Contents

Section 3

Affected Environment, Environmental Consequences, and Measures to Minimize Harm

Contents

Section 3

Affected Environment, Environmental Consequences, and Measures to Minimize Harm

Contents

Tables

Section 3

Affected Environment, Environmental Consequences, and Measures to Minimize Harm

Contents

Section 3

Affected Environment, Environmental Consequences, and Measures to Minimize Harm

Contents

Section 3

Affected Environment, Environmental Consequences, and Measures to Minimize Harm

Contents

Exhibits

Section 3

Affected Environment, Environmental Consequences, and Measures to Minimize Harm

SECTION 3

Affected Environment, Environmental Consequences, and Measures to Minimize Harm

This section describes the socioeconomic and natural resources in the project area. It also describes the effects the Build Alternative may have on those resources and identifies measures to minimize adverse effects. The discussions of affected environment and impacts are arranged by the following topics.

- Social/Economic Setting
- Agriculture
- Cultural Resources
- Air Quality
- Noise
- Geology and Soils
- Surface Water
- Wetlands
- Floodplains
- Plant Communities
- Wildlife Resources
- Threatened and Endangered Species
- Designated Lands
- Special Wastes
- Permits and Certifications
- Visual Resources
- Section 4(f) and Section 106 Applicability

Each subsection provides an analysis of direct effects associated with the Build Alternative. Indirect and cumulative effects of the Build Alternative are considered when applicable. The Council on Environmental Quality (CEQ) defines direct, indirect, and cumulative effects as follows:

- Direct effects are caused by the action and occur at the same time and place.[13]

- Indirect effects "are caused by an action and are later in time or farther removed in distance, but are still reasonably foreseeable."[14] They "may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems." Indirect effects associated with highway improvements are those that affect the natural or built environment beyond the immediate right-of-way (ROW) of the highway improvements. An example of an indirect impact is the loss of agricultural land at an interchange to the development of service stations, restaurants, and motels after it is constructed.

- Cumulative effects "result from the incremental consequences of an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions."[15] They can "result from individually minor but collectively significant actions taking place over a period of time." For example, degradation of a stream's water quality by several developments that taken individually would have minimal effects but collectively would cause a measurable negative impact is considered a cumulative effect. The cumulative effects of an action may be undetectable when viewed in the individual context of direct and even indirect impacts, but nonetheless can add to other disturbances and eventually lead to a measurable environmental change.

Indirect and cumulative effects are addressed for the following topics:

- Agriculture
- Surface Water
- Wetlands
- Floodplains (indirect only)
- Plant Communities

[13] Title 40, *Code of Federal Regulations*, Section 1508 (40 CFR 1508.8(a)).

[14] 40 CFR 1508.8(b).

[15] 40 CFR 1508.7

- Wildlife
- Threatened and Endangered Species and Other Protected Species
- Designated Lands

The indirect and cumulative analyses were prepared in accordance with the requirements of the National Environmental Policy Act (NEPA) and guidance from the CEQ, *Considering Cumulative Effects under the National Environmental Policy Act.*

The project design year (2035) was used to analyze indirect and cumulative impacts.

3.1 Geographic Setting

The IL 336 project corridor spans parts of McDonough, Fulton and Peoria Counties in west central Illinois (see Exhibit 1-4). The following communities are located adjacent to or within the project corridor: Macomb, New Philadelphia and Bardolph in McDonough County; Marietta, Smithfield, Cuba, Canton, Norris and Farmington in Fulton County; and Trivoli, Hanna City, Bellevue and Norwood in Peoria County. The city of Bushnell is located just north of the project corridor in McDonough County and the city of Peoria is just east of the corridor. The project corridor is about 60 miles long and extends from the proposed US 67 bypass east of Macomb to I-474 west of Peoria.

Relatively rugged topography along the major stream valleys and gentle topography elsewhere characterize the project area. Exhibit 3-1, which shows general land cover, provides a sense for the overall topography. The forested land along streams is mostly rugged and the agricultural land is mostly relatively flat. Elevation in the project corridor ranges from a maximum of about 800 feet above sea level just north of Norris in Fulton County to a minimum of about 475 feet above sea level along the Spoon River southwest of Smithfield, also in Fulton County.

3.2 Social / Economic Setting

3.2.1 Affected Environment

This section discusses the social and economic setting of the project corridor, which is primarily rural and agricultural. The boundaries of the counties, townships, communities and census tracts discussed in this section are shown in Exhibit 3-2.

3.2.1.1 Demographics

Population

County-Level Trends. For the three counties through which the project corridor passes, the population growth was slow or declining from 1960 to 2000, in contrast with the state trend (Table 3-1). Much of the population decline in Fulton and Peoria Counties from 1980 to 1990 may be attributable to decreases in manufacturing jobs. For example, in Fulton County, International Harvester closed its Canton plant in 1983. In Peoria County, Caterpillar reports on its website history that it dramatically reduced employment between 1981 and 1983. Population projections through 2020 show small increases for the three counties—much less than the projected increases for the state (Table 3-2). Note that more than half the population of Peoria County is in the City of Peoria, which is outside the project corridor.

Community- and Township-Level Trends. The project will connect two regional metropolitan areas, Macomb at the west (population about 19,000) and Peoria at the east (population approximately 113,000). Canton is the largest of the communities within or partially within the corridor and has a population around 15,000 (Table 3-3). All other communities in the corridor have populations less than 3,000 and some are very small.

Many communities and townships in the study area experienced population declines between 1990 and 2000 (Table 3-3). Only two communities experienced greater growth between 1990 and 2000 than the state overall: Canton and Bellevue. Canton's growth was primarily due to an increase of over 1,000 persons in correctional institutions (from the Illinois River Correctional Center at the west side of Canton). Bellevue's growth appears to be attributable to its position as a suburban community close to Peoria. All but four of the 11 townships in the study area lost population between 1990 and 2000. Small population increases occurred in Limestone and Logan, the two townships closest to Peoria (Exhibit 3-2). The small population increase in Putnam Township, located near the middle of the corridor, may be due to the Wee-Ma-Tuk residential development located in the formerly strip mined area on the north side of the Cuba to Canton Blacktop (County Highway 5).

Households

During the 1990s, the number of households in Peoria and McDonough Counties increased, although the percent gains were well below US and Illinois averages. During the same time the number of households in Fulton County decreased slightly. The average household size in the three project area counties in 2000 ranged from about 2.5 to 2.6, close to the Illinois and U.S. averages of about 2.7.

Age Distribution

The three-county area experienced an average annual decline of approximately one-half-percent in its under age 18 population from 1990 to 2000, compared with the Illinois average annual

Table 3-1
County Population Trends

County	1960	1970	1980	1990	2000	Percent Population Change					
						1960-70	1970-80	1980-90	1990-2000	1960-2000	1980-2000
Peoria	189,044	195,318	200,466	182,827	183,433	3.3	2.6	-8.8	0.3	-3.0	-8.5
Fulton	41,954	41,890	43,687	38,080	38,250	-0.2	4.3	-12.8	0.4	-8.8	-12.4
McDonough	28,928	36,653	37,467	35,244	32,913	26.7	2.2	-5.9	-6.6	13.8	-12.2
Three-county Area	261,886	275,831	283,600	258,141	256,596	5.3	2.8	-9.0	-0.6	-2.0	-9.5
State of Illinois	10,081,158	11,113,976	11,426,518	11,430,602	12,419,293	10.2	2.8	0.0	8.6	23.2	8.7

Source: US Bureau of Census 1995, US Bureau of Census 2000.

Table 3-2
Study Area Projected Population (2000-2020)

County	2000 Population	2005 Projection	2010 Projection	2015 Projection	2020 Projection	% Change 2000-2020
Peoria	183,433	185,245	187,876	190,903	194,083	5.8
Fulton	38,250	37,818	38,140	38,822	39,621	3.6
McDonough	32,913	33,373	33,710	34,346	35,147	6.8
State of Illinois	12,419,293	12,875,035	13,279,091	13,748,695	14,316,487	15.3

Source: US Bureau of Census 2000; Office of Policy, Development, Planning and Research, Illinois Department of Commerce and Economic Opportunity

Table 3-3
Population Trends for Project Area Townships and Incorporated Communities

	Township		Community		State		% Population Change
	1990	2000	1990	2000	1990	2000	1990-2000
Peoria County							
Limestone Township	19,072	19,374					1.6
Norwood			495	473			-4.4
Bellevue			1,491	1,887			26.6
Logan Township	3,041	3,091					1.6
Hanna City			1,205	1,013			-15.9
Trivoli Township	1,166	1,035					-11.2
Fulton County							
Farmington Township	3,469	3,358					-3.2
City of Farmington			2,535	2,601			2.6
Norris			212	194			-8.5
Canton Township	14,880	16,075					8.0
City of Canton			13,922	15,288			9.8
Putnam Township	2,169	2,198					1.3
City of Cuba			1,440	1,418			-1.5
Cass Township	647	642					-0.8
Smithfield			277	214			-22.7
Harris Township	421	410					-2.6
Marietta			142	150			5.6
McDonough County							
Mound Township	365	279					-23.6
Bardolph			301	253			-15.9
Macomb Township	729	608					-16.6
Macomb City Township	19,952	18,558					-7.0
City of Macomb			19,952	18,558			-7.0
Total including Macomb			41,972	42,049			
Total excluding Macomb			22,020	23,491			
State of Illinois					11,430,602	12,419,293	8.6

Source: US Bureau of Census 1990 and 2000.

growth rate of about one percent for the same population group. All under age 45 population groups in the three-county area declined over the same period. The only age group to experience a population increase in all three counties during the 1990s was the 45- to 64-year old group. The same growth trends are expected through 2004.

The median age in the study area townships in 2000 ranged from 36 to 42, except for Macomb City Township, which had a 2000 college dormitory population of 4,394 (of a total population of 18,558), and where the median age was 23. By comparison, the median age in Illinois in 2000 was 35.

Housing Units

Residential areas are concentrated primarily in the communities, with rural residences scattered throughout the project area. Housing units in the project area are primarily single-residence units. Most communities have some mobile homes, with Bellevue and Bardolph having the highest percentages, at 40 percent of housing units for Bellevue (estimated 345 mobile homes in 2004) and 25 percent of the housing units for Bardolph (estimated 26 mobile homes in 2004). Of the communities in the project area, only Macomb and Canton have multi-unit residences with more than 50 units.

Home ownership rates in Peoria County are comparable to the statewide average, while rates in Fulton County are well above the statewide average and rates in McDonough County are below the statewide average (Table 3-4). In 2000, home ownership rates were above the statewide rate in all but three communities and townships: the Village of Bardolph and the Township and City of Macomb. Home ownership rates in many of the communities and townships were well above the statewide rate, with Norwood the highest at 93 percent.

Housing in the project area tends to be older than in the state overall (Table 3-4). As reported in the 2000 Census, only two townships, Logan and Macomb City, had a lower percentage of houses built before 1960 than the statewide 47 percent. For townships, the percent of houses constructed before 1960 ranged up to 80 (Cass Township in Fulton County). Of the communities, only Bellevue, Bardolph and the City of Macomb had a smaller percent of pre-1960 housing than the statewide percent.

In the State of Illinois, based on the 2000 census, 22 percent of housing was constructed between 1980 and 2000. Almost all the study area townships and communities had a much smaller percentage of housing constructed between 1980 and 2000. Exceptions were Harris Township and Bellevue, which exceeded the statewide average.

The 2000 median value of owner-occupied housing units was $85,800, $58,100 and $61,200, respectively, for Peoria, Fulton and McDonough Counties, well below the statewide median value of $130,800 (US Bureau of Census 2000).

Table 3-4
County Housing Characteristics

	Housing Units	Occupied Housing that is Owner Occupied, %	% of Houses Built Before 1960	% of Houses Built After 1980
Peoria County	78,204	67.7	50.9	14.8
Limestone Township	7,777	82.4	49.1	14.6
Norwood	182	93.2	59.3	12.1
Bellevue	872	78.8	42.0	27.2
Logan Township	1,142	87.5	39.2	17.3
Hanna City	437	82.4	53.1	11.9
Trivoli Township	423	87.5	61.5	12.1
Fulton County	16,240	76.4	62.0	11.0
Farmington Township	1,432	80.7	75.6	8.1
City of Farmington	1,114	79.9	77.1	6.4
Norris	98	85.9	85.7	10.2
Canton Township	6,427	70.3	59.3	10.0
City of Canton	6,098	69.3	59.9	10.3
Putnam Township	958	83.0	51.6	9.6
City of Cuba	594	78.3	67.7	3.9
Cass Township	269	84.7	79.6	11.2
Smithfield	103	85.3	70.9	5.8
Harris Township	196	81.4	56.1	22.4
Marietta	59	83.9	67.8	3.4
McDonough County	13,289	63.1	50.1	15.0
Mound Township	117	79.1	54.7	6.0
Bardolph	102	58.6	42.2	18.6
Macomb Township	252	70.5	51.2	20.6
Macomb City Township	7,037	48.7	45.0	16.2
City of Macomb	7,037	48.7	45.0	16.2
State of Illinois	4,885,615	67.3	47.0	22.1

Source: US Census Bureau 2000

Racial and Ethnic Characteristics. The study area has low racial and ethnic diversity compared with the State of Illinois as a whole (Table 3-5). In 2000, Fulton County had 95 percent white residents and McDonough County, 93 percent. While Peoria County is more diverse with 79 percent white residents, that higher percentage is attributable to the City of Peoria, which is outside the project area. The Peoria County townships and communities within the project area had a much higher proportion of white residents, ranging from 92 to 99 percent. In Fulton County, the City of Canton and Canton Township both had about 90 percent white residents. Most of the remaining persons in the City of Canton and Canton Township were black residents. The other communities and townships in Fulton County had 98 to 100 percent white residents. Macomb City Township and Macomb City, which lie adjacent to the project corridor, had 89 percent white residents. The other McDonough County townships in the project corridor and the single community, the Village of Bardolph, all had nearly 100 percent white residents.

Table 3-5
Populations by Race

	Total Population	White		Black or African American		American Indian and Alaska Native Persons		Asian or Pacific Islander		Some Other Race or Two or More Races		Hispanic or Latino	
		Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Peoria County	183,433	145,602	79.4%	29,532	16.1%	411	0.2%	3,092	1.7%	4,796	2.6%	3,827	2.1%
Limestone Township	19,374	18,471	95.3%	490	2.5%	42	0.2%	102	0.5%	269	1.4%	245	1.3%
Norwood	473	469	99.2%	0	0.0%	1	0.2%	1	0.2%	2	0.4%	2	0.4%
Bellevue	1,887	1,805	95.7%	19	1.0%	5	0.3%	14	0.7%	44	2.3%	30	1.6%
Logan Township	3,091	2,832	91.6%	197	6.4%	5	0.2%	20	0.6%	37	1.2%	31	1.0%
Hanna City	1,013	985	97.2%	4	0.4%	2	0.2%	12	1.2%	10	1.0%	11	1.1%
Trivoli Township	1,035	1,011	97.7%	4	0.4%	4	0.4%	1	0.1%	15	1.4%	8	0.8%
Fulton County	38,250	36,384	95.1%	1,378	3.6%	68	0.2%	99	0.3%	321	0.8%	428	1.1%
Farmington Township	3,358	3,317	98.8%	5	0.1%	9	0.3%	4	0.1%	23	0.7%	25	0.7%
City of Farmington	2,601	2,565	98.6%	3	0.1%	9	0.3%	4	0.2%	20	0.8%		0.0%
Norris	194	194	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Canton Township	16,075	14,479	90.1%	1,356	8.4%	22	0.1%	65	0.4%	153	1.0%	326	2.0%
City of Canton	15,288	13,696	89.6%	1,353	8.9%	22	0.1%	65	0.4%	152	1.0%	320	2.1%
Putnam Township	2,198	2,163	98.4%	5	0.2%	2	0.1%	7	0.3%	21	1.0%	11	0.5%
City of Cuba	1,418	1,396	98.4%	3	0.2%	1	0.1%	2	0.1%	16	1.1%	8	0.6%
Cass Township	642	637	99.2%	1	0.2%	0	0.0%	0	0.0%	4	0.6%	0	0.0%
Smithfield	214	213	99.5%	0	0.0%	0	0.0%	0	0.0%	1	0.5%	0	0.0%
Harris Township	410	404	98.5%	0	0.0%	2	0.5%	0	0.0%	4	1.0%	7	1.7%
Marietta	150	148	98.7%	0	0.0%	2	1.3%	0	0.0%	0	0.0%	0	0.0%

Table 3-5
Populations by Race

	Total Population	White		Black or African American		American Indian and Alaska Native Persons		Asian or Pacific Islander		Some Other Race or Two or More Races		Hispanic or Latino	
		Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
McDonough County	32,913	30,568	92.9%	1,138	3.5%	47	0.1%	676	2.1%	484	1.5%	488	1.5%
Mound Township	279	278	99.6%	0	0.0%	0	0.0%	1	0.4%	0	0.0%	0	0.0%
Bardolph	253	253	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Macomb Township	608	606	99.7%	1	0.2%	1	0.2%	0	0.0%	0	0.0%	1	0.2%
Macomb City Township	18,558	16,467	88.7%	1,101	5.9%	29	0.2%	574	3.1%	387	2.1%	389	2.1%
City of Macomb	18,558	16,467	88.7%	1,101	5.9%	29	0.2%	574	3.1%	387	2.1%	389	2.1%
State of Illinois	12,419,293	9,125,471	73.5%	1,876,875	15.1%	31,006	0.2%	428,213	3.4%	957,728	7.7%	1,530,262	12.3%

Source: US Census Bureau 2000

Income Characteristics

Tables 3-6 and 3-7 summarize the median family incomes and percentages of families with incomes below the poverty level in 1999 by census tract, township, and community in the study area. (These political boundaries are shown in Exhibit 3-2.) In the eight census tracts within the project corridor in Fulton and McDonough Counties, 1999 median family incomes ranged from about $36,900 to about $47,700, all below the statewide median of $55,545 (Table 3-6). For the four census tracts in the Peoria County part of the corridor, 1999 median family income was higher, ranging from about $46,000 to about $61,800, comparable with the statewide median.

In 1999, 7.8 percent of Illinois families were living below the poverty level, based on the Department of Health and Human Services (HHS) 1999 Poverty Guideline for a family of 4 of $17,029 (Table 3-6)), while the 2008 HHS Poverty Guideline for a family of 4 is $21,200. For the four Peoria County census tracts in the study area, the percent of families below the poverty level ranged from 2.8 to 5.9 percent, all below the state level. In Fulton and McDonough County census tracts, the percent of families living below the poverty level in 1999 ranged from 4.5 to 16.2 percent, with four of the eight tracts having higher percentages than the state level, and two of them, located near the south side of Canton, having more than twice the statewide percent of families living below the poverty level (Table 3-6 and Exhibit 3-2).

Median family incomes (1999) for all communities in the study area ranged from about $30,000 for Norris to about $50,900 for Hanna City, all below the state median of $55,545 (Table 3-7). Median family incomes for the townships in the study area ranged from about $31,200 to about $57,200, with all falling below the state median except for two of the townships in Peoria County. In the Peoria County communities and townships, the percent of families living below the poverty level in 1999 ranged from 3.1 to 9.0, with only one (the Village of Bellevue) above the state rate. In contrast, the McDonough County communities and townships range was 7.4 to 32.2, with only one (Mound Township) below the state percent. In Fulton County townships and communities the percent of families living below the poverty level in 1999 ranged from zero (Village of Marietta) to 10.2 (Cass Township), with the largest community, the City of Canton, at 10.1 percent.

3.2.1.2 Economic

Employment Status

As with the state overall, the unemployment rate in the three-county area has declined since 1980. However, unlike the state overall, where the reduced unemployment rate has resulted from an increase in the number employed, in the three-county area the reduced unemployment rate has resulted from a much smaller labor force, especially in Fulton County (Table 3-8).

Table 3-6
Income Characteristics by Census Tract

Census Tract	Median Family Income, 1999	Families Below the Poverty Level, 1999
Peoria County	50,592	10.0%
40	56,141	2.8%
45	46,042	5.9%
48.01	61,768	3.9%
49.02	60,933	3.2%
Fulton County	41,193	7.3%
9528	47,667	4.5%
9529	46,120	5.4%
9531	45,769	7.3%
9532	39,528	8.9%
9533	45,625	5.5%
9534	41,071	15.8%
9535	36,875	16.2%
McDonough County	43,385	9.6%
110	46,397	9.4%
State of Illinois	55,545	7.8%

Source: U.S. Census Bureau 2000. The Department of Health and Human Services Poverty Threshold for a family of four in 1999 was $17,029.

Tracts are wholly or partially within the corridor.

Table 3-7
Income Characteristics by Township and Community

	Median Family Income 1999	Families Below Poverty Level, 1999
Peoria County	$50,592	10.0%
Limestone Township	$51,125	5.3%
Norwood	$44,688	3.7%
Bellevue	$35,972	9.0%
Logan Township	$56,277	3.9%
Hanna City	$50,938	7.6%
Trivoli Township	$57,250	3.1%
Fulton County	$41,193	7.3%
Farmington Township	$43,707	5.0%
City of Farmington	$49,167	4.2%
Norris	$30,000	5.9%
Canton Township	$40,482	9.6%
City of Canton	$39,910	10.1%
Putnam Township	$40,966	9.0%
City of Cuba	$35,952	8.4%
Cass Township	$46,406	10.2%
Smithfield	$43,125	3.3%
Harris Township	$31,250	8.8%
Marietta	$38,750	0.0%
McDonough County	$43,385	9.6%
Mound Township	$48,472	7.4%
Bardolph	$30,208	32.2%
Macomb Township	$40,833	16.9%
Macomb City Township	$42,069	12.2%
City of Macomb	$42,069	12.2%
State of Illinois	$55,545	7.8%

Source: US Census Bureau 2000

Table 3-8
Employment Status by County

County	1980			1990			2000			% Change in Labor Force		
	Labor Force	Number Employed	Unempl. Rate	Labor Force	Number Employed	Unempl. Rate	Labor Force	Number Employed	Unempl. Rate	1980-1990	1990-2000	1980-2000
Peoria	97,478	89,304	8.4	92,270	87,499	5.2	91,271	87,133	4.5	-5.3	-5.6	-10.6
Fulton	23,413	21,514	8.1	15,038	13,825	8.1	17,639	16,661	5.5	-35.8	10.8	-28.8
McDonough	20,050	18,337	8.5	16,813	16,259	3.3	16,834	16,102	4.3	-16.1	-4.2	-19.7
State of Illinois	5,534,500	5,082,300	8.2	5,931,600	5,560,500	6.3	6,467,700	6,176,800	4.5	7.2	4.1	11.6

Source: Illinois Department of Employment Security 2000

According to the Illinois Department of Employment Security (IDES), in 2000 the total labor force[16] in the three-county area was about 125,700 (see Table 3-8). Peoria County represented 73 percent of the labor force, followed by Fulton County with 14 percent, and McDonough County with 13 percent. Within the three-county area labor force, about 119,900 were employed, with a resultant unemployment rate of 4.6 percent unemployment rate, slightly above the state's average unemployment rate for 2000 (Table 3-8).

In 2000 Peoria County's unemployment rate was the same as the state's, McDonough County's was slightly lower, and Fulton County's was higher (Table 3-8). While unemployment rates declined in the three-county area between 1980 and 2000, the labor force also declined, by 11 percent (about 15,000 persons) (Table 3-8). During this same time, the labor force in the state increased by 12 percent.

Location of Employment

Table 3-9 takes a different look at county employment by showing not the number of workers in each county (Table 3-8), but the number of jobs[17] available in each county. As a comparison of Tables 3-8 and 3-9 shows, in 2000 Peoria County had many more jobs than workers, and Fulton County had many more workers than jobs (and most of the Peoria County jobs are outside the study area). McDonough County had slightly more workers than jobs. Peoria County accounted for the majority (81 percent) of jobs in the three-county area, followed by McDonough County (12 percent), then Fulton County (7 percent). The number of jobs in both Peoria and McDonough Counties increased between 1980 and 2000, while the number of jobs in Fulton County declined over the same period (Table 3-9). According to the US Bureau of Economic Analysis, about 5,800 jobs were lost in the three-county area between 2000 and 2005: 4,204 in Peoria County, 274 in Fulton County, and 1,339 in McDonough County.

[16] IDES methodology defines the labor force as all civilian, non-institutionalized, working age individuals (age 16+) who were employed or who were without employment but available and actively looking for work. The employed include those workers who worked at least 1 hour for pay or profit, were temporarily away from work due to reasons such as labor disputes, vacation, or illnesses, or worked at least 15 unpaid hours in a family business. No distinction is made among those who work full-time or part-time, are self-employed, or receive government assistance while working. The unemployed include those who lost their jobs involuntarily, quit their jobs, entered the labor market for the first time or reentered the labor market after a period of absence, or had been laid off but are expected to be recalled. Those not counted as either employed or unemployed are considered not to be in the labor force. This category includes people who want a job and those who do not.

[17] Bureau of Economic Analysis (BEA) employment estimates measure the number of jobs in a county, instead of the number of workers who perform the jobs. County employment estimates are estimated on a full-time and part-time basis because of the limitations of the available source data. Therefore BEA employment data differ from IDES employment data.

Table 3-9
Number of Jobs by County

County	1980	1990	2000	Percent Change 1980-1900	Percent Change 1900-2000	Percent Change 1980-2000
Peoria	102,576	101,070	111,374	-1.5	10.2	8.6
Fulton	10,796	10,123	9,848	-6.2	-2.7	-8.8
McDonough	13,747	15,126	15,845	10.0	4.8	15.3
Total	127,119	126,319	137,067	-0.6	8.5	7.8

Source: US Department of Commerce Bureau of Economic Analysis 2000

Between 1990 and 2000, the number of workers in all study area counties increased, as did the number of workers working outside their county of residence (Table 3-10). In 2000 Fulton County had a high percent of workers who work outside the county (42), while the percentage rates were much lower in Peoria County (15) and McDonough County (11).

Employment by Industry

In 2004, according to the U.S. Bureau of Labor Statistics (BLS), the largest single category of non-farm industry employment in all three counties was Education and Health Services (27, 36, and 26 percent of employment for Peoria, Fulton and McDonough respectively). The next highest category in all three counties was Trade, Transportation, and Utilities (18, 24, and 20

Table 3-10
Employee Travel Characteristics for 1990 and 2000

County	Number of Workers		Worked Outside County		Percent of Total	
	1990	2000	1990	2000	1990	2000
Peoria	80,300	84,003	11,542	12,492	14.4%	14.9%
Fulton	14,244	15,884	5,022	6,619	35.3%	41.7%
McDonough	15,146	15,531	931	1,649	6.1%	10.6%
State of Illinois	5,198,648	5,745,731	998,220	1,266,407	19.2%	22.0%

Source: Illinois Department of Employment Security 2000

percent for Peoria, Fulton and McDonough respectively). Professional and business services accounted for about 14 percent of employment in Peoria County. Manufacturing accounted for about 11 percent of employment in both Peoria and McDonough Counties. Leisure and Hospitality accounted for 10 to 11 percent of employment in all three counties. The two categories of Manufacturing and Natural Resources/Mining accounted for only three percent of employment in 2004 (BLS 2004).

Employers

The largest employer in the three-county area is Caterpillar, with more than 15,000 employees in the area. However, none of this employment is in Fulton or McDonough Counties, nor is it within the project area. While no large employers are located within the project area boundaries, several others are located in nearby Peoria (Table 3-11). The largest employer in McDonough County is Western Illinois University in Macomb and the largest Fulton County employer is Graham Hospital in Canton (Table 3-11). Locations of major employers in and near the project area are shown in Exhibit 3-3.

Table 3-11
Major Employers, 2006

Name	Product/Service	Principal Location	City	County
> 5000 employees				
Caterpillar (more than 15,000 employees)				
Headquarters	Manufacturing	100 NE Adams Street	Peoria	Peoria
(Manufacturing facilities in Peoria, Tazewell, and Whiteside Counties)				
1,000 to 5,000 employees				
Affina	Communications	2001 Ruppman Plaza	Peoria	Peoria
Bradley University	Education	1501 W. Bradley Avenue	Peoria	Peoria
Keystone Steel and Wire	Manufacturing	700 S. Adams	Peoria	Peoria
Methodist Medical Center	Health Services	221 NE Glen Oak Avenue	Peoria	Peoria
OSF Saint Francis Medical CTR	Health Services	530 NE Glen Oak Avenue	Peoria	Peoria
Par-a-Dice Casino	Hotel/Gaming	7 Blackjack Boulevard	Peoria	Peoria
Peoria School District 150	Education	3202 N. Wisconsin Ave	Peoria	Peoria
Proctor Community Hospital	Health Services	5409 N. Knoxville	Peoria	Peoria
Western Illinois University	Education	900 W. Adams	Macomb	McDonough
500 to 1,000 employees				
Advanced Technology Services	Commercial Machinery	8201 N. University Street	Peoria	Peoria
Ameren (AES Great Plains-CILCO)	Utilities	300 Liberty	Peoria	Peoria
CEFCU	Finance	5701 W. Dirksen Parkway	Peoria	Peoria
City of Peoria	Government	419 Fulton Avenue	Peoria	Peoria
Graham Hospital	Health Services	210 West Walnut Street	Canton	Fulton
Journal Star	Publishing	1 News Plaza	Peoria	Peoria
Pekin Hospital	Health Services	600 S. 13th Street	Pekin	Peoria
US Post Office	Government	95 State Street	Peoria	Peoria
USPS Remote Encoding Center	Government	6100 W. Everett McKinley Dirksen Pkwy	Bartonville	Peoria
200 to 500 employees				
Afni	Finance	8116 N. Hale	Peoria	Peoria
Ameritech	Communications	2315 N. Knoxville	Peoria	Peoria
Bemis Company	Manufacturing	1 Sloan	Peoria	Peoria

Table 3-11
Major Employers, 2006

Name	Product/Service	Principal Location	City	County
Bridgeway, Inc.	Rehabilitation Services	900 S. Deer Road	Macomb	McDonough
Butler Technical Group	Transportation	611 S. 4th Street	Chillicothe	Peoria
Canton School District	Education	20 West Walnut Street	Canton	Fulton
Childrens Home Assoc. of Illinois	Social Services	2130 N. Knoxville	Peoria	Peoria
ChoicePoint Direct	Advertising/Marketing	8600 N. Industrial Road	Peoria	Peoria
Degussa Goldschmidt	Manufacturing	8300 W. Route 24	Mapleton	Peoria
Komatsu Mining Systems	Manufacturing	2300 NE Adams	Peoria	Peoria
Illinois River Correctional Center	Criminal Justice	Route 9 West	Canton	Fulton
Interstate Brands	Manufacturing	1511 W. Lincoln	Peoria	Peoria
LR Nelson Corp.	Manufacturing	1 Sprinkler Lane	Peoria	Peoria
McDonough District Hospital	Hospital	525 E. Grant	Macomb	McDonough
Multi-Ad Services, Inc.	Printing / Graphic Arts	1720 W. Detweiller Drive	Peoria	Peoria
National Center for Ag. Util. Rsrch	Agriculture/Research	1815 N. University	Peoria	Peoria
NTN Bower Corporation	Manufacturing	711 N. Bower Road	Macomb	McDonough
RLI Corp.	Insurance	9025 N. Lindbergh Drive	Peoria	Peoria
University of IL College of Med	Education	1 Illini Drive	Peoria	Peoria
Vaughn & Bushnell Mfg	Manufacturing	201 W. Main	Bushnell	McDonough
Wal-Mart Supercenter	Retail	1730 E. Jackson Road	Macomb	McDonough

Sources:

(1) Illinois Department of Commerce and Economic Opportunity

(2) The Economic Development Council for Central Illinois

(3) The Macomb Area Economic Development Corporation

3.2.1.3 Neighborhoods and Other Development Concentrations

In addition to the incorporated communities that are located within and near the project corridor, there are a few unincorporated developments with smaller concentrations of population. As shown by the population distribution in Exhibit 3-4, most of these are located along IL 116 between the eastern project terminus and Farmington. Another development with relatively higher population density is Wee-Ma-Tuk, which is between Cuba and Canton, north of the Cuba to Canton blacktop.

3.2.1.4 Public Services and Facilities

Transportation Facilities

Existing Roadway Facilities. I-474 is the eastern project terminus and the proposed Macomb Bypass is the western terminus. Except for a small section of US 136, there are no other U.S. highways or parts of the Interstate Highway system in the corridor. IL 116 is the major east-west route in the eastern part of the project area. There are two other east-west routes within the

project area: IL 9, a small part of which passes through the project area just west of Canton; and an approximately 20-mile long section of IL 95 near the western end of the project. IL 78 runs north-south passing through Farmington, Norris and Canton. IL 97, to the west of IL 78, also runs north-south and passes through the project area at Cuba. IL 41 runs north-south near the west end of the project area, east of Bardolph. The Cuba to Canton blacktop (County Highway 5) is a relatively heavily used local road.

Proposed Roadway Facilities. As discussed in Section 2, the proposed Macomb Bypass, which will be a four-lane freeway around the north side of Macomb, will connect IL 336 with several other major improvements in west-central Illinois that are either existing, under construction, or proposed. These other related improvements, discussed in Section 1, are as follows:

- US 67, Macomb to Monmouth
- US 67, Macomb to Alton
- IL 336, Quincy to Macomb
- proposed Macomb Bypass

Airports. The one airport within the project corridor, the Canton-Ingersoll Airport just west of Canton is a public municipal airport mostly serving chartered flights. There are a few small airports and one regional airport located close to the project area.

The only regional airport near the project area is the Peoria International Airport, which is located just west of I-474 in Peoria, near the eastern end of the project area (south of IL 116). The airport currently has two runways with an annual capacity of 1,000,000 passengers, and is served by several commercial passenger and cargo carriers. The airport authority has proposed long-range master plans with the goal of making the airport a regional transportation hub for freight service. The proposed long-range plans include extending Runway 31/13, and constructing an additional runway northeast of and parallel to Runway 31/13 (Hanson 1999). Both the additional runway and extension of the existing runway are considered necessary for the airport to develop into a freight transportation hub (Spirito 2006). The plan includes improvements and additions to the existing roadway network. Potential long-range improvements include the development of a direct connection from I-474 to IL 116 and a connection from IL 116 to access the freight facility from the north and west.

Other Transportation Facilities. Several large and small truck firms operate from locations in and around the greater Peoria area. Most of these firms are located in industrial parks in Peoria and Bartonville, east and southeast of the project area. Three of the largest trucking facilities providing local, inter- and intra-state trucking services are located within 2 miles of I-474 in Peoria. Some commercial trucking companies are located within the project area in Canton, Farmington, and Macomb.

Several railroad companies provide freight movement within the project corridor including Class I and regional carriers such as Burlington Northern Santa Fe Railway (BNSF) and Union Pacific Railroad. Pioneer Railcorp, a short line railroad, also has a line in the project corridor. The only

railroad passenger service near the project area is at Macomb, which is serviced by the Amtrak route that extends from Quincy to Chicago.

There are no public transit service providers within the project area, but there are service providers just outside the project termini: the Greater Peoria Mass Transit District (GPMTD) and Go West Transit in Macomb.

Bikeways. There are no existing public bike trails within the project corridor. In addition to the bike path in Fulton County included as part of the Build Alternative (discussed in Section 2.3.4), a bike trail is under study by the Tri-County Regional Planning Commission (TCRPC).[18] In 2002, the TCRPC published a plan that identifies as a priority the construction of a trail along a corridor currently occupied by the unused Union Pacific rail line that runs west from Bellevue to beyond the western Peoria County line. This Union Pacific line is within the project corridor (TCRPC 2002). Although the Union Pacific rail line has been identified by the TCRPC as a priority corridor for bikeway construction, it is not currently owned by any public agency.

Public Safety and Medical Services

Exhibit 3-5 shows the locations of fire stations and the districts they serve, ambulances, hospitals, and police and sheriff departments in and near the project area.

Fire Protection and Emergency Responders. Volunteer fire protection districts protect that part of Peoria County that is within the project corridor. Ambulance service for Peoria County, including the city of Peoria, is provided by Advanced Medical Transportation of Central Illinois located in Peoria. A portion of the project area located near Farmington and Hanna City is also serviced by BYE Ambulance out of Elmwood, Illinois.

Fulton County is divided into fire protection districts staffed by volunteer fire personnel and emergency responders, with the exception of Canton, which has its own, paid fire department. The fire protection districts in Fulton County and the Canton Fire Department provide assistance to each other through mutual aid agreements. Portions of Fulton County are covered by fire protection districts based out of McDonough and Peoria Counties. The Fulton County Emergency Medical Association (EMA) provides paramedic and ambulance services county-wide with service bases out of both Canton and Ipava. The EMA also provides services to a small portion of the southwest corner of Peoria County near Farmington.

The Macomb Fire Department provides fire protection for several unincorporated areas around Macomb. The remainder of McDonough County is divided into districts staffed by volunteer fire personnel and emergency responders. These districts and the Macomb Fire Department also

[18] TCRPC is an organization that serves Peoria, Tazewell, and Woodford Counties, and was established to promote intergovernmental cooperation and regional planning

cooperate in mutual aid. Ambulance service for McDonough County is dispatched from the McDonough District Hospital in Macomb.

All three counties have enhanced 9-1-1[19].

Sheriff and Police Protection. Peoria, Fulton, and McDonough Counties all have sheriff departments. Norwood has its own police departments with part-time officers. In Fulton County, the Canton and Farmington police departments have full-time staff and the Cuba police department has part-time staff. Macomb has a police department.

Medical Services. There are no hospitals within the project corridor, but there is one in Macomb, one in Canton, and three in Peoria (Exhibit 3-5). All but one are general medical facilities. OSF Saint Francis Medical Center, located near downtown Peoria, has over 700 physicians, a Level I trauma center, its own air transportation system, and a children's hospital.

Dentists and ophthalmologists are located throughout the three counties. Also, many family and internal medicine physicians are located within the three counties, but are mostly concentrated in Macomb, Canton, and Peoria. All three counties have numerous physicians with a broad range of specialties, mostly based from the hospitals.

Educational Facilities. There are parts of six school districts within the project corridor (Exhibit 3-6). Kindergarten through grade 12 public and private schools in the corridor are within or near the project area communities. The City of Farmington has recently consolidated its elementary, junior high and high schools into one new facility located southeast of Farmington. The Cuba middle and senior high school, also fairly new, is located south of Cuba at IL 95 and IL 97. The City of Peoria has a juvenile detention center and a youth farm in the project corridor, near Bellevue. The private Spoon River College is in the corridor, south of Canton.

Churches and Cemeteries. There are two churches within the IL 336 project corridor: Holy Cross Lutheran Church near Peoria, west of I-74, and Cuba Church of the Nazarene in Cuba. There are 25 cemeteries within the IL 336 project corridor.

Other Public Facilities. Governmental and public facilities within the project area include the Illinois River Correctional Center at Canton, Spoon River Public Library in Cuba; post offices in Bardolph, Cuba, Hanna City, Marietta, Norris, Smithfield, and Trivoli; and city and village halls in Cuba, Hanna City, Marietta, and Norris.

[19] Enhanced 9-1-1 provides the public the ability to dial 9-1-1 for all emergencies, and provides automatic caller information critical in expediting the dispatch of emergency services.

3.2.1.5 Land Use and Zoning

Existing Land Use

The project corridor is largely rural, and land use is primarily agricultural. There is more urban and built up land at the far eastern end of the corridor, close to Peoria. The primary agricultural land use is growing crops. The majority of the corridor between Cuba and Norris is formerly strip mined land that now mostly consists of grassy areas with lakes that provide habitat for waterfowl and is valued for hunting. It is also used for pasture. There is some residential development in the formerly strip mined areas.

McDonough County Area. The McDonough County part of the project corridor is rural and consists mostly of high quality farmland of low relief that is used for crops. (Refer to Exhibit 3-7.) Macomb is located at the west end of the project and the communities of New Philadelphia and Bardolph are within the project corridor.

Western Fulton County—Spoon River Area. The part of the project corridor that lies in western part of Fulton County, west of the Cuba area, is dominated by the Spoon River and its tributaries. The land is primarily agricultural (Exhibit 3-8). The communities of Marietta and Smithfield are also located in this part of the project corridor.

Eastern Fulton County—Former Mining Area. Most of the eastern part of Fulton County within the project corridor is dominated by former strip mined land, until the far eastern part, east of Norris. This land is considered agricultural and can be used for grazing, but is valued for hunting (Exhibit 3-8).

Development associated with the City of Cuba and Putnam Township extends to the north and south of the city: the Cuba Middle/Senior High School has recently been constructed south of Cuba on the east side of the IL 95/IL 97 intersection, and Putnam Township Park is located just south of the school. Much of the land within the corridor to the south of CH 5 and IL 9 is owned by the Metropolitan Sanitary District of Greater Chicago and is used for land treatment of waste.

Development has occurred and is on-going in the corridor area at the west and southwest side of Canton and the surrounding area. Within that area lies the Illinois River Correctional Center, the Canton Airport, Spoon River College, and some industrial developments. Northwest of Canton and primarily in former strip mined land is the Illinois Department of Natural Resources' Double T Conservation area.

Far Eastern Fulton County and Peoria County—Farmland and Residential Development. East of the Village of Norris, the corridor is again primarily in agricultural cropland. Development is occurring along IL 116 corridor, with the highest in the east near the city of Peoria and the airport. The airport has long-range plans that would affect the far eastern part of the corridor, as discussed in Section 3.2.1.4.1. The communities of Farmington, Trivoli, Hanna City, Bellevue and Norwood are located in this part of the project corridor.

County Zoning

The Offices of Planning and Zoning for Peoria and Fulton Counties provided zoning information for the parts of the project area within those counties. McDonough County does not have an office of zoning and planning. The zoning officers for the cities of Canton and Macomb also provided zoning information. Land uses in and near the project area are shown on Exhibits 3-7, 3-8, and 3-9.

Fulton County, Exhibit 3-8, is divided into five general land uses: agriculture/conservation, business, industrial, and two types of residential zones. The majority of parcels within the project area in Fulton County are zoned agricultural. Small residential (single family), business and industrial zoned parcels are concentrated mostly in and around municipalities such as Farmington, Canton, Cuba, Smithfield, and Marietta.

Unincorporated areas of Peoria County in and near the project area are divided into the following general land uses: agricultural, residential, commercial, and industrial. In Hanna City, a special zoning district referred to as the Rural Community Conservation district, is intended to promote a mix of residential, commercial and institutional uses.[20] Most of the land within the project area in Peoria County is zoned agricultural preservation, which was established to conserve farmland and to encourage continued agricultural activities.[21]

Some commercial and residential districts are located mostly near Hanna City and in and around Trivoli along IL 116. There are a few light industrial parcels in Trivoli. The heaviest concentration of commercial and industrial zoning is in Norwood and Bellevue at the eastern end of the project area. (See Exhibit 3-9.)

Municipal Zoning

Only the City of Canton has municipal zoning within the project corridor. Most of Canton's land uses are residential. A significant portion of northwest Canton is zoned conservation, which encompasses Big Creek and Lakeland parks. Industrial-zoned parcels are located mostly west of Canton (Canton Airport and the Illinois River Correctional Center). Business districts are found throughout Canton.

3.2.1.6 Regional Development and Planning

Comprehensive plans prepared by local authorities were reviewed to determine if a new highway would be compatible with the future vision of each municipality or county. McDonough County developed the *Overall Economic Development Program* in 1980-81, which was revised in 1984.

[20] Peoria County Planning and Zoning, Code of Peoria County, Sec. 24-6-14. RCC Rural Community Conservation District.

[21] Peoria County Planning and Zoning, Code of Peoria County, Sec. 24-6-3. Agricultural Preservation District.

Macomb produced the *Macomb, Illinois Comprehensive Plan* in 1989. The *Impact of Poor Highways on Economic Development* in Fulton County was prepared in 1992 by the Economic Development Corporation of Fulton County. The Western Illinois Regional Council, which provides services to six western Illinois counties[22], developed the *Western Illinois Comprehensive Economic Development Strategy* in 2000. All of these plans pointed to transportation, highways in particular, as an important factor in economic development and set transportation-related goals and objectives.

Improved transportation facilities are also a planning priority for Peoria County. The TCRPC, a Metropolitan Planning Organization (MPO) for Peoria, Tazewell, and Woodford Counties, set regional transportation priorities that included "IL-336 into McDonough County" and a regional mass transit infrastructure (TCRPC 2003).

The Peoria County *Comprehensive Land Use Plan* (1992, currently being updated) emphasized protection of agricultural lands while promoting residential and economic growth in Peoria County.

