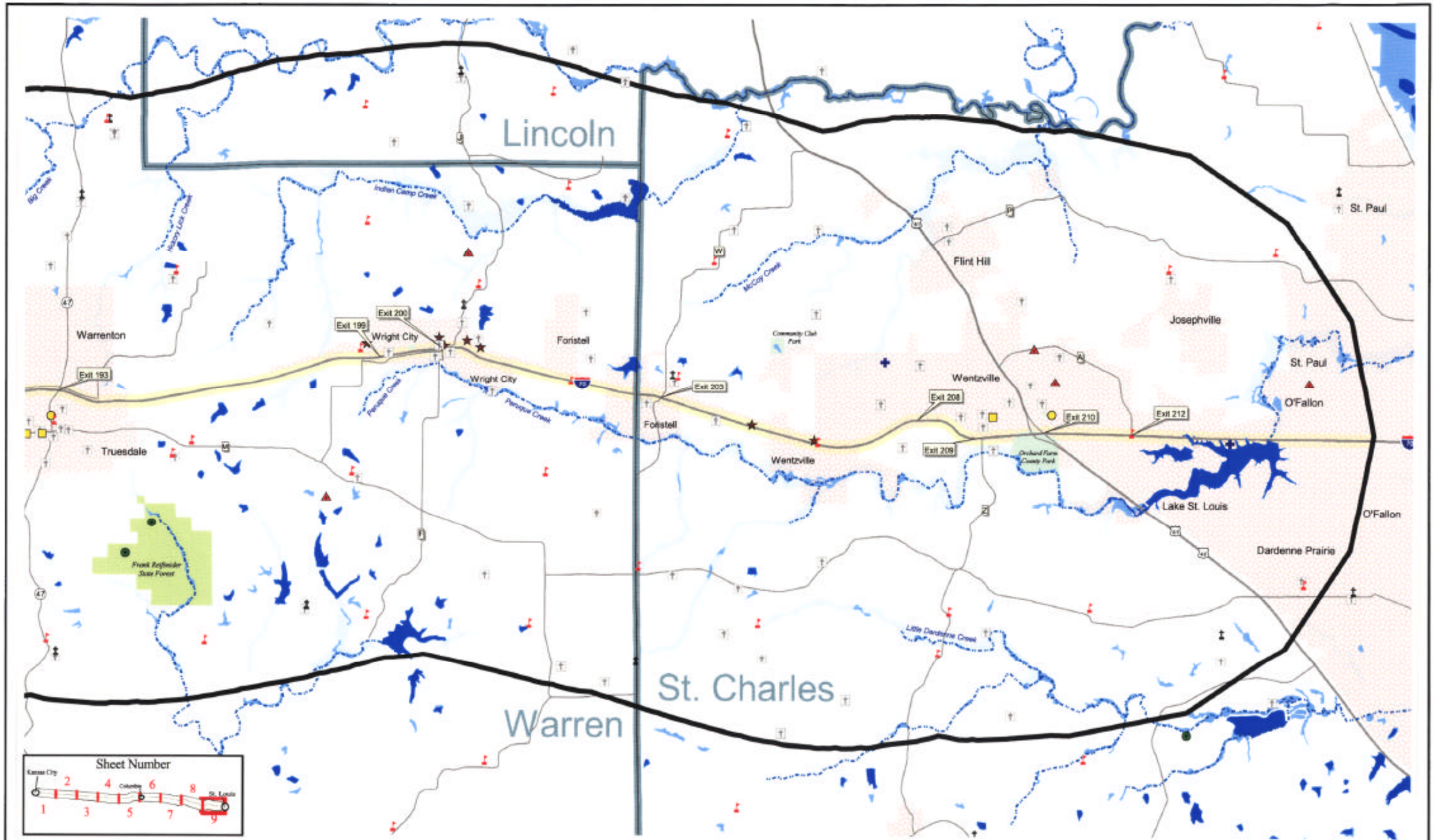
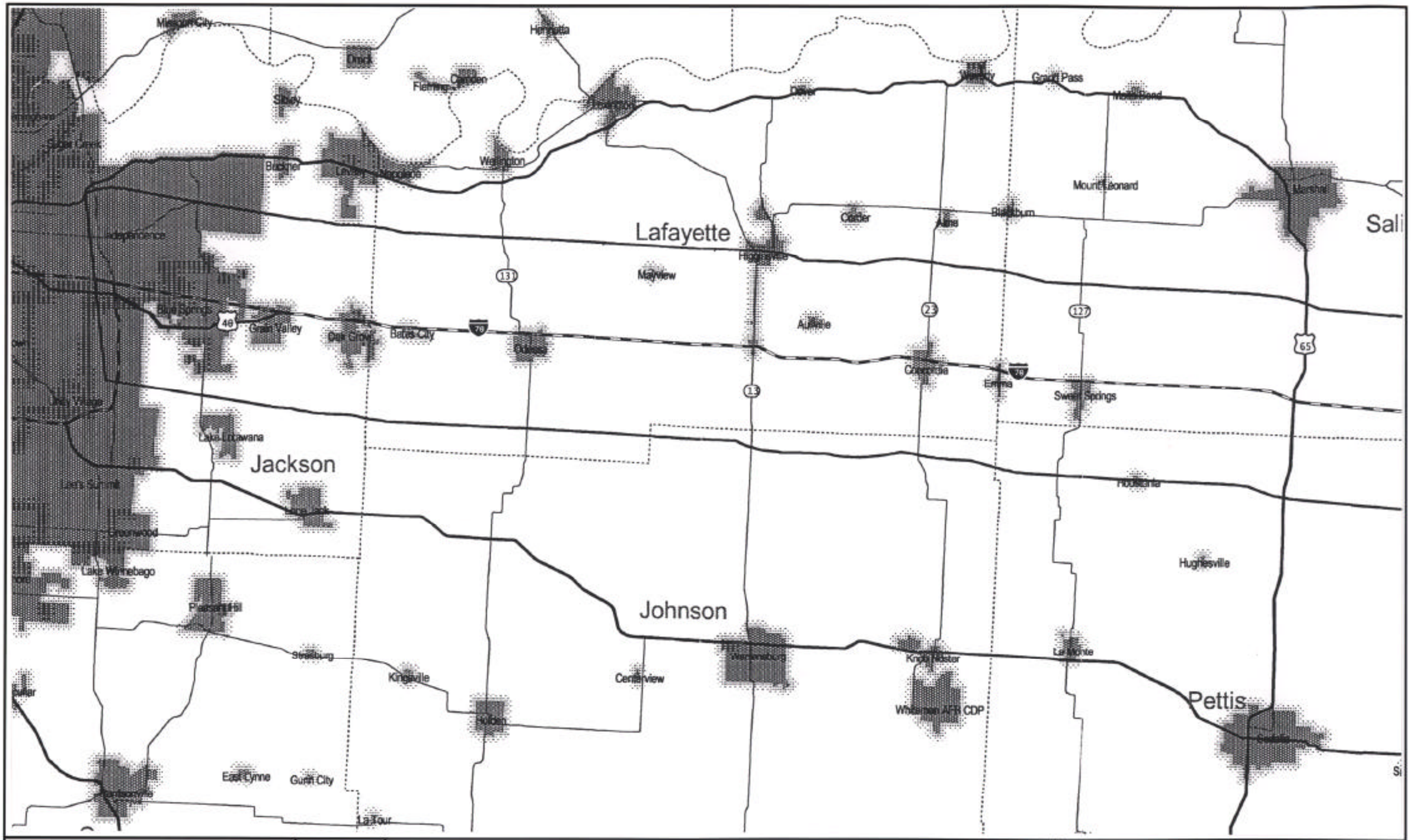