Illinois Ecosystem Program

Illinois' Ecosystem Program is a watershed-based program to enlist citizens to work toward making ecosystem improvements. It is funded by private money and through the Illinois Conservation 2000 program. Most of the state's watersheds have Ecosystem Partnerships that are coalitions of private citizens and organizations who work to improve their watersheds, with some technical support from state agencies. The project area includes parts of three Ecosystem Partnership areas: La Moine River (Macomb County), the Spoon River (Fulton County), and the Illinois River Bluffs (Peoria County). The La Moine River Ecosystem has developed a watershed plan to work toward achieving the partnership goal of preserving, protecting, and enhancing the natural resources of the La Moine River watershed ecosystem. Of eight funded projects within the watershed, one is in the project area, near a woodland along the East Fork of the La Moine River northwest of Bardolph. The project involves restoration of 16 acres of the Toland property, adjacent to the 30-acre Western Illinois University Ferster Woodland. The Ferster Woodland will not be impacted by the Build Alternative. The Spoon River Ecosystem Partnership has been awarded grants for 14 projects, one of which is at the corridor boundary, at the new Farmington school located southeast of Farmington. The project includes 30+ acres of habitat restoration on previously farmed land. None of the Illinois River Bluffs Ecosystem Partnership projects are within the project corridor (IDNR 2006a).

[22] Fulton, Hancock, Henderson, Knox, McDonough, and Warren Counties

Floodplain and Floodway Policies

County and municipal floodplain and floodway ordinances reflect the requirements of the Federal Emergency Management Agency and the Illinois Department of Natural Resources regarding construction in floodplains or floodways. (Wahl 2006, Hickman 2006).[23,24,25]

3.2.2 Environmental Consequences

The No-Build Alternative would have no additional impacts to socioeconomic resources in the project area.

3.2.2.1 Community Changes/Cohesion

Roadway improvements can have beneficial results, such as supporting local planning policies and accommodating future growth and development. But roadway improvements sometimes have undesirable effects and may become a barrier within a community. Communities along or near the proposed alignment include Macomb, Bushnell, New Philadelphia, Marietta, Smithfield, Cuba, Canton, Norris, Farmington, Hanna City, Norris, and Bellevue. The Build Alternative bypasses each of these communities, while providing improved access from each community to outside areas. For each of these communities, the Build Alternative will not separate residents from community facilities or services, impose barriers among existing neighborhoods, or adversely affect vehicular or pedestrian patterns within the community. The subsections below discuss the changes in roadways in the vicinity of these communities and the potential effects of these changes and the Build Alternative on community cohesion. Since some of these communities are close together and movement between the communities is also important, these subsections also address preservation of access between individual communities when inter-community travel will be impacted by the Build Alternative.

Macomb. The western end of the project, at the east side of Macomb, will tie into the proposed Macomb Bypass (Aerial Exhibit Sheet 1). While within the zoning jurisdiction of the City of Macomb, this part of the project is rural and is outside the city limits. Access to properties in the vicinity of the proposed Macomb Bypass and approximately one mile at the western end of the Build Alternative will be provided by frontage roads. Both the proposed Macomb Bypass and IL 336 will improve access to Macomb and are consistent with Macomb's land use plans.

Bardolph. The Build Alternative will be located about one half-mile south of Bardolph (Aerial Exhibit Sheet 2). This small community apparently developed as a railroad community: its streets lie on both sides of and either parallel or perpendicular to the BNSF rail line that runs southwest-northeast through the village. Access to the village is from 1800th Street and Airport

[23] City of Peoria Ordinance, Chapter 9.5, Floodplain Regulations.

[24] An Ordinance Regulating Development in Special Flood Hazard Areas. Fulton County, Illinois.

[25] City of Canton Ordinance, Chapter 20, Flood Hazard Areas.

Road on the north, Maryland Road on the west, and Hanna Road on the south. Of these roadways, only Hanna Road at the south, about one-half mile from Bardolph, will be affected by the Build Alternative. There will be an at-grade intersection at IL 336 and Hanna Road, which will improve access for the community.

New Philadelphia. The village of New Philadelphia is located on the south side of IL 95 in eastern McDonough County (Aerial Exhibit Sheet 5). In this area the proposed IL 336 lies parallel to IL 95 and about a half-mile south of IL 95. The village of New Philadelphia will not be affected by the Build Alternative.

Marietta. The Build Alternative will be located just south of Marietta, which is located on IL 95. Access to and from Marietta to the west on IL 95 will not be affected by the project. The Build Alternative will be on the IL 95 alignment just east of Marietta, and the existing IL 95 roadway will be closed. At the location of the closure, an intersection will be provided with IL 336 (Aerial Exhibit Sheet 8).

Two at-grade intersections will provide access to the Village of Marietta: one at County Highway 34 (CH 34), near the southwest corner of Marietta, and the other at East Coal Cut Road at the southeast corner of Marietta. A small section of East Coal Cut Road will be relocated to provide a perpendicular intersection with IL 336. East of Shaw Creek Road, which lies just east of Marietta, IL 336 will follow the IL 95 alignment, and will replace the current IL 95. IL 95 will be closed just east of Shaw Creek Road. Overall, these changes will improve access for Marietta to outside areas and will not impact community cohesion.

Smithfield. The Build Alternative will be located about one quarter-mile north of Smithfield, a small community that appears to have developed along a rail line currently owned by the Pioneer Railcorp. Access to the village is from CH 2, both on the north and south, and on the west from State Street, which becomes Fickle Road outside Smithfield (Aerial Exhibit Sheets 11 and 12). There will be an at-grade intersection at IL 336 and CH 2, at about the same location as the current CH 2/IL 95 intersection (IL 336 and IL 95 will be coincident at this location). Fickle Road will retain its existing intersection with IL 95, a section of which will be preserved in the vicinity of Fickle Road. Access to IL 336 will be provided by use of this section of IL 95 and an intersection about three-quarters of a mile west of Fickle Road (see Aerial Exhibit Sheet 11). From this new intersection east to Fickle Road, IL 336 will be shifted north enough to allow use of existing IL 95 as a frontage road. This section of IL 95 will be closed just east of Fickle Road, and on the west end will be extended with a curve to the new intersection. These changes will provide improved access for Smithfield and will not impact community cohesion.

Cuba. The Build Alternative will be located just north of the City of Cuba. Cuba is located on IL 97 (which runs north-south in this area), just north of the intersection of IL 95 and IL 97. There will be some access changes that will affect Cuba, all of which were planned in coordination with officials from the City. There will be an intersection at IL 97, just to the northwest of Cuba (Aerial Exhibit Sheet 15). A half-mile east of the IL 97 intersection, IL 336 crosses 7th Street,

which will not have access to IL 336. A quarter-mile further east, there will be an at-grade intersection at a northward extension of 10th Street. Seventh Street will be closed just north and south of IL 336. At the location of the closures, 7th Street is a rural route well outside the City of Cuba (Aerial Exhibit Sheet 15). On the north, a frontage road will be constructed to reroute 7th Street traffic to the 10th Street intersection. On the south, 7th Street will also be closed at the Pioneer Railcorp Railroad in Cuba, and a new east-west roadway approximately 800 feet long will be constructed to reroute 7th Street traffic to 6th Street (Aerial Exhibit Sheet 15).

Currently the only direct route between Cuba and Canton, the next town to the east, is County Highway 5 (CH 5), commonly referred to as the Cuba to Canton Blacktop. IL 336 will follow this CH 5 alignment for a distance of about 4.5 miles. Traffic that previously used CH 5 will use IL 336, accessing it at Cuba at 10th Street, the same street that currently provides access to CH 5. A half-mile-long south frontage road will be built, extending to the east from 10th Street, to provide access to properties on the south side of IL 336. These changes will provide improved access for Cuba and will not impact community cohesion.

Canton. The City of Canton, for the most part, lies about two miles east of the Build Alternative. However, the city limits were extended to include the Canton Airport and the Illinois River Correctional Center, which are both west of the community. The Build Alternative passes along the west side of both the airport and the prison (Aerial Exhibit Sheets 19 and 20). Impacts to access to the Illinois River Correctional Center are discussed in Section 3.2.2.5. Several intersections between IL 336 and roadways in the vicinity of Canton will provide improved access to the city. The interchange at IL 9 in particular will improve access to both Canton and the Canton Airport. These changes will not impact community cohesion.

Norris. Norris lies a few miles north of Canton, on the north side of IL 78. The Build Alternative passes just south of Norris, where there will be an interchange with IL 78 (Aerial Exhibit Sheet 23).

The existing south intersection with old IL 78 will be too close to the new ramp and will need to be closed. This intersection provided one of two primary truck routes to the grain elevator in the west part of Norris. The north connection with old IL 78 will remain open but has severe curves and very low vertical clearance not suitable for truck traffic.

The other primary truck route to the grain elevator is the intersection of existing IL 78 and CH 17. This intersection will remain open and traffic could connect from IL 336 to existing IL 78 via the new intersection north of Norris at Blue Spruce Lane (Aerial Exhibit Sheet 25). There will also be an intersection directly between IL 336 and CH 17, however the ROW is narrow and vertical alignment is poor. Improving this section of CH 17 to allow for truck traffic was not pursued as it will result in relocations, impacts to ponds and a good deal of new ROW.

Perhaps the most direct truck route into Norris other than the interchange connection itself will be a new north-south connection to CH 17 about one mile west of Norris. There is an existing narrow, private lane that is being used to provide access to parcels of property west and south of

Norris. This lane will be reconstructed as a public road and will connect to CH 17 to the north. This new connection will provide direct, unrestricted truck access to the Norris facilities located along CH 17 in Norris. Although access to the village of Norris will be modified, overall it will be improved through nearby access to IL 336 by means of the IL 78 interchange to the south of Norris and the IL 78/Blue Spruce Lane intersection east of Norris.

Farmington. The Build Alternative passes southeast of Farmington, and south of the new Farmington School District consolidated kindergarten through 12th grade school on Lightfoot Road east of Farmington (Aerial Exhibit Sheets 27. 28, and 29). Lightfoot Road will be upgraded to state highway standards from IL 336 to IL 78, and will be designated as IL 78 over that distance. The upgrading will provide improved access to the new Farmington school, located on the east side of existing Lightfoot Road, about a mile north of the proposed IL 336 alignment. Because of the higher projected traffic volumes for Lightfoot Road/IL 78, a diamond interchange will be constructed at its intersection with IL 336.

Access between Farmington and Canton along the existing IL 78 route will be maintained with an IL78/IL 336 intersection south of Farmington (Aerial Exhibit Sheet 27). IL 78 traffic south of the IL 336/IL 78 interchange at Norris will be unaffected. These changes will provide improved access for Farmington and will not impact community cohesion.

Trivoli. The village of Trivoli is located a half-mile north of the project, on CH 25 (Trivoli Road), between Farmington and Hanna City (Aerial Exhibit Sheet 31). Trivoli will not be directly affected by the Build Alternative. There will be an IL 336/CH 25 intersection south of the village, which will improve access.

Hanna City. The Build Alternative passes within about a quarter-mile of the south side of Hanna City. Hanna City is located at the intersection of IL 116 and CH 34. In the vicinity of Hanna City the proposed IL 336 will be generally parallel to IL 116 and a half-mile south. The freeway section of IL 336 will end about mile west of CH 34, and an interchange with CH 34 is proposed (Aerial Exhibit Sheet 33). This interchange will provide improved access for Hanna City and will not impact community cohesion.

Norwood and Bellevue. These communities are near the east end of the project. Neither will be directly affected by the Build Alternative (Aerial Exhibit Sheet 37).

3.2.2.2 Environmental Justice

Federal Executive Order 12898 requires federal actions to achieve environmental justice by identifying and addressing disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations. It also requires that representatives from low-income or minority populations that could be affected by the project be provided the opportunity to be included in the impact assessment and public involvement process.

An environmental justice analysis was completed to determine whether the Build Alternative will affect minority or low-income populations and to assess whether such impacts will be disproportionately high as compared to the impact on the overall population. If the project's expected impacts are found to be borne disproportionately by low-income and minority populations, an analysis must examine mitigation measures, offsetting benefits, and impacts of other system elements in accordance with FHWA [Federal Highway Administration] Order 6640.23, Actions to Address Environmental Justice in Minority Populations and Low-income Populations (USDOT, FHWA 1998).

Minority and low-income population data from the 2000 census was discussed for the overall project area in Section 3.2.1.1. Minority population data is available at the census block level and income data is available at the township and community level. The results specific to the Build Alternative are discussed below.

Minority Populations

As discussed in Section 3.2.1.1, the project area has very low racial diversity. The majority of the minority residents in the project area live in the cities of Macomb and Canton, neither of which will be directly impacted by the project.

The 26 residential relocations are scattered across the project corridor and do not disproportionately impact any particular census block except at the east side of Maxwell Road, where seven residences at one location will be relocated. This census block has less than one percent minority residents. None of the four businesses/commercial structures that will be relocated are minority-owned.

Low-Income Populations

Income information is available at the township and community level (Table 3-7). In one town, Bardolph, 32 percent of families living were living below the poverty level in 1999. A few other communities also exceeded the statewide level of 8 percent of families living below the poverty level. As discussed in Section 3.2.2.1, the Build Alternative will not directly affect any communities. None of the impacted townships had unusually high percentages of families living below the poverty level (Table 3-7), and, in any case, townships are large enough that no conclusions can be drawn about impacts on a particular location within the township. The relocation impacts are spread out across the project area and appear to represent a range of income levels.

Conclusion

Based on the above analysis, the Build Alternative will not have disproportionately high impacts on low-income or minority populations. With only 26 residential and four business relocations spread over a 60-mile long project, the Build Alternative will not have high impacts on any populations. The impacts that will occur will not be disproportionately borne by minority or low-income populations.

The project's public involvement program has afforded the opportunity for potentially affected communities, including minority and low-income populations, interested in the project to learn about and provide input to the project. See Section 4.3, Community Involvement, for a discussion of the public involvement opportunities offered to all area residents. The Build Alternative is in compliance with federal Executive Order 12898 and FHWA Order 6640.23. The project's public involvement process did not exclude any individuals because of income, race, color, religion, national origin, sex, age, or handicap. Meeting locations were selected to limit the distance project-area residents had to travel to attend the meetings and to accommodate people with disabilities.

3.2.2.3 Residential and Business Relocations

The Build Alternative will displace 26 residences and four businesses, as denoted on the Aerial Exhibits. Table 3-12 lists the general locations of residential displacements. A review of homes currently for sale indicated that displaced rural residents (those living in unincorporated areas) could relocate to similar housing in the area.

Table 3-12
General Locations of Residential Displacements

Location	Number of Displacements	Aerial Exhibit Sheet Number
North 1400 Road, south and southeast of Bardolph	2	2 and 3
North 1400 Road, between IL 41/E 2100 Street and East 2250 Street (east of IL 41)	1	4
North side of IL 95, east of Smysor Road (northwest of Smithfield)	1	11
South side of IL 95, west of CH 2 (north of Smithfield)	1	11
IL 95, east of Howeter Road	2	12
Northwest of Cuba, east of Cameron Road	1	14
IL 97 north of Cuba	1	15
CH 22 north of Wertman Road, near northwest corner of Canton Airport	1	20
North of Cypress Road, west of Canton	1	21
West of IL 78, south of Norris	1	23
IL 78, south of Cottonwood Road	2	25 and 26
Nelson Road, between Cramer Road and Stone School Road, southwest of Trivoli	1	30
Behrends Road, between Eden Road and Hanna City Road	3	33
Murphy Road, south of Hanna City	1	34
Maxwell Road south of Farmington Road (south of Norwood)	7	37
Total	26	

There is no Section 8 housing or other public subsidized housing affected by the Build Alternative. Of the 23 displaced residences, 12 are farm residences. Assuming an average household size of 2.5 to 2.6 persons (derived from the 2000 Census data for Peoria, Fulton and McDonough counties), the Build Alternative will displace roughly 60 persons. The No-Build Alternative will not affect residences or businesses.

The Build Alternative will displace one operating business with two employees, and three other commercial buildings with no employees (Table 3-13). The single business is a small trucking company south of Norris. There is undeveloped property in the immediate area that could be purchased to re-establish the business. This business employs 2 people. The other three buildings are on IL 95 just north of Smithfield. The Smithfield Sportsman Club building is used as a meeting place and for shooting practice and has no employees. The Mid-Century Telephone Cooperative building has switching equipment but no employees. The Old Cass Township building is used only for storage. Because these businesses are located in rural areas, there is unlikely to be nearby developed property available for use. However, there is undeveloped property in the vicinity of all of the businesses.

Table 3-13
General Locations of Business Displacements

Business	Number of Employees	Location	Aerial Exhibit Sheet Number
Osborne Trucking	2	Proposed IL 336/IL 78 intersection south of Norris	23
Smithfield Gun Club	0	IL 95 north of Smithfield	11
Mid-Century Telephone Cooperative	0	IL 95 and CH 2 north of Smithfield	12
Cass Township Building	0	IL 95 east of CH 2, north of Smithfield	12
Total	2		

The Illinois Department of Transportation (IDOT) will offer relocation assistance, in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (URA), as amended, and IDOT's Land Acquisition Procedures Manual, to all occupants of buildings they will purchase and remove. Those policies provide for relocation assistance services for both homeowners and renters. Participation under the state and federal policies is without discrimination. IDOT will pay property owners fair market value for all private property purchased. Adequate replacement housing is available near the proposed alignment, according to current listings.

3.2.2.4 Businesses to Remain

In addition to the business that will be relocated, several businesses will have access changes. Although access will change to these businesses, there will be no overall negative effect and the businesses will remain viable. These are summarized below.

- Pschirrer Asphalt. This asphalt company is located on the east side of IL 78 south of Norris. To provide adequate access control at the IL 78/IL 336 interchange just to the north, the existing access road will be relocated to the south (Aerial Exhibit Sheet 23).

- Businesses on Old Route 78 in Norris. At the north side of the IL 78/IL 336 interchange, Old Route 78 will be closed at its intersection with existing IL 78 (Aerial Exhibit Sheet 23), to provide adequate access control at the proposed interchange, and improvements will be made to CH 17 to provide comparable access from the north (described in Section 3.2.2.1). There are several businesses located between the proposed closure and the intersection of Old Route 78 and the BNSF rail line, including the Central Gas Company and Norris Grain Elevator.

3.2.2.5 Public Facilities and Services

Two public facilities and services will be affected indirectly by changes in access patterns, as described below.

- *The Illinois River Correctional Center (Prison).* The Build Alternative passes on the west side of the Prison, which is located at the west side of Canton. In the vicinity of the Prison, the main (north) Prison entrance off IL 9 will not be affected. The Prison has a smaller west entrance off Lone Barn Road (CH 22), which will be affected by the IL 9/IL 336 interchange. CH 22 will be closed from just north of the Prison's west entrance to IL 9, a distance of about 900 feet, to provide required access control for the interchange. This will eliminate access to the west Prison entrance from the north. To replace this closed access to the Prison, a new access road will be constructed on the east side of the Prison, connecting with CH 22 south of the prison, then to Lone Barn Road to the west. (Aerial Exhibit Sheets 19 and 20.)

- *Farmington School District.* Near Farmington, Lightfoot Road will be upgraded to state highway standards between IL 336 and IL 78, and will be designated as IL 78 over that distance. Improvements in the existing roadway, which varies from 11-foot lanes with curb and gutter to 10-foot lanes with grassed drainages and no shoulders, will reduce the impacts on the school caused by the increased traffic. State highway standards would require 12-foot wide lanes and 8-foot wide shoulders. There is currently a left-turn lane for southbound traffic at the school; this will be retained. South of the new Farmington School District consolidated K-12 grade school on Lightfoot Road, the IL 78 / IL 336 interchange will be designed as a diamond to manage the expected higher resulting volumes of traffic on IL 78.

Adjustments to school bus routes that may be needed during and after construction of the Build Alternative will be handled by the school district as part of their annual bus route planning process. The Build Alternative will not prevent school buses from accessing residences along the corridor.

Emergency service routes may need to use IL 336 when and where appropriate. With the Build Alternative, emergency services will benefit from the increase in travel speeds, additional capacity and improved safety conditions. Additionally, the access-controlled portions of the facility (i.e., freeway) at the western-most and eastern-most parts of the Build Alternative will improve the connections between Macomb and Bardolph, and Peoria and Hanna City.

3.2.2.6 Land Use Changes

Right-of-Way (ROW) Required

The Build Alternative will require 3,164 acres of total ROW; of which 513 acres will be existing road right-of-way (Table 3-14). As shown in the table, almost all of the land required is agricultural or existing right-of-way.

Table 3-14
Land Use Impacts

Land Use	Acreage Converted	Percent of Total Land Use Converted
Existing Transportation Right-of-Way	513	16%
Agriculture	1,843	58%
Agricultural Preservation	654	21%
General Business	6.2	0.2%
Heavy Industry	73	2.3%
Light Industry	19	0.6%
Rural Residential	27	0.9%
Single Family Residential	25	0.8%
Multifamily Residential	3.3	0.1%
No Data	0.6	0.02%
Total	**3,164**	**100%**

Note: *Table describes land uses, not cover types*

Consistency of the Proposed Action with Land Use Plans

As discussed in subsection 3.2.1.6, Regional Development and Planning, future land along the project corridor is addressed by various local agencies at the municipal and county level. The

plans identified in that section pointed to transportation, especially highways, as an important factor in economic development and set transportation-related goals and objectives. In some plans, references were specifically made to the proposed IL 336 project, and underscore the role of IL 336 in community and regional economic development.

3.2.2.7 Property Values

When roads are expanded or new roads constructed, the market value of adjacent properties may be affected. Local units of government base their residential property assessments (property value) on sale prices (market prices). With this approach, it is difficult to speculate on property value impacts, since property must be sold to determine its market value and then a comparison made to recent sales prices for similar properties. There is no evidence to suggest that four-lane roads result in diminished residential property values. Proximity of a road to a residence is a factor buyers consider in purchasing a residence, but the importance of "road setback" varies considerably among study area residents and prospective home buyers. There are examples of newer and older residences throughout the project corridor with a wide range of setbacks from the existing state routes.

The Build Alternative may be expected to have a positive effect on property values over the long term in areas where the improvements stimulate new development. While property values of individual parcels may decline, the cumulative impact of property value changes is expected to be positive for the communities and for the region. It is also likely that this positive effect would be greater in larger project area communities such as Canton and Farmington and in the area with higher growth rates along IL 336.

3.2.2.8 Employment

Maintaining the economic viability of agriculture, businesses, and industries in the project area and improving transportation access are closely linked. Commercial and industrial uses in the project communities stimulate transportation demand by increasing the number of workers commuting to and from work, customers traveling to and from service areas, and products being shipped between producers and consumers.

Businesses and agricultural interests in the study area depend on an efficient highway system to meet their shipping needs. The transport of raw materials and finished products is a part of the business costs borne by manufacturers and agricultural interests. The Build Alternative would benefit agricultural interests and commercial and industrial development by reducing travel time and distance, allowing businesses in the study area to potentially experience greater profitability.

Construction of the Build Alternative would create temporary construction-related jobs. Table 3-15 reflects the potential temporary labor force increases that could result from the creation of construction jobs related to the Build Alternative. The estimates are based on the current construction cost estimate of $650,000,000 (2005 dollars). Direct labor represents those workers directly involved with the project construction, for example, those who would be working for the

construction contractor or a subcontractor. The indirect labor represents jobs generated in other industries to support the construction, for example, road construction material suppliers. The induced labor represents the jobs generated by the spending and investment of the direct and indirect labor, for example, housing and food workers.

Table 3-15
Construction-Related Employment and Generated Income

	Jobs Supported
Direct Employment	4,000
Indirect Employment	10,000
Induced Employment	8,000
Total Estimated Employment	22,000

Source: Keane 1996, MacroSys 2003.
Note: These are adjusted numbers for which the BEA gross domestic product implicit price deflators are used. The original employment numbers are based on 1995 dollars. It is assumed that the same employment is required for the same work. However, one million 1995 dollars spending is inflated into 1.23 million 2005 dollars. The employment numbers in this table are derived through the division of the original employment numbers by 1.23.

3.2.2.9 Tax Revenues

A short-term tax revenue loss in the region would result from converting taxable land into a nontaxable transportation use. To evaluate the tax losses, information was obtained from the County Tax Assessor or Accounting offices for Peoria, Fulton, and McDonough counties. All taxing districts in the Project Area, including schools, fire protection, sanitary districts, and individual communities, were delineated. The results of this analysis are summarized in Table 3-16, with detail of impact to each taxing body. The tax loss analysis shows that total annual property tax losses are estimated to be $104,000 along the alignment. This potential loss represents 0.1 percent of the total annual taxes collected by the impacted taxing entities in the three counties.

Table 3-16
Estimated Tax Revenue Loss Analysis

Taxing District[a]	Additional Right-of-Way[b] (acres)	Estimated EAV of Land to be Acquired[c] ($)	Residential Structures in ROW	Commercial Structures in ROW	Estimated EAV of Structures to be Acquired[d] ($)	Tax Rates for 2005[e]	Revenue Loss from Acquisition[f] ($)	2005 Total Assessed Taxes[a,g] ($)	Percent of Tax Loss from Acquisition[a,g]
Peoria County			**9**	**0**			**32,600**	**52,676,200**	**0.1%**
Peoria County	704	107,993	9	0	323,676	0.848900	3,664	22,293,833	0.0%
Logan/Trivoli MTAD	480	73,630	2	0	71,928	0.024030	35	15,301	0.2%
City of Farmington (Peoria County share)	1	117	0	0	0	0.897110	0	6	0.0%
ICC JC #514 (Peoria County share)	704	107,993	7	0	251,748	0.480130	1,727	12,625,691	0.0%
ALPHA PARK LBRY DIST (Peoria County share)	225	34,479	9	0	323,676	0.254230	911	827,893	0.1%
Farmington Comm FD (Peoria County share)	53	8,191	0	0	0	0.317230	26	13,013	0.2%
Gr Peo Reg Airport Authority	225	34,479	7	0	251,748	0.203880	584	3,923,027	0.0%
Gr Peo SD	63	9,671	0	0	0	0.000000	0	0	0.0%
Limestone Twp	225	34,479	7	0	251,748	0.198520	568	456,870	0.1%
Rd & Br Limestone	225	34,479	7	0	251,748	0.283320	811	652,027	0.1%
Limestone FPD	225	34,479	7	0	251,748	0.308930	884	456,520	0.2%
Logan Twp	277	42,494	1	0	35,964	0.201710	158	91,648	0.2%
Rd & Br Logan	277	42,494	1	0	35,964	0.376030	295	170,853	0.2%
Logan/Trivoli FPD	426	65,322	2	0	71,928	0.322250	442	275,206	0.2%
Trivoli Twp	202	31,019	1	0	35,964	0.197380	132	36,000	0.4%
Rd & Br Trivoli	202	31,019	1	0	35,964	0.459890	308	83,879	0.4%
Trivoli Twp Cem Dist	202	31,019	1	0	35,964	0.052090	35	9,501	0.4%
Bellevue Village	0	35	0	0	0	0.153920	0	24,888	0.0%
Norwood SDE 63	85	12,970	7	0	251,748	2.565660	6,792	975,239	0.7%
Limestone HSD 310	225	34,479	7	0	251,748	2.136250	6,115	5,451,305	0.1%
Lime-Walt SDE 316	140	21,509	0	0	0	3.109910	669	1,058,423	0.1%
Farm-Cen SDU 265 (Peoria County share)	480	73,513	2	0	71,928	5.575740	8,109	3,108,927	0.3%
Farm Libr Dist (Peoria County share)	480	73,513	2	0	71,928	0.225270	328	123,003	0.3%
Bellevue TIF 2005	0	22	0	0	0	0.000000	0	3,162	0.0%
Fulton County			**11**	**4**			**56,300**	**19,026,100**	**0.3%**
Fulton County	1310	158,060	11	4	449,004	1.271000	7,716	4,142,174	0.2%

Table 3-16
Estimated Tax Revenue Loss Analysis

Taxing District[a]	Additional Right-of-Way[b] (acres)	Estimated EAV of Land to be Acquired[c] ($)	Residential Structures in ROW	Commercial Structures in ROW	Estimated EAV of Structures to be Acquired[d] ($)	Tax Rates for 2005[e]	Revenue Loss from Acquisition[f] ($)	2005 Total Assessed Taxes[a,g] ($)	Percent of Tax Loss from Acquisition[a,g]
Fulton County Ambulance & Emergency	1310	158,060	11	4	449,004	0.169700	1,030	526,118	0.2%
n/a	123	14,833	1	1	63,300	0.000000	0	0	0.0%
n/a	644	77,722	6	3	273,816	0.000000	0	0	0.0%
n/a	519	62,599	4	0	111,888	0.000000	0	0	0.0%
Marietta Village	5	652	0	0	0	0.548400	4	2,260	0.2%
Norris Village	25	3,062	1	1	63,300	0.438200	291	4,692	6.2%
Smithfield Village	19	2,254	0	0	0	0.720200	16	6,210	0.3%
Bushnell Fire District (Fulton County share)	23	2,759	0	0	0	0.376400	10	14,866	0.1%
Buckheart Fire District	53	6,369	0	0	0	0.380300	24	74,941	0.0%
Copperas Creek Fire District	414	49,915	3	1	119,244	0.308500	522	106,977	0.5%
Cuba Fire District	351	42,349	4	0	111,888	0.330700	510	91,706	0.6%
Farmington Fire District (Fulton County share)	175	21,053	2	0	55,944	0.317240	244	94,128	0.3%
Smithfield Fire District	211	25,475	2	3	161,928	0.335400	629	24,014	2.6%
Table Grove Fire District	84	10,140	0	0	0	0.342400	35	24,214	0.1%
Spoon River College (Fulton Cnty share)	1278	154,209	11	4	449,004	0.495000	2,986	1,562,122	0.2%
Farm Libr Dist (Fulton County share)	203	24,442	2	0	55,944	0.225500	181	73,103	0.2%
Spoon River Library	459	55,330	5	3	245,844	0.217400	655	70,962	0.9%
Harris-Cass-Bern-Farmers MTAD	241	29,020	4	3	217,872	0.028900	71	4,925	1.4%
n/a	210	25,298	2	0	55,944	0.000000	0	0	0.0%
Canton Park District	386	46,621	3	1	119,244	0.688500	1,142	801,238	0.1%
Farmington Park District	203	24,442	2	0	55,944	0.095400	77	30,446	0.3%
Putman Park District	218	26,310	1	0	27,972	0.166700	90	33,824	0.3%
n/a	1101	132,763	9	4	393,060	0.000000	0	0	0.0%
Unit 3 Cuba School	583	70,328	7	3	301,788	6.067400	22,578	1,951,643	1.2%
Canton Unit District 66	467	56,380	3	1	119,244	3.982000	6,993	6,102,779	0.1%
Bushnell-Prairie City Unit School (Fulton Cnty share)	85	10,300	0	0	0	4.553300	469	266,670	0.2%
Farm-Cen SDU 265 (Fulton County share)	175	21,053	2	0	55,944	5.576000	4,293	1,765,623	0.2%

Table 3-16
Estimated Tax Revenue Loss Analysis

Taxing District[a]	Additional Right-of-Way[b] (acres)	Estimated EAV of Land to be Acquired[c] ($)	Residential Structures in ROW	Commercial Structures in ROW	Estimated EAV of Structures to be Acquired[d] ($)	Tax Rates for 2005[e]	Revenue Loss from Acquisition[f] ($)	2005 Total Assessed Taxes[a,g] ($)	Percent of Tax Loss from Acquisition[a,g]
Farmington Township	203	24,442	2	0	55,944	0.266400	214	85,018	0.3%
Farmington Township Roads	203	24,442	2	0	55,944	0.367000	295	117,123	0.3%
Canton Township	386	46,621	3	1	119,244	0.236500	392	275,226	0.1%
Canton Township Roads	386	46,621	3	1	119,244	0.328600	545	382,407	0.1%
Harris Township	210	25,298	2	0	55,944	0.683200	555	27,640	2.0%
Harris Township Roads	210	25,298	2	0	55,944	0.665100	540	26,908	2.0%
Cass Township	241	29,020	4	3	217,872	0.572900	1,414	32,714	4.3%
Cass Township Roads	241	29,020	4	3	217,872	0.504500	1,246	28,808	4.3%
Putman Township	218	26,310	1	0	27,972	0.541800	294	109,935	0.3%
Putman Township Roads	218	26,310	1	0	27,972	0.417000	226	84,612	0.3%
Buckheart Township	53	6,369	0	0	0	0.298100	19	35,115	0.1%
Buckheart Township Roads	53	6,369	0	0	0	0.381700	24	44,962	0.1%
McDonough County			**3**	**0**			**15,300**	**18,428,300**	**0.1%**
City/County Building Commission	349	67,497	3	0	83,916	0.126410	191	365,015	0.2%
County Corporate Fund	349	67,497	3	0	83,916	0.270000	409	incl in CT55	n/a
McDonough County	349	67,497	3	0	83,916	1.153150	1,746	4,058,986	0.0%
Bushnell Fire District (McDonough County share)	168	32,406	2	0	55,944	0.376340	332	127,848	0.3%
Good Hope-Sciota Fire District	81	15,700	0	0	0	0.268390	42	60,288	0.1%
Industry Fire District (McDonough County share)	19	3,736	0	0	0	0.223580	8	48,975	0.0%
New Salem Fire District	81	15,656	2	0	55,944	0.257140	184	31,819	0.6%
Carl Sandburg College (McDonough County share)	13	2,427	1	0	27,972	0.575900	175	587,929	0.0%
Spoon River College McDonough Cnty share)	337	65,070	2	0	55,944	0.495000	599	902,349	0.1%
Bushnell Library District	97	18,723	2	0	55,944	0.170140	127	55,484	0.2%
Macomb-Mound Multi-Township Assessor	349	67,497	3	0	83,916	0.029020	44	4,491	1.0%
Macomb Township (Clerk)	171	33,119	0	0	0	0.513160	170	91,632	0.4%
Macomb Township (Road)	171	33,119	0	0	0	0.671180	222	incl in TT12	n/a

Table 3-16
Estimated Tax Revenue Loss Analysis

Taxing District[a]	Additional Right-of-Way[b] (acres)	Estimated EAV of Land to be Acquired[c] ($)	Residential Structures in ROW	Commercial Structures in ROW	Estimated EAV of Structures to be Acquired[d] ($)	Tax Rates for 2005[e]	Revenue Loss from Acquisition[f] ($)	2005 Total Assessed Taxes[a,g] ($)	Percent of Tax Loss from Acquisition[a,g]
Mound Township (Clerk)	178	34,379	3	0	83,916	0.535160	633	95,117	1.5%
Mound Township (Road)	178	34,379	3	0	83,916	0.694030	821	incl in TT13	n/a
Bushnell-Prairie City Unit Schl (McDonough Cnty share)	97	18,723	2	0	55,944	4.552960	3,400	1,484,755	0.2%
Macomb Unit School	252	48,775	2	0	55,944	5.880430	6,158	10,513,582	0.1%
TOTAL			**23**	**4**			**104,000**	**90,130,600**	**0.1%**

Source: Illinois Department of Revenue, Peoria County, Fulton County, McDonough County

Notes:

[a] Where tax districts span counties, only the county fair share is shown

[b] New Right-of-Way (ROW) required for construction

[c] Equalized Assessed Valuation (EAV) of land to be acquired = Additional ROW * equalized value per acre

EAV per acre is based upon cropland soil productivity, weighted average by county for acreage in ROW

According to Illinois Department of Revenue *Publication122 Instructions for Farmland Assessment* and *Bulletin 810;* Peoria County ($145/acre); Fulton County ($183/acre); McDonough County ($183/acre)

[d] Fair Market Value (FMV) of structures to be acquired = $84,000 in Fulton & McDonough, $108,000 in Peoria Cnty per residence; $100,000 per commercial building.

EAV for structures = FMV * 33.3% State of Illinois Property Assessment Factor

[c,d] *Note:* These values reflect general property value estimates and do not predict the actual purchase price to be offered to individual owners of properties and/or structures.

The FMV of any portion of a landowner's property and structures needed for the ROW shall be determined by qualified real estate appraisers.

[e] Tax rates are expressed in dollars per $100 of EAV; for tax year 2005 collected in 2006

[f] Revenue loss = taxes of acquired property = $[EAV_{land+bldgs}/100]$*tax rate

[g] Estimations based on 2005 taxes based on latest available data (taxes are collected one year in arrears), using extension after TIF/EZ distributions

3.3 Agriculture

3.3.1 Affected Environment

3.3.1.1 Agriculture in the State and Region

More than three-quarters of Illinois' land area is used for farming (Table 3-17). In 2002, 69 percent of Illinois' land area was in crops, the second-highest percentage of all states. The crops are primarily corn and soybeans (Table 3-18). In dollar value, corn and soybeans are also the two major U.S. crops, and Illinois is ranked second nationally in both corn and soybean production. About $10 billion of agricultural commodities are produced in Illinois annually. Over the past few years corn has represented an increasingly larger part of that share: in 2006, Illinois corn production was valued at $6 billion; soybeans, about $3 billion. Corn and soybeans are crops of global importance. Corn is now the world's top agricultural product, ahead of rice, wheat, and all livestock. The U.S. produces about 40 percent of the world's corn crop and about 70 percent of world exports. In 2006, Illinois accounted for 17 percent of U.S. corn production and nearly 7 percent of world production. The U.S. is also the world's largest producer and exporter of soybeans.[26]

Table 3-17
Agricultural Lands

	McDonough	Fulton	Peoria	Three County Total or Average	Illinois
Total Land Area of County (acres)	337,133	553,999	396,494	1,287,626	35,577,566
Total Land in Farms (acres)	324,724	413,415	266,280	1,004,419	27,310,833
Percent of Total Land Devoted to Farming	96	75	67	78	77
Percent of Total Land Designated Prime Farmland	52	34	42	41	60
Number of Farms	752	1,055	892	2,699	73,027
Average Farm Size (acres)	432	392	299	372	374

Sources: Illinois Agricultural Statistics, 2002 Census of Agriculture, U.S. Department of Agriculture, National Agricultural Statistic Service Natural Resources Conservation Service, USDA Economic Research Service, Illinois Department of Agriculture

The average percent of land in farms for the three-county area overall is about the same as for the state as a whole (Table 3-17); but, individually, McDonough County, with little urban land, has a much higher percent, and Peoria County, with a large urban area, has less. Corn and soybeans

[26] Sources for this paragraph: USDA 2005 and 2007; National Corn Growers Association, 2007; Food and Agricultural Organization of the United Nations 2006

Table 3-18
Farm Land in Corn and Soybeans, 2006

	McDonough County	Fulton County	Peoria County	Three-County Area	Illinois
Percent of Farmed Land in Corn	45	32	41	39	41
Percent of Farmed Land in Soybeans	37	30	30	32	37

Source: (USDA 2005, NASS 2007)

are also the primary crops in the three-county area (Table 3-18). Because of its large areas of former strip-mined lands, and more rugged lands near the Spoon River, Fulton County has less farmland suitable for row crops than the other two counties. Fulton County produces more hay than the other two. The farmland in the three-county area is about 3.6 percent of the total farmland in the state. Corn and soybean production in the three-county area in 2006 represented 3.5 and 3.3 percent of the total state production, respectively, with a cash value of about $207 million for corn and about $90 million for soybeans ($297 million total). The dollar value of the 2006 corn and soybean crops combined was greater than the total dollar value of all crops in 2004 ($281 million), the most recent year available from the U.S. Department of Agriculture (USDA) for total crop receipts. Total livestock receipts for the three-county area in 2004 were $18 million. The primary livestock is pork.[27]

Long-Term Trends

Table 3-19 shows farm data and trends between 1997 and 2002. Between 1997 and 2002, in all three counties, the amount of farmland and the number of farms decreased, while the average size of farms increased. These data reflect two trends in agriculture in the U.S since the end of World War II. First, farmland has been decreasing because of development. Secondly, increases in efficiency and productivity result in fewer workers being able to farm more land.

Short-Term Trends

The recent increase in demand for corn for ethanol production and from overseas markets has resulted in corn price increases that appear dramatic when compared with prices of five to ten years ago. (The inflation-adjusted price of corn is still far below the prices of the 1950s, 1960s, and 1970s.) (National Corn Growers Association 2007, Bureau of Labor Statistics 2007). Soybean prices have also risen, due to increased demand, much of it overseas. The relatively greater increases in corn prices have resulted in more acres being planted in corn. Illinois farmers planted 17 percent more acreage in corn in 2007 than 2006 (NASS 2007).

[27] Sources for this paragraph: USDA 2005 and 2007

Table 3-19
Agricultural Resources

County	1997			2002			Percent Change		
	Farmland (acres)	Number of Farms	Avg Size (acres)	Farmland (acres)	Number of Farms	Avg Size (acres)	Farmland (acres)	Number of Farms	Avg Size (acres)
McDonough	340,071	824	413	324,724	752	432	-4.5	-8.7	4.6
Fulton	424,942	1,101	386	413,415	1,055	392	-2.7	-4.2	1.6
Peoria	267,283	924	289	266,280	892	299	-0.4	-3.5	3.5

Sources: USDA 1997 and 2002 Census of Agriculture.

Real (inflation-adjusted) farm land prices in the U.S. have been rising since about 1992, with substantial increases in the last few years. Nominal farm land prices in Illinois rose about 43 percent between 2003 and 2007. In western Illinois, average productivity tracts in 2005 sold in the $2,500 to $3,480 per acre range (Illinois Society of Farm Managers and Rural Appraisers 2006). In 2006, prime farmland the area was selling in the range of $4,700 to $5,300 per acre (Aupperle 2007). Crop prices, demand for tax-deferred investments (local farmers compete with Chicago investors for some of the best land), high-productivity land, government program payments, and rural amenities all contribute to the price increases (USDA Economic Research Service 2006).

Farm Employment and Related Businesses

While agriculture is probably the most important section of economics in the project area, because of the mechanization and high productivity of modern farming, its importance is not reflected in farm employment. In Illinois in 2004, farm workers represented 1.2 percent of all workers. In the three-county area in 2004, there were about 3,400 farm workers, which was about two percent of all workers. Farm workers represented less than one percent of workers in Peoria County, about five percent in McDonough County, and about 10 percent in Fulton County. The percentages are much smaller when farm workers' compensation is compared with total workers' compensation. In Illinois and the three-county area in 2004, farm workers' compensation was about 0.2 percent of total workers' compensation. Of the three counties, Fulton was highest at 1.3%.[28] The Illinois Department of Agriculture estimates that about 39 percent of farmers hold jobs off the farm and considered farming their secondary occupation.

Food processing is an important manufacturing activity in Illinois, but most processors are located in the Chicago metropolitan area, which contains one of the largest concentrations of

[28] U.S. Bureau of Economic Analysis, 2004. Farm employment is the number of workers engaged in the direct production of agricultural commodities, either livestock or crops; whether as a sole proprietor, partner, or hired laborer; and includes both full-and part-time workers.

food-related businesses in the world.[29] There are businesses related to agriculture in the area, but none are large. Of the 19 businesses identified in the area with 500 or more employees in 2006, none were directly related to agriculture. Of the 21 businesses in the area with 200 to 500 employees in 2006, only one was directly related to agriculture, the National Center for Agricultural Utilization Research in Peoria.

3.3.1.2 Agricultural Lands

Land Programs Authorized by the Food Security Act of 1985, as Amended[30]

Conservation Reserve Program.[31] The USDA summarizes their Conservation Reserve Program (CRP) as follows:

> The purpose of the CRP is to assist farmers and ranchers in conserving soil, water, and wildlife resources by converting highly erodible and other environmentally sensitive acreage normally devoted to the production of agricultural commodities and marginal pastureland to a long-term resource-conserving cover. CRP participants enroll in contracts for periods of 10- to 15-years in exchange for annual rental payments and cost-share assistance for installing those long-term resource-conserving practices.[32]

The CRP is not a permanent program in the sense that it requires re-authorization through amendments to the Food Security Act or by new laws such as the Food, Conservation, and Energy Act of 2008 ("Farm Bills"). The 2008 Farm Bill extended the CRP to September 2012. The 2008 Farm Bill allows for managed harvesting for biomass and other uses, with a reduced payment.

Approximately 1,069 acres of land on 68 properties within the project corridor are part of the CRP. Twenty properties are located in McDonough County, 35 in Fulton County, and 13 in Peoria County.[33]

Conservation Reserve Enhancement Program. The Conservation Reserve Enhancement Program (CREP), established in 1998, is the name given to special joint undertakings between states and the federal government using CRP contracts and payments "to encourage enrollments and practices that may address particularly pressing environmental needs."[34] These projects address

[29] Illinois Department of Agriculture, 2001.

[30] Food Security Act of 1985, as amended through Public Law 109-171, February 8, 2005 [16 USC 3801]

[31] 40 CFR 1410

[32] Federal Register: May 27, 1998 (Volume 63, Number 101)

[33] Barb Kittell of the McDonough County Farm Service Agency (FSA), Joe Erlandson of the Fulton County FSA, and Thomas Austin of the Peoria County FSA.

[34] Federal Register: May 27, 1998 (Volume 63, Number 101)

area-wide issues associated with agricultural activities such as soil erosion, water quality degradation and wildlife habitat loss. The Illinois CREP was created in 1998 through an agreement between the State of Illinois and USDA to reduce sediment and nutrient content while enhancing wildlife habitats for threatened and endangered species in the Illinois River Watershed (including the Middle Illinois and Spoon River watersheds as described in Section 3.8).[35] The goals of the CREP are to reduce total sediment, phosphorous and nitrogen loading in the Illinois River; and to increase populations of waterfowl, shorebirds, native fish and mussels, and threatened and endangered species. Approximately 319 acres of land on 12 properties within the project corridor are part of the CREP. Two properties are located in McDonough County, 10 in Fulton County, and none are in Peoria County.[36] Impacts of the Build Alternative are discussed in Section 3.3.2.

Wetlands Reserve Program. This program, in effect since 1991, provides an opportunity for landowners to receive financial incentives to enhance wetlands in exchange for retiring marginal land from agriculture. Conservation easements to protect the wetlands are recordable and in effect for 30 years. No land within the project corridor is part of the Wetlands Reserve Program in any of the three counties considered under this study.[37]

Grasslands Reserve Program. This program began with the 2002 Farm Bill and provides incentive for farmers to restore grassland including prairie land. There is no land within the project corridor that is part of the Grassland Reserve Program in any of the three counties.[38]

Agricultural Areas (Ag Areas)

Under the Illinois Agricultural Areas Conservation and Protection Act of 1980,[39] landowners may voluntarily place their land into a protected district, commonly referred to as an "Ag Area", with the approval of the local county boards. Once approved, an Ag Area retains its legal status for 10 years. After the 10-year period expires, extensions of eight years can be granted. Under the enacting legislation, local governments are restricted from passing ordinances that unreasonably restrict or limit the Ag Area's use for agricultural purposes; and it is the "policy of all state agencies to encourage the maintenance of viable farming" in Ag Areas."[40] The county board has final approval of any changes to an Ag Area, following procedures similar to those for Ag Area establishment. Changes of ownership do not affect the Ag Area designation (Church 2000). There is one Ag Area in the project corridor, approximately 1,100 acres in size, north and west of Norris.

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[35] The USDA Commodity Credit Corporation (CCC), which funds CRP

[36] Barb Kittell of the McDonough County FSA, Joe Erlandson of the Fulton County FSA, and Thomas Austin of the Peoria County FSA.

[37] Ibid.

[38] Ibid.

[39] 505 ILCS 5/

[40] 505 ILCS 5/19 and 5/20.

Centennial and Sesquicentennial Farms

The Centennial and Sesquicentennial Farms program is administered by the Illinois Department of Agriculture to honor generations of farmers who have worked to maintain family farms in Illinois. To qualify for this status the same family must have owned an agricultural property for at least 100 years (Centennial) or 150 years (Sesquicentennial). However, status as a Centennial and Sesquicentennial Farm does not restrict the landowner from selling the farm outside the family.[41] There are 22 Centennial farms scattered throughout the project corridor, but no Sesquicentennial Farms.

3.3.1.3 Soils

The soils and topography throughout most of the corridor range from good to ideal for an agricultural environment. The least favorable soils for farming are those along the stream valleys, especially the Spoon River, the largest drainage in the project area.

USDA defines four categories of "important farmland," based on soil type:[42]

- *Prime farmland* is the land that is best suited for growing crops. USDA's definition is very specific and detailed. States are required to identify those mapped soil types that qualify as prime farmland.

- *Unique farmland* does not meet the requirement for prime, but it has qualities that make it usable for specific high-value crops (for example, citrus, tree nuts, vegetables, olives). Each state identifies its unique farmland.

- *Additional Farmland of Statewide Importance* does not meet the requirements for prime or unique, but is important in the state for crop production. Some cropland in this category is nearly as productive as prime farmland. Individual states determine the farmland in this category for their state.

- *Additional Farmland of Local Importance* may be identified by local agencies.

About 68 percent of lands in the three-county area have been identified by the State of Illinois as prime farmland or additional farmland of statewide importance. This land is spread throughout the project area. Prime farmland generally is used for crops, mainly corn and soybeans, which account for most of the local agricultural income each year. The amount of prime farmland, by county, is as follows (IDOA):

- In McDonough County, about 177,000 acres (52 percent of the total acreage)

[41] 20 ILCS 205/40.7.

[42] 7 CFR 657.5

- In Fulton County, about 190,000 acres (34 percent of the total acreage)
- In Peoria County, about 166,000 acres (42 percent of the total acreage)

The amount of important farmland by county is as follows:

- In McDonough County, about 46,000 acres (14 percent of the total acreage)
- In Fulton County, about 101,000 acres (18 percent of the total acreage)
- In Peoria County, about 75,000 acres (19 percent of the total acreage)

3.3.2 Environmental Consequences

This section describes the Build Alternative's impacts to farm operations. A farm operation is defined as one or more parcels of land farmed as a single unit. Although farmed under single management, a farm operation may be comprised of multiple land parcels with multiple owners. The USDA/Farm Service Agencies in the three counties provided information on farm boundaries and owners/operators of individual farm units in the project corridor. The Farmland Protection Policy Act[43] established criteria for identifying and considering the effects of federal programs (such as the construction of the Build Alternative) on the conversion of farmland to nonagricultural uses. Form AD-1006 of the Natural Resources Conservation Service (NRCS) is used for this purpose (Appendix A). The fundamental purpose of the Farmland Protection Policy Act is to minimize the extent of farmland conversion and impacts and to "assure that federal programs are administered in a manner that, to the extent practicable, would be compatible with state, unit of local government, and private programs and policies to protect farmland." The Build Alternative, as described in Section 2, was developed to limit severances and overall agricultural impacts to the extent practicable.

The agricultural impacts discussed in this section include loss of farmland, farmland severances and the associated changes in cropping patterns and field access, and displacement of farm residences and outbuildings. For the purpose of this discussion, farmland is defined as cropland and other cover types (wetlands, forest, etc.) found on farms. Cropland includes cropped fields, pasture and hay land, vineyards, and orchards.

The No-Build Alternative would not acquire land from farm operations in the project area. However, as traffic volumes increase travel efficiency and possibly safety for farm vehicles using existing routes in the project area would be expected to decline. Improvements to existing routes would potentially impact farm operations and farmland.

[43] What is known as the Farm Protection Policy Act is Subtitle I of Title XV, Section 1539-1549 of the Agriculture and Food Act of 1981 (Public Law 97-98)

Table 3-20 summarizes the Build Alternative's key impacts on agricultural lands. The number of farm operations affected is the total number that have some impact.[44] Most of these farms will be impacted only by loss of property along an edge. To minimize impacts on farmland, the proposed alignment was placed on section lines to the extent practicable. Exhibit 3-10 provides an illustration of the terms used in this subsection. Agricultural impacts are discussed in more detail in the subsections below.

Table 3-20
Summary of Key Agricultural Impacts

	No-Build Alternative	**Build Alternative**
Number of Farm Operations Affected	0	335
Farmland Required to Construct the Facility	0	2,461
Cropland Affected, acres	0	2,015
Number of Farm Severances	0	58
Displaced Agricultural Residences	0	12

3.3.2.1 Agricultural Acres Required

Approximately 2,461 acres of farmland will be purchased as right-of-way to construct the Build Alternative and therefore will be removed from agricultural use (Table 3-20). The breakdown based on prime farmland, farmland of statewide importance (Important), and other farmland is shown in Table 3-21. Of the 2,461 acres of farmland needed for the project, 2,015 acres are cropland. The affected cropland acreage includes 1,865 acres of row crops and 150 acres of pastureland. The land that will be purchased from farm operations for the Build Alternative represents 0.19 percent of the 1.3 million acres of farms in the three-county area (Table 3-21).

Table 3-21
Conversion of Prime and Important Farmland

Category	Acres Affected		Total in Three-County Area (acres)	% of Total in Three County Area
	Acres	% of Total Affected		
Prime	1,433	58	533,318	0.27
Important	394	16	222,809	0.18
Other	634	26	531,499	0.12
Total	2,461	100	1,287,626	0.19

Conservation Reserve Programs Lands. A total of 23 acres of land in one or more of the Conservation Reserve programs will be acquired from 12 farms. This includes 22 acres in the

[44] See the introductory paragraph of Section 3.3.2 for the definition of "farm operation."

CRP program, one acre in the CREP program, no acreage in either the grassland or the wetlands reserve programs.[45] While these lands are currently in the program and are not used for crop production, there may be substantial changes over the next few years in both land use and acreage in the programs, fueled by high corn prices, as discussed in Sections 3.3.1.1 and 3.3.1.2. Standard CRP contracts can be 10 to 15 years in duration, and 30 years for the wetlands reserve. Converting CRP land to highway right-of-way will violate the terms of the contract with NRCS and will require IDOT to coordinate with NRCS to determine if there will be financial consequences of acquiring CRP land.

Ag Areas. No Ag areas would be affected by the Build Alternative.

Centennial Farms. The Build Alternative will take land from six Centennial Farms in the project corridor:

- Approximately seven acres from a farm in far eastern McDonough County, located on the south side of North 1400 Road between East 2250 Street and East 2400 Street (Aerial Exhibit Sheet 5).
- Approximately eight acres from a farm east of Smithfield, on the south side of IL 95, east of Old Miller Road (Aerial Exhibit Sheet 12).
- Approximately 11 acres from a farm just northeast of Cuba (Aerial Exhibit Sheet 15).
- Approximately 10 acres from a farm south of Wertman Road and west of CH 22, west of the Canton Airport (Aerial Exhibit Sheet 20).
- Approximately five acres from a farm north of Wertman Road and west of CH 22, northwest of the Canton Airport (Aerial Exhibit Sheet 20).
- Approximately 10 acres from a farm on the north side of Behrends Road, east of South Eden Road and southwest of Hanna City (Aerial Exhibit Sheet 33).

No mitigation is required for Centennial Farms. However, Centennial Farms have value as cultural and agricultural resources, and their impacts are therefore identified.

3.3.2.2 Soils/Land Capability Groupings

Prime and Important Soils. Approximately 58 percent, or 1,433 acres of the total soils that will be converted by the project from agricultural use is classified as prime farmland (Table 3-21).

[45] Barb Kittell of the McDonough County FSA, Joe Erlandson of the Fulton County FSA, and Thomas Austin of the Peoria County FSA.

Another 16 percent, or 394 acres, of farmland that will be converted is classified as additional farmland of statewide importance.

Land Capability Classes. USDA classifies soil based on its ability to produce crops without deteriorating over a long period of time, with Class I soils most productive and long-lasting, and Class VII soils least productive and subject to deterioration. Generally, Classes I and II are considered prime farmland soils. Soils from six capability groupings will be impacted by the Build Alternative (Table 3-22), with most impacts on Class I and II soils. Existing right-of-way was excluded from the overall effects, because existing right-of-way already has been converted to nonagricultural uses.[46]

Table 3-22
Impacts by Soil Capability

Soil Grouping	Acres
Class I	1,002
Class II	1,118
Class III	254
Class IV	117
Class V	0
Class VI	62
Class VII	90
Total	**2,643**

Displacements. The Build Alternative will displace 12 farm residences and 67 outbuildings (Table 3-23). The Uniform Relocation Assistance and Real Property Acquisition Act of 1970, as amended applies to all federal or federal-assisted activities that involve the acquisition of real property or the displacement of residences or businesses. IDOT will provide just compensation for each property acquired for new right-of-way. Just compensation is a monetary payment equivalent to the fair market value of the property. Fair market value is the highest estimated price the property will bring if sold on the open market, with a reasonable time allowed to find a buyer, and buying with the knowledge of all the uses to which it is adapted, and for which it is capable of being used. Mitigation of relocation impacts or displaced structures will be in the form of financial remuneration or compensation for property loss and relocation expenses, as outlined in the Uniform Relocation and Real Property Acquisition Act of 1970, as amended. See Section 3.2.2.3 for more information about the compensation for displaced farm residences and other residences.

Severances. Severances occur when a contiguously farmed parcel is divided by the proposed improvements. Fifty-nine farms will be severed by the project. Property severances affect field access and require changes in cropping patterns and access. Direct access to farm fields from IL

[46] Table 3-22 includes 55 acres of urban/built-up land not included in Table 3-21

336 will not be allowed for the first mile on the west end of the Build Alternative and the first six miles on the east end of the project, but direct access will be permitted on the remainder of the route. As a result of farm severances, some project-area farmers will experience changes in the way they work and move between their fields. The inability to cross the freeway portion at the east end of the Build Alternative will affect farmers who have land on both sides of the proposed freeway. A severed farm requires farmers to travel on local roads with farm machinery to reach the nearest intersection tha provides access to the severed parcel. Not only does the increased travel time for farmers reduce profits, it also increases the potential for conflicts on local roads between farm machinery and other vehicles. Farmers whose wells will be separated from their irrigation equipment will incur the cost of developing a new well because IDOT will not permit irrigation piping to be located under the Build Alternative.

Table 3-23
Impacts to Farm Operations

Impact Type	Acres	Number
Displaced Agricultural Residences	--	12
Displaced Agricultural Outbuildings	--	67
Landlocked Parcels		0
Environmental Mitigation Parcels	46	1
Remnants less than 3 acres	0	0
Farms Severed	--	58

Remnants. Severed parts of a farm that are 3 acres or less and still accessible may be uneconomical to farm. No remnants less than 3 acres in size will be created as a result of the Build Alternative (Table 3-23).

Environmental Mitigation Areas. A 46-acre environmental mitigation parcel has been identified, near the Spoon River (Aerial Exhibit Sheet 10). This parcel was selected for several reasons: it could provide an area for compensatory floodplain storage; it could provide approximately 27 acres for tree mitigation; since it lies adjacent to the Harper Rector Woods Nature preserve, it could serve as a buffer for the nature preserve; and the irregular shape makes it less desirable for farming. The area that could be used for tree planting is shown in Aerial Exhibit Sheet 10.

Adverse Travel. Severances create adverse travel, which is defined as the increased distance a farmer must travel between the severed pieces of farm property. The amount of adverse travel each farmer experiences is calculated by subtracting the round trip distance the farmer travels today between one side of a field and the other or one field and another without the Build Alternative from the round trip distance after the Build Alternative is constructed. Nineteen farm operations will be affected by adverse travel. The amount of adverse travel ranges from 0.6 mile to 5.8 miles, with a total of 35.6 miles.

3.3.2.3 Lost Production

The Build Alternative will result in an annual loss of about $900,000 (2006 dollars) in the value of crops and livestock produced on farmland that will be used for the project.

For individual farmers, in some cases, the reduction in income generated by crops could be recovered by renting farmland. Prime farmland cropland in the area was renting for about $150 to $190/acre in 2005. For farmers who continue to work severed properties, there will be an increase in transportation costs associated with adverse travel. The transportation cost increase will vary by farmer depending on the amount of adverse travel. Offsetting the lost income from crops to some degree will be the possible savings in crop and fertilizer haul distances resulting from the Build Alternative. The distance and/or time associated with trips to and from grain elevators or beyond the study area could be reduced by the increased efficiency and safety of the Build Alternative.

3.3.2.4 Farmland Conversion Impact Rating

In order to comply with state and federal agriculture protection regulations (the Farmland Preservation Act and Farmland Protection Policy Act, respectively), the NRCS developed the Land Evaluation and Site Assessment (LESA) system. It is a tool for evaluating the relative effect development projects will have on farmland. NRCS uses it to evaluate the productivity of the soils affected by a project (the Land Evaluation (LE) section). The Illinois Department of Agriculture (IDOA) also uses it to assess the impact a project may have on the viability of farmed land in that project's corridor (the Site Assessment (SA) section). The following are examples of the factors that contribute to a Build Alternative's SA rating:

- Amount of agricultural land required
- Creation of severed farm parcels, uneconomical remnants, landlocked parcels, and adverse travel
- Relocations of rural residences and farm buildings
- Use of minimum design standards

Each factor is given points, which are tallied to reach an overall rating and included on Farmland Conversion Impact Rating Form AD-1006 (Appendix A). For corridor projects, the LE section can receive up to 150 points, and the SA section can receive up to 150 points. The higher the rating, the better suited the location is for agriculture and is encouraged to be retained for agricultural uses. LESA scores of 226 and above are in the high protection bracket, a rating between 176 and 225 indicates a moderate need for protection, and a rating below 175 indicates low protection status. The NRCS has completed the LE portion of Form AD-1006 and has assigned 137 points. IDOA has completed the SA section and has assigned 118 points. The

resulting LESA score is 255 points, which places the Build Alternative in the high protection bracket. Because of the length of the proposed project and the fact that most of the area between Macomb and Peoria is agricultural and prime farmland, a high LESA score would be unavoidable for any alternative route. Measures to minimize harm are discussed below.

3.3.3 Measures to Minimize Harm

The Build Alternative will maximize the use of existing roadway ROW and minimize new ROW required to the extent practicable. The Build Alternative will share about 7 miles of alignment with IL 95, about 5 miles with County Highway 5, about three miles with IL 78, and several more miles with various other county highways. Altogether, the Build Alternative will use about 513 acres of existing roadway right-of-way.

When farmland itself could not be avoided, design standards such as the following were employed to minimize impacts:

- When crossing agricultural land, the alignment was placed on section lines as much as practicable to minimize severances, minimize adverse travel, avoid diagonal severances and keep uneconomic remnants to a minimum.

- The design of the highway as an expressway rather than a freeway (except for the east end) results in far less farm impact due to the greatly reduced right-of-way requirements of intersections rather than interchanges, the fact that the roadway can be directly accessed with and used by farm equipment, and the reduced adverse travel of an expressway compared with a fully access-controlled highway.

- In the area from the Illinois River Correctional Center to Norris, the alignment was placed along the edge of farmland adjacent to strip mines, the Correctional Center, Double T State Fish and Wildlife Area and the Canton Airport, to reduce operational impacts and impacts on the farmland itself.

- The interchange next to the prison was designed as a partial cloverleaf (with loops all on one side) rather than a conventional diamond to minimize farmland impacts.

- IDOT worked with individual farmers to identify locations where cattle crossing will help reduce impacts on farm operations; and locations where median crossings for farms may be added, to reduce adverse travel.

- Consistent with Illinois Department of Agriculture recommendations, IDOT is evaluating a site for mitigation that could potentially be used for multiple purposes: compensatory flood storage, tree replacement, and wetland replacement. While this site is in farmland, it is adjacent to the existing/proposed roadway, partially wooded, and the portion suitable for crops is irregularly shaped. Topsoil could be saved and re-used on site.

- IDOT will implement sediment and erosion control measures during construction.

3.3.4 Indirect Impacts

3.3.4.1 Background Information

Because agriculture is the first resource topic that includes an analysis of indirect impacts, an explanation is provided here about the general philosophy that guided the thought process on this topic. The background text below describes the indirect development potential in the project area. Following this general discussion is an evaluation of the project's indirect impacts on agriculture.

The assessment of indirect impacts follows the guidance in FHWA's *Questions and Answers Regarding the Consideration of Indirect and Cumulative Impacts in the NEPA Process*.[47] Based on the guidance, the assessment of indirect impacts considers "reasonably foreseeable actions," which are those "likely to occur or probable rather than those that are merely possible."

The analysis of indirect impacts began by examining the project area's potential for growth beyond the proposed IL 336 right-of-way. Residential and commercial development decisions generally are based on such factors as labor force quality, housing prices, tax structure, quality of schools, proximity to employment and others largely unrelated to proposed highway improvements. Efficient transportation facilities are a factor in development decisions, but without most or all the other factors mentioned, transportation improvements alone are not enough to change an area's attractiveness for development.

Thus, it seems unlikely that reasonably foreseeable development attributable to the IL 336 project will occur outside project communities and interchanges adjacent to them. There is no current evidence in the project area of widespread development (or a movement in that direction) that will be stimulated by the proposed improvements. The limited existing growth in the corridor is found mostly in the eastern end of the project, from Hanna City east, primarily because of its proximity to employment in Peoria. Population trends and projections as described in Section 3.2 support the contention of limited future growth potential in the study area.

However, while substantial commercial development and residential subdivisions are unlikely as a result of the project, as discussed in Section 3.2, the Build Alternative will make the project area more accessible for commuters. This is likely to result in scattered residences in the project area that would not have been built but for the Build Alternative (though increasing fuel costs may inhibit relocations that increase commute distances).

[47] Available at: http://environment.fhwa.dot.gov/projdev/qaimpact.asp

3.3.4.2 Agricultural Indirect Impacts

Some fairly small highway-related developments, such as service stations, fast food restaurants and quick shops, are expected along project interchanges. Interchanges at the east end of the project, along Maxwell, Murphy, and Taylor Roads, where traffic will be highest and there is already development, are most likely. Much of the available land area at those interchanges is prime farmland. Some development is likely at the Lightfoot Road/IL 336 interchange south on Farmington, which is located primarily in prime farmland. Much of the available land at the proposed IL 78 interchange south of Norris, and at the proposed IL 9 interchange near the Illinois River Correctional Center is also prime farmland. The western part of the project—a little over half the total length—will have no accessible interchanges and little development is expected.

The development of borrow areas that will be required to construct the proposed IL 336 improvements could adversely affect farm land.

Commercial development along the Build Alternative is not expected, as businesses will not have direct access to the route. Residential development is also not expected immediately along the route. Most of the land within the project area in Peoria County is zoned agricultural preservation, which was established to conserve farmland and to encourage continued agricultural activities, thereby helping to ensure that sustainable agriculture will continue as a long term land use and a viable economic activity within Peoria county.[48] Most of the land within the project area near Canton is zoned agricultural.

Because the Build Alternative offers an improved commute, it is likely to encourage growth in residential development in the area from the east end of the project to Farmington, where many residents probably already commute to Peoria for work. While it is impossible to predict exactly where growth in residential development may occur, much of it is likely to occur in farmland, because of its predominance and the greater ease of construction on more level ground, where the better farmland is located.

Displaced farms buildings, including residences and outbuildings, are likely to be reconstructed on farm land.

[48] Peoria County Planning and Zoning, Code of Peoria County, Sec. 24-6-3. Agricultural Preservation District.

3.3.5 Cumulative Impacts

New development unrelated to the Build Alternative has and will continue to contribute to the loss of agricultural land in the area, particularly at the eastern end of the project near Peoria. The proposed North Canton Mine will result in the loss of 619 acres of cropland and 12 acres of pasture/grassland, according to the Capital Resources Development Company (CRDC) permit application (CRDC 2006), although the cropland would be reclaimed (IDNR 2008a) ((Section 3.7.1.5). The proposed expansion at the Peoria airport would result in loss of farmland.

3.4 Cultural Resources

3.4.1 Affected Environment

Cultural resources in the project area have been investigated pursuant to the National Historic Preservation Act of 1966, as amended. The studies were designed to identify the types of cultural resources present in the project area and to produce data which will allow a determination of eligibility in terms of National Register of Historic Places criteria and to aid in the formulation of mitigation measures, if and when appropriate.

The National Register of Historic Places is the nation's official list of cultural resources worthy of preservation, and was authorized under the National Historic Preservation Act. Properties listed in the Register include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture. The National Register is administered by the National Park Service, which is part of the U.S. Department of the Interior.

3.4.1.1 Historic Resources

There are three properties within the project corridor that are on the National Register: two bridges on the Spoon River in Fulton County south of the IL 95 bridge: Seville Bridge and Tartar's Ferry Bridge; and Christ Church of Lower Kickapoo, on Christ Church Road in Peoria County near the east end of the corridor. Several other listed properties are located nearby outside the corridor (Exhibit 3-11). There are no historic districts in the project area.

A photo log of potentially eligible structures was compiled for use in developing alternative alignments. The photo log was reviewed by IDOT's historic resources specialist and it was determined that 21 structures have the characteristics to be potentially eligible for the National Register (Walthall 2005). None of these structures are located within or near the Build Alternative ROW.

There are no known cemeteries located within the right-of-way of the Build Alternative. Cemeteries in the vicinity of the Build Alternative are shown in the Aerial Exhibits.

3.4.1.2 Archaeological Resources

No archaeological sites listed on the National Register are located within or near the Build Alternative ROW. Archaeological surveys of the Build Alternative have not yet been conducted.

3.4.2 Environmental Consequences

3.4.2.1 Historic

None of the sites listed on the National Register are located near the Build Alternative and none will be physically or visually affected by the project. All known cemeteries were avoided. No sites or structures on or eligible for the National Register will be impacted or visually affected by the Build Alternative.

3.4.2.2 Archaeological

FHWA and IDOT, in consultation with the Illinois State Historic Preservation Officer (SHPO), have identified more than 30 archaeological habitation sites (Sites) that appear to be eligible for the National Register of Historic Places under Criterion D and that will be adversely affected by the Preferred Alternative. The Sites include both prehistoric and historic habitation sites that cannot be affliliated with historic Indian Tribes and the Sites are important for the scientific data they likely contain; however, the sites do not require preservation in place. FHWA has completed the Section 106 consultation process, and, along with IDOT, has entered into a Memorandum of Agreement (MOA) with the SHPO that stipulates how the data are to be recovered and how any post-review discoveries will be handled. The MOA also requires IDOT to prepare a detailed data recovery plan. The MOA is included as Appendix E.

The following tribes have expressed an interest in this part of Illinois: Peoria, Ho Chunk, Potawatomi, and the Sac & Fox. Pursuant to 36 CFR 800.3(f), the FHWA sent a letter to each of these tribes inviting them to be a Section 106 consulting party on this project (see Appendix D).

3.5 Air Quality

3.5.1 Affected Environment

The National Ambient Air Quality Standards (NAAQS), established by the USEPA, set maximum allowable concentration limits for six criteria air pollutants, as well as for Particulate Matter (PM). Areas in which air pollution levels persistently exceed the NAAQS may be designated as “nonattainment.” No part of the project lies within a designated nonattainment area or maintenance area.

3.5.2 Environmental Consequences

3.5.2.1 Microscale Analysis

A prescreen analysis was completed for the Build Alternative. The results for the proposed roadway improvement indicate that a carbon monoxide screen for intersection modeling (COSIM) air quality analysis is not required, as the results for the worst-case receptor are below the 8-hour average NAAQS for carbon monoxide of 9.0 parts per million, which is necessary to protect the public health and welfare.

3.5.2.2 Conformity

No part of the project is within a designated nonattainment area for any of the air pollutants for which the USEPA has established standards. Accordingly, a conformity determination under 40 Code of Federal Regulations (CFR) Part 93 ("Criteria and Procedures for Determining Conformity to State or Federal Implementation Plans of Transportation Plans, Programs, and Projects Funded or Approved Under Title 23 USC of the Federal Transit Act") is not required.

3.5.2.3 Construction Related Particulate Matter

Demolition and construction work can result in short-term increases in fugitive dust and equipment-related particulate emissions in and around the project area. (Equipment-related particulate emissions usually are minor when equipment is well maintained.) The potential air quality impacts will be short-term, occurring only while demolition and construction work is in progress and local conditions are appropriate. The potential for fugitive dust emissions typically is associated with building demolition, ground clearing, site preparation, grading, stockpiling of materials, onsite movement of equipment, and transportation of materials. The potential is greatest during dry periods, high wind conditions, and periods of intense construction work. IDOT's Standard Specifications for Road and Bridge Construction include provisions for dust control. Under those provisions, dust and airborne dirt generated by construction will be managed through dust control procedures or a specific dust control plan, when warranted. The contractor and IDOT will meet to review the nature and extent of dust-generating activities and will cooperatively develop specific types of control techniques appropriate to the specific situation. Techniques that may warrant consideration include measures such as minimizing track-out of soils onto nearly publicly traveled roads, reducing speed on unpaved roads, covering haul vehicles, and applying chemical dust suppressants or water to exposed surfaces, particularly those on which construction vehicles travel. With the application of appropriate measures to limit dust emissions during construction, this project will not cause any notable, short-term particulate matter air quality impacts.

3.5.2.4 Mobile Source Air Toxics

In addition to the criteria air pollutants for which there are NAAQS, the USEPA also regulates air toxics. Most air toxics originate from human sources, including on-road mobile sources, non-

road mobile sources (such as airplanes), area sources (such as dry cleaners), and stationary sources (such as factories or refineries).

Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics defined by the Clean Air Act (CAA). The MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when fuel evaporates or passes uncombusted though the engine. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

The USEPA is the lead federal agency for administering the Clean Air Act and has certain responsibilities regarding the health effects of MSATs. The USEPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources (66 *Federal Register* [March 29, 2001]: 17229). The rule was issued under the authority in Section 202 of the Clean Air Act. In its rule, the USEPA examined the impacts of existing and newly promulgated mobile source control programs, including its reformulated gasoline program, its national low emission vehicle (NLEV) standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy duty engine and vehicle standards on-highway diesel fuel sulfur control requirements. FHWA projects that even with a 64 percent increase in vehicle miles traveled (VMT) between 2000 and 2020, these programs will reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by 57 to 65 percent, and will reduce on-highway diesel particulate matter emissions by 87 percent. As a result, USEPA concluded that no further motor vehicle emissions standards or fuel standards are necessary to further control MSATs. The agency is preparing another rule under authority of CAA Section 202(l) that will address these issues and could make adjustments to the full 21 and the primary six MSATs.

This FINAL EIS includes a basic analysis of the likely MSAT emission impacts of the project. However, the technical tools that are available do not enable us to predict the project-specific health impacts of emission changes associated with the alternatives carried forward. Thus, the following discussion is included in accordance with CEQ regulations (40 CFR 1502.22(b)) regarding incomplete or unavailable information:

Evaluating the environmental and health impacts of MSATs on a proposed highway project will involve several key elements, including emissions modeling, dispersion modeling to estimate ambient concentrations resulting from the estimated emissions, exposure modeling to estimate human exposure to the estimated concentrations, and final determination of health impacts based on the estimated exposure. Each of these steps is encumbered by technical shortcomings or uncertain science that prevents a more thorough determination of the MSAT health impacts of the project.

1. Emissions. The USEPA's tools for estimating MSAT emissions from motor vehicles are not sensitive to key variables determining emissions of MSATs in the context of highway projects.

MOBILE 6.2 is used to predict emissions at a regional level but has limited applicability at the project level. MOBILE 6.2 is a trip-based model: emission factors are projected based on a typical trip of 7.5 miles and on average speeds for the typical trip. This means that MOBILE 6.2 cannot predict emission factors for a specific vehicle operating condition at a specific location at a specific time. Because of this limitation, MOBILE 6.2 can only approximate the operating speeds and levels of congestion likely to be present on the largest-scale projects and cannot adequately capture emissions effects of smaller projects. For particulate matter, the model results are not sensitive to average trip speed, although the other MSAT emission rates do change with changes in trip speed. Also, the emissions rates used in MOBILE 6.2 for both particulate matter and MSATs are based on a limited number of tests of mostly older-technology vehicles. Lastly, in its discussions of particulate matter under the conformity rule, USEPA has identified problems with MOBILE6.2 as an obstacle to quantitative analysis.

These deficiencies compromise the capability of MOBILE 6.2 to estimate MSAT emissions. MOBILE6.2 is an adequate tool for projecting emissions trends, and performing relative analyses among alternatives for very large projects, but it is not sensitive enough to capture the effects of travel changes tied to smaller projects or to predict emissions near specific roadside locations.

2. Dispersion. The tools for predicting how MSATs disperse are also limited. The USEPA's current regulatory models, CALINE3 and CAL3QHC, were developed and validated more than a decade ago for the purpose of predicting episodic concentrations of carbon monoxide to determine compliance with the NAAQS. The performance of dispersion models is more accurate for predicting maximum concentrations that can occur at some time at some location within a geographic area. This limitation makes it difficult to predict accurate exposure patterns at specific times at specific highway project locations across an urban area to assess potential health risk. The National Cooperative Highway Research Program is conducting research on best practices in applying models and other technical methods in the analysis of MSATs. The work will focus on identifying appropriate methods of documenting and communicating MSAT impacts in the NEPA process and to the general public. Along with these general limitations of dispersion models, FHWA is also faced with a lack of monitoring data in most areas for use in establishing project-specific MSAT background concentrations.

3. Exposure Levels and Health Effects. Finally, even if emission levels and concentrations of MSATs could be predicted accurately, shortcomings in current techniques for exposure assessment and risk analysis preclude us from reaching meaningful conclusions about project-specific health impacts. Exposure assessments are difficult because it is difficult to accurately calculate annual concentrations of MSATs near roadways, and to determine the period that people are actually exposed to those concentrations at a specific location. These difficulties are magnified for 70-year cancer assessments, particularly because insupportable assumptions will have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over a 70-year period. Considerable uncertainty is associated with the existing estimates of toxicity of the various MSATs because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population. Because of these shortcomings, any calculated difference in health impacts among alternatives is likely to be much

smaller than the uncertainties associated with calculating the impacts. Consequently, the results of such assessments are not useful to decision makers, who need to weigh such information against other project impacts that are better suited for quantitative analysis.

Research into the health impacts of MSATs is ongoing. For different emission types, there are a variety of studies that show either that some are statistically associated with adverse health outcomes through epidemiological studies (frequently based on emissions levels found in occupational settings) or that animals demonstrate adverse health outcomes when exposed to large doses. Exposure to toxics has been a focus of several USEPA efforts. Most notably, the agency conducted the National Air Toxics Assessment (NATA) in 1996 to evaluate modeled estimates of human exposure applicable to the county level. While not intended for use as a measure of or benchmark for local exposure, the modeled estimates in the NATA database best illustrate the levels of various toxics when aggregated to a national or state level.

The USEPA is in the process of assessing the risks of various kinds of exposures to these pollutants. Its Integrated Risk Information System (IRIS) is a database of human health effects that may result from exposure to various substances found in the environment. The IRIS database is located at http://www.epa.gov/iris. The following toxicity information for the six prioritized MSATs was taken from the IRIS database Weight of Evidence Characterization summaries. This information is taken verbatim from USEPA's IRIS database and represents the agency's most current evaluations of the potential hazards and toxicology of these chemicals or mixtures.

- Benzene is characterized as a known human carcinogen.

- The potential carcinogenicity of acrolein cannot be determined because existing data are inadequate for an assessment of human carcinogenic potential for the oral and inhalation routes of exposure.

- Formaldehyde is a probable human carcinogen, as indicated by limited evidence in humans and sufficient evidence in animals. 1,3-butadiene is characterized as carcinogenic to humans by inhalation.

- Acetaldehyde is a probable human carcinogen based on increased incidence of nasal tumors in male and female rats and laryngeal tumors in male and female hamsters after inhalation exposure.

- Diesel exhaust is likely to be carcinogenic to humans by inhalation from environmental exposures. Diesel exhaust, as reviewed in this document, is the combination of diesel particulate matter and diesel exhaust organic gases.

- Diesel exhaust also represents chronic respiratory effects, possibly the primary non-cancer hazard from MSATs. Prolonged exposures may impair pulmonary function and

could produce symptoms, such as cough, phlegm, and chronic bronchitis. Exposure relationships have not been developed from these studies.

Other studies have addressed MSAT health impacts in proximity to roadways. The Health Effects Institute, a nonprofit organization funded by the USEPA, FHWA, and industry, has undertaken a major series of studies to research near-roadway MSAT hotspots, the health implications of the entire mix of mobile source pollutants, and other topics. The final summary of the series is not expected for several years.

Some recent studies have reported that proximity to roadways is related to adverse health outcomes—particularly respiratory problems.[49] Much of this research is not specific to MSATs, but rather surveys the full spectrum of both criteria and other pollutants. The FHWA cannot evaluate the validity of these studies, but more importantly, it does not provide information that would be useful to alleviate the uncertainties listed above and enable us to perform a more comprehensive evaluation of health impacts specific to this project.

Because of the uncertainties outlined above, the effects of air toxic emissions on human health cannot be assessed quantitatively at the project level. Available tools allow us to reasonably predict relative emissions changes between alternatives for larger projects, but the amount of MSAT emissions from each project alternative and MSAT concentrations or exposures created by each project alternatives cannot be predicted with enough accuracy to be useful in estimating health impacts. (As noted, the current emissions model cannot serve as a meaningful emissions analysis tool for smaller projects.) Therefore, the relevance of the unavailable or incomplete information is that it is not possible to determine whether any of the alternatives carried forward would have "significant adverse impacts on the human environment."

As noted, technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions and effects of this project. However, even though reliable methods do not exist to estimate accurately the health impacts of MSATs at the project level, it is possible to qualitatively assess the levels of future MSAT emissions under the project. Although a qualitative analysis cannot identify and measure health impacts from MSATs, it can give a basis for identifying and comparing the potential differences among MSAT emissions between the No-Build Alternative and the proposed alternative. The qualitative assessment presented below is derived in part from a study conducted by the FHWA entitled A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives, found at
www.fhwa.dot.gov/environment/airtoxic/ msatcompare/msatemissions.htm.

[49] South Coast Air Quality Management District, Multiple Air Toxic Exposure Study-II; Highway Health Hazards, The Sierra Club (2004) summarizing 24 studies on the relationship between health and air quality); NEPA's Uncertainty in the Federal Legal Scheme Controlling Air Pollution from Motor Vehicles, Environmental Law Institute, 35 ELR 10273 (2005) with health studies cited therein.

For the Build Alternative, the amount of MSATs emitted would be proportional to vehicle miles traveled, or VMT. The VMT for the proposed alternative is slightly higher than for the No-Build Alternative, because the additional capacity increases the efficiency of the roadway. This increase in VMT would lead to higher MSAT emissions for the proposed alternative along the highway corridor, along with a corresponding decrease in MSAT emissions along the parallel routes. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds; according to EPA's MOBILE6 emissions model, emissions of all of the priority MSATs except for diesel particulate matter decrease as speed increases. The extent to which these speed-related emission decreases will offset VMT-related emission increases cannot be reliably projected due to the inherent deficiencies of technical models.

With the implementation of the proposed alternative action, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce MSAT emissions by 57 to 87 percent between 2000 and 2020. Local conditions may differ from these national projects in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the project area are likely to be lower in the future in nearly all cases.

The additional travel lanes contemplated as part of the proposed alternative will have the effect of moving some traffic closer to nearby homes, schools and businesses; therefore, there may be localized areas where ambient concentrations of MSATs could be higher with the proposed alternative than the No-Build Alternative. The localized increases in MSAT concentrations would likely be most pronounced along the expanded roadway sections in areas where the proposed alternative follows the existing alignment. However, as discussed above, the magnitude and the duration of these potential increases compared to the No-Build alternative cannot be accurately quantified because of the inherent deficiencies of current models.

In summary, when a highway is widened and, as a result, becomes closer to receptors, the localized levels of MSAT emissions for the proposed alternative action could be higher relative to the No-Build Alternative, but this could be offset by increased speeds and reductions in congestion (which are associated with lower MSAT emissions.) Also, MSATs will be lower in other locations when the roadway shifts away from them. However, the USEPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than those of today.

In this document, FHWA has provided a qualitative analysis of MSAT emissions relative to the various alternatives carried forward and has acknowledged that the proposed alternative may result in increased exposure to MSAT emissions in certain locations, although the concentrations and duration of exposures are uncertain. Because of this uncertainty, the health effects from these emissions cannot be estimated.

3.6 Noise

3.6.1 Environmental Consequences

Traffic on the Build Alternative could affect noise levels at adjacent noise-sensitive areas such as homes. The noise analysis described in this section compared existing conditions and predicted design year (2035) noise levels with the FHWA's Noise Abatement Criteria (NAC) to determine whether there are impacts and if noise abatement measures should be considered. The NAC are threshold criteria for consideration of noise abatement measures. At noise-sensitive locations where there are impacts and abatement measures should be considered, a noise abatement analysis was conducted to assess the effectiveness, feasibility and reasonableness of sound barrier walls and other abatement measures. The analysis was conducted in accordance with FHWA and IDOT methodology and requirements.[50]

3.6.1.1 Noise Measurements and Abatement Criteria

Measuring Noise

Noise is defined as "unwanted sound," however, the terms noise and sound are used interchangeably in this document. Sound or noise is measured using units of decibels (dB), which are based on a logarithmic scale. Because humans have different sensitivity to different frequencies of sound, noise measurements are weighted by frequency content ("A-weighted") (dBA). A-weighting indicates the sound measurement has been filtered in a manner that accounts for the human response to sound. Without A-weighting, a noise monitor responds to sound events people cannot hear, such as a dog whistle or very low frequencies. Since the scale is logarithmic, a 10 dBA increase in noise represents a doubling in volume to the human ear. For example, 60 dBA is perceived to be twice as loud as 50 dBA. A change in noise level of 5 dBA is readily perceptible by humans with average hearing. A sound level of about 60 dBA is associated with normal speech at a distance of three feet.

Abatement Criteria

FHWA NAC (Table 3-24) are expressed in term of the "Leq(h)" which stands for Equivalent Sound Level, on an hourly basis. All noise levels referenced in this section of the document are Leq(h), both for noise levels in the project area, and for noise abatement criteria. FHWA defines Leq and Leq(h) as follows:

[50] FHWA requirements are in Title 23 of the Code of Federal Regulations, Part 772 (23 CFR 772), Procedures for Abatement of Highway Traffic Noise and Construction Noise, updated May 2, 2005. IDOT requirements are in the Illinois Department of Transportation Bureau of Design and Environment Manual, Chapter 26, including BDE Procedure Memorandum No. 50-06.

Leq(h)--The hourly value of Leq. Leq is the equivalent, steady-state sound level, which in a stated period of time contains the same acoustical energy as the time-varying sound level during the same period.[51]

The FHWA and IDOT consider a traffic noise impact to occur if predicted design year traffic noise levels approach, meet or exceed the NAC, or if predicted noise levels are substantially higher than existing noise levels. IDOT defines "approach" as noise levels within one dBA of the NAC. For Activity Category B, which applies to the noise-sensitive sites evaluated for this study, this value is equal to 66 dBA. IDOT defines "substantially higher" as an increase of more than 14 decibels (dBA) than the existing noise level.[52] Noise abatement must be considered if there are traffic noise impacts. Any abatement measure must also be reasonable and feasible.[53]

Table 3-24
FHWA Noise Abatement Criteria

Activity Category	Leq(h)	Description of Activity
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (Exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	--	Undeveloped lands.
E	52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Source: 23 CFR Part 772, Table 1

3.6.1.2 Methodology

Existing year (2005) and future year (2035) traffic noise levels were evaluated using FHWA's Traffic Noise Model (TNM®) version 2.5. TNM® is the current FHWA-approved analytical method developed for highway traffic noise prediction.

3.6.1.3 Identification of Receptors

Table 3-25 summarizes the selected sensitive noise receptors in the project corridor. Fifteen receptor locations were selected that represent either the most likely impacted sites or areas that include multiple receptors. These locations are known as noise-sensitive areas (NSA).

The receptor locations are shown in the Aerial Exhibits, as summarized in the second column of Table 3-25.

[51] 23 CFR §772.5

[52] Illinois Department of Transportation *Bureau of Design and Environment Manual*, Chapter 26, Figure 26-6A.

[53] 23 CFR §772.11 and §772.13

3.6.1.4 Existing Noise Levels

Using year 2005 traffic data, existing noise levels at the 15 receptor locations were estimated using TNM® 2.5, based on the traffic noise from existing roadways adjacent to the receptors. The estimated noise levels under existing conditions range from 36 to 68 dBA, expressed as Leq(h) (Table 3-26). These estimates assume typical noise environments based on population density in areas that are not affected by a major predominant noise source such as an Interstate Highway or frequently used railroad line.

3.6.1.5 Design Year Noise Levels

Design year (2035) noise levels were modeled for both the No-Build and the Build conditions. Predicted peak-noise-hour levels under the No-Build 2035 condition range from 37 to 69 dBA (Table 3-26). Minimal traffic volume increases are anticipated to occur on existing roadways, and therefore, modeled No Build noise level increases are minimal when compared to existing modeled noise levels. Predicted peak-noise-hour levels under the Build condition range from 46 to 67 dbA, approaching or exceeding the NAC at four receptor locations (shown in bold text in Table 3-26).

Under project build conditions, future peak-noise-hour levels at noise-sensitive areas adjacent to the Build Alternative exceed the existing noise levels by more than 14 dBA at 7 locations (four of which also approach, meet, or exceed the NAC).[54] In accordance with FWHA and IDOT requirements, noise abatement must be considered for these receptors. Note that Receptor 10 shows a lower noise level for the Build condition compared to existing and No-Build. This is a result of the shift of existing traffic on a nearby roadway to a roadway further from the receptor under the Build condition.