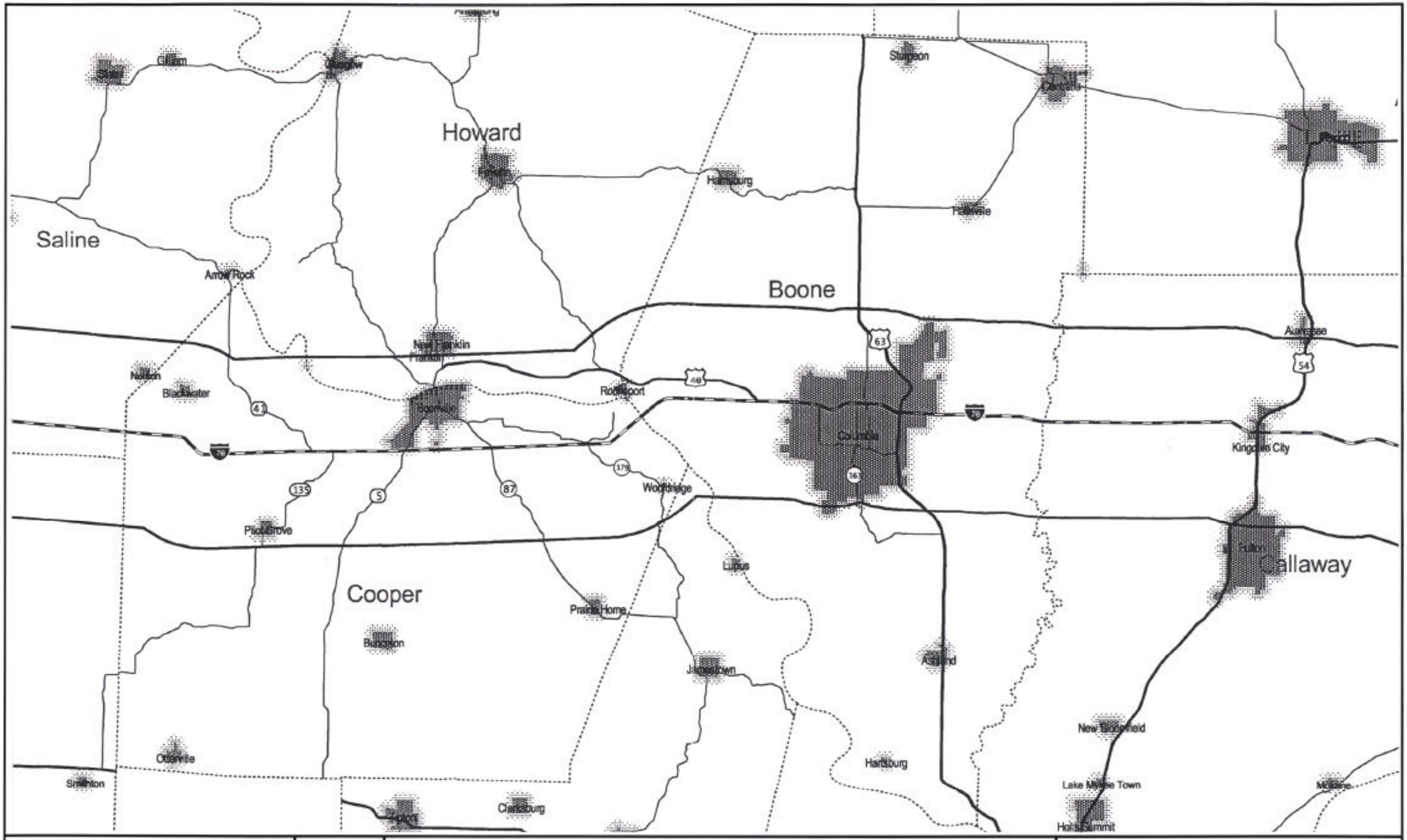