3.6.1.6 Evaluation of Abatement Measures

The feasibility and reasonableness of noise abatement measures were evaluated for those locations where receptor locations approach, meet, or exceed the FHWA NAC criteria or where a substantial increase in noise level is predicted. Such abatement measures may include:

- traffic management measures (e.g., traffic control devices and signing for certain vehicle types, time use restrictions for certain vehicle types, modified speed limits and exclusive lane designations);
- alteration of horizontal and vertical alignments;
- property acquisitions for construction of noise barriers (such as earthen berms and sound walls); and

[54] An eighth receptor, No. 7, that will now be a relocated residence, would also have been impacted (Table 3-25)

- installation or construction of noise barriers or devices within the highway right-of-way.[55]

Transportation management measures such as modification of speed limits and restriction of trucks are not consistent with the project's defined purpose and need.

[55] Illinois Department of Transportation *Bureau of Design and Environment Manual*, Chapter 26, Section 26-6.05(d)(2)(a).

Table 3-25
Receptor Descriptions

Receptor Number	Aerial Exhibit Sheet No.	Distance from Existing Roadway (Ft from Edge of Pavement)	Existing Roadway	Existing Roadway to Remain?	Distance from Proposed Improvements (Ft from Edge of Pavement)	Surrounding Land Use	# of Sensitive Receptors Represented	Receptor Type
1	3	75	N 1400th Rd	No	153, south of IL 336	Rural	1	Residential
2	5	140	N 1400th Rd.	No	246, north of IL 336	Rural	2	Residential
3	8	300	Marietta Rd	Yes	205, north	Rural	2	Residential
4	8	415	None within 1000’	NA	415, north	Rural	3	Residential
5	9	160	IL 95	No	85, south	Rural	3	Residential
6	11	480	IL 95	No	325, north	Rural	1	Residential
7[a]	11	185	IL 95	No	90, south	Rural	1	Residential
8	15	95	IL 97	Yes	150, north	Rural	3	Residential
9	20	60	IL 78	No	140, west	Rural	2	Residential
10	25	40	IL 78	No	130, east	Rural	4	Residential
11	28	480	Lightfoot Road	No	480, east of IL 78	Rural	1	School
12	29	80, west	S. Cramer Rd.	Yes	110, south of IL 336	Rural	1	Residential
13	33	115, east	S Eden Rd	Yes	165, north of IL 336	Rural	1	Residential
14	34	150, east	S Pinkerton Rd	Yes	210, south of IL 336	Rural	1	Residential
15	37	129	W Farmington Rd.	Yes	490, south of IL 336	Urban	12	Residential

[a]Due to increased ROW requirements at this location because of an embankment, Receptor 7 now represents a relocated residence, and is not further considered in the noise analysis.

Table 3-26
Predicted Peak Hour Traffic Noise Levels (dBA)

Receptor Number	No of Dwelling Units	Noise Abatement Criteria (NAC)	Modeled Existing Conditions Leq(h)	Future 2035 No-Build Leq(h)	Future 2035 Build Leq(h)	Future 2035 Build Change from Existing Leq(h)
1	1	67	51	51	60	9
2	2	67	53	53	57	4
3	2	67	38	38	60	**22**
4	3	67	37	39	52	**15**
5	3	67	52	54	**67**	**15**
6	1	67	36	37	49	13
7	Residence to be relocated	NA	NA	NA	NA	NA
8	3	67	58	59	63	5
9	2	67	56	58	65	9
10	4	67	**68**	**69**	**67**	-1
11	1	67	43	44	46	3
12	1	67	50	50	**66**	**16**
13	1	67	51	54	**66**	**15**
14	1	67	47	47	63	**16**
15	12	67	59	60	63	4

Note: Bold indicates approaching or exceeding the NAC, or increase of >14 dBA from existing

Alignment modifications generally involve situating the roadway at sufficient distances from noise-sensitive areas to minimize noise impacts. Because of the added impacts and the cost of acquiring additional property, a property acquisition program to create noise buffer zones was considered unreasonable. Local government and planning agencies with land use control authority should consider land use controls to minimize impacts to future developments, but this approach would not affect existing land developments.

The FHWA regulations require that the overall noise abatement benefits be feasible and reasonable and outweigh the overall adverse social, economic, and environmental effects and the costs of the noise abatement measures.[56] To implement the feasible and reasonable requirement, IDOT specifies the following for noise abatement barriers:[57]

- The noise barrier must reduce traffic noise generated from the project by a minimum of 8 dBA at the receptor(s). This is considered the measure of feasibility of the barrier.

- The total cost of a noise barrier may not exceed $24,000 per benefited residence (one that experiences a reduction of 5 dBA or more as a result of the barrier). This is a measure of the reasonableness of the noise abatement.

[56] 23 CFR §772.13(a)(3)

[57] IDOT *Bureau of Design and Environment Manual* – 2002 Edition. Chapter 26, Section 26-605(d)(3).

FHWA guidance is also considered when evaluating feasibility and reasonableness (FHWA 1995). In addition to cost issues, the guidance specifies consideration of the views of the impacted residents (e.g., aesthetic impacts and the impacts on their surrounding view).

3.6.1.7 Noise Barrier Analysis

Noise barriers, including earthen berms, reduce noise levels by blocking the sound path between a roadway and noise-sensitive receptor. To be effective in reducing traffic noise impacts, a noise barrier must have certain characteristics. The barrier must be long (about four times the distance from the receptor to the source), continuous (without openings), and high enough to provide the necessary reduction in noise levels.

The TNM® was used to determine the noise level reduction provided by various barrier heights along the Build Alternative.

Almost all the potential receptors in the project area are either isolated residences or widely spaced residences. Of the noise-sensitive locations that approached, met or exceeded the NAC or have projected increases in noise levels greater than 14 dB, detailed analyses were conducted for those with more than one affected residence: Receptors 3, 4, 5, and 10. For those with one residence (7, 12, 13, and 14), a screening analysis was done, using a minimum potential wall height (10 feet) and a minimum potential wall length (four times the distance from the receptor to the source). If this screening analysis showed that a barrier was close to being economically reasonable for any affected residence, a detailed analysis would be done.

The analysis results are shown on Table 3-27. For the detailed analysis, noise barrier heights were analyzed at 2 foot increments between 10 and 20 feet. As shown in the table, the barrier analysis found that noise barriers are feasible at Receptors 3, 5, and 10; that is, they could be constructed to reduce noise levels at affected receptors by at least 8 dBA. At Receptor 4, an 8-dBA noise reduction could not be achieved. Although noise walls are expected to meet the feasibility criterion at Receptors 3, 5, and 10, cost estimates show that they do not meet the reasonableness criterion of a maximum cost of $24,000 per benefited residence. Noise wall costs were estimated using $25 per square foot. The barrier analysis performed in TNM® found:

- Adjacent to Receptor 3, analysis was conducted for the placement of a 1,490-foot-long barrier along the right-of-way line. A 12-foot tall wall would be required to obtain an 8-dBA reduction. As shown in Table 3-27, the cost of the wall does not meet the $24,000 cost criterion and therefore is not economically reasonable.

- Adjacent to Receptor 4, analysis was conducted for the placement of a 2,700-foot long barrier along the ROW line. For a 20-foot wall, a noise reduction of only 6 dBA would be achieved (Table 3-27. This wall could not achieve an 8-dBA noise reduction and thus is not considered feasible under IDOT's abatement policy.

- Adjacent to Receptor 5, analysis was conducted for the placement of a 2,100-foot long barrier along the ROW line. At a height of 10 feet an 8-dBA reduction is achieved; however, the cost of the wall does not meet the $24,000 cost criterion and therefore is not considered economically reasonable.

- Adjacent to Receptor 10, analysis was conducted for the placement of an 850-foot-long barrier along the right-of-way line. At a height of 14 feet, the lowest height that obtains at least an 8-dBA reduction, the cost of the wall does not meet the $24,000 cost criterion and is therefore not economically reasonable (Table 3-27).

The screening level analysis done for Receptors 7, 12, 13 and 14 showed that with the minimum potential wall height and length, none of the barriers are close to meeting the economically reasonable criteria, and further detailed analysis is not warranted (Table 3-27).

The results of the mitigation analyses at these locations demonstrate that because of the rural nature of the project, with its low density housing, noise mitigation is not economically reasonable.

3.6.2 Measures to Minimize Harm

Abatement studies found that options for reducing noise levels at affected locations do meet the feasibility criterion of reducing traffic noise levels by at least 8 dBA for all but one location evaluated; however, they do not meet the reasonableness criterion of costing no more than $24,000 per benefited residence.

Trucks and machinery used for construction produce noise which may affect some land uses and activities during the construction period. Residents along the alignment will at some time experience perceptible construction noise. To minimize or eliminate the effect of construction noise on these receptors, mitigation measures have been incorporated into the Illinois Department of Transportation's Standard Specifications for Road and Bridge Construction as Article 107.35.

Table 3-27
Noise Abatement Summary Table

Receptor Number	Barrier Height, ft.	Barrier Length, ft.	Cost	Number of Benefited Residences	Cost per Benefited Residence	Reduction Potential, dBA	Likely to Be Implemented	If No, Reasons Why
3	12	1,490	$447,200	2	$223,600	8	No	Not economically reasonable
4	20	2,700	$1,350,000	3	450,000	6	No	Not feasible
5	10	2,100	$525,000	3	175,000	8	No	Not economically reasonable
7	NA	NA	NA	None-residence to be relocated	NA	NA	NA	NA
10	14	850	$297,500	4	74,375	8	No	Not economically reasonable
12	≥ 10	440±	≥ $110,000	1	≥ $110,000	Not determined	No	Not economically reasonable
13	≥ 10	660±	≥ $165,000	1	≥ $165,000	Not determined	No	Not economically reasonable
14	≥ 10	840±	≥ $210,000	1	≥ $210,000	Not determined	No	Not economically reasonable

3.7 Geology and Soils

3.7.1 Affected Environment

This section summarizes the geologic and geotechnical conditions within the project area. Part of the information presented is compiled from previous studies by the Illinois State Geological Survey (ISGS), the Illinois Department of Natural Resources (IDNR), the Illinois Environmental Protection Agency (IEPA), and IDOT. In 1970, Alan Goodfield, an IDOT geologist, conducted a geotechnical survey of the proposed corridor that was used as a reference for this section (Goodfield 1970).

Geotechnical data will be obtained during Phase II design to verify existing conditions. Some aspects of the preliminary design may need to be reconsidered in light of that data.

3.7.1.1 Bedrock Geology

Exhibit 3-12 shows the bedrock geology in the general project area. The bedrock underlying the area is present at variable depths, usually more than about 20 feet. The bedrock surface had much more relief than the current ground surface. There are ancient bedrock valleys, some of which correspond to present-day valleys (such as the Spoon River and Illinois River), and some that do not. The bedrock consists of Pennsylvanian Age sandstone, shale, limestone, and coal. Coal is discussed in Section 3.7.1.5. The youngest unit, the Modesto Formation, underlies the Peoria County part of the study area and the far eastern part of Fulton County, and consists of layers of clayey limestone and thin coal seams. Underlying the Modesto is the Carbondale Formation, shown in green in Exhibit 3-12. The Carbondale Formation contains the thickest coal beds in Illinois. Beneath the widespread Carbondale is the Spoon Formation. The Spoon has less sandstone and more limestone and coal than the Abbott Formation, which lies below it, but less limestone and coal than the overlying Carbondale. Mississippian limestone underlies the Pennsylvanian formations and forms the bedrock in a few parts of the western study area where Pennsylvanian bedrock is absent. Local areas of bedrock are exposed in the dissected terrain near the Spoon River with areas of shale and sandstone exposed in drainageways and on slopes bordering streams. Narrow seams of coal are exposed locally and in a few cases as small glade-like areas (Willman et al 1975). Two of these areas have been identified as Illinois Natural Area Inventory Sites, the Marietta Geologic Area and the Seville Geologic Area (Section 3.14).

3.7.1.2 Surficial Geology and Topography

The study area lies within the southeastern portion of the Galesburg Plain Physiographic Division of the Till Plains Section of the Central Lowlands Province. Surface geology in this division is characterized as level to undulating with some ridges resulting from glacial deposits. Exhibit 3-13 shows the major physiographic divisions in Illinois.

The wooded areas along streams are mostly rugged and the agricultural areas are relatively flat. Elevation in the project corridor ranges from a maximum of about 800 feet above sea level just north of Norris in Fulton County to a minimum of about 475 feet above sea level along the Spoon River southwest of Smithfield, also in Fulton County. Other than the strip-mined areas, most of the project area is underlain by glacial deposits of the Glasford Formation, as shown in Exhibit 3-14. The glacial material, referred to as till, is unsorted clay, silt, and sand. A silty glacial lake deposit, the Pearl Formation, underlies the northwest corner of the project area. Over most of the site a windblown silt deposit referred to as loess overlies the glacial deposits. These loess deposits are not shown in Exhibit 3-14 but are present above the glacial till throughout the project area, except in areas of alluvial deposits, and along other stream channels where the loess has been eroded away. The loess deposits are thickest near the Illinois River (about 25 feet thick), and thin westward to a thickness of about 3 feet at Macomb (Willman and Frye 1970, ISGS 1995). The silt that formed the loess deposits probably originated from the alluvium on the ancestral Illinois River. Alluvial deposits of sand, silt, and clay (Cahokia and/or Henry Formation on Exhibit 3-14) underlie the floodplains of the Spoon River and the East Fork of the La Moine River, as well as some of their tributaries. The large area of Cahokia and/or Henry Formation material at the southeast part of Exhibit 3-14 is the Illinois River floodplain. The alluvium was being deposited during the time of the loess deposition, and alluvial deposition has continued since then. Thus, the alluvial soils do not have overlying loess deposits.

3.7.1.3 Soils

In the level uplands of the eastern and western portions of the project corridor, soils developed primarily under prairie vegetation, while soils on the dissected terrain near the Spoon River developed predominately under forest and probably transitional savanna-like habitats. Almost all the soil developed in loess, the uppermost geologic material in the project corridor, except for the localized areas of alluvium.

Broad areas that have a distinctive pattern of soils, relief, and drainage are called associations. Four soil associations are located within the project area in McDonough County, seven in Fulton County, and five in Peoria County. The soil associations within the project area by county have been defined by the Natural Resources Conservation Service (NRCS, formerly the Soil Conservation Service) and are as follows:

- McDonough County -- Sable-Ipava, Ipava-Tama, Hickory-Rozetta-Elco, and Sawmill-Wakeland-Tice (NRCS 1997).[58]

  Each of these associations formed exclusively in loess, except Hickory-Rozetta-Elco, which formed in either loess or till; and Sawmill-Wakeland Tice, which formed in alluvium.

[58]The NRCS 1997 soil survey for McDonough County has been superseded by the 2005 edition, which no longer references soil associations.

- Fulton County -- Ipava-Sable, Ipava-Osco, Rozetta-Keomah-Clarksdale, Hickory-Rozetta, Wakeland-Tice-Beaucoup, Rozetta-Keomah-Camden, and Lenzburg-Lenzwheel (NRCS 2001).

  These associations formed mostly in loess, except Wakeland-Tice-Beaucoup, which formed in alluvium; and Lenzburg-Lenzwheel, which formed in the cast overburden soil from strip mining.

- Peoria County -- Sable-Ipava, Ipava-Tama-Elkhart, Rozetta-Keomah-Sylvan, Hickory-Strawn-Marseilles, and Jules-Paxico-Lawson (Soil Conservation Service 1992).

  Each of these associations formed exclusively in loess, except Hickory-Strawn-Marseilles, which developed in till; and Jules-Paxico-Lawson, which formed in alluvium.

Detailed descriptions of these soil associations can be found in the referenced county soil surveys. Soils within an association are further subdivided into soil series and detailed soil map units. Appendix B, Exhibit B-1 summarizes the soil map units found in the project corridor. Properties of the soil map units within areas of construction may place limitations on activities relevant to the construction.

One hundred twenty different NRCS soil map units have been identified in the project corridor. The 10 most prevalent cover about 79,750 acres of the 132,100 acres in the project corridor (about 60 percent). The 10 most prevalent soil types are listed below, in decreasing order of coverage. See Appendix B for a description of these soil map units (Exhibit B-2).

- 43A - Ipava Silt Loam – 22,005 acres
- 279B - Rozetta Silt Loam – 10,373 acres
- 279C2 - Rozetta Silt Loam – 9,544 acres
- 68A - Sable Silty Clay Loam – 9,517 acres
- 8F - Hickory Silt Loam – 7,521 acres
- 43 - Ipava Silt Loam – 4,866 acres
- 86B - Osco Silt Loam – 4,550 acres
- 871B - Lenzburg Silty Loam – 4,133 acres
- 871G - Lenzburg Silty Clay Loam – 3,880 acres
- 17A - Keomah Silt Loam – 3,362 acres

All of these soils formed exclusively or primarily in loess, except for the two Lenzburg soils, which developed in the cast material from strip-mining.

Silt is highly erodible, and soil developed on loess, a silt deposit, tends to be erodible. In the project area, highly erodible soils are defined as map units with slope designations of C or higher (that is, with slopes of 4 percent or steeper). Appendix B, Exhibit B-3 lists the highly erodible soils identified in the project study area. Highly erodible soils occupy roughly 24,100 acres

within the project corridor (about 18 percent of the corridor area). Highly erodible soils in the project corridor are present primarily on the margins of drainage cuts in the upland areas, and on the margins of stream deposits and river terraces (Exhibit 3-15). Steeper slopes adjoining the floodplains of streams are commonly susceptible to severe soil erosion, which leads to development of extensive gully networks. The extensive distribution of loess, which tends to be thickest near major streams and is erodible, contributes to erosion problems (IDNR 1998).

NRCS defines hydric soil as a soil that formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions in the upper part. Hydric soils occupy about 2,500 acres within the project corridor (about two percent of the total area). Soils with slopes of 0 to 2 percent, with low runoff and slow drainage, are generally classified as hydric. Soils in the floodplains and former strip-mined areas are more likely to be classified as hydric. Appendix B, Exhibit B-4 lists the hydric soils identified in the project corridor.

3.7.1.4 Landslides

Landslides are not common within the project area and almost all that have been documented have been related to roadway construction. A 1985 ISGS landslide inventory map showed just three slides within the project corridor.

According to Goodfield (1970), who observed several landslides near the project area, the slides, or slope failures, in the project area are generally due to "(a) build-up of groundwater on top of impermeable units (loess/till, till/shale, loess/shale, or fill/shale on rock) and (b) oversteepening of slopes by highway construction or erosion." The landslides within the project corridor all appear to be associated with road cuts. Goodfield recommended preventing slope failures by proper drainage and slope design.

3.7.1.5 Mineral Resources

The project area was once part of a major coal mining region, but, as shown in Exhibit 3-16, there are currently no active coal mines in the project area. As the exhibit shows, there were once large surface and underground mining operations in the area, especially around Canton. The former strip mined areas are apparent from the topography by the high density of elongated lakes that often trend in similar directions.

While there are still minable reserves, the market for the high-sulfur Illinois coal has declined since Clean Act Amendments put restrictions on sulfur emissions for coal-fired power plants. A 1975 map of Illinois coal reserves shows a large area of the site as underlain by a reserve of the Herrin (No. 6) Coal, greater than 42 inches thick (Smith and Bengal 1975). This roughly triangular area extends generally from the eastern project corridor terminus west to the Fairview area and south to the area around Norris. A comparison of the 1975 Illinois coal reserves map with locations of coal mining in the corridor (shown in Exhibit 3-16) indicates that as of 2007 only a very small part of this coal had been mined out. The Illinois Department of Natural

Resources (IDNR) has recently approved an application from the Capital Resources Development Company (CRDC) for development of the North Canton Mine, a proposed strip mine northeast of Canton (Exhibit 3-16) (IDNR 2008a, CRDC 2006). Future mining of other parts of this coal reserve is likely.

Other mineral resources within or near the project area include limestone quarries and sand and gravel pits. There is a large sand and gravel pit within the project corridor along the east side of the Spoon River, southeast of Marietta.

3.7.1.6 Mine Subsidence

Subsidence of the ground surface resulting from collapse of underground coal mines, due either to mine-roof failure or to squeezing of the underclay out from under mine pillars has occurred in the project area (Goodfield 1970). Goodfield quotes an earlier source as follows: "In several areas where the Springfield (No. 5) or the Colchester (No. 2) coals have been mined, subsidence of the overlying strata has produced irregular depressions or sink holes in the surface of the till plain. Locally the cave-ins occur under small streams which then drain into the mine tunnels and shafts. Areas pitted by mine subsidence occur near Cuba, St. David, Astoria, and Pleasantview."

At the transition areas from surface to underground mining, the underground mines are generally shallow and may be subject to collapse, depending on the mining methods used. For example, in the area around Cuba there are underground mines almost completely surrounded by surface mines. Based on boring data on file with the Illinois State Geological Survey, some of the underground mines are only about 50 feet deep in places, with a 5-foot thick coal seam mined out.

In 1970, when Goodfield did a geotechnical survey of the project corridor, there were no longer any underground coal mines in operation. While the more modern mines have been documented and mapped, it was Goodfield's opinion that older mines may exist that have not been mapped. Underground mining in this area began in the nineteenth century and the operations were often small. Goodfield recommended special caution in any area where underground mining had or may have occurred, whether or not there was evidence of mine subsidence. This will be taken into account in the design of the Build Alternative, particularly in the Cuba area.

3.7.1.7 Groundwater Resources

An aquifer is an underground geologic unit capable of producing water for wells. The glacial till and Pennsylvanian bedrock that underlie the project area generally do not produce sufficient quantities of groundwater for production wells and are therefore not considered aquifers by the ISGS. According to ISGS aquifer maps, the Spoon River alluvium is considered a major sand and gravel aquifer, although it is generally less than 20 feet thick in the project area. Through most of the project area, major bedrock aquifers are at depths greater than 500 feet below the ground surface. In the western part of the project area, a major bedrock aquifer is present at depths between 300 and 500 feet.

Water Supply Sources. Both the Cities of Macomb and Canton receive their municipal water supply from a combination of surface reservoirs and deep wells, all of which are located outside the project corridor. Macomb's groundwater supply is from a deep well at the north end of Randolph Street in Macomb. The City of Macomb also supplies water to Bardolph. Bushnell has its own deep wells for water supply (Clause 2006). Canton's groundwater supply is from two deep wells east of Canton, near Canton Lake, the City's surface water supply reservoir. Cuba formerly obtained water from shallow wells (Goodfield 1970). Now, however, Canton supplies Cuba, Norris, several other small municipalities outside the corridor, and Wee-Ma-Tuk, a residential development on the north side of the Cuba to Canton blacktop (CH 5). Farmington has a deep well for water supply (Hale 2006). In most cases the deep aquifer is the St. Peters Sandstone, a regional water source (Goodfield 1970).

Potential for Groundwater Contamination. Susceptibility of an aquifer to contamination depends upon its depth and the nature of the subsurface materials between potential contaminant sources and the aquifer. Based on Keefer and Berg's 1990 map of groundwater recharge zones in Illinois, the ISGS identified seven categories showing increasing potential for aquifer recharge (Keefer and Berg 1990). "Recharge" refers to the replenishment of the aquifer from surface water infiltration. High potential for aquifer recharge corresponds to high potential for contamination. The highest potential (Zone 1) for aquifer recharge occurs in regions that contain a major aquifer (100,000 gallons per day) within five feet of the surface. The lowest potential for aquifer contamination occurs in regions that have no aquifer within 50 feet of the surface and no major aquifer at any depth (Zone 7). The Illinois River Aquifer, to the southeast of the project area, is a Zone 1 area: it is a very large aquifer essentially at the surface. The project corridor is not within the area of impact for the Illinois River Aquifer. Based on a modified version of the Keefer and Berg map used by the IEPA, the highest potential within the study area is moderate to moderately low (corresponding to Keefer and Berg Zone 6) (IEPA 2006). This designation includes most of the project area within McDonough and Peoria Counties, and a small part of the adjacent Fulton county areas. Almost all of the Fulton County part of the study area is classified as low (the lowest contamination potential shown),[59] or is unclassified because of surface mining ground disturbance. The material in the Spoon River floodplain is alluvium and is underlain by a

[59] This would appear to correspond to Keefer and Berg Zone 7, but there are major aquifers at depth, even in this lowest potential zone.

deep bedrock valley with glacial river deposits, and had been previously classified by others as having contamination potential (Berg et al 1984). Parts of this Spoon River alluvial aquifer are classified as having very high potential, but none of these are in the vicinity of the project corridor.

In accordance with a mandate from the USEPA, the IEPA has established four Priority Groundwater Protection Planning Regions. Groundwater protection is focused on areas with major, high-use aquifers close to the surface. Within the corridor, groundwater protection is managed by the Central Region that includes Peoria, Woodford, Tazewell and Mason Counties. The associated committee for the Central Region, the Central Groundwater Protection Planning Committee, has initiated several groundwater protection activities. None of these will affect the project corridor.

Sole Source Aquifers. Illinois has no sole source aquifers, as defined in Section 1424(E) of the Safe Drinking Water Act.

Regulated Recharge Areas. There are no regulated recharge areas within the project corridor.[60] These are areas that have special restrictions for storage of certain chemicals and waste materials.

3.7.2 Environmental Consequences

Geological and soil conditions vary throughout the project area. Environmental consequences of the Build Alternative related to geology and soils are discussed below.

3.7.2.1 Bedrock Geology

Within the right-of-way of the Build Alternative the ground is mostly fairly level ground and the bedrock is typically overlain by loess and glacial till more than 20 feet deep. Therefore, impacts on bedrock geology are generally not anticipated. An exception is in the vicinity of the Spoon River, where there are some bedrock exposures and where there will be some cut slopes needed for the additional right-of-way width. Some of these geologic materials are susceptible to slope failure, particularly where shale bedrock is close to the surface, and drainage of the slopes will be important in design. The slope angles will be determined based on the results of the geotechnical investigation that will be conducted during the design phase of the project. In most cases the slopes will be similar to the existing slopes along IL 95 near the Spoon River.

The Build Alternative will not impact any locations with outstanding geologic features.

[60] Title 35 of the Illinois Administrative Code, Part 617 (35 IAC 617), Subpart B.

3.7.2.2 Surficial Geology and Topography

The surficial geologic profile of loess underlain by Glasford till is present throughout most of the Build Alternative right-of-way. Notable exceptions are the strip-mined areas, which are underlain by cast-off materials from mining; and the stream crossings, especially the Spoon River, where alluvium is present and there are some bedrock exposures.

Till consists of clay, silt, and sand, and generally does not present any special engineering problems. Through the area underlain by till relief is low and cuts will be shallow.

At the Spoon River, there could be concerns with slope stability at the interface between the till and the bedrock, if shale bedrock is present. These will be addressed by providing adequate drainage and by appropriate slope angles. Slope and drainage details will be based on the geotechnical investigation that will be done during design.

The primary location of alluvial soils within the Build Alternative right-of-way is at the Spoon River, with less extensive and thinner deposits at other stream crossings. Placement of embankment fills on alluvial soils will require geotechnical investigations of the alluvial soils to assess bearing capacity and settlement. This will be done during the design phase.

The Build Alternative follows along the edges of strip mined areas from west of Cuba to Norris; and, in the case of the section along the Cuba to Canton Blacktop, follows a narrow strip of unmined ground between two strip mines. However, there are only small localized areas where the alignment may actually cross strip-mined material. This material varies in thickness and consists of unsorted, uncompacted soil and rock. In areas where this material underlies the Build Alternative, roadway design will require geotechnical investigations to determine if any areas will require preloading to consolidate the material before construction.

3.7.2.3 Soils

Highly erodible soils (with slope designations of C or higher, indicating 4 percent or steeper slopes) are present within the Build Alternative ROW. Of the 2,651 acres of new ROW that will be required, 435 acres (16 percent) are designated as highly erodible. Most of the highly erodible soils are located along the edges of drainageways (Exhibit 3-15). Measures to minimize harm and mitigate impacts from erosion are discussed in Section 3.7.3.

3.7.2.4 Landslides and Land Subsidence

No construction at locations of known landslides will be required. Slope stability concerns that will be addressed during design are discussed in Sections 3.7.2.1 and 3.7.2.2.

In the area around Cuba the Build Alternative alignment passes over areas where shallow underground mining has occurred in the past. There are subsidence features in this area, but not within the Build Alternative right-of-way. Subsurface investigation of this area will be needed

during design to assess the risk of subsidence and to identify preventive measures, if such measures are needed.

3.7.2.5 Mineral Resources

The Build Alternative will not impact any existing operating quarries or mines.

There are unmined coal reserves (discussed in Section 3.7.1.5) underlying part of the Build Alternative right-of-way. These reserves have been known since before 1975 and may be mined in the future. The only known planned project, CRDC's development of the North Canton Mine (discussed in Section 3.7.1.5 and shown in Exhibit 3-16), will not impact the Build Alternative. Any future mining plans will need to consider not only the Build Alternative but all other roadways and development in the area that may be affected.

3.7.2.6 Groundwater

As discussed in Section 3.7.1.7, IEPA map data shows the project area to have moderate to low potential for groundwater contamination of aquifers (the lowest two of seven contamination potential designations). Contamination potential is generally low because the aquifers used in the area are deep bedrock aquifers overlain by low-permeability till and Pennsylvanian bedrock.

The Build Alternative is not expected to modify existing groundwater flow conditions, except for very localized shallow groundwater flow modifications of the type that may result from any construction of relatively impermeable features such as buildings or roadways.

The primary potential source of groundwater contamination from road construction is from fuel spills. Adherence to federal and state regulations regarding the use and storage of fuels, including the response and reporting requirements for spills will avoid the potential for groundwater contamination.

Groundwater contamination from roadway operations is an unusual occurrence. There are documented occurrences of truck crashes resulting in the release of toxic substances that have contaminated the groundwater, but these have generally occurred in karst environments (areas with limestone caves and sinkholes). Given the relatively low contamination potential for aquifers in the project area, the likelihood of an accidental release of a toxic substance in an amount sufficient to contaminate an aquifer beneath the Build Alternative appears to be very low.

3.7.3 Measures to Minimize Harm and Mitigation

The Build Alternative will be constructed through areas with high erosion potential. Exhibit 3-15 indicates the highly erodible soils that occur in the project corridor. Highly erodible soils are subject to special erosion control procedures under a National Pollutant Discharge Elimination

System (NPDES) construction permit.[61] Approaches that will be considered when dealing with highly erodible soils include:

- The use of commercially available spray-on polymers that can limit or hold the soil in place.
- Temporary seeding.
- Limiting the amount of area that is disturbed at any one time.
- Leaving buffer strips, if possible, to catch and filter sediment.

Additional erosion control measures are identified in Subsection 3.8.3.

Areas susceptible to subsidence from abandoned mines, and areas prone to slope instability, if identified, can be addressed through appropriate design and construction techniques, and, if necessary, will be addressed in road design.

3.8 Surface Water Resources and Quality

3.8.1 Affected Environment

This section describes the watersheds and important surface water features in the project area (Exhibit 3-17). It describes the physical, biological, and chemical characteristics of selected surface water bodies as those characteristics relate to aquatic habitat, aquatic species type and diversity, and surface water quality in general.

3.8.1.1 Watersheds

The acreage and percent of surface water types within the project corridor are as follows:

- Lacustrine: 1,448.2 acres, 1.2% of project corridor
- Pond: 1,322.4 acres, 1.1% of project corridor
- Stream: 146.0 acres, 0.1% of project corridor

The project corridor includes parts of the following watersheds as catalogued by the U.S. Geological Survey (Exhibit 3-17):

- Lower Illinois-Lake Chautauqua, hydrologic unit code (HUC) 07130003. The IEPA's term for this watershed, the Middle Illinois River Watershed, is used in this document. Within the project corridor, almost all the Peoria County and a small part of northeast Fulton County are in this watershed.

[61] Erosion control measures for highly erodible soils would be addressed in the storm water pollution prevention plan (SWPPP) that would be required as part of the NPDES permitting process for construction. IDOT Form BDE 2342 (Rev 06/07), or a later update as applicable, would be used to develop the SWPPP.

- Spoon River, HUC 07130005. Within the project corridor this unit includes all of Fulton County except the northeast part, and it includes a small part of eastern McDonough County.

- La Moine River, HUC 07130010. All but the far eastern part of the McDonough County portion of the corridor is within this unit.

Middle Illinois River Watershed. The Illinois River, which lies southeast of the corridor, drains almost half the State of Illinois. The eastern part of the corridor that parallels IL 116 generally follows a drainage divide between Middle Illinois subwatersheds that drain to the Illinois River. The area to the north of IL 116 drains mostly to Kickapoo Creek, which flows into the Illinois River just east of the area shown in Exhibit 3-17. Copperas and Lamarsh Creeks drain the area south of IL 116. The Copperas Creek Subwatershed drains the area to the north and east of Canton and Norris, and includes Canton Lake, the water supply for the City of Canton. The West Branch of Copperas Creek flows directly into Canton Lake.

Spoon River Watershed. The Spoon River, the major stream in the project corridor, flows into the Illinois River at Havana, south of the project corridor (Exhibit 3-17). The rugged, wooded bluffs along the river dominate the topography in the vicinity of the river. The Spoon River drains about a million acres (1,600 square miles) and is the largest contributor to sedimentation in the Illinois River (IDNR 1998).

The Spoon River is considered a public water body from the Illinois River to a point approximately one-half mile upstream of the IL 95 bridge, and as such is subject to Illinois Department of Natural Resources regulations for Public Water.[62] The purpose of the regulations is to protect public interest in public water bodies by preventing interference with navigation and encroachment on public water bodies. The Spoon River is the only public water body in the project corridor.

Most of the project corridor from Norris to just west of Cuba is in the Big Creek subwatershed (Exhibit 3-17). Big Creek flows south through Canton and empties into the Spoon River west of Lewistown. The western edge of the corridor from Norris to just east of Smithfield is in the Turkey Creek Subwatershed. Within the corridor, parts of this subwatershed area have been highly disturbed by strip mining and the surface drainage characteristics have been altered. From east of Smithfield to the La Moine River watershed boundary, drainage is dominated by the Spoon River. The subwatersheds within this area incorporate several small streams that discharge directly to the Spoon River.

The many irregularly-shaped lakes that appear in the corridor on Exhibit 3-17, primarily between Cuba and Norris, result from past strip mining in the area. While the creation of these lakes was incidental to the mining process and not intentional, the lakes provide habitat for waterfowl and

[62] Illinois Administrative Code Title 17, Section 3704.

have become important for waterfowl hunting, especially goose. In addition, the lakes have become important sport fishery resources. There are also residences on some of these lakes. A residential development has grown up around Lake Wee-Ma-Tuk, just north of the project corridor, between Cuba and Canton (Exhibit 3-17).

La Moine River Watershed. The far western part of the project corridor is within the drainage area of the La Moine River, primarily the East Fork of the La Moine River, which has a drainage area of about 143,000 acres (220 square miles). The East Fork of the La Moine River is the second largest stream in the project corridor. Much of the land around the river is wooded, but the topographic relief is much more subdued than that surrounding the Spoon River.

A small portion of the southwest part of the project area drains toward the southwest through Troublesome and Camp Creeks to the La Moine River (Exhibit 3-17).

Macomb's surface water supply is from Spring Lake, a reservoir located northwest of Macomb and outside the corridor. No streams within the project corridor flow into Spring Lake.

3.8.1.2 Physical Characteristics of Streams

As part of the biological assessment for this project, during 2004 to 2006 biologists documented the physical characteristics of 18 streams and two lakes in the project corridor (sampling locations shown on Exhibit 3-17). At the time most of the biological work was done, there were a number of alignments under consideration, and sampling was corridor-wide. The discussions in this section focus on streams that will be crossed by the Build Alternative, receive project runoff, or occur within a mile of the project. The following characteristics of sampled locations are summarized in Table 3-28.

Flow Characteristics. Streams have either a perennial (water present year-round) or intermittent (flow occurs during wetter periods of the year) flow regime. Perennial flow is required for full support of fish and mussels. Except for the Spoon River, all streams within the project area have 7-day 10-year low flows of zero cubic feet per second (cfs) (Singh et al, 1988).

Surrounding Land Use. Surrounding land use has a direct relationship to stream quality. In particular, erosional features, linear drainage ditches and tilled land contribute to the pollutant load in surface water runoff, and exacerbate runoff intensity. For example, runoff from cropland is likely to contribute more sediment, pesticides and herbicides than runoff from forested areas. Runoff intensity is higher from impervious paved areas than from heavily vegetated areas.

Riparian Vegetation. "Riparian" refers to the vegetation that grows on the stream banks. Woody riparian habitat is important for healthy streams and aquatic communities. Typical riparian trees in the project area are willow, cottonwood, sycamore, and silver maple. These trees provide cover for fish and other wildlife, keep streams cool, help stabilize stream banks, and add organic material for the primary producers in the aquatic food chain. As shown in Table 3-28, streams in the project corridor have limited woody riparian vegetation.

Stream Substrate. Streams bottoms (substrates) are composed of sand, gravel, cobble, detritus, silt, or clay. Excessive mud, sand and silt in the stream substrate can diminish habitat quality for fish and other aquatic life. Other substrate types such as gravel, cobble, and detritus can contribute to a diverse aquatic life.

Stream Width. A wide stream may have more variation in substrate type than narrow stream, and thus support a more diverse assemblage of aquatic life.

Habitat Quality. For each stream, field biologists assigned a score for habitat quality based on visual observation of physical stream characteristics, including those tabulated in Table 3-28 and others (channel structure/alteration, deposition, bottom substrate/instream cover, pool variability, and bank stability). The habitat quality score is a preliminary screening tool used to identify streams that may have higher water quality and greater species diversity.

Habitat quality scores greater than 130 indicate excellent conditions, 110 to 129.9 good conditions, 80 to 109.9 fair conditions, and below 80 poor conditions. Habitat scores for the 10 assessed stream locations near the Build Alternative ranged from 32.0 to 119.5 (Table 3-28); of these, 6 sites received “poor” habitat quality ratings, two received “fair” habitat quality ratings, and two received ”good” habitat quality ratings.

No sites were ranked as “excellent”. The two streams ranked “good” for aquatic habitat are in the Spoon River Watershed, near the Spoon River. The highest ranked site, a small, unnamed tributary to the Spoon River, informally designated as Kedzior Woodlands Creek (IL336-12), is in a forested area, has forested banks, and has a high gravel content in the stream substrate. The North Tributary to Barker Creek (IL336-3) also received a good rating; it is in a forested area, with forested/grassed banks, and a high gravel content in the substrate. The two streams ranked “fair” for aquatic habitat were both in the Copperas Creek Subwatershed of the Middle Illinois Watershed. The evaluation of stream habitat quality done for the IL 336 study was the first evaluation of stream habitat quality done for streams within the present IL 336 project corridor (Feist and Trester 2005).

Table 3-28
Physical Characteristics of Streams in the IL 336 Project Corridor

Water Body	Site #	Flow Characteristics	Surrounding Land Use	Riparian Vegetation	Streams Substrate	Steam Width (ft)	Habitat Quality (score)	Watershed	Aerial Exhibit Sheet No.[1]
Kepple Creek	IL336-2	Perennial Stream	fallow field	Bare banks, grasses	90% mud, 5% gravel, 5% cobble	3-10	70.0 poor	La Moine River	2 and 3
North Trib. Barker Creek	IL336-3	Intermittent	railroad ROW, light forest	Forest, grasses	20% cobble, 50% gravel, 20% sand, 10% mud	2-10	112.5 good	Spoon River	8
Spoon River	IL336-5	Perennial Stream	50% road ROW, 50% row crops	Bare banks, agricultural fields, grasses, some trees	10% gravel, 10% sand, 80% mud	65	73.0 poor	Spoon River	9 and 10
Big Creek (upper)	IL336-7	Perennial Stream	airport, farm fields	Grasses	30% gravel, 40% sand, 30% mud	7-10	74.5 poor	Spoon River	23
West Branch Copperas Creek	IL336-8	Perennial Stream	50% cemetery, 25% fallow field, 25% light forest	Grasses, forest	30% cobble, 30% gravel, 20% sand, 20% mud	2-10	91.0 fair	Middle Illinois River	24
Middle Branch Copperas Creek	IL336-9	Perennial Stream	100% forest	Forest, grasses	5% cobble, 40% gravel, 40% sand, 15% mud	5-11	101.5 fair	Middle Illinois River	25
East Branch Copperas Creek	IL336-10	Perennial Stream	50% livestock, agricultural fields, grasses	Livestock yard, agricultural fields, grasses	100% mud	2-5	32 poor	Middle Illinois River	33
Unnamed tributary to West Branch Lamarsh Creek	IL336-11	Perennial Stream	50% highway ROW, 25% residential, 25% fallow field	Bare banks, grasses, forest, highway	mud/sand/gravel mix	2-7	55.0 poor	Middle Illinois River	36
Kedzior Woodlands Creek	IL336-12	Perennial Stream	forest	Forest	80% gravel, 10% sand, 10% mud	2-8	119.5 good	Spoon River	11
Lone Barn Road Pond (Strip Mine Lake)	IL336-16	Not applicable	Row crops, strip mine	Grasses, small woody vegetation	Silt, gravel	460	Not available	Spoon River	19 (unlabeled lake along Lone Barn Pond Road)

Table 3-28
Physical Characteristics of Streams in the IL 336 Project Corridor

Water Body	Site #	Flow Characteristics	Surrounding Land Use	Riparian Vegetation	Streams Substrate	Steam Width (ft)	Habitat Quality (score)	Watershed	Aerial Exhibit Sheet No.[1]
Route 5 Loong Pond (Strip Mine Lake)	IL336-17	Not applicable	strip mine, highway and rail ROW	Grasses	Silt, gravel	164	Not available	Spoon River	16 (unlabeled lake on north side CH 5)
Unnamed tributary of West Fork of Kickapoo Creek	IL336-C	Perennial	Row crops, state highway ROW	Wood vegetation, trees, grasses	silt, cobble, boulders	0.3-1.2	72 poor	Middle Illinois River	28

[1] Refer to Exhibit 3-17 for locations of sampling points.

3.8.1.3 Biological Characteristics of Streams

Biological characteristics of selected streams were assessed through sampling of fish, mussels, and other macroinvertebrates. Macroinvertebrates are the larger aquatic animals without backbones (e.g., dragonfly nymphs, mayflies, caddisflies and snails) and are useful indicators of stream quality.

Fish Species. Fish were sampled at seven of the locations from Table 3-28 at which habitat assessments were conducted (Table 3-29 and Exhibit 3-17). Twenty-nine species of fish were documented in these streams, with eight species dominating (Table 3-29). Fish species have different tolerances to siltation. Those that are intolerant to siltation are typically the first to disappear following a disturbance. Of the 29 species of fish identified, three are considered intolerant species (hornyhead chub, southern redbelly dace, and smallmouth bass). The number of intolerant individuals at each sample site is given as a percentage of all individuals observed at the site (Table 3-29). Eight of the species identified are considered tolerant (red shiner, common carp, bluntnose minnow, fathead minnow, creek chub, white sucker, yellow bullhead, and green sunfish). The number of tolerant individuals at each sample site is given as a percentage of all individuals observed at the site (Table 3-29). The majority of fish species are neither intolerant nor tolerant. Dominant fish species are those that occurred in the greatest numbers and are represented in Table 3-29 by the percentage of the total catch. Most of the streams in the project area are dominated by tolerant species of fish.

Table 3-29
Summary of Fish Species in Project Area Streams

Water Body	Site #	# Fish Species	Total # of Individuals Sampled	Dominant Species**	% Intolerant Individuals+	% Tolerant Individuals+	Aerial Exhibit Sheet1
Kepple Creek	IL336-2	13	243	bluntnose minnow 21%, Johnny darter 19%, blackstripe topminnow 17%	6	47	2 and 3
Spoon River	IL336-5	15	304	red shiner, 76%	1	83	9 and 10
Big Creek (upper)	IL336-7	2	77	creek chub, 77%	0	100	23
West Branch Copperas Creek	IL336-8	9	176	bigmouth shiner 32%, creek chub 19%, southern redbelly dace 18%	18	49	24
Middle Branch Copperas Creek	IL336-9	6	174	southern redbelly dace 66%	66	5	25
East Branch Copperas Creek	IL336-10	5	156	southern redbelly dace 86%	86	10	33

Table 3-29
Summary of Fish Species in Project Area Streams

Water Body	Site #	# Fish Species	Total # of Individuals Sampled	Dominant Species**	% Intolerant Individuals+	% Tolerant Individuals+	Aerial Exhibit Sheet1
Unnamed tributary to West Branch Lamarsh Creek	IL336-11	0	0	no fish present	0	0	36
Kedzior Woodlands Creek	IL336-12	2	9	orangethroat darter 89%	11	0	11

[1] Refer to Exhibit 3-17 for locations of sampling points.

As part of the 2005 IEPA/IDNR Intensive Spoon River Basin Survey, 22 stream sections in the Spoon River Basin were sampled. Each stream section contained from 10 to 50 species of fish. The dominant species at particular stream sections included the bluntnose minnow, red shiner, sand shiner, creek chub and golden redhorse. From 0 to 6 intolerant species were observed in each stream section. The IDNR results are similar to those obtained by the Natural History Survey within the project corridor.

Aquatic diversity in the prairie streams of glaciated regions is often relatively low, as was found in these streams. This is a result of both natural conditions and human activity. Because the glacial till is fairly impermeable to infiltration of surface water and, in this area, the Pennsylvanian bedrock is also usually fairly impermeable, surface water runoff from rainfall is high, and infiltration to groundwater is low. Crop cover and stream channelization further increase runoff intensity and volume, compared with natural conditions. As a result of high runoff and low infiltration there is little recharge to streams from groundwater during periods of low rainfall. These conditions result in large flow variations and very low flows during dry weather. A limited number of species can thrive in these conditions, resulting in generally low aquatic diversity.

Of the two streams that received "good" habitat quality scores (Table 3-28), the North Tributary to Barker Creek was not sampled for fish, and only two species were found at Kedzior Woodlands Creek. All fish species documented in the project area are commonly found in streams of central Illinois streams.

Mussels. In 2004, mussel sampling was attempted at the sites listed in Table 3-28 but almost all the sites yielded no results (Feist and Trester 2005). Live mussels were found at only one site, the Spoon River (IL336-5), which yielded nine species of live mussels, including three monkeyface mussels. Empty shells from seven additional species were collected at the Spoon River site, including relict shells of the state threatened spike (*Elliptio dilatata*) and black sandshell (*Ligumia recta*) (See Section 3.13 for a discussion of threatened and endangered species). Empty shells from one species were found at Kepple Creek (IL336-2).

All the live and fresh dead mussel specimens found in the mussel sampling for the corridor were from species that are widespread and common in central Illinois (Feist 2006).

Other Aquatic Macroinvertebrates. During 2004-2005 over 7,000 aquatic macroinvertebrate specimens were collected and later identified from ten sites in the IL 336 project corridor. The macroinvertebrates collected during this study are common inhabitants of central Illinois streams. Based on the type and distribution of species, Hilsenhoff's family level biotic index was used to classify the sites (Hilsenhoff 1988). Hilsenhoff's family level biotic index is an indicator of the pollution-tolerance of the species present. The presence of tolerant species of aquatic macroinvertebrates at several sites provides evidence of organic pollution. Notable among these are physid snails, baetid mayflies, abundant midges and some aquatic worms (oligochaetes). Other impacts, such as the presence of cattle, also point to organic pollution as well as extensive, though localized, erosion. All sampled sites were classified as fairly poor (substantial pollution likely), except for the Middle Branch of Copperas Creek, which was classified as poor (Table 3-30).

Illinois Species in Greatest Need of Conservation. In the Illinois Comprehensive Wildlife Conservation Plan and Strategy (IDNR 2005a, with updates on the IDNR website), IDNR identifies Species in Greatest Need of Conservation in Illinois (IDNR 2005a, Appendix I).

One mussel species from Appendix I, the monkeyface, was found in the vicinity of the Build Alternative. Three individuals were found in the Spoon River. The greatest habitat stress contributing to concern for this species is pollutants and sediment.

Three fish species listed in Table 3-29 are considered Illinois Species in Greatest Need of Conservation: the smallmouth bass, the southern redbelly dace and the blacknose dace.

One individual smallmouth bass was found during the sampling summarized in Table 3-29, at the Spoon River. IDNR reports that for the smallmouth bass, pollutant and sediment have had or are likely to have a severe effect on population viability or abundance (IDNR 2005a).

The southern redbelly dace was found at five of the locations sampled (Table 3-29): nine individuals at Kepple Creek, 32 at West Branch Copperas Creek, 114 at Middle Branch Copperas Creek, 134 at East Branch Copperas Creek, and one at Kedzior Woodlands Creek. For the southern redbelly dace, three stresses have had or are likely to have a severe effect on population viability or abundance—fragmentation of habitat, physical composition and structure of habitat, and hydrologic disturbances such as changing water levels.

The blacknose dace (2 individuals) was found at one location from Table 3-29, at the Middle Branch Copperas Creek. IDNR reports that stresses to the blacknose dace are similar to those for the smallmouth bass and the southern redbelly dace, but have had or are likely to have a moderate (rather than severe) effect on population viability or abundance (IDNR 2005a).

Biological Stream Characterization. The Biological Stream Characterization (BSC) index system developed by Hite and Bertrand (1989) and Bertrand et al. (1996), classified Illinois waterways into one of five classes based on fish populations, water quality, and aquatic macroinvertebrates. Those five classes are:

A - excellent, unique aquatic resource;
B - good, highly valued aquatic resource;
C - fair, moderate aquatic resource;
D - poor, limited aquatic resource; and
E - very poor, restricted aquatic resource.

Two streams in the vicinity of the Build Alternative, Big Creek and the Spoon River, were rated under the BSC index (Bertrand et al. 1996). Both were rated as Class C (Table 3-30). These stream ratings are based on fishery data from the mid 1970s to mid 1980s. Based on stream information obtained by IEPA/IDNR in 2005 from the Spoon River Basin, stream sections within the Basin ranged from Class A to Class E. The Spoon River ranges from Class B (London Mills) to Class D (Lewistown). The project area reach of the Spoon River is most likely a Class C stream (Buckeye Church Road). Big Creek north of Lewiston is rated as a Class D stream.

In a recent publication the IDNR identified biologically significant streams in Illinois. None of these streams are within the project area (IDNR 2008b).

In summary, based on the information in Table 3-30, the streams in the area do not have the characteristics of high quality streams. The habitat rating was either poor or fair for all the perennial streams except the very small Kedzior Woodlands Creek; aquatic diversity was generally low; and the biotic index was either fairly poor or poor for all streams that were rated. However, project area streams provide habitat for one mussel and three fish Species in Greatest Need of Conservation. Relatively large numbers of one of these species, the southern redbelly dace, were found in the three branches (West, Middle and East) of Copperas Creek. The highest number was found in the East Branch, which had the lowest habitat quality score of the streams rated (Table 3-30).

Table 3-30
Comparison of Stream Ratings

Water Body	Site #	Habitat Quality (based on physical characteristics)	Total Number of Fish Species Documented	Total Number of Live Mussel Species Documented	Biological Stream Characterization Index[1] (based on fish population, water quality, and macroinvertebrates)	Hilsenhoff biotic index (based on macroinvertebrate sampling)
Kepple Creek	IL336-2	70.0 poor	13	0	Not rated	fairly poor--substantial pollution likely
North Trib. Barker Creek	IL336-3	112.5 good	Not sampled	0	Not rated	fairly poor--substantial pollution likely
Spoon River	IL336-5	73.0 poor	15	9	Class C (fair, moderate aquatic resource)	fairly poor--substantial pollution likely
Big Creek (upper)	IL336-7	74.5 poor	2	0	Class C (fair, moderate aquatic resource)	Not rated
West Branch Copperas Creek	IL336-8	91.0 fair	9	0	Not rated	fairly poor--substantial pollution likely
Middle Branch Copperas Creek	IL336-9	101.5 fair	6	0	Not rated	poor--very substantial pollution likely
East Branch Copperas Creek	IL336-10	32 poor	5	0	Not rated	Not rated
Unnamed tributary to West Branch Lamarsh Creek	IL336-11	55.0 poor	0	0	Not rated	Not rated
Kedzior Woodlands Creek	IL336-12	119.5 good	2	0	Not rated	fairly poor--substantial pollution likely
Unnamed tributary of West Fork of Kickapoo Creek	IL336-C	72 poor	Not sampled	Not sampled	Not rated	Not rated

[1] (Hite and Bertrand 1989) and (Bertrand et al 1996)

National Rivers Inventory

Under Section 5(d) of the WSR Act, the Department of Interior, National Park Service (NPS) maintains a Nationwide River Inventory (NRI), which is a list of stream sections that may have potential for eventual designation as WSRs, but have not been authorized for study. Of the more than 3,400 stream sections in the NRI, 86 are in Illinois, with a combined total length of 2,762 miles. The only stream in Fulton, McDonough or Peoria Counties in the NRI is the Spoon River, which was listed in 1982. The 175 miles "from mouth to channelization" is included for its potential scenic and recreational qualities. The NRI summarizes this section of the Spoon River as follows:

> "A long river section through central Illinois farm country having very few cultural intrusions. Unique in this respect for the area. Banks fairly well wooded with some large forested areas in corridor. Receives moderate recreational use."

If an NRI river may be impacted, both CEQ and FHWA policy require coordination with the NPS, assessment of impacts that could affect the eligibility of the stream for designation as a WSR, and mitigation where appropriate.[63]

Visual impacts of the project on the Spoon River are discussed in Section 3.17.2.1.

3.8.1.4 Water Quality Characteristics

This section discussed water quality characteristics of project area streams by comparison with the Illinois General Use Water Quality Standards.[64] These standards, established by the State, are applicable to all waters of the State for which there is no specific standard, and are intended to be protective for aquatic life, agricultural use, primary contact, and most industrial uses. The General Use Water Quality Standards are numerical standards for inorganic and organic chemicals, and for biological and physical characteristics (e.g., fecal coliform and pH).

Water Sampling. Several water sampling events were conducted in 2004 and 2005 at or near the locations of aquatic sampling sites at West Branch Lamarsh Creek and West Branch Copperas Creek. A severe drought occurred in the summer of 2005 and many of the streams and rivers experienced low to no flows. Baughman Branch, an intermittent stream tributary to the Spoon River, on the south side of IL 95 just south of Kedzior Woodlands Creek, was also sampled

[63] CEQ memorandum Interagency Consultation to Avoid or Mitigate Adverse Impacts on Rivers in the Nationwide Inventory, dated August 10, 1980; FHWA memorandum Policy Guidance for Wild and Scenic Rivers, dated October 3, 1980. Note that both memoranda refer to coordination with the Heritage Conservation and Recreation Service. This has since been transferred to the NPS.

[64] Title 35 Illinois Administrative Code, Subpart B

(Exhibit 3-17). Samples were analyzed for 30 elements,[65] dissolved oxygen, pH, total dissolved solids, sulfates and chloride. Sample results that did not meet General Use Illinois Surface Water Quality Standards are summarized in Table 3-31. The General Use Standards are applicable to all surface waters in the project area.

Dissolved Oxygen. Dissolved oxygen levels were below minimum values for General Use Water Quality Standards (5.0 milligrams per liter (mg/L) in two samples taken in June 2005, with results of 4.5 mg/L at both locations.

pH. pH levels exceeded the upper end of the General Use Illinois Surface Water Quality Standard range of 9.0 standard units in two samples from June 2005: West Branch Copperas Creek, upstream (9.1) and West Branch Copperas Creek, downstream (9.3). No samples were below pH 6.0, and exceedances of the upper end of the range were reported only in June 2005.

Table 3-31
Water Samples from INHS 2005 Sampling that Did Not Meet Water Quality Standards

	Dissolved Oxygen, mg/L	pH, standard units	Chloride, mg/L
Illinois General Use Water Quality Standard	March-July > 5.0 minimum Aug-Feb > 3.5 minimum	6-9	500
West Branch Copperas Creek, June 2005 (downstream)	4.5	9.3	
West Branch Copperas Creek, June 2005 (upstream)	4.5	9.1	
Lone Barn Road Pond, September 2005			515

Chloride. Chloride was reported above General Use Water Quality Standards (500 mg/L) in the sample from September 2005 from Lone Barn Road Pond (515 mg/L).

Section 303(d) Listed Waters. Section 303(d) of the federal Clean Water Act (CWA)[66] and the Water Quality Planning and Management regulation at 40 CFR 130.7[67] requires states to identify waters that are impaired for specific uses. The latest Section 303(d) list of water quality limited waters for the State of Illinois is contained in the State's 2008 report.[68] Stream sections near the Build Alternative that are listed as impaired in the 2008 report are shown Exhibit 3-18. The Section 303(d) information from the IEPA 2008 report is summarized in Table 3-32. Pollutants include total fecal coliform, phosphorus and sedimentation/siltation.

Water Resource Quality within the Study Area. INHS water sampling in 2004 and 2005 found only a few minor exceedances of water quality standards for dissolved oxygen, pH and chloride. Three streams in the area are listed as impaired by IEPA, the Spoon River (for fecal coliform),

[65] Aluminum, arsenic, boron, barium, beryllium, calcium, cadmium, cobalt, chromium, copper, iron, potassium, lanthanum, lithium, magnesium, manganese, molybdenum, sodium, nickel, lead, antimony, scandium, selenium, silicon, strontium, titanium, thallium, vanadium, zinc, and zirconium

[66] The Clean Water Act is the common name for the Federal Water Pollution Control Act (33 U.S.C. 1251 - 1376).

[67] Code of Federal Regulations (CFR), Title 40, Section 130.7.

[68] State of Illinois Environmental Protection Agency Bureau of Water, *Illinois Integrated Water Quality Report and Section 303(d) List – 2008 (Final).* August 2008.

Big Creek (phosphorus and sedimentation/siltation) and Slug Run (sedimentation/siltation). As stated in Section 3.8.1.3, project streams do not have the characteristics of high quality streams.

Table 3-32
Impaired Waters

Feature	IEPA Section ID	Area/Length	Designated Use	Pollutants
Spoon River	DJ08	9.9 Miles	Primary Contact	Fecal Coliform
Big Creek	DJB18	28.83 Miles	Aquatic Life	Phosphorus (Total); Sedimentation/Siltation
Slug Run	DJBZ01	3.23 Miles	Aquatic Life	Sedimentation/Siltation

Source: State of Illinois Environmental Protection Agency Bureau of Water, *Final* Illinois Integrated Water Quality Report and Section 303(d) List – 2008. August 2008.

3.8.2 Environmental Consequences

Impacts to surface waters from the No-Build Alternative will be those associated with existing roadways, including impacts from maintenance and increased traffic.

The Build Alternative will have some impact on the streams and other water bodies it crosses. U.S. Geological Survey (USGS) 7.5-minute quadrangle topographic maps were used to identify surface water features within the right-of-way of the IL 336 Build Alternative. These features are listed in Table 3-33, along with location descriptions and other summary characteristics. The flow characteristics are based on the USGS 7.5-minute quadrangle designation at the location of the IL 336 crossing. In addition to the stream crossings, fill will need to be placed at six edges of strip-mine lakes (Table 3-33 and Aerial Exhibit Sheets 14, 15, and 19).

Most of the stream crossings are at intermittent streams. Perennial stream crossings are as follows:

- Spoon River;
- Manmade channel adjacent to strip mine lake;
- Big Creek;
- West Branch Copperas Creek;
- Middle Branch Copperas Creek; and
- East Branch Copperas Creek.

The habitat quality of the Spoon River, Big Creek, and East Branch Copperas Creek were all rated as poor (Table 3-30). The West and Middle Branches of Copperas Creek were rated as fair for habitat quality. The manmade channel was not rated. The Spoon River, Big Creek and the West Branch of Copperas Creek have had exceedances for Illinois Water Quality Standards for fecal coliform, pH, phosphorus, sulfates, and/or dissolved oxygen (Tables 3-32 and 3-33).

3.8.2.1 Construction Impacts to Surface Water

The major potential construction impacts to surface water quality are sedimentation (total suspended solids) and increased turbidity resulting from soil erosion. Typical operations associated with roadway construction involve clearing, grading, filling and excavation. These activities all increase the erosion potential of surface soils because of the reduction in vegetative cover.

Crossings with relatively larger upstream drainage areas generally have greater potential impacts because of the larger flows and greater stream widths associated with the larger drainage areas. The 11 stream crossings with upstream drainage areas of about 400 acres or more are summarized in Table 3-34. At a minimum, each stream crossing listed in Table 3-34 will require at least a 6-foot wide concrete box culvert, and some will need bridges.

The streams listed in Table 3-34 include all the USGS perennial streams shown in Table 3-33 (except for the channel adjacent to the strip mine), plus the following intermittent streams from Table 3-33:

- Kepple Creek and a tributary,
- Kedzior Woodlands Creek,
- Tributary to Laswell Branch, and
- Tributaries to the East Branch of Copperas Creek.

Table 3-33
Proposed IL 336 Crossings of Water Features Noted on USGS 7.5-Minute Quadrangles

Water Feature	Flow Characteristics (USGS)	Location	Subwatershed	Major Watershed	EPA Habitat Quality Rating	Stream Impairments	Aerial Exhibit Sheet
Three unnamed tributaries of East Fork LA Moine	Intermittent	Between East 1600 St. and East 1700 St.	East Fork La Moine River	La Moine	Poor for East Fork	East Fork La Moine: 303(d), manganese; INHS: dissolved oxygen, pH, chloride	1 and 2
Kepple Creek	Intermittent	Between BNSF bridge and East 1800 St.	East Fork La Moine River	La Moine	Poor	None noted (Kepple Creek not sampled in INHS)	2, 3, and 4
Unnamed tributary to Kepple Creek	Intermittent	Between East 1800 St. and East 2000 St.	East Fork La Moine River				
Three unnamed tributaries to Kepple Creek	Intermittent	East of IL 41	East Fork La Moine River				
Unnamed tributary to Barker Creek	Intermittent	Just west of McDonough/Fulton County Line	Spoon	Spoon	Poor	Spoon: 303(d), fecal coliform; INHS: Barker, pH 9.5	5 and 8
Unnamed tributary to North Trib. Barker Creek (IL336-3)	Intermittent	Just west of Point Pleasant Road	Spoon	Spoon	Good for IL336-3		
Unnamed tributary to North Trib. Barker Creek (IIL336-3)	Intermittent	Just southeast of Marietta, just west of Coal Cut Road	Spoon	Spoon			
Spoon River	Perennial	At existing IL 95 bridge		Spoon	Poor	Spoon: 303(d), fecal coliform	10 through 15
Two unnamed tributaries to Kedzior Woodands Creek (IL336-12)	Intermittent	Just north of Smithfield	Spoon	Spoon	Good		
Three unnamed tributaries to Laswell Branch	Intermittent	Just east of Howerter Road	Turkey	Spoon	Not rated		
Two unnamed tributaries to Laswell Branch	Intermittent	Between IL 95 and Laswell Road	Turkey	Spoon	Not rated		
Unnamed tributary to Put Creek	Intermittent	North of Laswell Road	Turkey	Spoon	Not rated		
Edge of strip mine lake	Lake	East of Cameron Road	Turkey	Spoon	Not rated		
Unnamed tributary to Put Creek	Intermittent	West of IL 97	Turkey	Spoon	Not rated		
Edge of strip mine lake	Lake	West of IL 97	Turkey	Spoon	Not rated		
Edge of strip mine lake	Lake	East of Ripper Road	Big Creek	Spoon	Not rated	Big Creek: 303(d) for phosphorus and sulfates; Spoon: 303(d), fecal coliform	19 through 23
Edges of two strip mine lakes	Lake	South of IL 336/IL 9 interchange	Big Creek	Spoon	Not rated		
Edge of strip mine lake	Lake	IL 336/IL 9 interchange	Big Creek	Spoon	Not rated		
Two tributaries to Big Creek	Intermittent	West of Canton Airport	Big Creek	Spoon	Not rated		
Three tributaries to Big Creek	Intermittent	North and south of Cypress Road	Big Creek	Spoon	Poor		
Channel adjacent to strip mine lake	Perennial (manmade)	Richardson Road	Big Creek	Spoon	Not rated		

Table 3-33
Proposed IL 336 Crossings of Water Features Noted on USGS 7.5-Minute Quadrangles

Water Feature	Flow Characteristics (USGS)	Location	Subwatershed	Major Watershed	EPA Habitat Quality Rating	Stream Impairments	Aerial Exhibit Sheet
Channel adjacent to strip mine lake	Intermittent (manmade)	Half mile west of Richardson Road	Big Creek	Spoon	Not rated		
Channel adjacent to strip mine lake	Intermittent (manmade)	Mile west of Norris	Big Creek	Spoon	Not rated	Big Creek: 303(d) for phosphorus and sulfates; Spoon: 303(d), fecal coliform	
Big Creek, multiple crossings	Intermittent and Perennial	IL 336/IL 78 interchange	Big Creek	Spoon	Poor		
West Branch Copperas Creek	Perennial	Between Brerton and Norris and east of both	Copperas	Middle Illinois	Fair; also note: Feeds directly to Canton Lake, water source for City of Canton	West Branch Copperas Cree, INHS: dissolved oxygen, 4.5 mg/L, pH 9.1-9.3	24
Unnamed tributary to Middle Branch Copperas Creek	Intermittent	East of IL 78 and east of Norris	Copperas	Middle Illinois	Fair; also note: Feeds directly to Canton Lake, water source for City of Canton		25
Middle Branch Copperas Creek	Perennial	East of IL 78 and northeast of Norris; also crosses with connector to IL 78	Copperas	Middle Illinois	Fair		25
Unnamed tributary to Middle Branch Copperas Creek	Intermittent	North of Cottonwood Road on IL 78 alignment	Copperas	Middle Illinois	Fair for Mid. Br.		26
Seven unnamed tributaries to East Branch Copperas Creek	Intermittent	Between Cramer Road and Trivoli Road	Copperas	Middle Illinois	Poor		30 and 31
Two unnamed tributaries of East Branch Copperas Creek	Intermittent	One on east and one on west side of Texas Road	Copperas	Middle Illinois	Poor		31 and 32
Junction of two unnamed tributaries to East Branch Copperas Creek	Intermittent	Just west of Fisher Road	Copperas	Middle Illinois	Poor		32
Unnamed tributary of East Branch Copperas Creek	Intermittent	Northwest of Eden/Behrends Road intersection	Copperas	Middle Illinois	Poor		32 and 33
East Branch Copperas Creek	Perennial	North of Eden/Behrends Road intersection	Copperas	Middle Illinois	Poor		33
Unnamed tributary to East Branch Copperas Creek	Intermittent	West of Hanna City Road	Copperas	Middle Illinois	Poor		33
Unnamed tributary to Largent Creek	Intermittent	East of Murphy Road	Lamarsh	Middle Illinois	Not rated		34
Unnamed tributary to West Branch Lamarsh Creek	Intermittent	East of Taylor Road and north of Farmington Road	Lamarsh	Middle Illinois	Poor		36

Table 3-34
Locations of Bridges and Large Box Culverts on IL 336

Water Feature	Location	Drainage Area	Construction Activities	Other Information
Kepple Creek	Between BNSF bridge and East 1800 St.	3,012 acres	New structure.	No existing roadway.
Tributary to Kepple Creek	Between East 1800 St. and East 2000 St	2,055 acres	New structure.	No existing roadway.
Spoon River	At existing IL 95 bridge	1,047,000 acres (1,636 square miles)	The existing IL 95 bridge will be demolished and two closely-spaced structures will be built just upstream from the existing IL 95 bridge.	The new bridge will have no piers in the river.
Kedzior Woodlands Creek	Just north of Smithfield	600 acres	New structure	
Tributary to Laswell Branch	Between IL 95 and Laswell Rd	743 acres	New structure.	No existing roadway.
Big Creek, multiple crossings	IL 336/IL 78 interchange	1,092 acres	Interchange construction will result in three crossings of Big Creek.	
West Branch Copperas Creek	Between Brerton and Norris and east of both	2,275 acres	New structure.	No existing roadway.
Middle Branch Copperas Creek	East of IL 78 and northeast of Norris; also crosses with connector to IL 78	1,475 acres	New structures.	No existing roadway.
Unnamed tributary of East Branch Copperas Creek	Near Texas Road	429 acres	New structures.	No existing roadway.
Junction of two unnamed tributaries to East Branch Copperas Creek	Just west of Logan Road	786 acres	New structures.	No existing roadway.
East Branch Copperas Creek	North of Eden/Behrends Road intersection	530 acres	New structure.	No existing roadway.

Note that the Spoon River drainage is orders of magnitude larger than that of any of the other streams listed in Table 3-34.

Because the Build Alternative will mostly be on new alignment, the structures at the locations listed in Table 3-34 will be new rather than replacement structures, except that the new Spoon River crossing will replace the existing IL 95 bridge. Construction activities at the Spoon River crossing will consist of the following activities. Two closely-spaced structures would be built just upstream of the existing structure. These structures will not have piers within the river. The existing two-lane bridge and its piers will be removed. Demolition of the existing bridge and its piers would require placing temporary, clean aggregate work pads in the river. The material would be removed and disposed of at an upland site away from the river.

The project as proposed will have temporary effects on the stream's scenic and recreational Outstandingly Remarkable Values (ORVs). The Spoon River and the adjacent lands are scenic. The Spoon River Valley Scenic Drive passes through the project area. The scenic features are the picturesque villages and historic sites and the spectacular fall foliage. Minor impacts due to construction activity to the rivers scenic qualities will be sustained at the point of the bridge crossing with the removal of some trees.

The IDNR has no information on the recreational usage of the river. Canoeing guide books indicate that the Spoon River is a good stream for those who enjoy roughing it. There are a few commercial facilities along the river but most access to the stream is from bridges on paved roads. Some temporary impacts to the recreational use of the river are anticipated. The river at this point will not be open to canoeing during the construction of the new bridges and the removal of the existing bridge. The removal of the piers from the river will enhance the scenic view and recreational usage of those that use this resource.

To reduce impacts to the river and to ensure the Spoon River maintains its eligibility to be included into the Wild and Scenic River system, the NPS recommended 4 critical bridge design principles, 8 erosion control/riparian zone protection/tree replacement measures, 15 bridge demolition and construction measures, and 5 construction equipment practices. The NPS response is in Appendix D.

Installation of box culverts at other stream crossings will require excavation, riprap, and earthwork in the stream channels.

Crossing through and working in streams will cause an increase in turbidity and sedimentation, and temporarily alter downstream hydraulics and substrate conditions. The level and velocity of water present in the streams while work is being conducted will affect the amount of sediment transported downstream. Any long-term increases in suspended sediments can reduce aquatic productivity by limiting photosynthesis, lowering oxygen levels, clogging gill-breathing fauna, and covering food sources, sessile organisms (those anchored in the stream substrate) and fish spawning areas. As discussed in Section 3.8.1.3, sedimentation has adverse effects on two species identified by IDNR as in need of conservation, the smallmouth bass and the black dace. The major short-term water quality impacts due to construction are increases in turbidity and sedimentation resulting from erosion of disturbed areas and in-stream work. With the mitigation measures IDOT will employ, and the regulatory requirements for protection of surface water (Section 3.16), the in-stream work and construction activities adjacent to streams will not be expected to adversely affect the streams' overall habitat quality. Permits required for potential impacts to surface water resources are discussed in Section 3.16, Permits.

Construction over the edges of strip-mine lakes will require placing fill in the lakes. This fill placement will cause a short-term increase in turbidity and sedimentation, which could be reduced by using granular materials for fill. Long-term adverse impacts are not anticipated: fill placement is consistent with the history of these lakes, which have formed in the miscellaneous depressions surrounded by spoil piles that remain from past surface mining operations.

3.8.2.2 Operation and Maintenance Impacts to Surface Water

Operation and maintenance impacts of the project on water quality will result from stormwater runoff from highway surfaces, bridge decks, median areas, and adjoining rights of way. The increase in impervious area will increase stormwater runoff volumes, which will be controlled to prevent flooding and erosion impacts through appropriate design of conveyances and detention facilities.

There will be a cattle crossing included with crossing of the East Branch of Copperas Creek, to support the current land use in that area. The crossing will probably be a large concrete box culvert. Since cattle currently have access to the stream at this location, impacts are not expected to change.

Based on IEPA information, in all but the most highly urbanized areas, highway-related runoff is not considered a potential contributing source to stream impairment. According to the IEPA, the major potential sources of stream impairments are: "agriculture, hydromodification, municipal point sources, resource extraction, habitat modification (other than hydromodification), and urban runoff/storm sewers". Of the several thousand miles of impaired streams in Illinois in 2005, the category "Highway/Road/Bridge Runoff (Non-construction Related)" is never listed as a sole potential source and is listed as a potential contributing source for 118 miles of impairments. In every case the impaired stream is either in the Chicago or Springfield area, and many other urban sources are included as potential impairment sources, along with highways and bridges. Pollutants include chloride, nitrogen, phosphorus, total suspended solids and total dissolved solids (IEPA 2006).

The IEPA considers salt and pesticides to be the potential pollutants in highway runoff (IEPA 2006). Chloride is the primary pollutant that originates from road salt. Results from the biological survey for chloride from streams in the project area generally ranged from about 10 to 40 mg/L, although two water bodies had much higher levels in the September 2005 sampling event (East Fork La Moine River, 1,879 mg/L, and Lone Barn Road Pond, 515 mg/L; Table 3-31). Of the many pollutants for which area streams are impaired, chloride is not included for any in IEPA's 303(d) list (Table 3-32). Because the Illinois General Use Water Quality Standard for chloride is 500 mg/kg, it is reasonable to expect that the additional chloride that may reach project-area streams from salting IL 336 will not result in chloride levels that violate state water quality standards.

IDOT policy prohibits spraying at stream crossings, ponds, or other water bodies crossing or adjacent to the highway right-of-way, within 150 feet of a state listed natural area, or near an occurrence of a threatened or endangered species.

3.8.3 Measures to Minimize Harm and Mitigation

Although adverse impacts to surface water quality are not expected, features are incorporated into the roadway design to reduce stormwater runoff loadings. Proposed designs include grassed medians and roadside ditches. These features will reduce pollutant loadings to nearby waterways. Pollutant removal in vegetated swales occurs through filtration by the vegetation, deposition of particulate matter in low velocity areas, and infiltration through soils. A grass swale system can be effective in removal of total suspended solids and phosphorus (FHWA 1996). Native, deep-rooted grasses and other prairie plants are more effective than turf grass.

Principles and standards from the 2002 IDOT *Bureau of Design and Environment Manual* Section 59-8 will be used to minimize the Build Alternative's potential water quality impacts. Construction in or near waterways will be performed in accordance with Section 107.01 of IDOT's *Standard Specifications for Road and Bridge Construction*. State-of-the-art erosion control devices will be installed before erosion prone construction activities begin. Construction at stream crossings will be conducted during low or normal flow periods and will comply with all federal and state laws, local ordinances, and regulations. The following measures will be implemented to help control erosion:

- Temporary Ditch Checks—Ditch check material and spacing will vary, depending on ditch flow velocity and slope.

- Ditch Linings—Temporary linings (excelsior blankets) will be installed during construction (before revegetation) where appropriate, depending on ditch flow velocity. Permanent linings (pavement, riprap) will be installed after construction (after revegetation) where appropriate, depending on ditch flow velocity.

- Culverts—Downstream channels will be protected where appropriate (riprap, energy dissipater basins), depending on culvert outlet velocities.

- Perimeter Erosion Barrier will be installed in areas where sediments run off the construction area in sheet flow.

- Inlet and Pipe Protection will be installed immediately after inlets and pipes are constructed until surrounding area is paved or revegetated.

- Detention Features will be incorporated into ditches or interchange areas.

- The size of disturbed area exposed at any one time and the duration of exposure will be minimized. To accomplish this, construction contracts will include limits on the amount of soil that can be exposed, measures to prevent erosion during spring thaw if construction is not completed before winter, and specifications to complete grading as soon as possible and revegetate with temporary and permanent cover. Specific types and methods of erosion control will be determined during the project's design phase.

3.8.4 Indirect Impacts

Indirect impacts to streams may occur from development near interchanges or major intersections. See the discussion of indirect impacts under Section 3.3, Agriculture, for more information. The only proposed interchange in the project area near a surface water feature is the IL 336/IL 78 interchange, which has multiple crossings of Big Creek, at the location where it transitions from an intermittent to a perennial stream. There is also a strip-mine lake southwest of the interchange. Big Creek has been rated as having poor habitat quality, and as a moderate aquatic resource (Table 3-30). It is currently considered impaired over its entire length due to elevated levels of phosphorus (from municipal point source discharges) and sulfates (from mining) (Table 3-30 and Exhibit 3-18). Big Creek drains formerly strip-mined lands and runs through the City of Canton. This interchange is in a rural area south of the Village of Norris and north of Canton. While this is a low-growth area, with moderate future growth projections, some commercial development may occur in the vicinity of this interchange. Some adverse impacts to Big Creek are likely as a result of the combination of the interchange construction, operation, and maintenance and future development at the interchange. However, the results are expected to have a negligible impact to Big Creek compared with the other factors currently contributing to the condition of and impairments to the stream. Impacts that may be related to this project, both direct and indirect, are not expected to affect the phosphorus and sulfate levels in the stream that are the bases for its current status as an impaired stream.

3.8.5 Cumulative Impacts

As described in Section 3.8.1, the streams and other water bodies in the vicinity of the Build Alternative have been impacted by channelization, the widespread use of land in the watersheds for agriculture (especially crop production), extensive strip mining for coal, and in some cases, by combined sewer overflows. Three streams in the project area have been identified by IEPA as impaired for at least some uses, and even those streams not specifically identified as impaired have been impacted by agriculture and/or mining. The species diversity of both fish and mussels in the streams is low, and all species found are common in this part of Illinois. While sufficient data do not exist to quantify the added impacts of the Build Alternative, the data that do exist, as discussed in this section, suggest that additional impact to these streams from the construction and maintenance of the Build Alternative will be so small in comparison with impacts from existing sources that the impacts will likely not be separately detectable. Therefore no discernable contributions to cumulative impacts are anticipated.

3.9 Wetlands

The Illinois Interagency Wetland Policy Act of 1989[69] defines wetland as follows:

[69] 20 ILCS 830

> "Wetland" means land that has a predominance of hydric soils (soils which are usually wet and there is little or no free oxygen) and that is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of hydrophytic vegetation (plants typically found in wet habitats) typically adapted for life in saturated soil conditions.

This definition is based on the *U.S. Army Corps of Engineers Wetland Delineation Manual* (USACE 1987) and has been adopted by the USEPA and the U.S. Army Corps of Engineers (USACE) for administering Section 404 of the Clean Water Act. An area is designated as a wetland when there are positive indicators for wetland vegetation, soils, and hydrology, as defined in the USACE 1987 Manual.

3.9.1 Affected Environment

3.9.1.1 Mapped Wetlands

National Wetland Inventory Mapping. Published data, including National Wetland Inventory (NWI) maps, were used to conduct a preliminary evaluation of the extent of wetlands within the project area. Wetland resources per the U.S. Fish and Wildlife Service (FWS) National Wetland Inventory (NWI) mapping for Peoria, Fulton, and McDonough counties are summarized in Suloway and Hubbell (1994). Three of the five broad types of wetlands classified by NWI are found in Illinois: lacustrine (lakes), riverine (rivers) and palustrine (swamp, bottomland forest, shallow marsh/wet meadow, deep marsh, open water, and scrub-shrub). Based on NWI mapping, wetlands of all types occupy 3.5 percent of the total area of Illinois; the great majority, 3.3 percent, is palustrine wetland (Suloway and Hubbell 1994). Table 3-35 summarizes the NWI data for the three-county project corridor. As shown in the table, of the three project area counties only Fulton County has a larger percentage of palustrine wetlands than the statewide average.

The project corridor occurs within the following watersheds (hydrologic units) as catalogued by the U.S. Geological Survey:

- Lower Illinois-Lake Chautauqua, HUC 07130003. This unit is designated as the Middle Illinois River Watershed by the IEPA and includes roughly the Peoria County portion of the project corridor.

- Spoon River, HUC 07130005. This unit includes nearly all of Fulton County within the corridor and a small part of eastern McDonough County.

- La Moine River, HUC 07130010. All but the far eastern part of the McDonough County portion of the corridor lies within this unit.

Table 3-35
NWI-Mapped Palustrine Wetlands within the IL 336 Project Corridor Counties

County	Acres within County	Palustrine Wetland Acres	Percent Palustrine Wetlands
Peoria	399,182	12,353	3.1%
Fulton	559,507	19,051	3.4%
McDonough	373,708	7,430	2.0%
Three-County Total	1,332,397	38,834	2.9%
State of Illinois	35,691,046	1,168,964	3.3%

Source: NWI as reported in Suloway and Hubbell (1994)

Table 3-36 summarizes the extent of wetland types that occur within these three hydrologic units, based on NWI maps. The IDNR uses these same hydrologic units to determine compensation ratios when wetlands are impacted and compensation is required. IDNR encourages nearby replacement by requiring higher compensation ratios when the replacement wetlands are not in the same watershed as the original wetlands.[70] This is discussed in more detail in Section 3.9.3.3.

Onsite Wetland Delineations. On-site delineations done in accordance with the USACE 1987 Manual may differ from NWI-mapped wetlands for two reasons. First, NWI mapping is based on remote sensing, using maps and photographs. Secondly, the USACE 1987 Manual requires a positive indicator of wetlands for soil, vegetation, and hydrology to be considered "jurisdictional"; NWI requires that only one of these three indicators be present. Table 3-37 summarizes characteristics of individual wetlands in the project corridor.

By the 2005 field season, alternative alignments had been identified, as discussed in Section 2, and the field effort focused on these alignments. In 2005, all areas within these alignments were surveyed except those parts that were previously surveyed in 2004. Two hundred thirteen routine onsite wetland investigations were performed, and 113 of these sites were determined to be wetlands and were delineated (Feist 2006).

Table 3-36
NWI-Mapped Wetland Types within the IL 336 Project Corridor Watersheds

Watershed Name:	Middle Illinois River	Spoon River	La Moine River
Hydrologic Unit Code:	713003	7130005	7130010
	Acres	Acres	Acres
Swamp	1,875	1	4
Bottomland Forest	28,192	6,553	12,599

[70] Illinois Administrative Code, Title 17, Subpart 1090.70.

Table 3-36
NWI-Mapped Wetland Types within the IL 336 Project Corridor Watersheds

Watershed Name:	**Middle Illinois River**	**Spoon River**	**La Moine River**
Hydrologic Unit Code:	**713003**	**7130005**	**7130010**
	Acres	**Acres**	**Acres**
Shallow Marsh/Wet Meadow	3,592	2,276	3,158
Deep Marsh	2,603	453	96
Scrub-Shrub	3,368	575	456
Open water	6,942	8,538	2,811
Shallow Lake	13,107	207	9
Lake Shore	67	47	1
Emergent Lake	0	0	0
Total	**59,746**	**18,650**	**19,134**

Because of adjustments to alignments, 12 additional sites were investigated for wetland characteristics in 2006. Eight of these sites were delineated as wetlands (Feist 2007).

3.9.1.2 Wetland Plant Communities

As part of the onsite wetland delineations, each wetland was classified based on plant types and hydrologic characteristics (Table 3-37). The floristic quality index (FQI) shown in Table 3-37 is discussed in detail in Section 3.9.1.3.