EXHIBIT III-9
Environmentally Sensitive Features


Lafayette
Jackson
Johnson
Pettis
Missouri City
Orrick
Camden
Fleming
Sibley
Hardin
Wellington
Napoleon
Dover
Wellington
Grand Pass
Mayview
Mount Leonard
Marshall
Blackburn
Odessa
Higginsville
Aullville
Concordia
Emma
Sweet Springs
Blue Springs
Grain Valley
Oak Grove
Bates City
Lake Lotawana
Lees Summit
Greenwood
Lake Winnebago
Peculiar
Strasburg
Kingsville
Holden
Centerview
Warrensburg
Knob Noster
Whiteman AFB CDP
La Monte
Houstonia
Hughesville
East Lynne
Gunn City
La Tour
Pettis
MoDOT
IMPROVEMENT STUDY
Scale: 1"=4.75 miles
EXHIBIT III-10
Developed Areas



MoDOT IMPROVEMENT STUDY

Scale: 1"=4.75 miles

EXHIBIT III-11
Developed Areas

Benton City
Marshfield
Wellsville
Middletown
Silex
Lincoln
Foley
Auxvasse
54
Bellflower
Truxton
Hawk Point
Winfield
Montgomery City
Mexico
Mills
Old Monroe
161
19
New Florence
High Hill
Jonesburg
Montgomery
47
61
Wright City
Warrenton
Troy
Wentzville
Lake St. Louis
40
Warren
St. Charles
McKittrick
Rhineland
Hermann
New Melle
Chesterfield
Berger
Morrison
Gasconade
Marthasville
New Haven
Augusta
Washington
MoDOT
IMPROVEMENT STUDY
Scale: 1"=4.75 miles

EXHIBIT III-12
Developed Areas