Table 3-37
Wetland Sites within the IL 336 Project Corridor

Site No.	Wetland Type	Dominant Plant Species	FQI	% Adventive (Non-native)	Total Wetland Size (ac)
1	Wet meadow	Fowl manna grass, rice cut grass.	13.2	10.7	0.08
3	Pond	Rice cut grass, small duckweed.	8.1	29.4	0.1
4	Pond	Rice cut grass, small duckweed, water meal.	7.8	22.2	0.27
5	Pond	Purplestemmed tickseed, small duckweed.	5.7	26.7	0.08
7	Pond	Blunt spike rush, rice cut grass.	10.4	25	0.19
9	Pond	Rice cut grass, comb pondweed.	12.2	16.7	0.06
10	Pond	Rice cut grass, small duckweed, water meal.	5.3	24.3	0.08
11	Pond	Small duckweed, narrow-leaved cattail.	10.1	33	0.19
12	Pond	Small duckweed, comb pondweed, great duckweed, narrow-leaved cattail.	11.3	24.1	0.38
13	Pond	Small duckweed, cursed crowfoot, water meal.	6.9	31.6	0.12
14	Wet meadow	Panicled aster, dark green rush.	13.8	11.5	0.05
16	Wet meadow	Panicled aster, reed canary grass.	14.4	14.6	0.12
17	Wet meadow	Rice cut grass, reed canary grass.	10	15.8	0.01
21	Farmed wetland	Corn.	1.5	20	0.81
23	Forested wetland	Silver maple, American elm, red top, honewort, Canada wood nettle, Canada clearweed.	10.7	10.5	0.56
26	Wet meadow	Reed canary grass.	14.9	8.6	0.33
28	Farmed wetland	Corn.	1.8	50	1.12
30	Forested wetland	Silver maple, buttonwood, American elm, honewort, Virginia wild rye, Canada wood nettle.	16	17.8	7.47
33	Wet meadow	Spotted touch-me-not.	17.5	5	0.01
34	Pond	Comb pondweed, broad-leaved cattail.	15	7.4	0.94
35	Pond	Black willow, small duckweed, reed canary grass.	6.3	35.3	0.29
37	Pond	Rice cut grass, small duckweed.	9.2	17.4	0.19
38	Wet meadow	Sweetflag, brown fox sedge, reed canary grass, cursed crowfoot.	14.2	25	0.32
40	Wet meadow	Reed canary grass, broad-leaved cattail.	8.3	39.3	0.14
41	scrub-shrub wetland	Sandbar willow, reed canary grass, dark green rush.	10.7	16	0.06
42	Pond	Small duckweed, broad-leaved cattail.	10	22.2	0.13
45	Pond	Reed canary grass, narrow-leaved cattail.	13.8	26.2	0.61
46	Pond	Reed canary grass, narrow-leaved cattail.	10.8	25	0.3

Table 3-37
Wetland Sites within the IL 336 Project Corridor

Site No.	Wetland Type	Dominant Plant Species	FQI	% Adventive (Non-native)	Total Wetland Size (ac)
47	Pond	Panicled aster, rice cut grass, deer-tongue grass, reed canary grass.	12.2	12.5	0.08
48	Pond	Purplestemmed tickseed, spiny barnyard grass, rice cut grass, smartweed, curttop lady's thumb.	8.7	25	0.4
49	Wet meadow	Reed canary grass, mild water pepper.	3	50	0.02
50	Pond	Small duckweed, reed canary grass.	6	35.7	1.44
51	Pond	Rice cut grass, pinkweed, northern yellow cress.	6.9	12.5	0.52
52	Pond	Watermilfoil, southern naiad.	12.6	34	0.46
53	Wet meadow	Red top, brown fox sedge, rice cut grass, dark green rush.	9.9	27.8	0.11
54	Pond	Comb pondweed.	8.9	34.5	0.78
55	Pond	Rice cut grass, small duckweed, common naiad, comb pondweed, water meal.	10.8	8	0.93
56	Wet meadow	Red top, brown fox sedge, rice cut grass, reed canary grass.	9.6	33.3	0.14
57	Wet meadow	Rice cut grass, reed canary grass.	11.7	17.9	0.13
59	Wet meadow	Rice cut grass, reed canary grass, dark green rush, great bulrush.	8.5	20	0.29
61	scrub-shrub wetland	Sanbar willow, reed canary grass.	9.2	17.2	0.2
64	Farmed wetland	Soybean.	0	100	0.61
65	Pond	(not determined--denied access to site)	NA	NA	1.96
66	Pond	Narrow-leaved cattail, broad-leaved cattail.	6.3	28.5	0.84
71	Marsh/Wet meadow	Reed canary grass, broad-leaved cattail.	8.5	34.6	0.3
72	Wet meadow	Reed canary grass.	7.2	22.2	0.07
73	Pond	Small duckweed, mild water pepper, smartweed, water meal.	6.7	21.1	0.06
75	Wet meadow	Spotted touch-me-not, reed canary grass.	15.2	18.4	0.29
76	Wet meadow	Rice cut grass, dark green rush.	11.8	8.7	0.26
77	Pond	Rice cut grass, broad-leaved cattail.	9.8	27	0.99
78	Pond	Broad-leaved cattail.	10.4	21.9	0.92
79	Wet meadow	Rice cut grass, reed canary grass, dark green rush.	13.7	21.6	0.62
80	Pond	Reed canary grass.	10.4	10.3	0.93
81	Wet meadow	Reed canary grass.	9.6	28.2	1.96
82	Pond	Rice cut grass, reed canary grass, broad-leaved cattail.	9.2	15	0.77

Table 3-37
Wetland Sites within the IL 336 Project Corridor

Site No.	Wetland Type	Dominant Plant Species	FQI	% Adventive (Non-native)	Total Wetland Size (ac)
83	Pond	Small duckweed, narrow-leaved cattail, broad-leaved cattail.	7.1	14.3	0.25
85	Pond	Rice cut grass, reed canary grass.	10.3	30	1.17
86	scrub-shrub wetland	Common elder, garlic mustard, honewort, spotted touch-me-not.	13.1	12.9	0.08
88	Wet meadow	Meadow fescue, spotted touch-me-not, rice cut grass.	15.2	20	0.07
90	Marsh	Rice cut grass, narrow-leaved cattail, broad-leaved cattail.	14.8	13	0.28
93	Pond	Purplestemmed tickseed, small duckweed.	6.3	21	0.13
95	Farmed wetland	Soybean.	1.5	50	0.29
96	Farmed wetland	Corn.	2.3	47.1	0.38
97	Farmed wetland	Long-leaved ammannia, spiny barnyard grass, clammy hedge hyssop, purslane.	4.5	36.4	0.16
100	Wet meadow	Reed canary grass.	3.8	33.3	0.15
102	Farmed wetland	Quack grass, spiny barnyard grass, corn.	2.5	60	0.23
106	scrub-shrub wetland	Black willow, common horsetail, common reed, Canada goldenrod.	13.5	7.7	0.14
110	Wet meadow	Reed canary grass.	8.7	47.1	0.08
111	Marsh	Flag root, reed canary grass.	11.5	13.6	0.15
112	Wet meadow	Flag root, blunt spike rush, meadow fescue, fowl manna grass, water pepper.	11.5	36	0.1
114	Wet meadow	Awned graceful sedge, prickly sedge, meadow fescue, fowl manna grass, Canada clearweed.	11.4	25	0.02
115	Forested wetland	Silver maple, green ash, honey locust, hedge apple, American elm, honewort, Canada wood nettle, reed canary grass	17.9	23	6.72
116	Wet meadow	Brown fox sedge, fowl manna grass.	11.6	23.1	0.02
119	Wet meadow	Purplestemmed tickseed, common beggar's ticks, brown fox sedge, blunt spike rush, marsh elder, rice cut grass.	10.4	25	1.48
120	Wet meadow	Brown fox sedge, blunt spike rush, great spike rush, marsh elder.	7.9	37.5	2.88
121	Sedge meadow	Hop sedge, brown fox sedge, spiny barnyard grass, blunt spike rush, great spike rush, reed canary grass, water knotweed.	15.5	16.7	1.76
122	Wet meadow	Brown fox sedge, late boneset, marsh elder, water pepper.	10.4	32.4	1.06
123	Forested wetland	Silver maple, panicled aster, prickly sedge.	11.1	30.2	1.08
124	Wet meadow	Reed canary grass, water pepper.	8.2	16.7	0.91

Table 3-37
Wetland Sites within the IL 336 Project Corridor

Site No.	Wetland Type	Dominant Plant Species	FQI	% Adventive (Non-native)	Total Wetland Size (ac)
125	Forested wetland	American elm, reed canary grass, Virginia wild rye.	8.5	34.8	1.01
126	Wet meadow	Marsh elder, reed canary grass, water pepper.	9.7	32	0.02
128	Forested wetland	Silver maple, reed canary grass.	10	26.7	0.51
129	Wet meadow	Reed canary grass.	4.7	41.2	8.92
130	Forested wetland	Silver maple, honey locust, giant ragweed, poison hemlock, Virginia wild rye, reed canary grass, Canada clearweed.	12.5	25	4.69
131	Sedge meadow/Wet meadow	Giant ragweed, panicled aster, bristly cattail sedge, prickly sedge, brown fox sedge, reed canary grass, water knotweed, mild water pepper.	11.9	8.3	1.26
132	Wet meadow (seep)	Spotted touch-me-not, Canada wood nettle, white grass, clustered black snakeroot.	18.8	14.9	0.12
133	Pond	Reed canary grass.	8.3	30.4	0.18
135	Forested wetland	Green ash, honey locust, giant ragweed, honewort, Virginia wild rye, reed canary grass, clustered black snakeroot.	13	9.7	0.15
136	Wet meadow (seep)	Spotted touch-me-not, reed canary grass.	14.7	9.4	0.08
137	Forested wetland	Silver maple, honey locust, honewort, Virginia wild rye, Canada clearweed.	16.5	6.7	0.13
138	Wet meadow (seep)	Spotted touch-me-not, Canada clearweed.	13.5	5	0.03
139	Forested wetland	Silver maple, honewort, rice cut grass, Canada clearweed, water pepper.	12.7	8	0.23
142	Wet meadow	Reed canary grass.	17.6	9.6	3.61
143	Pond	Small duckweed, reed canary grass.	12.9	17.9	0.23
146	Wet meadow	Squirrel-tail grass, common knotweed, water pepper.	3.5	72.7	0.28
148	Pond	Small duckweed, reed canary grass, narrow-leaved cattail.	5.1	38.9	0.35
152	Wet meadow (seep)	Reed canary grass.	8.5	21.1	0.1
154	Marsh (seep)	Narrow-leaved cattail.	10.6	31.3	0.07
156	Pond	Common horsetail, white grass, small duckweed, dark green rush.	14.7	15.6	0.02
157	Forested wetland	Silver maple, eastern cottonwood, giant ragweed, honewort.	10.4	8	0.14
158	Wet meadow	Giant ragweed, green-headed fox sedge, reed canary grass, red clover.	8.5	43.3	0.14
161	Pond/wet meadow	Anacharis, reed canary grass, comb pondweed.	17.3	15.3	1.62

Table 3-37
Wetland Sites within the IL 336 Project Corridor

Site No.	Wetland Type	Dominant Plant Species	FQI	% Adventive (Non-native)	Total Wetland Size (ac)
164	Forested wetland/ wet meadow	Black willow, reed canary grass.	7.1	25	0.17
165	Pond	Rice cut grass, comb pondweed, broad-leaved cattail.	10.9	22.2	0.05
166	Forested wetland	Silver maple, spotted touch-me-not, reed canary grass, swamp buttercup.	12.6	7.1	0.16
170	Pond/wet meadow	Rice cut grass, small duckweed, American pondweed, comb pondweed.	14.5	17.2	0.09
173	Pond/wet meadow	Red-rooted spike rush, American pondweed, comb pondweed.	12.5	15.8	0.13
174	Pond	Needle spike rush, beginner's pondweed, comb pondweed.	11.6	18.5	2.59
175	Wet meadow	Spiny barnyard grass, reed canary grass, cursed crowfoot.	5.4	37.5	0.23
179	Forested wetland	Black willow, sandbar willow, meadow fescue, reed canary grass.	11	16.7	0.59
180	Marsh/Wet meadow	Sweetflag, brown fox sedge, fowl manna grass, reed canary grass.	20.6	19	0.53
181	scrub-shrub wetland/ pond	Rice cut grass, reed canary grass.	13	24.2	0.48
186	Pond	small duckweed, reed canary grass.	5.8	23.8	0.04
192	Wet meadow (seep)	Red-rooted spike rush, American bulrush, dark green rush.	11.3	20	0.1
193	Pond	Spike rush, beginner's pondweed, American pondweed, broad-leaved cattail, narrow-leaved cattail.	8.7	18.2	4.99
194	Pond	Spike rush, beginner's pondweed, American pondweed.	10.1	33.3	0.77
195	Pond	small duckweed, reed canary grass, beginner's pondweed.	12.2	19.4	0.37
196	Pond	Flat-stemmed spike rush, spike rush, beginner's pondweed, American pondweed.	13.3	35	0.92
197	Pond	Spike rush, European water milfoil, American pondweed, comb pondweed.	12.6	38.4	1.13
201	Marsh	Narrow-leaved cattail.	7.3	34.5	0.23
202	Marsh	Reed canary grass, water knotweed, narrow-leaved cattail, broad-leaved cattail.	14	19.1	0.37
204	scrub-shrub wetland	Sandbar willow, reed canary grass.	12.7	35.1	0.23
206	Scrub-shrub wetland/ wet meadow	Sandbar willow, small duckweed, reed canary grass, narrow-leaved cattail, broad-leaved cattail.	10.6	20.7	1.11

Table 3-37
Wetland Sites within the IL 336 Project Corridor

Site No.	Wetland Type	Dominant Plant Species	FQI	% Adventive (Non-native)	Total Wetland Size (ac)
207	scrub-shrub wetland/ marsh	Sandbar willow, red-rooted spike rush, water knotweed, narrow-leaved cattail, broad-leaved cattail.	13.1	14.3	0.21
208	Pond	Red-rooted spike rush, fog fruit, comb pondweed.	11.5	8.3	0.12
210	scrub-shrub wetland/ pond	Sandbar willow, black willow, needle spike rush, red-rooted spike rush, small duckweed, fog fruit, comb pondweed, water meal.	14.6	11.6	0.98
211	Pond	Sandbar willow, spike rush.	8.7	17.4	0.99
212	Pond	Spike rush, European water milfoil, American pondweed, comb pondweed.	11.6	27.8	1
214	Wet meadow	Reed canary grass.	2.5	60	0.06
215	Pond	Spike rush, small duckweed, European water milfoil, American pondweed.	13.2	24.1	0.99
220	Marsh	Reed canary grass, narrow-leaved cattail.	9.7	23.1	0.06
223	Wet meadow	Reed canary grass.	4.9	40	0.09
224	Marsh	small duckweed, reed canary grass, narrow-leaved cattail.	7	33.3	0.22
227	Forested wetland	Silver maple, black willow, sandbar willow, reed canary grass.	13.8	15.8	1.15
228	Pond/wet meadow	Coontail, reed canary grass, American pondweed, great bulrush.	15.2	15.8	2.23
230	scrub-shrub wetland/ marsh	Sandbar willow, black willow, reed canary grass, Canada goldenrod, narrow-leaved cattail.	10.2	29	1.13
232	Forested wetland	Silver maple, common elder, reed canary grass, Canada clearweed, smartweed.	8	15.8	0.16
237	Pond/wet meadow	Spotted touch-me-not, white grass, small duckweed, reed canary grass, Canada clearweed.	16.7	12.7	1.21
238	Marsh	Panicled aster, spike rush, water pepper, narrow-leaved cattail.	6	46.7	0.53
242	Wet meadow	Needle spike rush, red-rooted spike rush, American pondweed.	11.5	7.7	0.16
244	Marsh	Red-rooted spike rush, great bulrush, narrow-leaved cattail.	10.4	15.4	0.27
245	Marsh	Red-rooted spike rush, water pepper, narrow-leaved cattail.	8.3	33.3	0.01
246	Marsh	Red-rooted spike rush, narrow-leaved cattail.	5.4	31.3	0.06
247	Marsh	Needle spike rush, great bulrush.	8.5	16	0.2
248	Marsh	Red-rooted spike rush, fog fruit, narrow-leaved cattail.	10.8	21.1	0.22

Table 3-37
Wetland Sites within the IL 336 Project Corridor

Site No.	Wetland Type	Dominant Plant Species	FQI	% Adventive (Non-native)	Total Wetland Size (ac)
249	Wet meadow	Rice cut grass.	9.9	37	0.25
252	Wet meadow	Spiny barnyard grass, red-rooted spike rush, rice cut grass.	5.4	35.3	0.04
253	Wet meadow	Spiny barnyard grass, red-rooted spike rush, eastern cottonwood.	5.7	25	0.07
254	Forested wetland	Black willow, reed canary grass.	5.5	38.1	0.07
255	Wet meadow	Red top, reed canary grass, dark green rush.	13.3	10	0.26
256	Forested wetland	Eastern cottonwood, black willow, spotted touch-me-not, small duckweed, reed canary grass.	12.8	17.8	0.99
258	Wet meadow	Reed canary grass.	15	20	4.24
260	Wet meadow	Reed canary grass.	7.8	17.6	0.49
261	Pond/wet meadow	Rice cut grass, small duckweed, reed canary grass, great bullrush, water meal.	10	8.3	0.15
263	Wet meadow	Reed canary grass.	10.8	28.1	0.8
264	scrub-shrub wetland/ pond	Sandbar willow, slender naiad, reed canary grass, comb pondweed.	9.4	27.6	0.55
266	Pond	Needle spike rush, red-rooted spike rush, common arrowhead.	10.3	0	0.26
267	Pond	Needle spike rush, red-rooted spike rush, European water milfoil, reed canary grass, comb pondweed.	14.3	12.1	0.34
268	Marsh	Narrow-leaved cattail.	10.8	13.3	0.06
270	Pond/wet meadow	Needle spike rush, red-rooted spike rush, rice cut grass, fog fruit, comb pondweed, water star-grass.	13.4	8.3	0.43
272	Wet meadow	Needle spike rush, old witch grass, curttop lady's thumb, cocklebur.	8.3	11.5	0.46
276	Pond	Sandbar willow, small duckweed, reed canary grass.	4.6	29.4	0.49
277	scrub-shrub wetland	Sandbar willow, sawtooth sunflower, reed canary grass, dark green rush, Canada goldenrod.	10.9	31.3	1.97
278	Pond/wet meadow	Red-rooted spike rush, rice cut grass, reed canary grass, American pondweed, broad-leaved cattail.	13	15.2	0.06
282	Wet meadow	Red top, meadow fescue, reed canary grass, common reed.	4.8	26.7	0.14
289	Wet meadow	Red-rooted spike rush, reed canary grass.	2.7	44.4	0.06
291	Wet meadow	Red-rooted spike rush, reed canary grass.	4.9	44.4	0.08
293	Wet meadow	Red-rooted spike rush, American bulrush.	3.8	12.5	0.22
294	Wet meadow	Reed canary grass.	2.1	60	0.02
296	Wet meadow	Reed canary grass.	4	50	0.11

Table 3-37
Wetland Sites within the IL 336 Project Corridor

Site No.	Wetland Type	Dominant Plant Species	FQI	% Adventive (Non-native)	Total Wetland Size (ac)
297	Wet meadow	Red-rooted spike rush, reed canary grass.	2.1	60	0.02
298	Wet meadow	Red-rooted spike rush, reed canary grass.	3.9	15.4	0.09
299	Wet meadow	Red-rooted spike rush, reed canary grass.	3.5	33.3	0.06
305	Forested wetland	Black willow, reed canary grass.	13.3	14.8	0.22
309	Pond	Purplestemmed tickseed, American pondweed.	5.3	18.2	0.5
310	Pond	small duckweed, reed canary grass.	6.9	26.7	0.03
312	Pond	Sandbar willow, reed canary grass, comb pondweed, small duckweed.	4.9	36.4	0.12
315	Pond	Silver maple, sandbar willow, reed canary grass.	6	11.1	0.27
316	Wet meadow	Spiny barnyard grass, reed canary grass.	7.5	83.3	0.91
317	Wet meadow	honewort, spotted touch-me-not, small duckweed, Canada clearweed.	13.6	15.2	0.15
323	Wet meadow	Tall waterhemp, giant ragweed, horseweed, reed canary grass.	6.9	35	0.4
324	Wet meadow	Spiny barnyard grass, reed canary grass.	6.8	19	4.92
326	Wet meadow	Common reed, American pondweed.	8.1	21.4	0.08
328	Pond	Spiny barnyard grass, rice cut grass, curttop lady's thumb, pinkweed.	6.5	28.6	0.48
329	Wet meadow	Reed canary grass.	3.5	33.3	0.06
330	Pond	Rice cut grass.	9.4	18.5	0.32
331	Marsh	Swamp beggar's ticks, broad-leaved cattail.	8.4	24.4	0
332	Wet meadow	Reed canary grass.	3.3	25	0.66
		Total			**123.8**

Note: No. 22 was identified as a farmed wetland during the field delineations but was later determined not to be a wetland and is not included.

The wetland cover types (plant communities) within the project corridor are summarized below and in Table 3-38 in order of decreasing predominance. As shown in Table 3-38, 86 percent of the wetland acreage is wet meadow, pond, forested, or a combination wet meadow and pond.

Wet Meadow Wetlands. Wet meadows comprise 32.5 percent of the wetland acreage delineated within the project area. Sixty-six wetlands were identified as wet meadows. Reed canary grass, an invasive, non-native species that spreads quickly was by far the most common dominant in wet meadows. Other dominants included rice cut grass, red-rooted spike rush, panicled aster, spotted touch-me-not, mild water pepper, marsh elder, fowl manna grass, and spiny barnyard grass.

Pond Wetlands. All 57 pond wetlands were excavated and/or diked and impounded. These sites, which make up 27.6 percent of the wetland acreage delineated within the project area, consist primarily of constructed farm ponds or ponds resulting from strip mining. Common dominant species in pond wetlands include rice cut grass, narrow-leaved cattail, broad-leaved cattail, reed canary grass, sandbar willows, and several species of rush. Some ponds were also dominated by floating and aquatic herbs such as small duckweed, lesser duckweed, comb pondweed, common naiad, and water meal.

Forested Wetlands. The 18 forested wetlands make up 21.0 percent of the delineated wetland area. The larger forested wetlands tended to occur near the Spoon and La Moine Rivers. As shown in Table 3-38, when compared with the other wetland types, the average forested wetland is larger. Silver maples were the most dominant tree species; American elm, buttonwood, honey locust, green ash and black willow were also dominant trees. Honeywort, Virginia wild rye, Canada wood nettle and Canada clearweed were common dominants in the herbaceous layer.

Pond/Wet Meadow. These eight sites, 4.8 percent of the delineated wetlands, were combination wetland sites where a wet meadow was adjacent to a wetland pond. The boundary between the two community types is very dynamic, constantly changing both seasonally and from year to year. Dominant plants included red-rooted spike rush, rice cut grass, elodea, reed canary grass, spotted touch-me-not, American pondweed, lesser duckweed, and comb pondweed.

Farmed Wetlands. The seven farmed wetlands, which comprised 2.9 percent of the delineated wetlands, were all planted in either corn or soy beans. Some had other dominant species including reed canary grass, spiny barnyard grass, and quack grass.

Marsh Wetlands. The 15 small marshes made up 2.2 percent of the delineated wetland area. Dominant species included narrow-leaved cattail, reed canary grass, panicled aster, red-rooted spike rush, flag root, lesser duckweed, softstem bulrush, water pepper, swamp beggar’s tick, broad-leaved cattail and needle spike rush.

Table 3-38
Summary of Project Area Wetlands

	Acre-age	Percent of Total	Size Range, Acres	Average Size, acres	FQI Range	Average FQI	Number with FQI>20	Number with FQI 10-20	Number with FQI 5-10	Number with FQI<5	Percent Adventive Range	Percent Adventive Average
Wet Meadow	40.3	32.5	0.1-8.92	0.61	2.1-18.8	9.1	0	27	22	17	5-83.3	28.1
Pond	34.1	27.6	0.02-4.99	0.60	4.6-15	9.4	0	28	27	2	0-38.9	23.0
Forested	26.0	21.0	0.07-7.47	1.45	5.5-17	12.0	0	15	3	0	6.7-38.1	18.1
Pond/Wet Meadow	5.9	4.8	0.06-2.23	0.7	10-17.3	14.1	0	8	0	0	8.3-17.2	13.6
Farmed	3.9	2.9	0.16-1.12	0.49	0-4.5	2.3	0	0	0	8	20-100	49.3
Marsh	2.7	2.2	0.01-0.53	0.20	5.4-14.8	9.6	0	7	8	0	13-46.7	24.6
Scrub-shrub	2.7	2.2	0.06-1.97	0.45	9.2-13.5	11.7	0	5	1	0	7.7-35.1	20.03
Scrub-shrub/pond	2.0	1.6	0.24-0.49	0.30	9.4-14.5	12.3	0	2	1	0	11.6-27.6	21.1
Sedge Meadow	1.76	1.4	NA	NA	15.5	NA	0	1	0	0	16.7	NA
Scrub-shrub/marsh	1.34	1.1	0.21, 1.13	NA	13.1, 10.2	NA	0	2	0	0	14.3, 29	NA
Sedge meadow/wet meadow	1.26	1.0	NA	NA	11.9	NA	0	1	0	0	8.3	NA
Scrub-shrub/wet meadow	1.11	0.9	NA	NA	10.6	NA	0	1	0	0	20.7	NA
Marsh/wet meadow	0.83	0.7	0.3, 0.53	NA	8.5, 20.6	NA	1	0	1	0	34.6, 19	NA
Forested/wet meadow	0.17	0.1	NA	NA	7.1	NA	0	0	1	0	25	NA

Scrub-Shrub Wetlands. Six wetlands in the project area were designated as scrub-shrub, comprising 1.6 percent of the wetland area. The scrub-shrub wetlands were dominated by sandbar willows. Other dominants included common elder, black willow, common reed, reed canary grass, and dark green rush.

Scrub-Shrub Wetland/Pond. Three wetlands, comprising 1.6 percent of the project wetland area, were a combination scrub-shrub and pond. Dominant species included sandbar willow, rice cut grass, reed canary grass and comb pondweed.

Sedge Meadow. The single sedge meadow represented 1.4 percent of the project wetland area. Dominant plants included hop sedge, brown fox sedge, spiny barnyard grass, reed canary grass, blunt spike rush, and great spike rush.

Scrub-Shrub Wetland/Marsh. Two wetlands were a combination scrub-shrub and marsh and comprised 1.1 percent of the project wetland area. Dominant species included sandbar willow, black willow, red-rooted spike rush and narrow-leaved cattail.

Sedge Meadow/Wet Meadow. The single wetland in this category represented about one percent of the project wetland area and was dominated by giant ragweed, panicled aster, bristly cattail sedge, common fox sedge, brown fox sedge, reed canary grass, water knotweed, water pepper.

Scrub-Shrub Wet Meadow. The one wetland in this category comprised less than one percent of the project wetland area and was dominated by Sandbar willow, lesser duckweed, reed canary grass, narrow-leaved cattail, broad-leaved cattail.

Marsh/Wet Meadow. This single wetland was dominated by sweetflag, brown fox sedge, fowl manna grass and reed canary grass.

Forested/Wet Meadow. The single 0.17-acre wetland in this category was dominated by black willow and reed canary grass.

3.9.1.3 Wetland Functions

Wetland functions were assessed qualitatively for all sites during field delineations. Specific functions assessed included wildlife habitat, floristic quality, groundwater discharge and heritage characteristics. A brief description of the suite of wetland functions follows. Flood storage and recreation value were assessed later.

Wildlife Habitat. Forested wetlands along the East Fork of the La Moine River, Spoon River and Shaw Creek provided the most high-quality wildlife habitat within the project corridor. Although the actual amount of forested areas within the project corridor that was jurisdictional wetland was quite small (18.0 acres at the La Moine River and 0.6 acre at Spoon River/Shaw Creek), these wetlands were within larger floodplain forests that bordered the rivers and streams.

Many animal species make use of these forested areas, as both nesting and foraging habitat. They also provide a riparian corridor for use in migration and local travel.

Pond wetlands, regardless of floristic quality, are important year-round water sources for wildlife and important breeding habitat for amphibians. Marshes provide important cover, nesting habitat, and foraging habitat for birds such as rails and bitterns. Wet meadows and scrub-shrub wetlands can also provide cover, nesting habitat, and foraging habitat for a number of birds and mammals.

Floristic Quality and Percent Adventive. Floristic quality was measured using the Floristic Quality Assessment (FQA) methodology of Taft et al (1997). The FQA method is based on a numerical rating (floristic quality index, FQI) of plant communities. The numerical rating describes the natural quality of plant communities. A low FQI often indicates disturbance and low natural quality, whereas a high FQI indicates low disturbance and high natural quality. The basis for the numerical rating is the assignment of coefficients of conservatism (numbered 0 to 10) to each plant species known to occur in Illinois. Nonnative species are not given a numerical rating. Higher coefficients of conservatism generally are assigned to species that are native and found in specialized habitats, whereas lower coefficients are assigned to species that are weedy, common, and habitat generalists. Once a comprehensive plant species list has been compiled for a natural area remnant, its FQI is calculated. An FQI below 10 suggests a site of low natural quality, and an FQI below 5 may denote a highly disturbed site. An FQI above 20 suggests that a site has evidence of native character and may be an environmental asset. Calculated FQIs in this document include all native plant species recorded at the site. The FQA method also measures "percent adventive" of a plant community. Adventive plant species are not native to Illinois. Percent adventive is the number of nonnative plant species divided by the total number of plant species in an area. A high percentage of adventive plants indicates a high level of ecological disturbance, whereas a low percentage indicates a low level of disturbance. As part of the onsite wetland delineations, the FQI was calculated for each site, and the percent of adventive (non-native) plants was estimated. These values are shown in Table 3-37 for each wetland, and are summarized in Table 3-38 by wetland type.

FQIs were less than 5 for 17 wet meadows, 2 ponds, and all 8 farmed wetlands. Most of the forested and scrub-shrub wetlands, and all of the pond/wet meadows, the sedge meadow, the scrub-shrub marshes, the sedge meadow/wet meadow, and the scrub-shrub/wet meadow had FQIs between 10 and 20. Only one wetland in the project area (Site 180), had a FQI greater than 20. This 0.53-acre marsh/wet meadow complex is located in a drainageway west of Cuba.

Heritage Characteristics. Heritage characteristics refer to wetlands that provide habitat for state or federal listed species and wetlands located in designated lands such as Illinois Nature Preserves, natural areas, parks and wildlife refuges. None of the wetland sites within the project area were identified as having heritage characteristics.

Flood Storage. Generally, wetlands that, because of landscape position, can readily receive floodwaters are those that provide the greatest flood storage function. This includes wetlands

situated in the floodplain and also those in the upper parts of the watershed that have the opportunity to detain and desynchronize floodwaters from tributaries. Wetlands that are hydrologically isolated from streams have little opportunity to detain or desynchronize flood waters. Wetland data on hydrologic connectivity and flood storage functions of individual wetlands are based on hydrology observations as part of the wetland delineations completed in the project area. Some of the delineated wetlands are located within the 100-year floodplain of the La Moine River and thus could readily receive and store floodwaters: 116, 119 through 126, 128 through 131, 137, 139, 142, 144 and 146. Wetlands 21, 23, 28 and 30 are in the 100 year floodplain of the Spoon River. The only other delineated wetlands located in a floodplain were 86 and 88, in the 100-year floodplain of the West Branch of Lamarsh Creek, near the east end of the project. Wetland 237 is located on the West Branch of Copperas Creek, a perennial stream, and while not in a 100-year flood plain, has some value for flood storage. Wetlands 227 and 228 are located on an intermittent drainage with impoundments both upstream and downstream, and have some minor value for flood storage. Some of the wetlands have streamflow in and out, indicating some value for flood storage.

Groundwater Discharge. Wetlands within the project area that express the function of groundwater discharge are identified as hillside seeps. Groundwater discharge is an important wetland characteristic because of the unique water chemistry, plant communities, and uncommon plant species that seep areas support. Wetlands within the project area that are seeps are Sites 132, 136, 138, 152, 154 and 192. Wetland 152 is a marsh and all others are wet meadows.

Recreation Values. Wetlands valued for recreation generally are in public ownership and maintained for passive and consumptive recreation. Except for wetlands within existing roadway right-of-way, no wetlands delineated in the project area are in public ownership and none are maintained for recreation.

3.9.2 Environmental Consequences

Of the 189 field-delineated wetlands in the project area, the Build Alternative will affect 21 individual wetlands totaling approximately 4.11 acres (Table 3-39). Besides the loss of wetland area, wetland functions and values will be affected by the Build Alternative. The effect of the Build Alternative on wetlands is discussed below. The No-Build Alternative will not affect wetlands.

3.9.2.1 Acreage Impacts

Table 3-39 summarizes wetland impacts by wetland type. Of the 21 wetlands that will be impacted, 8 are pond wetlands, three are forested and three are marshes. There are two each of pond/wet meadow and scrub-shrub. There is one each of wet meadow, scrub-shrub/marsh, and scrub-shrub/pond. The largest wetland that will be impacted is Site 228, a 2.2-acre wetland pond. Site 228 is in a drainage in a disturbed area near strip-mined ponds south of Cypress Road. Five other impacted wetlands are greater than one acre: another pond, a forested wetland, two scrub-shrub wetlands, and a pond/wet meadow.

Only three wetlands will have impacts greater than one-half acre: No. 227, a forested wetland (0.96 acre impact); No. 230, a scrub/shrub wetland (0.75 acre impact), and No. 237, a pond/wet meadow (1.13 acre impact).

3.9.2.2 Functional Impacts

The discussions below summarize impacts to wetlands functions, which are defined in Section 3.9.1.3.

Wildlife Habitat. A characteristic relevant to wildlife habitat is plant community structure. Wetland complexes, which are wetlands that consist of more than one wetland type, generally provide varied habitat and are attractive to wildlife. The Build Alternative will impact the following wetland complex sites: 207 (a scrub-shrub wetland/marsh complex), 210 (a scrub-shrub wetland/pond complex), and 173 and 237 (pond/wet meadow complexes). None of these impacted wetlands is large (the largest is Site 237 at 1.21 acre). Impacts to Sites 207, 210, will all be edge impacts, while Site 173 will be totally taken, and over 90 percent of Site 237 will be taken. Impacts to Sites 207 and 210 will be very minor. Accordingly, the minor impacts to Sites 207 and 210 are expected to have only negligible effects on the limited attractiveness of those small wetlands to wildlife. Although it will lose most of its area, the remnant of Site 237 will continue to provide some limited wildlife habitat. All impacted wetlands were considered to provide wildlife habitat (Table 3-39).

Floristic Quality and Percent Adventive. Wetlands having an FQI of 20 or greater may be considered environmental assets. The Build Alternative will not affect any wetlands with FQI of 20 or greater. The highest FQI of any impacted wetland is 16.7 (Site 237), the lowest is 5.1 (Site 148) and the average of all 21 impacted wetlands is 11.2.

The lowest percent adventive species of any impacted wetland is 8.3 (Site 208) and the highest is 38.9 (Site 148). Earthmoving associated with road improvements can create an environment suitable for reed canary grass and other invasive species. Introduction of invasive species can lead to decline of floristic diversity and FQI and an increase in percent adventive. Potential impacts will occur along the edges of 16 of the impacted wetlands and the remaining five will be totally filled. No wetlands are bisected. Edge impacts likely will have less impact on FQI than will wetland bisection.

Table 3-39
Summary of Wetland Acreage and Functional Impacts in the IL 336 Project Area

Wetland No.	Aerial Exhibit Sheet	Wetland Type and Setting	Total Wetland Size (Acres)	Impact Area (Acre)	FQI	% Adventive	Function
148	3	Pond in agricultural field	0.35	0.15	5.1	38.9	Wildlife habitat
13	9	Pond in wooded ravine	0.12	0.04	6.9	31.6	Wildlife habitat
173	13	Pond/Wet meadow in pasture	0.13	0.13	12.5	15.8	Wildlife habitat
175	14	Wet Meadow in pasture	0.23	0.23	5.4	37.5	Wildlife habitat, flood storage
195	17	Pond in strip mined area next to road	0.37	0.02	12.2	19.4	Wildlife habitat
196	17	Pond in strip mined area next to road	0.92	0.05	13.3	35.0	Wildlife habitat
197	17	Pond in strip mined area next to road	1.13	0.09	12.6	38.4	Wildlife habitat
201	17	Marsh in strip mined area next to road	0.23	0.02	7.3	34.5	Wildlife habitat
202	17	Marsh in strip mined area next to road	0.37	0.37	14.0	19.1	Wildlife habitat
206	17	Scrub-shrub Wetland in strip mined area next to road	1.11	0.15	10.7	20.7	Wildlife habitat
207	17	Scrub-shrub Wetland/Marsh in strip mined area next to railroad	0.21	0.01	13.1	14.3	Wildlife habitat
208	17	Pond in strip mined area next to railroad	0.12	0.06	11.5	8.3	Wildlife habitat
210	17	Scrub-shrub Wetland/Pond in strip mined area next to railroad	0.98	0.01	14.6	11.6	Wildlife habitat
211	17	Pond in strip mined area next to road	0.99	0.04	8.7	17.4	Wildlife habitat
220	19	Marsh in farm field	0.06	0.06	9.7	23.1	Wildlife habitat, flood storage
256	19	Forested wetland in wooded ravine	1.67	0.2	12.8	17.8	Wildlife habitat, flood storage
228	21	Pond in strip mined area	2.23	0.23	15.2	15.8	Wildlife habitat, flood storage
227	21	Forested Wetland in wooded ravine	1.37	0.96	13.8	15.8	Wildlife habitat, flood storage
230	23	Scrub-shrub Wetland in ag field ravine	1.13	0.75	10.2	29.0	Wildlife habitat, flood storage
232	23	Forested Wetland in wooded ravine	0.16	0.16	8.0	15.8	Wildlife habitat, flood storage
237	24	Pond/Wet meadow along wooded stream	1.21	0.38	16.7	12.8	Wildlife habitat, flood storage
		Total	**15.09**	**4.11**			

Note: Table 3-36, which is based on Feist 2006, shows Wetland 227 as 1.15 acres. GIS files from INHS show 227 in three separate sections totaling 1.37 acres.

Floristic Quality and Percent Adventive. Wetlands having an FQI of 20 or greater may be considered environmental assets. The Build Alternative will not affect any wetlands with FQI of 20 or greater. The highest FQI of any impacted wetland is 16.7 (Site 237), the lowest is 5.1 (Site 148) and the average of all 21 impacted wetlands is 11.2.

The lowest percent adventive species of any impacted wetland is 8.3 (Site 208) and the highest is 38.9 (Site 148). Earthmoving associated with road improvements can create an environment suitable for reed canary grass and other invasive species. Introduction of invasive species can lead to decline of floristic diversity and FQI and an increase in percent adventive. Potential impacts will occur along the edges of 16 of the impacted wetlands and the remaining five will be totally filled. No wetlands are bisected. Edge impacts likely will have less impact on FQI than will wetland bisection.

Heritage Characteristics. Wetlands that lie partly within designated lands or provide refuge for federal- or state-listed species express the function of heritage characteristics. No wetlands that will be impacted by the project lie wholly or partly within currently-designated or potentially-designated lands. In addition, no wetlands harboring federal- or state-listed species will be impacted by the project.

Flood Storage. None of the impacted wetlands are in 100-year floodplains, where wetlands provide important flood storage. However, for seven of the impacted wetlands, field observations noted stream flow into the wetland, which indicates the wetland may provide flood storage in some capacity (Table 3-39).

Groundwater Discharge. No wetland that expresses the function of groundwater discharge (that is, a hillside seep) will be impacted by the project.

Recreation Values. No wetlands in public ownership and maintained for passive and consumptive recreation will be impacted by the project.

3.9.3 Measures to Minimize Harm and Mitigation

Executive Order 11990, Protection of Wetlands, requires federal agencies to avoid, to the extent practicable, long- and short-term adverse impacts associated with the destruction or modification of wetlands. More specifically, the Order directs federal agencies to avoid new construction in wetlands unless there is no practicable alternative. It states further that where wetlands cannot be avoided, the proposed action must include all practicable measures to minimize harm to wetlands. “In making this finding the head of the agency may take into account economic, environmental and other pertinent factors.” In accordance with state and federal policies and regulations for wetland preservation, including the Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 CFR, Part 230), the discussion below summarizes the Build Alternative’s wetland mitigation strategies.

3.9.3.1 Wetland Avoidance

Wetlands were avoided where practicable. However, it will not be feasible to design a functional 60-mile-long four-lane highway in the project corridor and avoid all wetland impacts, considering the other environmental and engineering factors.

3.9.3.2 Minimize Wetland Impacts

Minimization of wetland impacts was an important factor in the development and screening of alternatives. Alignments with notable wetland impacts, such as the North alignment at the west end of the project in Corridor Section 1, near the East Fork of the La Moine River, were eliminated from consideration (discussed in Section 2). In the screening process in Corridor Section 4, the West South alignment was retained in spite of higher potential wetland impacts. It is in this section that the majority (72 percent) of the Build Alternative wetland impacts occur. The alignment was retained because it met the project purpose and need better than the alignment with fewer wetland impacts, and because it had fewer relocations and less impact on other resources, including prime farmland, wooded land and grassland. In Corridor Section 3, the North alignment was selected over the North (A), in spite of higher wetland impacts (5.6 acres estimated, compared with 1.4 acres estimated; Table 2-5). The North alignment had fewer impacts on farmland, and resulted in fewer relocations. In addition, final adjustments in the North alignment reduced wetland impacts to 0.36 acres.

The Build Alternative, described in Section 2, incorporated alignment shifts where practicable to minimize impacts to wetlands, and to completely avoid wetlands in floodplains, Group 2 wetlands (sedge meadows, wet prairies and swamps, as defined by IDOT; see Section 3.9.3.3), and wetlands with FQI greater than 20.

In a future design phase, IDOT will investigate additional measures to minimize wetland impacts, such as keeping roadway sideslopes as steep as practicable, using equalizer pipes to maintain wetland hydrology, and employing strict erosion control measures to minimize sedimentation and siltation into adjacent wetlands. The mitigation measures discussed in Section 3.8.3 also will minimize sedimentation into wetlands.

3.9.3.3 Wetland Compensation

Compensation Ratios

Where there is no practicable alternative to filling wetlands, wetland compensation is required. IDNR's rules for implementing the Interagency Wetland Policy Act, which are the rules that govern IDOT's wetland practices, describe wetland compensation as "the replacement of wetland function and area to offset an adverse wetland impact."[71] As required by IDNR's

[71] Title 17 Illinois Administrative Code, Part 1090.

wetland rules, IDOT has a Wetlands Action Plan for its implementation of IDNR's wetland rules. The Wetland Action Plan refers to the IDNR rules for determining compensation ratios.[72] These rules are based on the size of the impacted area and the location of the replacement wetland in relation to the impacted wetland. "On-site" and "off-site" replacement wetlands are in the same hydrologic unit (drainage area as defined in the IDNR regulations) as the impacted wetland, with on-site replacement wetlands being within a mile of the impacted wetlands. Replacement wetlands that are in a different hydrologic unit than the impacted wetlands are "out-of-basin." Replacement ratios for wetlands with less than one half-acre impacted are 1.5:1 (on-site), 2.0:1 (off-site) and 3.0:1 (out-of-basin). Replacement ratios for wetlands with more than one half-acre impacted are 2.5:1 (on-site), 4.0:1 (off-site) and 5.5:1 (out-of-basin). IDNR's wetland rules require higher mitigation ratios for impacted wetlands that have endangered and threatened species, essential habitat for endangered and threatened species, an FQI above 20 or been designated by IDNR as a natural area. No wetlands in these categories will be impacted by the Build Alternative. The wetland compensation requirements for the Build Alternative are shown in Table 3-40. The service area of the IDOT LaGrange Wetland Bank includes the project area and this bank will be used to mitigate the projects wetland impacts. A total of 4.11 acres of wetland will be affected and will require 17.55 acres of wetland compensation.

3.9.4 Indirect Impacts

The Build Alternative is expected to have negligible indirect impacts on wetlands. Secondary development caused by the Build Alternative may occur at or near proposed interchanges. The only proposed interchanges that might experience secondary development and that have wetland areas nearby are those at IL 9 west of the Illinois River Correctional Center, and at IL 78 south of Norris. Both these interchanges are in the vicinity of former strip-mined areas with wetlands. Development at the IL 9 interchange will be limited to areas along IL 9 outside the access control area for the interchange. Nearly all of this available area, outside the area already occupied by the prison, is farmland without wetlands. There are some potential wetland areas west of the interchange, along the west side of proposed IL 336, but not along IL 9. (Because of the size of the project, wetland delineations were not completed at all locations of potential wetlands, but only at locations where impacts were likely. Wetland delineations were not completed at the wetlands noted here as "potential.") At the IL 78 interchange, if development occurred, it will more likely be on existing IL 78, where businesses could have direct access to the highway (businesses will not have direct access to IL 336). The wetlands in the area are not along IL 78.

[72] Title 17 Illinois Administrative Code, §1090.5(c)(8)

Table 3-40
Summary of Wetland Mitigation Requirements for IL 336

Wetland No.	Aerial Exhibit Sheet	Wetland Type	Impact Area (Acre)	Hydrologic Unit	Ratio Category	Ratio X:1	Compensation Required (Acres)
148	3	Pond	0.15	La Moine	Out-of-Basin	3	0.45
13	9	Pond	0.04	Spoon	Out-of Basin	3	0.12
173	13	Pond/Wet meadow	0.13	Spoon	Out-of Basin	3	0.39
175	14	Wet Meadow	0.23	Spoon	Out-of Basin	3	0.69
195	17	Pond	0.02	Spoon	Out-of Basin	3	0.06
196	17	Pond	0.05	Spoon	Out-of Basin	3	0.15
197	17	Pond	0.09	Spoon	Out-of Basin	3	0.27
201	17	Marsh	0.02	Spoon	Out-of Basin	3	0.06
202	17	Marsh	0.37	Spoon	Out-of Basin	3	1.11
206	17	Scrub-shrub Wetland	0.15	Spoon	Out-of Basin	3	0.45
207	17	Scrub-shrub Wetland/Marsh	0.01	Spoon	Out-of Basin	3	0.03
208	17	Pond	0.06	Spoon	Out-of Basin	3	0.18
210	17	Scrub-shrub Wetland/Pond	0.01	Spoon	Out-of Basin	3	0.03
211	17	Pond	0.04	Spoon	Out-of Basin	3	0.12
220	19	Marsh	0.06	Spoon	Out-of Basin	3	0.18
256	19	Forested wetland	0.2	Spoon	Out-of Basin	3	0.60
228	21	Pond	0.23	Spoon	Out-of Basin	3	0.69
227	21	Forested Wetland	0.96	Spoon	Out-of Basin	5.5	5.28
230	23	Scrub-shrub Wetland	0.75	Spoon	Out-of Basin	5.5	4.13
232	23	Forested Wetland	0.16	Spoon	Out-of Basin	3	0.48
237	24	Pond/Wet meadow	0.38	Middle Illinois	Out-of-Basin	5.5	2.09
		Total	**4.11**				**17.55**

3.9.5 Cumulative Impacts

Other development, particularly near Canton in the strip-mined areas, could contribute to loss of wetlands in the project area. Recent residential development is apparent along strip-mined lakes near Canton, and there are plans for a residential development in the strip-mined areas west of Canton. The proposed North Canton coal mine (discussed in Section 3.7.1.5) could impact wetlands. There is potential for future development of ethanol plants in all corn-growing regions, including the project area. There are no known plans for more ethanol plants in the project area, but others may be constructed.

Other activities will positively impact wetlands. IDNR is developing wetlands in the Double T State Fish and Wildlife Area. The CRP, CREP, and Wetland Reserve Program (WRP), while not all specifically targeted to wetland enhancement/restoration, will positively affect wetlands. The CRP and WRP have the potential to improve water quality from nonpoint sources discharging to wetlands. The focus of the CREP is improving water quality and habitat in the Illinois River basin. There are roughly 1,400 acres of farmland enrolled in the three programs in the project area.

3.10 Floodplains

3.10.1 Affected Environment

This section describes the floodplains within the project corridor. The only large floodplains in the project corridor are those associated with the Spoon River and the East Fork of the La Moine River (Exhibit 3-19). There are no drainage districts or flood protection levees in the project corridor.

Floodplains provide flood and storm water attenuation by decreasing water velocities and providing temporary water storage. By temporarily storing water, floodplains help to filter sediments and provide erosion control. They also provide important ecosystem functions such as nutrient export, increased primary productivity, and wildlife habitat and movement corridors. The extent to which these functions are expressed varies depending on vegetative structure, stream hydrology, and distance from the stream. Floodplains are often fertile and used for agriculture. Because of the value of floodplains for agriculture, the wooded parts of most floodplains in the project corridor tend to be narrow and confined to the area immediately adjacent to the stream channel.

The Federal Emergency Management Agency (FEMA) and FHWA regulations at 23 CFR 650 have identified the base (100-year) flood as the flood having a one-percent probability of being equaled or exceeded in any given year. The base floodplain is the area of 100-year flood hazard. The regulatory floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 100-year flood discharge can be conveyed without increasing the base flood elevation more than a specified amount. FEMA has mandated that

projects can cause no rise in the regulatory floodway, and a one-foot cumulative rise for all projects in the base (100-year) floodplain.

3.10.1.1 Floodplains

There are six designated 100-year floodplains within the project corridor, in three watersheds (Table 3-41). (Section 3.8 discusses these watersheds.) The floodplain near the northeast side of Cuba is an isolated area that is not part of a stream. This floodplain area is bordered by a railroad on the north and by strip-mined lands on the south and southeast. This floodplain may be the result of disruption of natural drainages caused by the railroad construction and the strip mining.

The 100-year floodplain boundaries for water bodies in the project area were obtained from flood insurance rate maps published by FEMA for McDonough, Fulton, and Peoria counties.

Table 3-41
Designated 100-Year Floodplains within the Project Corridor

Water Resource	County	Watershed	Total Floodplain Area within the Three-County Area (acres)	Floodplain Area within Project Corridor (acres)
East Fork La Moine River	McDonough	La Moine River	3,325	1,560
Spoon River	Fulton	Spoon River	20,428	1,710
Big Creek	Fulton	Spoon River	1,487	780
Low area northeast side of Cuba	Fulton	Spoon River	1,386	84
Copperas Creek	Fulton/Peoria	Middle Illinois	1,385	11
Lamarsh Creek	Peoria	Middle Illinois	154	62

3.10.1.2 Natural and Beneficial Floodplain Values

Floodplains may have value in the following areas:

- Natural values for water resources: moderation of floods, water quality maintenance, and groundwater recharge. Forested floodplains provide the most water resource value.

- Natural values for living resources: fish, wildlife and plant resources. Forested floodplains also provide the most living resource value.
- Beneficial values for cultural resources: open space, recreation. An example of this use is parks or athletic playing fields that could be fairly easily restored after flooding.

- Beneficial values for cultivated resources: agriculture, aquaculture and forestry.

Cover types in floodplains provide an indication of the values the floodplains serve. As noted above, forests provide natural value, and agriculture provides value as a cultivated resource. Urban/built-up lands are not considered to provide floodplain values. Cover types for the portions of each of the six floodplains that lie within the project corridor are summarized in Table 3-42 and discussed below.

The floodplain of the East Fork of the La Moine River, with about two-thirds of the floodplain area forested, provides the most natural value of the floodplains in the project corridor. The cover type for most of the remainder of this floodplain within the corridor is cropland and pasture/hayland, which provides beneficial value from cultivated resources. Only a small part is classified as urban/built-up.

Table 3-42
Cover Types within the Project's Designated 100-Year Floodplain

Water Resource	County	Floodplain Area within Project Corridor (acres)	Cover Type in Floodplain (acres)
East Fork La Moine River	McDonough	1,560	pasture/hayland (63), urban/built-up (32), cropland (696), forest (759), pond (9)
Spoon River	Fulton	1,710	pasture/hayland (70), urban/built-up (95), cropland (575), forest (793), stream (169), pond (8)
Big Creek	Fulton	780	pasture/hayland (323), urban/built-up (82), cropland (168), forest (207)
Low area northeast side of Cuba	Fulton	84	pasture/hayland (21), urban/built-up (63)
East Branch Copperas Creek	Peoria	11	pasture/hayland (4), urban/built-up (3), cropland (3), forest (1)
Lamarsh Creek	Peoria	62	pasture/hayland (44), urban (3), cropland (3), forest (12)

About half the floodplain of the Spoon River in the project corridor is forested. Most of the remainder within the corridor is agricultural.

Within the project corridor the Big Creek floodplain is about one-quarter forested, and has a higher percentage of urban/built-up land than either the La Moine or the Spoon (about 10 percent). Part of the floodplain is in the City of Canton. Almost 70 percent of the floodplain cover type is cropland or hayland/pasture.

The isolated floodplain at the northeast side of Cuba is about three-quarters urban/built-up and one-quarter pasture/hayland. Part of the floodplain is in the City of Cuba. This is not a natural floodplain, so it has no real natural values for water resources. With most of the floodplain in urban/built-up land, it has little natural value for living resources.

The small part of the floodplain of the East Fork of Copperas Creek that extends into the project corridor is mostly agricultural, with roughly one-quarter urban/built-up, and less than 10 percent forested.

The Lamarsh Creek floodplain is about three-quarters agricultural, with about 20 percent forested, and about five percent urban/built-up.

3.10.1.3 Floodways

FEMA has not determined regulatory floodway boundaries for any of the stream's sections within the project corridor.

3.10.1.4 Flood Buyout Properties

There are no flood buyout properties in the project corridor.

3.10.2 Environmental Consequences

Federal Executive Order 11988 and 23 CFR 650 Subpart A direct federal agencies to take action to reduce the risk of flood loss; minimize the impacts of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values served by floodplains. The Order also requires agencies to elevate structures above the base flood level whenever possible. The object of the Order is to avoid the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative.

3.10.2.1 Floodplains

The Build Alternative will affect about 8.0 acres within 100-year floodplains of two streams, and an additional approximately 3.1 acres of a non-naturally occurring floodplain that apparently developed as a result of local disruption of natural drainage from mining and construction. Given that any route from Macomb to Peoria will need to cross the Spoon River and its associated floodplain, there is no practicable alternative to construction in floodplains. Table 3-43 summarizes potential floodplain encroachments. The No-Build Alternative will not affect floodplains beyond the existing roadway crossings.

Project-related potential floodplain impacts at stream crossings will be caused by transverse floodplain crossings. Transverse crossings are those that are roughly perpendicular to the long direction of the floodplain, such as a perpendicular bridge crossing of a river or stream. Transverse crossings are preferred, as they minimize floodplain impacts. The isolated floodplain near Cuba will be impacted along one edge.

Table 3-43
Summary of Potential 100-Year Floodplain Encroachments

Water Resource	County	Aerial Exhibit Sheet	Floodplain Area within Project Corridor (acres)	Total Affected Area (acres)	Impacts by Cover Types (acres)	Type and Length of Floodplain Encroachment (ft)	Existing Structure at Proposed Crossing (Y/N)
Spoon River	Fulton	10	1,710	4.6	open water (1.2), cropland (2.4), pasture/hayland (0.1), upland forest (0.9)	Transverse (1,100)	Y
Tributary of East Branch Copperas Creek	Peoria	32	11.2	6.6	pasture/hayland (6.6)	Transverse (600)	N
Low area northeast side of Cuba	Fulton	15	84	3.1	cropland (3.1)	Transverse (1,450)	N
Total			1,805	**14.3**			

All structures crossing floodplains will be sized to handle the 50-year flood without interruption to public transportation caused by flood damage to the roadway or structures. None of the floodplain crossings will interrupt or terminate a transportation route needed for emergency vehicles or serve as the area's only evacuation route. Crossings will be consistent with local floodplain management goals and objectives. The project roadway surface will be constructed to be 3 feet above the 50-year flood elevation. Bridges will be constructed to allow 2 feet of freeboard above the 50-year flood elevation.

3.10.2.2 Natural and Beneficial Floodplain Values

Federal Executive Order 11988 directs agencies to restore and preserve the natural and beneficial values served by floodplains, when floodplain impact avoidance is impracticable. Of the 14.3 acres of floodplain that will be affected by the Build Alternative, the cover types within those floodplains include about 12.2 acres of agricultural land, 1.2 acres of open water, and 0.9 acres of forest.

Of the 12.2 acres of agricultural land affected within floodplains, 5.5 acres are cropland and 6.7 acres are pasture/hayland. Although agriculture is a recognized natural floodplain value in federal Executive Order 11988, the Order acknowledges that agricultural uses may be incompatible with wildlife and may induce aggravated erosion and sedimentation. Of the remaining natural floodplain values, the loss of cropland may affect only the water resources value in that its loss reduces the amount of land available for flood storage and possibly the natural moderation of floods. Only the 0.9 acres of forest has natural values for water and living resources. On a large scale, the loss of naturally vegetated floodplains may aggravate the flood hazard because these naturally vegetated areas help slow floodwaters and reduce flood velocities and peaks. Given the small acreage affected compared to the size of the floodplain, loss of cover type is not expected to alter the flood hazard. For similar reasons, the loss of naturally vegetated

areas may adversely affect water quality maintenance. The slowing of floodwater (and runoff) by ground cover allows the deposition of sediments. Finally, loss of forests may diminish the cultural resources value of floodplains. Loss of forest cover and the habitat it supports may diminish passive and active recreation possibilities in the project area.

3.10.2.3 Floodways

No floodways will be impacted by the Build Alternative. The bridge at the Spoon River will not have piers in the river and will have no other obstructions within the floodway. The floodway at the tributary to the East Branch Copperas Creek will not be impacted.

3.10.3 Measures to Minimize Harm and Mitigation

When a proposed action is to occur in the base floodplain, federal Executive Order 11988 requires that practicable alternatives to avoid affecting the floodplain be identified. This section discusses the floodplain minimization and mitigation measures and concludes that there is no practicable alternative to construction in floodplains.

The No-Build Alternative would avoid the impacts created by the Build Alternative but would result in the continued presence of the impacts of the existing IL 95 bridge at the Spoon River, which would be eliminated by the Build Alternative. As discussed in Section 3.10.3.2, the existing IL 95 Spoon River has piers in the river and it does not meet current minimum flood clearance criteria. With the Build Alternative, the existing bridge would be removed and replaced by a bridge that would meet clearance standards and would not have piers in the river. As a result, flood conveyance would be improved with the new proposed Spoon River bridge compared with the existing IL 95 bridge, which would be removed. Therefore, in terms of overall impacts on the major functions of floodplains, which are flood conveyance and flood storage, the No-Build Alternative would have more impact than the Build Alternative. The No-Build Alternative would not meet the project purpose and need, and is not practicable.

3.10.3.1 Floodplain Minimization

Alternative Screening and Selection

Minimization of floodplain impacts was considered in the project's alternatives development/ screening phase. Several alignments with notable floodplain impacts, such as the North alignment at the west side of the corridor and the North alignment at the east side of the corridor were eliminated from consideration (Section 2). The Build Alternative alignment had the least floodplain impact of any alignment considered. Both stream crossings are transverse. The major floodplain crossing, at the Spoon River, is at the location of an existing bridge, thus minimizing the impacts on floodplain values. This location is also one of the narrowest parts of the Spoon River floodplain.

Only one other stream floodplain in the 60-mile long Build Alternative would be impacted, 6.6 acres at a tributary of the East Branch of Copperas Creek.

Floodplain Near Cuba

About 3.1 acres of impacted floodplain are not in a natural drainage, but in floodplain located at the northeast part of Cuba that appears to have been created by disruption of natural drainage patterns. In the vicinity of this floodplain, 10th Street in Cuba, a north-south street, turns east and becomes the Cuba to Canton Blacktop. The FEMA Flood Insurance Rate Map for the part of the floodplain within the City of Cuba (on the west side of 10th Street) indicates a flood depth of one foot (FEMA 1983). No depth is indicated for the floodplain on the east side of 10th Street, outside the city (FEMA 1986). With a flood depth of only one foot in the surrounding area, it is unlikely that 10th Street itself will be included in the base flood zone, and 10th Street will not be raised as part of the Build Alternative. In this area, a south frontage road is proposed for property access. It will connect with 10th Street and run parallel to the relocated Pioneer Railcorp line and the proposed IL 336. Only a small section of the frontage road will be within in the floodplain (Aerial Exhibit Sheet 15).[73] The small amount of net compensatory storage that may be required for the short section of the frontage road will be provided as part of the Build Alternative, if needed. The IL 336 roadway itself will not impact the floodplain.

Since the floodplain impact near Cuba is on a floodplain that is not natural, the only impact on beneficial values will be from the loss of cropland.

3.10.3.2 Floodplain Mitigation

As required by IDOT policy, the storage volume for floodwater in floodplains that is taken for a roadway project is compensated for by creating volume at another location. For any fill material placed between the normal water elevation and the 10-year flood elevation, IDOT policy requires creation of an equal volume of compensatory storage between the normal water elevation and the 10-year flood elevation. Likewise, fill material placed between the 10-year and the 100-year flood elevation must be compensated for by an equal volume of flood storage between the 10-year and 100-year flood elevations.[74] Compensatory storage for roadway embankments constructed to raise the bridge to the levels required to pass floodwaters will be provided within the floodplain of the affected stream. This compensatory storage will restore the natural floodplain value of floodwater storage.

The overall effect of the project will be to improve flood flow conditions on the Spoon River, the larger of the two stream floodplain crossings, thus improving the natural floodplain value of the Spoon River floodplain. The proposed IL 336 bridge at the Spoon River will have less impact on floods than the existing IL 95 bridge it will be replacing. The existing bridge has piers in the

[73] The floodplain area within the City of Cuba is not shown in Aerial Exhibit Sheet 15.

[74] IDOT *Bureau of Design and Environment Manual* – 2002 Edition. Chapter 40, Section 40-3.04.

river, which impact the floodway. The proposed IL 336 bridge will not have piers in the river and will have no impacts on the floodway. The proposed bridge will meet IDOT flood clearance standards, while the existing bridge does not. The IDOT currently requires a minimum clearance of two feet between the 50-year natural high water elevation and the low beam elevation of bridge structures.[75] The existing bridge provides less than 0.5 foot. The existing IL 95 bridge will be demolished after construction of the Build Alternative bridge.

At the tributary to the East Branch of Copperas Creek (Aerial Exhibit Sheet 32), a culvert with a cattle pass will be constructed. The floodway will not be impacted. Compensatory storage will be provided as required.

3.10.3.3 No Practicable Alternative

As discussed above, there is no practicable alternative to crossing floodplains in the project area.

3.10.4 Indirect Impacts

One of the objects of Federal Executive Order 11988 is to avoid indirect support of floodplain development wherever there is a practicable alternative. According to the Order, an action supports floodplain development if it encourages, allows, serves, or otherwise facilitates additional floodplain development. No floodplain development is expected to occur as a result of this project. Areas where development may occur along the project are not in floodplains (see also general discussion of indirect impacts in Section 3.3.4). The project does not provide access to the Spoon River floodplain, the larger of the two stream floodplains that will be crossed.

3.11 Plant Communities

This section describes the plant communities in the project area and the impacts on those communities.

More than 99 percent of the land area of Illinois, once covered by prairie (60 percent) and forest (40 percent), has been converted to agriculture and urban/built up use. In 1820 there were about a half-million acres of prairie in the three-county area. By 1976 only 14 acres of high quality prairie remained, all of it in Peoria County (Robertson 2002).

[75] *IDOT Drainage Manual*, Section 1-304 Design Criteria. June 1, 2004.

Natural Divisions

Because natural communities vary with topography, latitude, soil and geology, natural divisions based on these characteristics are used to help classify communities. The project corridor occurs almost entirely within the Western Forest-Prairie Natural Division, an area of west-central Illinois that was once covered primarily by forest and prairie in roughly equal parts (blue in figure at right). Prior to European settlement grassland dominated the level to rolling uplands and oak-hickory forests dominated the more dissected areas, particularly near the Spoon River (Schwegman et al 1973). The far eastern part of the corridor, about 0.2 percent of the total area, is in the Grand Prairie Natural Division, which, prior to European settlement, was mostly grassland.

Each natural division has its own suite of community classes such as prairie, forest, wetland, lake and stream. Community classes are further subdivided into natural communities. In any given natural community within a natural division, a particular assemblage of plants is expected in a natural condition.

3.11.1 Affected Environment

3.11.1.1 Cover Types

The 2004 Illinois Natural History Survey (INHS) biological investigation (Feist and Trester 2005) included determination of land cover types primarily by use of aerial photography, followed by detailed characterization of selected reference sites within the corridor. Cover types and percentages for the project corridor in 2004 as reported by INHS are summarized in Table 3-44 and shown in Exhibits C-1 through C-7 in Appendix C. Cropland is discussed in Section 3.3 and wetland cover types are discussed in Section 3.9. Other cover types are summarized below.

Upland Forests. Forests, by far the largest natural community in the project corridor, cover over 16,000 acres of the corridor (13 percent; refer to Table 3-44). Of those cover types evaluated through reference sites in 2004, forests were the only ones identified as environmental assets that will be impacted by the Build Alternative. The INHS therefore further assessed the forests in the corridor in 2005 (Feist 2006). By 2005, alignments had been identified, and the assessment focused on forests greater than 20 acres that would be impacted by the alignments under consideration. The results of the assessments of these forests are summarized in Table 3-45, and locations of all forests are shown in Appendix C, Exhibit C-14. Dry-mesic forests are the most common type in Illinois, and in the corridor (Table 3-45). All forests are second growth, but there is considerable age range (Table 3-45).

Table 3-44
Land Area of Cover Types - Project Corridor

	Acreage	% Cover in Project Area
Cropland	67,267.0	55%
Pasture/hayland	20,465.9	17%
Upland forest	15,475.0	13%
Urban and built-up land	12,575.9	10%
Lacustrine	1,448.2	1.2%
Pond	1,322.4	1.1%
Pasture with ponds	1,251.4	1.0%
Non-native grassland	1,086.6	0.9%
Floodplain forest	673.1	0.5%
Non-native grassland with ponds	587.9	0.5%
Forest with ponds	517.0	0.4%
Grassland (prairie)	252.1	0.2%
Stream	146.0	0.1%
Wet meadow	108.5	0.1%
Shrubland	90.7	0.1%
Shrub-scrub wetland	73.5	0.1%
Forbland	11.0	0.01%
Forested wetland	8.0	0.01%
Marsh	6.7	0.01%
Farmed wetland	3.8	< 0.01%
Wet meadow/marsh	0.2	< 0.01%
Total	**123,370.9**	**100%**

Source: Feist and Trester 2005.

All forests were graded to assess whether they may qualify for the Illinois Natural Area Inventory (INAI). The grading takes into account size, age, native species and other factors. A grade A or B indicates high quality and potential for qualification. All forests were assigned INAI Grade C or D (with some plusses and minuses), indicating that none qualified for the INAI. Table 3-45 also shows the dominant canopy species (as opposed to understory species), with average diameter at breast height (dbh) for each species. While these forests do not qualify as Natural Areas, they are considered environmental assets, and they provide important wildlife habitat, as discussed in Section 3.12.

Floodplain Forests. Floodplain forests are found along streams at locations identified by the National Wetlands Inventory as palustrine, forested, broad leaved deciduous, and temporarily flooded. The majority of these forests are not jurisdictional wetlands, although small areas of wetland may be included. Dominant trees species in the floodplain forest included American elm, black walnut, silver maple and box elder.

Grassland (Prairie). Common species found in prairies were big bluestem, Indian grass, white wild indigo, tall coreopsis, round-headed bush clover, and common mountain mint.

Shrubland. This cover type was represented by disturbed old field communities that were in the process of converting to young forest and were dominated by early successional woody vegetation (e.g., rough-leaved dogwood, smooth sumac, amur honeysuckle, and autumn olive) and a few large trees (e.g., various oaks, white mulberry, and hedge apple).

Non-Native Grassland. Land uses associated with this cover type included roadway rights-of-way, pasture, strip-mined reclamation land, and residential lawn. The non-native grassland communities were dominated by non-native, cool-season grasses and forbs (e.g., Hungarian brome, meadow grass, bluegrass, sweet clover).

Pasture/Hayland. These sites were dominated by non-native grasses (e.g., meadow fescue, smooth brome) and were highly disturbed because of the land use (e.g., grazing or mowing).

Other Pre-2005 Sites Assessed in Addition to Reference Sites

Other Noteworthy Forest Sites. The 2004 biological survey identified a 33-acre forested/barrens area located near the southern boundary of the corridor, south of Marietta (FQI = 53) (Exhibit C-12). Habitats included submature to mature forest with mesic floodplain forest on stream terrace, mesic upland forest locally in ravines, and dry-mesic upland forest on slopes and ridges. On southwest-facing aspects and along ridge tops were local occurrences of dry-mesic barrens. Upland portions of the site had recently been burned. There are many indicator species for savanna and barrens-like habitats including a population of the state-endangered meadow blue grass. The dominant canopy species was white oak. The authors concluded that if management is continued with prescribed fire, there is very high restoration potential and possibility to quality for the INAI (Feist and Trester 2005).

Grassland (Prairie). INHS biologists identified six prairies in the project area (Table 3-46). Five of these were discussed in the biological report for 2004 (Feist and Trester 2005) and one had been identified in a 2003 survey. The five sites included in the biological report are all in the vicinity of the Spoon River and are shown in Exhibit C-12. The sixth site, not included in the INHS 2004 report, was characterized by an INHS biologist in 2003 and the one-page summary report was submitted to IDOT by email (Handel 2003). This site (#9) was along the railroad next to the Cuba to Canton blacktop (CH 5). The general location is shown in Exhibit C-5 in Appendix C.

Table 3-45
Characteristics of Forest Stands in the Vicinity of March 2006 Alignments

No.	Forest Type	Age	Disturbance History	INAI Grade	Description from 2005 Biological Survey	Dominant Forest Canopy Species (Average diameter at breast height, Inches)	Aerial Exhibit Sheet
1	Wet- mesic upland to wet-mesic floodplain forest	Mature second growth (40-60 years)	Moderate grazing	C-	This forest had been pastured in the past 30 years. It had several disturbance-tolerant species in the herbaceous and shrub layers.	Silver maple (19.6) green ash (13.1) honey locust (16.7)	1
2	Dry-mesic forest	Mature second growth (30-50 years)	Heavy grazing	D-	Half this forest was currently heavily grazed and the other half had been heavily grazed within the last 30 years. The canopy, sapling, and shrub layers are all dominated by thorny species, an indication of severe over-grazing.	Hackberry (16.5) honey locust (25.7) Osage orange (14.2) shingle oak (12.4) American elm (17.8)	1
3	Dry-mesic forest	Mature second growth (30-50 years)	Heavy grazing	D-	This forest was very similar to Forest 2 in species composition, age, class, and disturbance history.	Honey locust (24.1) Osage orange (13.7) shingle oak (11.2) American elm (12.7)	1
4	Dry-mesic to mesic forest	Mature second growth (30-50 years)	Light to moderate grazing	C to C-	The western half of Forest 4 was dominated by large black oaks. The eastern half of the forest had more intensive grazing in recent history. A small area of Forest 4 was mesic forest adjacent to the East Fork of the La Moine River.	Shagbark hickory (16.1) Black walnut (15.9) northern red oak 17.8) black oak (21.4) American elm (13.8)	Area not included
5	Dry-mesic forest	Mature second growth (30-60 years)	Light grazing	C	This small forest tract occurred along a man-made pond and was bordered by hay and crop fields.	Shagbark hickory (15.8) white oak (19.7) northern red oak (16.3)	7
6	Dry-mesic forest	Young second growth to mature second growth (40-60 years)	Clearing, grazing, and recent fire to clear downed trees.	C	A portion of this forest tract was being cleared for development during the 2005 survey. The majority of the forest was formerly pastured and was transitioning into young successional forest habitat with small openings.	Shagbark hickory (15.0) cottonwood (13.9) wild black cherry (7.9) white oak (21.3) shingle oak (9.1) northern red oak (10.9) slippery elm (8.5)	7 & 8
7	Dry-mesic forest	Regrowth (10-20 years)	Very heavy grazing	D-	This forest is currently pastured and was highly disturbed by heavy grazing and erosion.	Shagbark hickory (8.9) Osage orange (7.2) shingle oak (8.7) American elm (6.0)	8

Table 3-45
Characteristics of Forest Stands in the Vicinity of March 2006 Alignments

No.	Forest Type	Age	Disturbance History	INAI Grade	Description from 2005 Biological Survey	Dominant Forest Canopy Species (Average diameter at breast height, Inches)	Aerial Exhibit Sheet
8	Dry-mesic forest	Mature second growth (40-60 years)	Light grazing	C	This forest tract was one of the least disturbed forests surveyed during the 2005 field season.	White oak (23.9) northern red oak (14.4)	8
9	Dry-mesic forest	Regrowth (10-20 years)	Recently pastured and severe erosion	D-	This forest consists of several small ravines that had been colonized by woody vegetation adjacent to the village of Marietta. The tree species were a mixture of exotic and pioneer tree species.	Black locust (10.9) red sassafras (5.9)	8
10	Dry-mesic forest	Mature second growth (30-50 years)	Erosion and exotics	C	Most of this site was dry-mesic forest that occupied steep upland slopes. There are some old plantings of exotic species around a small abandoned homestead that was colonized by tree-of-heaven.	Shagbark hickory (13.8) white oak (20.0) black oak (15.8) black locust (10.0)	8
11	Dry-mesic forest	Mature second growth (30-50 years)	Erosion and exotics	C-	Most of this site was dry-mesic forest that occupied steep upland slopes. The species composition and disturbance history was very similar to Forest 10.	Shagbark hickory (14.0) black walnut (15.4) white oak (19.0) black oak (17.0) black locust (11.9)	8
12	Dry-mesic forest	Mature second growth (40-60 years)	Heavy grazing, erosion, logging	D	It appeared that this forest was heavily grazed within the previous 20 years. There were still some feeding pens remaining in the forest.	Shagbark hickory (14.0) white oak (21.7) shingle oak (11.9) northern red oak (16.5) black oak (13.9)	8
13	Dry-mesic forest	Mature second growth (30-50 years)	Heavy grazing and erosion	D	This forest was being grazed and pastured.	Shagbark hickory (13.9) white oak (15.7) black oak (14.1)	8 and 9
14	Dry-mesic forest	Mature second growth (30-50 years)	Development and logging	C	This forest consisted of several small forested ravines that were a part of a very large forest that was surveyed during the 2004 field season. It appeared that this forest might be logged in the near future. A new logging road was cut in the late summer and trees were starting to be harvested during the time of the survey in 2005.	White oak (19.7) black oak (15.8)	9 and 10

Table 3-45
Characteristics of Forest Stands in the Vicinity of March 2006 Alignments

No.	Forest Type	Age	Disturbance History	INAI Grade	Description from 2005 Biological Survey	Dominant Forest Canopy Species (Average diameter at breast height, Inches)	Aerial Exhibit Sheet
15	Dry-mesic forest	Mature second growth (40-60 years)	Heavy grazing	D	This forest was disturbed and heavily grazed.	Shagbark hickory (19.7) black oak (27.0)	9
16	Dry-mesic forest	Mature second growth (60-80 years)	Light grazing	C	This forest was an open oak/hickory forest. It was separated by an old field that had young successional woody vegetation. Several disturbance-tolerant prairie and savanna species occurred in the old field, which might indicate that this area may have been a former savanna community.	Shagbark hickory (16.2) white oak (21.8) northern red oak (21.8) black oak (18.7)	10
17	Dry-mesic forest	Young second growth (10-30 years)	Past grazing, erosion, and exotics	D	This community consisted of several steep forest slopes on the edge of crop fields. The woody species were dominated by early successional old field species.	Honey locust (9.1) black walnut (8.3) Osage orange (9.3) wild black cherry (8.8) white oak (10.0) shingle oak (10.0) American elm (6.0)	10 and 11
18	Dry-mesic forest	Young second growth (10-30 years)	Logging	D	This forest tract had been logged in the recent past and the valuable oak species were removed leaving a solid stand of hop hornbeam.	Hop hornbeam (6.0)	Area not included
19	Dry-mesic forest	Mature second growth (40-60 years)	Exotics	C	This forest is part Medium Quality Forest 1 (MF 1) included in the 2004 INHS report.	Hard maple (24.6) white oak (18.6) black oak (13.1) black locust (13.8)	10 and 11
20	Dry-mesic forest	Mature second growth (40-60 years)	Light past grazing	C-	The forest consisted of two steep ravines. A portion of this forest tract had been cleared for development for a shooting range and maintained a dense stand of shrubs.	Sugar maple (12.8) black walnut (13.8) white oak (20.2) basswood (15.8)	11
21	Wet-mesic forest	Mature second growth (40-60 years)	Heavy past grazing and exotics	D-	A large portion of this forest was heavily grazed in the recent past. Several thorny species were the dominant vegetation in the canopy, sampling, and shrub layers.	Honey locust (15.8) Osage orange (21.7) black walnut (16.2) American elm (13.8)	20

Table 3-45
Characteristics of Forest Stands in the Vicinity of March 2006 Alignments

No.	Forest Type	Age	Disturbance History	INAI Grade	Description from 2005 Biological Survey	Dominant Forest Canopy Species (Average diameter at breast height, Inches)	Aerial Exhibit Sheet
22	Dry-mesic to wet-mesic forest	Mature second growth (60-80 years)	Moderate past grazing, flooding	C-	The upland slope of this forest tract had the open grown canopy characteristic of a former savanna. The bottomland portion had been flooded by the construction of a large beaver dam. A large portion of the forest near the creek was either dead or dying to the flooding of the valley.	Shagbark hickory (19.0) Osage orange (12.8) white oak (31.7) shingle oak (13.9) black oak (27.8) American elm (10.4)	24
23	Dry-mesic to mesic forest	Mature second growth (40-60 years)	Moderate past grazing, exotics	C-	This forest had some large open grown oaks on the south facing slopes. Sugar maple dominated the north facing slope. Black walnut was the dominant tree species along the Middle Branch of the Copperas Creek.	Sugar maple (17.0) black walnut (15.8) white oak (20.2) black oak (16.6) black locust (11.9) American elm (10.3)	25
24	Dry-mesic forest	Mature second growth (60-90 years)	Light grazing, all-terrain vehicle (ATV) trails.	C+	This forest had the most diversity in the herbaceous layer and the largest overall average diameter at breast height (dbh) of dominant canopy species of the forests surveyed in the corridor in 2005. Some areas of the forest were relatively undisturbed; however, some areas have had disturbance, i.e., ATV trails, past grazing, and logging.	Silver maple (24.4) black walnut (22.8) white oak (21.9) chestnut oak (24.0) northern red oak (22.7)	35
25	Dry-mesic forest	Mature second growth (40-60 years)	Moderate past grazing, erosion	D	Half this forest was heavily grazed. It had several disturbance-tolerant species in the herbaceous and shrub layers.	Silver maple (15.8) white oak (26.5) northern red oak (14.7) black oak (10.9)	35

Site 2 was an INAI Grade C to Grade B dry-mesic prairie located west of the Spoon River and south of IL 95, and adjacent to Floodplain Forest 6 (Exhibit C-12). The prairie vegetation within this site covers approximately 16 acres. This area appeared to be recovering from past disturbance. Common species were round-stemmed false foxglove, big bluestem, white wild indigo, health aster, golden cassia, gray dogwood, western sunflower, round-headed bush clover, rough blazing star, smooth sumac, and old field goldenrod. The FQI was 29.9 (31.1 for native only) (Table 3-46). This site may qualify for inclusion in the INAI (Feist and Trester 2005).

Site 3 (Exhibit C-12) was a small prairie/savanna remnant along the former railroad line, southeast of Marietta that was found during an INHS survey in 2003. This site is within an existing INAI site, the Marietta Geological Area, discussed in Section 3.14.

Site #9 is a 50-foot wide strip of grassland along the railroad on the north side of the Cuba to Canton Blacktop (CH 5), from just east of Cuba to the road that leads to the Spoon River College (Exhibit C-5). It was surveyed in 2003 by an INHS biologist. It is threatened by exotic grasses (smooth brome grass, reed canary grass), woody vegetation (autumn olive, which is also exotic; and black locust) and mowing. Dominant plant species among the 20 species identified included big bluestem, hairy aster, tall sunflower, smooth sumac, and Indian grass. FQI and percent adventive (non-native) were not noted (Handel 2003).

3.11.1.2 Invasive and Noxious Plant Species

Executive Order 13112 (Invasive Species) directs federal agencies to expand and coordinate their efforts to combat the introduction and spread of plants and animals not native to the U.S. Noxious species are those regulated by statute (municipality, county, state, or federal) and listed in the U.S. Department of Agriculture Noxious Weeds List for Illinois. Large populations of species identified in the Illinois Noxious Weed Law as Noxious Species were found in the project corridor. These species include both native and non-native plants: hemp, musk thistle, Canada thistle, field sow thistle, five-year sorghum, Johnson grass.

Unlike noxious species, invasive species is a broader term without regard to statute. Highly invasive species that were observed in the study area included garlic mustard, poison hemlock, orange daylily, autumn olive, amur honeysuckle, black locust, multiflora rose, and common buckthorn.

Table 3-46
Characteristics of Grassland (Prairies) within the Project Corridor

Designation	Type	Location	Size (acres)	FQI (Native Only)	Number of Species	Percent Adventive	C Values
Prairie 1 (P1)	dry-mesic	South of Marietta, west of Spoon River (Exhibit C-12)	Not noted	26.4	49	4.1	3.9
Prairie 2 (P2)	dry-mesic	South of Marietta, west of Spoon River (Exhibit C-12)	Not noted	25.8	44	6.8	4.0
Prairie 3 (P3)	ten-year old reconstruction	East of Spoon River (part of Kedzior Wood Land and Water Reserve) (Exhibit C-12)	Not noted	27.8	46	10.9	4.3
Site 2	dry-mesic	West of Spoon River, south of IL 95 (Exhibit C-12)	16	31.1	54	7.4	4.4
Site 3	prairie/savanna	West of Spoon River, south of IL 95 (part of Marietta Geological Area INAI), along unused rail line south of Marietta (Exhibit C-12)	Not noted	Not noted	Not noted	Not noted	Not noted
#9	dry-mesic	Along railroad paralleling CH 5, 10 feet from edge of pavement, for 6.15 miles: from the N-S road to Spoon River College to just east of Cuba; last half-mile mowed for hay. (Exhibit C-5)	37	Not determined	20	Not determined	Not determined

3.11.2 Environmental Consequences

3.11.2.1 Construction Impacts

Table 3-47 lists the acreage of each cover type within the Build Alternative ROW. Of the cover types listed, only forests are discussed in detail in this section. The Build Alternative will result in 157 acres of impacts to forest with an INAI Grade of C or lower. The 37 acres of impacted prairie was rated as INAI Grade D, meaning that it has been severely disturbed. Cropland is discussed in Section 3.3 and wetlands in Section 3.9. Non-native cover types that may have value for wildlife, such as non-native grassland, are discussed in Section 3.12. The No-Build Alternative will not affect any areas of land cover.

Table 3-47
Acreages and Percentages of Cover Type Within Proposed IL 336 ROW

	Acres Required for Project	Percent	Acres Required, as a Percent of this Cover Type within the Corridor
Existing road ROW	513	16.2%	not applicable
Cropland	2015	63.7%	3.0%
Forest	157	5.0%	1.0%
Prairie	37	1.2%	14.7%
Non-native Grassland	157	5.0%	14.4%
Wetlands	5	0.2%	2.5%
Other Land	278	8.8%	0.7%
Total ROW	3,164	100.0%	
Total Additional ROW	2,651		

Of the non-wetland land cover types impacted, forests are the most important environmentally. Several forests were rated INAI Grade C, and are important in providing wildlife habitat (Section 3.12). Therefore, forest impacts were evaluated in more detail than impacts to other types of land cover. This subsection discusses impacts to the 25 forests identified in the biological survey (Feist 2006) (Exhibit C-14). Most of the forest impacts occur in the wooded area near the Spoon River. The alignment near the Spoon River follows an existing route and therefore, as described in more detail below, minimizes impacts to forests. The locations and characteristics of upland forest impacts are discussed below and summarized in Table 3-48. Forests are also shown in the Aerial Exhibits; see Table 3-48 for sheet references.

Forest 1 will be impacted by the proposed Macomb Bypass project, but not by the proposed IL 336 project. Forests 2 and 3, both dry-mesic, will be impacted by both the Build Alternative and the proposed Macomb Bypass. Both forests have been impacted by heavy grazing.

There are no forest impacts from the proposed Macomb Bypass to just west of Marietta.

Less than one acre will be removed from Forest 7, west of the IL 336/Marietta Road intersection southwest of Marietta (Table 3-48). Forest 7 is a dry-mesic forest that is pastured and is highly disturbed by heavy grazing and erosion. Trees are second growth and no more than 20 years old (Table 3-45).

South of Marietta, the Build Alternative will bisect Forests 8 and 9 (Table 3-48). Forest 8 is Grade C dry-mesic, mature second growth (40 to 60 years), and was lightly grazed at the time of the study. Dominant canopy species in Forest 8 were white oak and northern red oak, with the largest average size of white oak in the 25 surveyed forests. Forest 9 is dry-mesic regrowth (10 to 20 years) that has been used as pasture and is severely eroded. Black locust and red sassafras are the dominant tree species (Table 3-45).

Forests 10 and 11 are along existing IL 95 east of Shaw Creek Road. Forest 10 is on the south side of IL 95 and Forest 11 is on the north side. At Shaw Creek Road, the proposed IL 336, routing from south of Marietta, merges with the existing IL 95 alignment. The proposed intersection with Shaw Creek Road will be located south of the existing Shaw Creek/IL 95 intersection, resulting in impacts to Forest 10, from IL 95 south, for the width of the IL 336 ROW, plus the additional area required for extension of Shaw Creek Road south to Coal Cut Road. Part of the southern edge of Forest 11 along the existing IL 336 ROW will be removed to accommodate the wider ROW of IL 336 (Table 3-48). Both Forest 10 and 11 were mature second growth (30 to 50 years) dry-mesic forests impacted by erosion and exotic species. Dominant canopy species in both were shagbark hickory, white oak, black oak and black locust. Black walnut was also dominant in Forest 10 (Tables 3-45 and 3-48).

Forests 13, 14, and 15 (west of Spoon River) and Forests 19 and 20 (east of Spoon River) are located along existing IL 95 between Marietta and Smithfield, where the proposed IL 336 and IL 95 will share an alignment. Edge impacts will occur to these forests because of the wider ROW requirements for IL 336. Forests 13, 15, and 20 are north of existing IL 95 and Forests 14 and 19 are south. Forest 13, located east of Pheasant Road, was dry-mesic, mature second growth (30 to 50 years), disturbed by heavy grazing and erosion. Dominant canopy species were shagbark hickory, white oak, and black oak. Forest 14 borders a meander bend of the Spoon River south of existing IL 95, and has separated ravines (fingers) extending up to existing IL 95, along drainageways. (Flatter areas between the fingers of forest have been cleared for pasture.) The

Table 3-48
Acreage Impacts to Forests Greater Than 20 Acres in the IL 336 Alignment

Forest No.	Location	INAI Grade	Acreage Impact	Impact Type	Aerial Exhibit Sheet
2	Frontage road at west side proposed Macomb Bypass.	D-	7.35	Edge	1
3	North frontage road at proposed Macomb Bypass.	D-	1.00	Edge	1
7	Southwest of IL 336/Marietta Road (CH34) intersection	D-	0.4	Edge	8
8	East of Marietta Road intersection, in an intermittent drainage to Barker Creek	C	6.19	Bisects	8
9	Southwest of existing intersection of IL 95 and Coal Cut Road.	D-	7.26	Bisects	8
10	East side of IL 336/Shaw Creek Road intersection (south)	C	7.88	Edge	8
11	East side of IL 336/Shaw Creek Road intersection (north)	C-	5.44	Edge	8
13	East of IL 336/Pheasant Road intersection (north of existing IL 95)	D	1.16	Edge	8 and 9
14	South of existing IL 95 between Pheasant Road and Wood Road	C	2.13	Edge	9
15	North of existing IL 95, east of Woody Road	D	0.26	Edge	9
19	South of existing IL 95 between Spoon River and Smysor Road	C	4.65	Edge	10 and 11
20	Along Kedzior Woodland Creek, north of existing IL 95 near Smithfield	C-	5.24	Edge	11
22	Along West Branch Copperas Creek southeast of Norris	C-	10.47	Bisects	24
23	Intersection of IL 336 and IL 78 northeast of Norris; along Middle Branch Copperas Creek	C-	29.77	Bisects twice	25

additional ROW requirements for IL 336 will result in edge impacts to four of these separate fingers. Forest 14 was dry-mesic, with mature second growth (30 to 50 years). It had been impacted by development and logging, which was occurring during the 2005 field observations. It was dominated by white oak and black oak. Forest 15 is opposite Forest 14, on the north side of existing IL 95, just east of Woody Road. This dry-mesic mature second-growth (60 to 80 years) had been disturbed by heavy grazing. It was dominated by shagbark hickory and black oak. Forest 19 is a linear feature along the south side of existing IL 95 between the Spoon River and Smithfield. It was part of the medium-quality forest (MF 1) that was evaluated in 2004. As discussed in Section 3.11.1.1, 49 acres of MF 1 were judged to potentially qualify for inclusion in the INAI. MF 1 includes an INAI property, the Seville Savanna (Aerial Exhibit Sheet 11). INHS concluded that the part of Forest 19 that potentially qualifies for inclusion in the INAI is outside the proposed IL 336 ROW (Feist 2006). Forest 20 is north of Smithfield, along Kedzior Woodlands Creek, west of CH 2. Forest 20 was mature second growth (40 to 60 years) and had

been impacted by light grazing. Dominant canopy species were sugar maple, black walnut, white oak, and basswood.

The only other forests impacted by the Build Alternative, Forests 22 and 23, are along the West and Middle Branches of Copperas Creek, east of Norris. The Build Alternative will be on new alignment and will bisect Forest 22, a dry-mesic to wet-mesic mature second growth (60 to 80 years) forest along the West Branch of the Copperas Creek southeast of Norris. The bottomland part of the forest along the creek had been flooded by construction of a large beaver dam, and, during the 2004 and 2005 INHS visits, much of the forest near the creek was either dead or dying from the flooding. The beaver dam has since been removed and the stream was confined to the channel when last observed (Feist 2007). Dominant canopy species include shagbark hickory, Osage orange, white oak, shingle oak, black oak, and American elm. Northeast of Norris, just south of the point where the proposed IL 336 merges with the existing IL 78 alignment, the Build Alternative cuts through Forest 23. The combined impacts of the new alignment plus a connecting road and intersection with existing IL 78 to the west will result in two separate cuts through this forest. Forest 23 is a dry-mesic to wet-mesic forest along the Middle Branch of Copperas Creek. It has mature second growth (40 to 60 years), with sugar maple, black walnut, white oak, black oak, black locust, and American elm as the dominant canopy species. Sugar maples dominate the north slopes, with oaks on the south slopes and black walnuts near the creek. Forest 23 has been degraded by grazing and exotics.

None of the impacted forest qualifies for inclusion in the INAI.

At most locations, the forest impacts are edge impacts. The floristic composition of forest edge is more indicative of disturbed conditions than is the composition of forest interior. Trees with high importance values in disturbed forest edge habitat generally include red elm, hackberry, osage orange, black cherry, walnut, basswood, and black locust. Forest edge does not provide quality nesting habitat for neotropical migratory birds as does forest interior. However, forest edge provides some wildlife habitat, aesthetic values, windbreaks, shading, and air quality enhancement.

Beyond the Build Alternative's direct impact on upland plant communities is the issue of whether areas of exposed soil during construction will allow nuisance plant species to become a problem. When soil is stripped of vegetation, it creates an opportunity for exotics in the soil's "seed bank" or encroaching into the area (by wind, animal droppings) to establish themselves and expand their range. The Build Alternative's sideslopes and ditches will be most at risk for supporting nuisance species.

3.11.3 Measures to Minimize Harm and Mitigation

By using the existing IL 95 alignment through the part of the project corridor with the most extensive and highest quality forest, that is, the part within the dissected drainages along the Spoon River between Marietta and Smithfield, the proposed alignment for IL 336 minimizes impacts to forests in the corridor.

IDOT will develop a landscaping plan during a future engineering phase that will identify areas where native grasses, shrubs and trees will be planted on highway sideslopes and backslopes and in the median, except where clear vision needs to be maintained at intersections and median openings.

Where appropriate, the backslopes of the proposed roadway will be seeded with Class 4 (native grasses) and Class 5 (forb mixture) seed mixture. These are prairie seed mixes.

IDOT's erosion control measures will, however, mitigate against the disturbed areas from being overtaken by exotics. The seed mix IDOT will recommend for the ditches and backslopes and the cover that will be used to protect the seed mix (straw, erosion matting, nurse crop) will limit the potential for exotics to take root. By limiting the extent of newly disturbed soil and the length of time it is left unvegetated, IDOT will minimize the potential for nuisance species to be a project issue.

3.11.4 Indirect Impacts

While most of the forest impacts are edge impacts, removing the existing edge will create a new edge within what may have been interior forest.

As noted in the discussion of indirect impacts in Section 3.3, Agriculture, the project's indirect impacts are expected to occur primarily at or near the proposed interchanges. All of the proposed interchanges are dominated by agricultural land and none have natural upland plant communities that could be affected by secondary development.

3.11.5 Cumulative Impacts

Contractor use areas (borrow, use areas, waste sites) are approved by IDOT after biological, cultural, and wetland reviews. If necessary, the sites are coordinated with the appropriate state or federal agency. The development of borrow areas that will be required to construct the proposed IL 336 improvements could adversely affect upland plant communities, including forests. IDOT's normal practice is to prohibit the use of IDNR land, floodplains, wetlands, or endangered species locations as borrow sites. That will leave upland areas as a borrow source.

Residential development, whether individual lot or subdivisions, also could affect upland plant communities, particularly forested areas. Residential development west of Peoria in the eastern part of the corridor is expected to continue and may affect forests such as Forest 24 and 25, located northeast of Hanna City.

The development of the North Canton Mine is expected to require 443 acres of "fish and wildlife habitat," which will be restored after the mine is closed (CRDC 2006, IDNR 2008a).

Tree harvesting is an example of past impacts to forested areas that is expected to continue. Although unforeseen development is likely in the corridor, it is very difficult to estimate its

potential impact on upland plant communities. On the positive side, land acquired or placed under conservation easement will preserve remaining forests. The designated lands in the project area, such as Harper Rector Wood and the Kedzior Woodlands Land and Water Reserve will preserve some forested areas.

3.12 Wildlife Resources

This section describes the wildlife and habitats currently present in the corridor, with an emphasis on those species and habitats that contribute most to biodiversity. In accordance with NEPA guidance[76], this section focuses on native Illinois wildlife species in the project area that are declining and may eventually be at risk of extirpation in Illinois, but which are not yet sufficiently imperiled to be listed as threatened or endangered.

This section also addresses wildlife of recreational importance, and wildlife that may be killed as a result of the Build Alternative (construction and operation mortality). It evaluates the potential of wildlife crossings.

Threatened and endangered species are discussed in Section 3.13 and fish and mussels are discussed in Section 3.8.

3.12.1 Affected Environment

The biological surveys done for the project from 2004 to 2006 were the primary source for identifying wildlife that may be present in the project corridor (Feist and Trester 2005, Feist 2006, Feist 2007).

Based on field work, review of museum specimens and literature review, the number of bird, mammal, amphibian and reptile species known to occur or potentially occurring in the project corridor are as follows:

	Known or Potentially in Area	Observed During Project Work
Birds	206	121
Mammals	45	18
Amphibians	24	7
Reptiles	26	11

3.12.1.1 Habitat

The biological survey considered four major habitat associations for wildlife: forest, shrubland, grassland, and wetland/aquatic. Habitat associations of wildlife known or potentially occurring

[76] Council on Environmental Quality, 1993. *Incorporating Biodiversity Considerations into Environmental Impact Analysis under the National Environmental Policy Act.*

in the corridor are listed in Table 3-49, with the number of species of birds, mammals, and reptiles corresponding to each habitat association. Note that many species are associated with multiple habitats. For example, as shown in the groupings toward the bottom of the table, 48% of the species potentially occurring in the project corridor (143 of 301) have a habitat association that includes forest (forest; forest and shrubland; forest, grassland, shrubland, etc.) A little less than half (44%, or 132 of 301) have a habitat association that includes wetlands/aquatic. On the other hand, some species are limited to one habitat type, as summarized at the bottom of the table. For example, 4% of the species (11 of 301) are found *only* in shrubland. Cropland and urban/built-up land, which make up about 65 percent of the project corridor cover, are not included, although they do provide habitat for some highly adaptable wildlife. The grassland that is available for habitat is primarily non-native.

Forested Habitat. Forests are used by many Neotropical migrant bird species (those that winter in the tropics and breed in North America), up to 27 of which potentially breed in the corridor. Another 15 species of Neotropical migrants use forests during migration (INHS 2005). However, available evidence suggests no forests in Illinois are of sufficient size to reliably function as "sources" (i.e., locations where recruitment exceeds mortality) for Neotropical migratory birds, "though small woodlots and riparian forests are important stopover habitat during migration." Forests larger than 50,000 acres are assumed to be large enough to function as population sources for Neotropical migratory birds (IDNR 2005a). Forests greater than 20 acres in size in the project area are discussed in Section 3.11.1.1. The largest of these forests covers about 160 acres. None of theses forested areas is compact; it is never possible to be more than 1,000 feet from a non-forested area. Low reproductive success is thought to be largely the result of nest parasitism by brownheaded cowbirds and nest predation by snakes, birds, and mammalian predators that flourish in agricultural landscapes. Both nest parasitism and predation are higher in fragmented forests such as those in the project corridor, especially where the area around the forests is dominated by row crop agriculture. Cowbirds forage in pastures, row crops, and lawns, but not in taller grassland, shrub or forest habitats. Brown-headed cowbirds were observed during the breeding season at 21 of the 27 avian census points from the biological survey (Feist and Trester 2005, Feist 2007). They were observed at all but one of the forest census points (LF1, low quality forest).

The following Neotropical migrants that may breed in area forests were observed during the INHS surveys (number of individuals observed in parentheses): Eastern wood-pewees (26), great-crested flycatcher (23), red-eyed vireo (22), house wren (15), wood thrush (11), gray catbird (15), northern parula (19), yellow-throated warbler (1), Louisiana waterthrush (1), scarlet tanager (6), blue-gray gnatcatcher (15), rose-breasted grosbeak (2), Baltimore oriole (6), yellow-billed cuckoo (7), American redstart (3), indigo bunting (33), worm-eating warbler (1), ovenbird (6), Acadian flycatcher (2), and yellow-throated vireo (1). The following birds of other habitat types were also observed in forest settings during breeding season (habitat type in parentheses): four brown thrashers (shrubland), 13 common yellowthroats (shrubland/wetland), one warbling vireo (shrubland).

Several species of snakes, salamanders and frogs inhabit the area forests. Examples of mammals that use the area forests are deer, opossums, chipmunks, raccoons and several species of bats.

Wetland/Aquatic Habitat. Marsh and lake areas such those at Double T State Fish and Wildlife Area (referred to as Hitchcock Wetlands in Feist and Trester 2005) and others within the strip-mined lands between Cuba and Norris provide stopover sites for migrating waterfowl and shorebirds. Twenty-two species of migratory waterfowl may be found in the project area and seven were observed during the censuses (Feist and Trester 2005, Feist 2006). The following Neotropical migrants that may breed in area wetlands were observed during the INHS surveys (number of individuals observed in parentheses): Willow flycatcher (5) and common yellowthroat (17). The following birds of other habitat types were also observed in wetland settings during breeding season (habitat type in parentheses): one eastern phoebe (forest/shrubland), three warbling vireos (shrubland), three house wrens (forest/shrubland), five gray catbirds (forest/shrubland), three brown thrasher (shrubland), three black-billed cuckoos (forest/shrubland), two yellow warblers (forest/shrubland), seven indigo buntings (forest/shrubland), two dickcissels (grassland), two bobolinks (grassland), one eastern kingbird (shrubland, grassland), one warbling vireo (shrubland), two sedge wrens (grassland), and one winter wren (forest).

Beavers, muskrats, river otters and several species of frogs and turtles inhabit the streams, stream banks and lakes in the project area.

Grassland Habitat. The great majority of the project area grasslands are non-native grasses, with the strip-mined areas making up a large part of the grassland. Up to 28 species of Neotropical migrants may nest in project area grasslands. The following Neotropical migrants that may breed in area grasslands were observed during the INHS surveys (number of individuals observed in parentheses): willow flycatcher (2), barn swallow (19), yellow-breasted chat (2), dickcissel (6), bobolink (2), eastern kingbird (2), northern rough-winged swallow (1), and sedge wren (2). The following birds of other habitat types were also observed in forest settings during breeding season (habitat type in parentheses): 2 eastern phoebes (forest/shrubland), one eastern wood-pewee (forest), three warbling vireos (shrubland), two red-eyed vireo (forest), three willow flycatchers (shrubland), six house wrens (forest/shrubland), one wood thrush (forest), nine gray catbirds (forest/shrubland), three brown thrashers (shrubland), six blue-winged warblers (shrubland), 46 common yellowthroats (shrubland/wetland), three scarlet tanagers (forest), two blue-gray gnatcatchers (forest), six Baltimore orioles (forest/shrubland), 2 yellow-billed cuckoos (forest/shrubland), nine yellow warblers (forest/shrubland), and 24 indigo buntings (forest/shrubland).

Mice and voles are typical grassland mammals, and several snake species are restricted to grassland.

Table 3-49
Habitat Associations of Bird, Mammal, Amphibian and Reptile Species Potentially Occurring in the Project Corridor

	Bird Species	Amphibian and Reptile Species	Mammal Species	Total	Percent of Total
Wetland/aquatic	61	16	3	80	
Forest	41	5	6	52	
Forest and shrubland	38			38	
Grassland and shrubland	23			23	
Grassland	15	5	8	28	
Forest, wetland/aquatic, grassland, shrubland		7	10	17	
Shrubland	11			11	
Forest, grassland, shrubland	5	5	1	11	
Forest and wetland/aquatic	1	4	4	9	
Shrubland, grassland and wetland/aquatic	6			6	
Grassland and wetland/aquatic	1	3	2	6	
Forest, wetland/aquatic and buildings			5	5	
Forest and grassland		4		4	
Shrubland and wetland/aquatic	3			3	
Forest, grassland and wetland/aquatic		1	2	3	
Grassland, forest edges, shrubland			2	2	
Forest, shrubland and wetland/aquatic	1			1	
Buildings, grassland and wetland/aquatic			1	1	
Buildings, grassland, wetland/aquatic and forest			1	1	
Totals	206	50	45	301	
Habitat associations that include forest	86	26	31	143	48%
Habitat associations that include shrubland	49	12	13	74	25%
Habitat associations that include grassland	50	25	27	102	34%
Habitat associations that include wetland/aquatic	73	31	28	132	44%
Forest only	41	5	6	52	17%
Shrubland only	11	0	0	11	4%
Grassland only	15	5	8	28	9%
Wetland/aquatic only	61	16	3	80	27%

Shrubland Habitat. There are only about 100 acres of shrubland in the project corridor. Examples of wildlife that use shrubland are deer, the eastern cottontail, coyote, and red-tailed hawk. Almost all shrubland animals also use other habitat. The following Neotropical migrants that may breed in area shrublands were observed during the INHS surveys (number of individuals observed in parentheses): eastern phoebe (2), warbling vireo (2), willow flycatcher (2), gray catbird (2), brown thrasher (1), blue-winged warbler (2), common yellowthroat (2), Baltimore oriole (1), black-billed cuckoo (1), and Bell's vireo (2). The following birds of other habitat types were also observed in forest settings during breeding season (habitat type in parentheses): 11 indigo buntings, one red-eyed vireo (forest), and two rose-breasted grosbeaks (forest).

3.12.1.2 Illinois Species in Greatest Need of Conservation

The IDNR has identified conservation priorities for the state, in the document titled *Illinois Species in Greatest Need of Conservation* (IDNR 2005a, with updates on IDNR website).

Birds. Illinois Species in Greatest Need of Conservation that were identified during the biological survey are summarized in Table 3-50.

Forest and Forest /Shrubland Habitat (IDNR Forest/Savanna)

The three forest/shrubland habitat bird species are all migratory and all may be breeding birds in the area. The northern flicker was observed many times during breeding season, in forested areas, in pasture/hayland, prairies, grassland and wet meadows. The red-headed woodpecker, was also observed many times during breeding season, in forests and prairie sites. The other birds were observed only a few times, almost always in a forest, except for the yellow-billed cuckoo, which was observed in marshes and a wet meadow.

Table 3-50
Illinois Species in Greatest Need of Conservation, Birds

Species	Habitat Association (from IDNR 2005a)	Number Observed in Specific Project Habitats	Total Number Observed in Corridor	Habitat Project Corridor, Acres[1]	Notes
Yellow-billed Cuckoo	Forest/ Savanna	Forest-7 Grassland-2 Wetland-2	11	16,764	INHS habitat association: Forest/shrubland
Red-headed Woodpecker	Savanna	Forest-42 Grassland-6 Shrubland-4 Wetland-3	55	16,764	INHS habitat association: Forest/shrubland
Northern Flicker	Savanna/ grassland	Forest-15 Grassland-16 Shrubland-7 Wetlands-8	40	16,764	INHS habitat association: Forest/shrubland
Grasshopper Sparrow	Grassland	Grassland-9	9	1,338	

Table 3-50
Illinois Species in Greatest Need of Conservation, Birds

Species	Habitat Association (from IDNR 2005a)	Number Observed in Specific Project Habitats	Total Number Observed in Corridor	Habitat Project Corridor, Acres[1]	Notes
Dickcissel	Grassland	Grassland-6 Wetland-2	8	1,338	
Bobolink	Grassland	Grassland-2 Wetland-2	4	1,338	
Yellow-breasted Chat	Successional fields/edges	Grassland-2	2	1,429	INHS habitat association: Shrubland/grassland
Northern Bobwhite	Successional fields/grassland	Grassland-18 Shrubland-2 Wetland-6	26	1,429	INHS habitat association: Shrubland/grassland
Blue-winged Warbler	Successional, forest	Forest-5 Grassland-2 Shrubland-1	8	91	INHS habitat association: Shrubland
Field Sparrow	Successional	Forest-8 Grassland-57 Shrubland-26 Wetland-6	97	91	INHS habitat association: Shrubland
Bell's Vireo	Successional, forest	Grassland-1 Shrubland-2 Wetland-1	4	1,666	INHS habitat association: Shrubland/wetland/aquatic

[1]The habitat acreage shown is based on the INHS habitat association, if different from the IDNR association. Acreage is available only for the INHS habitat association.

Grassland and Shrubland/Grassland Habitat (IDNR Grassland, Successional Fields)

According to Partners in Flight, grassland birds are probably most in need of conservation efforts in the tallgrass prairie region and nationally (PIF 2006). IDNR notes that "open, treeless, upland grasslands more than 0.5 mile wide are especially important to species in greatest need of conservation" (IDNR 2005a). In general, the strip-mined lands will probably have the highest potential for habitat for conservation priority species: they are more likely to be unmowed, have few trees, have abundant water, and are least fragmented. Three grassland and two shrubland/grassland species observed during the biological survey have been identified as Illinois conservation priority species. Observations of the grassland birds were mostly in non-native grassland, pasture/hayland, marshes and wet meadows. All these birds will potentially breed in the corridor area, and all but the northern bobwhite are migratory. All three of the grassland-only birds were observed during breeding season: grasshopper sparrow, dickcissel, and bobolink. Observations of these birds during breeding season were primarily in the non-native grassland and pasture/hayland sites. The chat was observed in pasture/hayland locations. The northern bobwhite was observed at the marsh locations in Double T State Fish and Wildlife Area and at non-native grassland locations. The northern bobwhite leads the list of Partners in Flight shrubland birds for the Eastern Tallgrass Prairie Region.

Shrubland Habitat

Two conservation priority species, the blue-winged warbler and the field sparrow, are considered only shrubland birds (several others use shrubland). Both these birds were observed during the breeding season in the biological survey. The field sparrow was observed many times, in non-native grassland, forests, prairies, a wet meadow, and shrubland. There were fewer observations of the blue-winged warbler, in forests, shrubland, and prairies. Birds who use shrubland habitat are able to use small patches (PIF 2006).

Wetland/Aquatic Habitat (IDNR, Successional, Forest)

One migratory wetland/aquatic species, the Bell's vireo, is a conservation priority (Table 3-50). It was observed in the project corridor during breeding season in a prairie, a shrubland, and a marsh.

Mammals. One Illinois Species in Greatest Need of Conservation, the muskrat, was observed during the biological survey.

Amphibians and Reptiles. No Illinois Species in Greatest Need of Conservation were observed during the biological survey.

3.12.1.3 Recreationally Important Species

Hunting is important in the three-county area, particularly in Fulton County, where hunters making many thousands of trips each year harvest Canada geese, ducks, white-tailed deer, and wild turkey in great numbers. Based on available data from IDNR, it appears that duck hunting is most important on public lands such as those along the Illinois River south of the project area, and that goose, deer, and turkey hunting are most important on private land. There is one public land in the project corridor open to hunting: the 2,000-acre Double T State Fish and Wildlife Area (formerly referred to as the Fulton County Goose State Wildlife Area). Parts of Double T are open to waterfowl and dove hunting. Many game species were detected in the corridor during the biological surveys, including seven species of waterfowl, wild turkey, northern bobwhite, ring-necked pheasant, and mourning dove.

The importance of hunting is reflected in the strong demand and relatively high prices for recreational property, which has risen substantially in the last few years and was selling for $1,800 to $3,000 per acre in 2005. These properties are typically bought by non-farmers and paid for with non-farm income. The higher-priced land in this category tends to have at least enough tillable land to provide food plots.[77]

Canada Geese. Goose hunting is important on the former strip-mined areas, which are mostly privately owned. IDNR's seasonal aerial geese surveys have reported 20 to 30 thousand geese in

[77] Illinois Society of Farm Managers and Rural Appraisers, *Farmland Values and Lease Trends Report*, 2006.

a single count in Fulton County (January 2005 and 2006). These geese are found on all the major strip-mined lakes in the area, with sometimes as many as 10,000 geese at a single location.

Wild Turkey. The wooded areas of Fulton County are popular for wild turkey hunting. Of the approximately 16 thousand wild turkeys harvested in Illinois in 2006, 444 were from Fulton County, which ranked 5th in the state.

Ducks. The lakes along the Illinois River south of the project corridor are popular for duck hunting. The 2000 duck harvest at Rice Lake and Anderson Lake State Fish and Wildlife Areas totaled over 8,000.

Deer. Deer hunting is important in all three counties, and most important in Fulton County. In 2005, Fulton County reported a deer harvest (firearm, November season) of 2,801, third highest of 99 Illinois counties reporting, and with a total state deer harvest over 100,000 (IDNR 2006c). Illinois estimates the Illinois deer population at 750,000 to 800,000 (IDNR 2005a).

3.12.1.4 Vehicle-Deer Crashes

Deer-vehicle collisions are a costly and dangerous problem. According to the Insurance Institute for Highway Safety there are an estimated 1.5 million deer-vehicle collisions annually in the United States, causing more than 150 fatalities and $1.1 billion in property damage. One major insurance company reported average 2005-2006 property damage cost of $2,800 per crash, with Illinois as their third-ranked state for deer collisions (State Farm 2006). Deer crashes in Illinois increased by 46 percent between 1993 and 2005. In the three-county area, deer crashes nearly doubled between 1993 and 2003.

The number of Illinois deer crashes increased by 22 percent increase from 2000 to 2005, while total crashes declined. During the past few years, deer crashes in Illinois have accounted for about six percent of all crashes, about four percent of injury crashes, and less than one percent of fatal crashes.

Because of the lower traffic volumes and the higher frequency of deer crashes in rural areas, deer crashes represent a much higher percent of crashes in rural areas. For example, in 2003 Cook County, which is almost entirely urban, had the highest number of deer crashes in the state (918), but deer crashes accounted for only 0.4 percent of total crashes. Pike County, which is rural and leads the state is deer harvests had 669 deer crashes, which represented 67 percent of total crashes. All three counties in the study area have higher deer crash percents than the state overall (Table 3-51). For Fulton and McDonough Counties, deer crashes represent a substantial percent of total crashes (34 and 27 percent, respectively).

Animal crash locations for 2003-2005 for state routes near or along the Build Alternative are shown in Exhibit 3-20.[78] While the data indicate only animal crashes, most of these are probably

[78] These data are publicly available and were not collected for this project.

deer crashes. Except for the west end of the corridor and in the immediate vicinity of Canton, where there are few crashes, deer crashes in the project corridor occur all along IL 95, IL 78, IL 116, and the Cuba to Canton blacktop (CH 5). Crash density appears to be a little higher in the vicinity of wooded drainages of perennial streams at the Spoon River between Marietta and Smithfield, at the West and Middle Branches of the Copperas Creek near Norris. On IL 116, there appears to be a higher density of crashes near the east end of the corridor, where traffic is higher.

3.12.1.5 Important Use Areas and Area of Concern for Amphibians and Reptiles

As part of the 2005 and 2006 biological field studies, biologists identified important use areas for amphibians and reptiles near the alignments then under consideration. Important use areas for amphibians and reptiles were defined as specific areas (pond, marsh, or similar feature) having a high species diversity relative to other areas in the region. For purposes of the study, specific areas within the proposed IL 336 corridors with five or more amphibian and reptile species were designated as important use areas (Feist 2006). Data from the 2004 biological survey (Feist and Trester 2005) was the primary source of information for identifying the important use areas. Information from the 2005 and 2006 biological surveys (Feist 2006, 2007) was also used, as well as museum records and 1996-1997 surveys for the proposed Macomb Bypass. The identification of important use areas included only the alignments under consideration in 2005 and the area around the proposed Macomb Bypass. Three important use areas and one area of concern were identified. The "area of concern" was a location that did not meet the "important use" criteria but still showed enough diversity to be of note. For each of these four sites, Table 3-52 describes the location, summarizes the extent of the survey, and lists the species found. For each species Table 3-52 also includes a brief habitat description and summary of the status of the species in Illinois.

Important Use Area No. 1, at the East Fork La Moine River, was identified from the proposed Macomb Bypass biological survey information. In 1996 and 1997 biologists observed seven amphibian and one reptile species at this location (Table 3-52). No amphibians or reptiles were observed here during a single half-hour visit in October 2005.

Important Use Area 2 is at the Spoon River in the vicinity of the existing IL 95 bridge (Table 3-52). Biologists observed five amphibian and two reptiles during 3 visits in 2004 and 2005.

Important Use Area 3 was identified as an area of concern during the 2005 field work. At the time of the 2005 field work, it was a forested beaver impoundment on the West Branch of the Copperas Creek, Forest 22, east of Norris (discussed in Subsection 3.11.1.1). Although this site was visited late in the season and no amphibian or reptile species were observed, it was considered an area of concern because of the potential for five or more amphibian/reptile species to inhabit the impounded stream and adjacent habitats (Feist 2006). When the site was visited in August 2006, the impoundment was gone and the stream was confined to the channel. However,

five amphibian species were identified; thus the site met the Feist 2006 criteria for important use area (Table 3-52).

An area along the Cuba to Canton blacktop, between North Gale Road and Highway 1950 East (CH 22), was identified as an area of concern. There are strip-mine lakes along both side of the road through this area. During surveys in 2004 and 2005 biologists observed three amphibian (frog) and one reptile species in the ponds south of the road. The report noted that other amphibian and reptile species are likely in the strip-mine lakes (Feist 2006). From May to September 2004 biologists made incidental observations of road-killed painted turtles (on five dates between May 2004 and September 2005), a central rat snake, a northern water snake and an eastern garter snake along the Cuba to Canton blacktop between North Gale Road and CH 22, a distance of about four miles.

Almost all the amphibian and reptile species found are common species in Illinois, and most are widespread (Table 3-52). Two of them have apparently experienced decline, though: the Illinois Natural History Survey notes that Blanchard's cricket frog has declined over much of Illinois, and that the plains leopard frog "remains widespread but not abundant." Blanchard's cricket frogs appear to be fairly common in the project area: biological surveys done for this project documented Blanchard's cricket frogs at 12 locations, some with multiple individuals, including the Middle Branch of the Copperas Creek with an estimated 80-140 Blanchard's cricket frogs observed (Feist and Trester 2005, Feist 2006). Plains leopard frogs were documented at six locations during the surveys; only one with multiple individuals (Feist and Trester 2005, Feist 2006).

Table 3-51
Deer Crashes by County

	Deer Crashes				Total Crashes				Deer Crashes as Percent of Total			
	2000	**2001**	**2002**	**2003**	**2000**	**2001**	**2002**	**2003**	**2000**	**2001**	**2002**	**2003**
Fulton	287	335	351	404	1,009	1,036	1,038	1,194	28%	32%	34%	34%
McDonough	164	190	205	240	969	985	952	897	17%	19%	22%	27%
Peoria	360	442	438	508	6,726	6,342	6,620	6,485	5%	7%	7%	8%
	811	967	994	1,152	10,704	10,364	10,612	10,579	8%	9%	9%	11%

Sources: Deer crash Information from Illinois Department of Transportation, Division of Traffic Safety, Bureau of Safety Data & Data Services. Obtained through the Deer Vehicle Crash Information Clearinghouse. Total crash information from Annual Illinois Crash Facts and Statistic.

Table 3-52
Reptile and Amphibian Important Use Areas and Area of Concern

Area	Location	Notes on Survey	Species		Notes from Illinois History Survey	
			Scientific Name	Common Name	Habitat	Status
Important Use Area No. 1	proposed Macomb Bypass. East Fork La Moine River, floodplain, forest, marshes, oxbows.	All animals were identified during 1996-1997 proposed Macomb Bypass survey. No amphibians or reptiles observed October 2005 (0.53 man-hours).	*Ambystoma texanum*	small-mouthed salamander	Widespread in poorly drained woodlands, prairies, pastures, and in cultivated or urban areas when breeding ponds remain.	Common and widespread. Greatest threat is lost of wet areas for breeding and larval development.
			Bufo americanus americanus	eastern American toad	Virtually all forest and prairie habitats in Illinois, and in urban and agricultural areas, where flooded fields, ditches, and other bodies of water are available for reproduction.	Common throughout nearly the entire state.
			Acris crepitans blanchardi	Blanchard's cricket frog	Shallow margins of lakes, ponds, marshes and streams.	Once one of the most common frogs in the Midwest, it has declined over much of northern Illinois. Threats not well understood.
			Pseudacris triseriata	western chorus frog	Found in almost any type of wet habitat, including agricultural fields and urban settings, such as city parks, as long as vernal breeding pools are available. Breeds in ditches, flooded fields, floodplain depressions, even in wet areas along the busiest highways.	One of the most common spring frogs in the northern two-thirds of Illinois.
			Rana blairi	plains leopard frog	Uncultivated former prairies, marshlands, along creeks, in open bottomlands, and in old fields (former prairie) not far from water. Breeds in still waters of pools, roadside and drainage ditches, marshes, and ponds.	Most of original habitat has been rendered unsuitable by agriculture. Remains widespread but not abundant.

Table 3-52
Reptile and Amphibian Important Use Areas and Area of Concern

Area	Location	Notes on Survey	Species		Notes from Illinois History Survey	
			Scientific Name	Common Name	Habitat	Status
Important Use Area No. 1 *(cont.)*	proposed Macomb Bypass. East Fork La Moine River, floodplain, forest, marshes, oxbows. *(cont.)*	All animals were identified during 1996-1997 proposed Macomb Bypass survey. No amphibians or reptiles observed October 2005 (0.53 man-hours). *(cont.)*	*Rana catesbeiana*	American bullfrog	Permanent bodies of water (lakes, ponds, rivers, sluggish portions of streams) in forests, prairies, and disturbed habitats (including urban areas).	Abundant statewide in permanent aquatic habitats.
			Rana sphenocephala	southern leopard frog	This is a species of broad ecological tolerance and is found in all sorts of shallow water habitats.	Widespread and locally abundant over the southern half of the state.
			Storeria dekayi wrightorum	midland brown snake	Variety of forest and prairie habitats, floodplains and uplands, forest edges, even cultivated fields, and especially in vacant lots in cities.	Common throughout most of the state.
Important Use Area No. 2	Spoon River, pools, and riparian area near existing IL 95 bridge.	April 16, 2004 (1.5 man-hours), September 29, 2004 (1.6 man-hours), October 22, 2004 (0.7 man-hour), August 11, 2005 (1.3 man-hour).	*Bufo* sp.	unidentified toad		
			Acris crepitans blanchardi	Blanchard's cricket frog	See notes under Important Use Area No. 1	
			Hyla versicolor	eastern gray treefrog	Trunks and branches of trees. Adults mate in woodland pools, roadside ditches, and other temporary bodies of water.	Common to very common throughout Illinois.
			Rana blairi	plains leopard frog	See notes under Important Use Area No. 1	

Table 3-52
Reptile and Amphibian Important Use Areas and Area of Concern

Area	Location	Notes on Survey	Species		Notes from Illinois History Survey	
			Scientific Name	Common Name	Habitat	Status
Important Use Area No. 2 *(cont.)*	Spoon River, pools, and riparian area near existing IL 95 bridge. *(cont.)*	April 16, 2004 (1.5 man-hours), September 29, 2004 (1.6 man-hours), October 22, 2004 (0.7 man-hour), August 11, 2005 (1.3 man-hour). *(cont.)*	*Rana catesbeiana*	American bullfrog	See notes under Important Use Area No. 1	
			Lampropeltis calligaster	prairie kingsnake	Grasslands from high-quality remnant prairie to degraded brushy fields. Less common in heavily farmed black-soil prairie.	Locally common in prairie remnants of the Southern Till Plain counties.
			Thamnophis sirtalis sirtalis	eastern gartersnake	Forests and edge habitats, commonly near water. Vacant lots in cities.	Common throughout the state.
Important Use Area No. 3	West Branch Copperas Creek, at Forest 22. Had been inundated in 2005 (beaver impoundment), but in 2006 stream was confined to channel.	Visual survey (1.1 man-hours) on August 24, 2006.	*Rana catesbeiana*	American bullfrog	See notes under Important Use Area No. 1	
			Acris crepitans blanchardi	Blanchard's cricket frog	See notes under Important Use Area No. 1	
			Hyla chrysoscelis or H. versicolor	gray treefrog	See notes under Important Use Area No. 1. These two species are morphologically identical.	
			Rana blairi	plains leopard frog	See notes under Important Use Area No. 1	

Table 3-52
Reptile and Amphibian Important Use Areas and Area of Concern

Area	Location	Notes on Survey	Species		Notes from Illinois History Survey	
			Scientific Name	Common Name	Habitat	Status
Area of Concern No.1	Along CR 5 (Cuba to Canton blacktop), between North Gale Rd and CR 22, with strip-mined lakes on both sides of road. Species (some roadkill) identified at various times 2004-2005.	Incidental observations of road-killed reptiles on May 13, June 8, September 16, September 29, 2004; and August 16 and September 29, 2005. Visual survey (0.33 man-hours) of two ponds on September 29, 2004; visual survey of pond on September 2, 2005.	*Bufo americanus americanus*	American toad	See notes for eastern American toad (subspecies) under Important Use Area No. 1	
			Acris crepitans blanchardi	Blanchard's cricket frog	See notes under Important Use Area No. 1.	
			Rana blairi	plains leopard frog	See notes under Important Use Area No. 1.	
			Rana catesbeiana	American bullfrog	See notes under Important Use Area No. 1.	
				painted turtle	Frequents most aquatic habitats but most common in shallow, quiet, weedy parts of lakes, ponds, marshes and river backwaters.	Common and widespread. Highly adaptable, less susceptible to habitat modification than many turtles.
			Elaphe spiloides	central rat snake (roadkill)	Variety of forest, shrub, and edge habitats. Common around farm buildings and abandoned houses.	Locally common, especially in the southern half of the state.

Table 3-52
Reptile and Amphibian Important Use Areas and Area of Concern

Area	Location	Notes on Survey	Species		Notes from Illinois History Survey	
			Scientific Name	Common Name	Habitat	Status
Area of Concern No.1 *(cont.)*	Along CR 5 (Cuba to Canton blacktop), between North Gale Rd and CR 22, with strip-mined lakes on both sides of road. Species (some roadkill) identified at various times 2004-2005. *(cont.)*	Incidental observations of road-killed reptiles on May 13, June 8, September 16, September 29, 2004; and August 16 and September 29, 2005. Visual survey (0.33 man-hours) of two ponds on September 29, 2004; visual survey of pond on September 2, 2005. *(cont.)*	*Nerodia sipedon*	northern watersnake (roadkill)	Streams, lakes, ponds, and ditches.	Abundant throughout Illinois in both natural and man-made bodies of water
			Thamnophis sirtalis sirtalis	eastern gartersnake (roadkill)	See notes under Important Use Area No. 2.	

Sources: Feist and Trester 2005, Feist 2006, Feist 2007, Illinois Natural History Survey website updated 2004

3.12.2 Environmental Consequences

3.12.2.1 Habitat Loss

The No-Build Alternative would not cause the loss of wildlife habitat. The Build Alternative will cause the conversion of 2,651 acres of cover types to highway use (Table 3-47). Loss of wildlife habitat can be measured through estimates of cover type losses that support wildlife. Construction of the Build Alternative will result in the conversion of several cover types that support various species of wildlife. These habitats include upland forest, nonnative grassland, prairie and wetlands. To some extent, impacts will occur to all the animals that currently use the land that will be taken for the Build Alternative. However, impacts to populations of wildlife that are common in the project area, including recreational species (except for the bobwhite, which is not common and is discussed under grassland species below) will be negligible. Potential impacts to species of conservation priority as defined by FWS and IDNR are discussed in the following paragraphs.

Of the reference sites used for avian surveys, four were within the alignment for the Build Alternative:

- The first was Pasture/hayland Reference Site 2 (Appendix C, Exhibit C-11), which was located in a former strip-mined area along the south side of the Cuba to Canton Blacktop (CH 5) that includes several wetlands, some of which will be partially impacted by the Build Alternative.

- Second was Forest 23, located northeast of Norris (Exhibit C-14).

- Third was a non-native grassland site, not one of the plant community reference sites, south of Laswell Road and east of Grant Keime Road, west of Cuba, in the area where the Build Alternative is entering the strip-mined lands that extent from west of Cuba to Norris.

- Fourth was a pasture/hayland site in a strip-mined area south of the Canton Airport. This location was also not a plant community reference site.

Forested Habitat. The Build Alternative will require 91 acres of forested land. As noted in Table 3-48, 73 acres will come from forests and the remaining 41 acres will come from very small scattered plots and strips of trees throughout the 60-mile corridor. Of the impacts on the 12 forests seven forests have edge impacts (14 acres, along an existing right-of-way) and five forests are bisected (59 acres). The largest impacts to bisected forests are to Forests 22 and 23 at crossings of the West and Middle Branches of Copperas Creek, where 34 acres of forest will be impacted (Table 3-48). Of this, 25 acres is from Forest 23. Impacts to forested wildlife will be expected to be higher at the locations of bisected forests; however, all the forests in this area are already highly fragmented. Impacts to conservation priority forest avian species will be unlikely

except possibly at Forests 22 and 23. Of the species of conservation concern (Section 3.12.1.2), only the northern flicker was observed at Forest 23, which was a census location (no census was done at Forest 22). There were many sightings of the red-headed woodpecker, which Partners in Flight has identified as the lead priority savanna species for the tallgrass prairie region. No savanna will be impacted by the project. No conservation priority mammals, reptiles, or amphibians will be expected in any of the forest areas.

Grassland Habitat. The Build Alternative will require 157 acres of non-native grassland and 37 acres of prairie for a total of 194 acres of grassland. The 37 acres of prairie is in a single location: it is a 50-foot wide strip of highly degraded prairie along an active railroad adjacent to the Cuba to Canton blacktop (CH 5) (Section 3.11.1.1). This prairie will have minimal value for wildlife. The remaining 167 acres of grassland is pasture, hay, and grassland that is not used for agricultural purposes (in the former strip-mined areas). The following grassland or grassland/shrubland species were observed at the three pasture/hayland or non-native grassland avian census locations that will be impacted by the Build Alternative: dickcissel, eastern meadowlark, yellow-breasted chat, and northern bobwhite. In addition, the Bell's vireo, a potential grassland species that is an FWS conservation priority species, was observed during breeding season at the pasture/hayland reference site 2 (Exhibit C-11).

There are no mammal conservation priority grassland species that might occur within the project area. The Illinois conservation priority smooth green snake and the ornate box turtle are both grassland species, but neither was observed during the biological survey.

The Build Alternative may result in some impacts to individual birds of some of the grassland conservation priority species observed during the biological survey.

Shrubland Habitat. No shrubland will be impacted by the Build Alternative, and therefore no shrubland-only species are likely to be impacted. Potential impacts to forest/shrubland species are discussed with forest habitats, and potential impacts to shrubland/grassland species are discussed with grassland.

Wetland Habitat. The Build Alternative will require less than five acres of wetland (Section 3.9). As noted above in this subsection, some of the wetlands that will be partially impacted are located within one of the avian census points, pasture/hayland reference site 2, located along the Cuba to Canton blacktop. Bell's vireo, an FWS and IDNR conservation priority species, was observed at this location during breeding season. The only other conservation priority wetland/aquatic species observed during the biological survey was a pie-billed grebe at a marsh area in the Double T State Fish and Wildlife Area, and at a wet meadow on the East Fork La Moine River, both away from the Build Alternative.

Two mammal wetland/aquatic IDNR conservation priority species, the river otter and the muskrat, have been documented recently within the project corridor. The river otter is known in the Spoon River within the project corridor. Construction of the Spoon River crossing for the Build Alternative will not be expected to impact the river otter, since no construction will occur

in the river (Section 3.8). Demolition and removal of the existing bridge will have potential minor and short-term impacts. River otters are known to be tolerant of nearby roadways with traffic much higher than anticipated for this project. Muskrats inhabit marshes, stream, and ponds.

The Build Alternative may result in minor impacts to individual birds of some conservation priority wetland/aquatic species, specifically the Bell's vireo, and potentially to the muskrat, but, because of the very small areas of impact on wetlands (less than 5 acres), any impacts are expected to be very small.

3.12.2.2 Construction Mortality

Construction of a roadway, from clearing to paving, can result in the death of slow-moving and nesting animals in the path of the road. The most pronounced and immediate effects may be on burrowing rodents and reptiles (or other species) with small territories. Individuals of those species either may be killed or permanently displaced by excavation, filling, and other ground disturbance. More mobile wildlife species in the project area will move from the construction area into surrounding habitats during construction. In addition, some degree of construction-related wildlife impact may result from the disruption of wildlife travel patterns arising from construction noise and activity. Road construction in road sections where wildlife frequently cross the highway can impair efficient crossing. As a result of noise and construction-related barriers, wildlife may spend more time on the highway searching for a crossing location. Unexpected wildlife road crossings are correlated with a higher probability of animal/vehicle collisions.

Aside from mortality issues, another potential impact will be temporarily displacing wildlife species by habitat alteration or noise disturbance (including nesting birds) from construction equipment.

3.12.2.3 Operational Mortality

Deer Crashes

Deer crashes currently account for a substantial percentage of total crashes in the project area (Table 3-51). This situation will be expected to continue, with either the No-Build Alternative or the Build Alternative. A deer crash pattern similar to that shown in Exhibit 3-20 will be expected with either case. If deer populations continue to rise and traffic increases, deer crashes will be expected to increase with either the No-Build Alternative or the proposed action.

However, construction of a new project provides the opportunity to incorporate measures to reduce crashes, if feasible and cost-effective measures are available. Many different measures have been implemented across the country and around the world to prevent deer crashes, but unfortunately, for most measures that have been tried the effectiveness has not been assessed, or if it has, the results are conflicting. In a review of research on measures used to reduce deer-

vehicle collisions, the author of the review concludes that, while several measures merited more study, the only measure that has been demonstrated to reduce deer crashes is an exclusionary fence. To qualify as exclusionary, a fence must be continuous (with no gaps or openings), must be sufficiently tall to keep deer from jumping over, and must extend in both directions beyond the areas where deer are expected. Otherwise, deer may become trapped in the right-of-way, exacerbating the problem. Exclusionary fences in combination with wildlife crossings are most effective, but wildlife crossings without exclusionary fences are generally not effective in reducing deer crashes (Knapp 2004).

Exclusionary deer fences do not appear to be feasible for this project. As Exhibit 3-20 shows, while there do appear to be slightly more crashes at areas of wooded stream crossings, the deer crashes locations are spread all along the roadways: there are no high-concentration areas beyond which the fence could end. Any fence that did not tie into something specific allows deer to go around it and be trapped within the right-of-way between the fences. Fences could not be installed along the expressway part of the project because they prevent access. The only locations on the Build Alternative where fences could potentially be installed are at the freeway section at both ends (approximately three miles on the west end and six miles on the east end). Even in those areas, fences could not cross roadways or railroads at grade-separated crossings. Tying in the ends of the fences is problematic. Finally, using the rule of thumb from Knapp, the frequency of deer crashes in the project area does not appear to justify the cost of a fence (Knapp 2004).

Amphibian and Reptile Important Use Areas and Areas of Concern

While the biological surveys for the Build Alternative did not include specific road kill studies, three amphibian and reptile important use areas, all at perennial streams, were identified in the biological surveys (Section 3.12.1.5). One of the important use areas is along the location of the proposed Macomb Bypass, which is not part of the Build Alternative. The two important use areas that are within the Build Alternative alignment are both at locations of proposed bridges, the Spoon River and the West Branch of Copperas Creek. There will be some short-term impacts to amphibians and reptiles during bridge construction. All the amphibians and reptiles found at these locations are common in Illinois, and these short-term impacts will have no effect on populations. Operations should have no impact on these areas. One of the important use areas is at the location of the existing IL 95 bridge, which will be replaced by the Build Alternative bridge. For both proposed bridges, there will be adequate space beneath the structures to allow wildlife crossings.

An amphibian and reptile area of concern was identified along the Cuba to Canton blacktop. In this area are strip-mine ponds with frogs and turtles along both sides of the road. Also, between North Gale Road and CH 22, a distance of about four miles, roadkill turtles and snakes were observed. The Build Alternative will follow the Cuba to Canton blacktop alignment through most of this area. The Cuba to Canton blacktop follows a narrow strip of unmined land between two areas of former strip mines. The entire area is highly altered. Frog and painted turtles were observed in the ponds, and roadkilled turtles and snakes were found on the road over a period of

several months. Currently, a railroad parallels the Cuba to Canton blacktop on the north. The slope from the railroad to the strip-mined area on the north is very steep. The slope from the roadway to the strip-mined area on the south is much flatter.

Wildlife crossings were considered along the roadway to allow wildlife to move back and forth between the strip mine ponds on the north and the strip mine ponds on the south. To be effective, some type of fence or barrier would be needed to funnel the wildlife to the crossings. Fences designed for reptiles have been used in other areas, and are quite expensive (NCHRP 2002). The crossings and fences would need to be constructed along approximately four miles of roadway. Since the Build Alternative would be sharing the strip of land with a railroad, the crossings would need to also go beneath the railroad, which would increase the cost and require additional coordination with the railroad. It would not be practical to place a fence between the proposed road and the railroad, as it would likely increase mortality from the railroad. Therefore, the south fence would need to be on railroad property, an arrangement that the railroad may or may not agree to. The fences would need to have openings for roads, which would reduce their effectiveness. Fences could interfere with right-of-way maintenance for both the Build Alternative and the railroad. Fence maintenance would be an added expense.

While elaborate systems to keep amphibians and reptiles off roadways and allow movement from one side of the road to the other are justified in some cases, such as the Gainesville, Florida example where many thousands of animals were killed in one year on a two-mile stretch of road, none of the information from the biological surveys (Feist and Trester 2005, Feist 2006) suggests that a system to allow movement and prevent access to the roadway at this location for this Build Alternative is warranted. Only common reptiles and amphibians were observed in the ponds, and eight common roadkill animals were observed over a period of more than a year. These were informal observations and not part of a roadkill survey, which may have yielded higher numbers of roadkilled animals; however, none of the information that was obtained during the surveys suggests an environmental benefit for safe movement for reptiles and amphibians between the strip mines north and south of the road that would be commensurate with the expense of constructing and maintaining a system to allow potentially safe movement.

No areas of high roadkill were observed at any other locations in the biological reports.

3.12.3 Measures to Minimize Harm and Mitigation

All bridges (but not culverts) over perennial streams will be constructed with openings wide enough to allow passage for wildlife. At the Spoon River crossing, there will be a fairly level area about 100 feet wide and well above the normal river elevation on each side of the river that can be used by wildlife. The Spoon River bridge will not have piers in the water, which will reduce impacts to wildlife including the otter, a conservation priority species.

Median barriers can cause animals to be trapped on the roadway. The Build Alternative will not have median barriers.

Implementation of erosion control measures (Section 3.8.3) and water-related permitting requirements (Section 3.16) will help minimize impacts to aquatic life. Wetland mitigation (Section 3.9) and tree mitigation will provide replacement habitat for forest species and wetland species. An approximately 46-acre parcel near and east of the Spoon River and north of the Build Alternative could potentially be used for both wetland and tree mitigation.

3.12.4 Indirect Impacts

Most of the available land in areas where project-related development could potentially occur is currently in cropland, and wildlife impacts will be negligible (Section 3.3.4.1).

In locations where forests are impacted, most impacts are edge effects, where wildlife impacts, especially on conservation priority species, will be minimal. However, removing the edge of a forest causes further penetration of interior forest, effectively moving the edge inward, and generally increasing fragmentation and could thus indirectly affect forested areas not directly impacted by the Build Alternative.

The greater accessibility to the area that the Build Alternative will provide could encourage more construction of residences on large single lots in more remote areas such as in the strip-mined and forested areas.

3.12.5 Cumulative Impacts

As discussed in Section 3.12.2.1, the Build Alternative has the potential to impact conservation priority wildlife species, and thus biodiversity, by reducing forest, wetland, and grassland habitat and by increasing fragmentation of forest and grassland habitat that is already highly fragmented. Residential multi-home developments and, more recently, development of single homes on relatively large and isolated tracts within the strip-mine lands and forested areas is on-going and further contributes to habitat loss and fragmentation. The development of the North Canton Mine is expected to require 443 acres of “fish and wildlife habitat,” which will be restored after the mine is closed (CRDC 2006, IDNR 2008a).

In its Wildlife Plan (2005), IDNR reports that while there are several thousand acres of CRP grassland in the Western Forest-Prairie Natural Division where this project is located, much of it is not managed and offers limited wildlife benefits. The plan sees this land as an opportunity and an important resource for providing the habitat needed for conservation priority species. This outcome will be beneficial; however, much of the CRP and CREP land might also be converted to growing corn when the current conservation contracts expire (Section 3.3), which will reduce wildlife habitat.

3.13 Threatened and Endangered Species

The federal Endangered Species Act, administered by the FWS, protects those animal and plant species that FWS has determined are endangered (in danger of extinction) or threatened (likely to

become endangered). The Illinois Endangered Species Protection Act, administered by the Illinois Department of Natural Resources, protects species determined to be endangered or threatened in Illinois. An Illinois endangered species is defined as one that is in danger of becoming extinct as a breeding species in Illinois. An Illinois threatened species is defined as any breeding species which is likely to become a state endangered species within the foreseeable future in Illinois. Those species that are determined by FWS to be threatened or endangered are referred to in this document as federal-listed species. Those species that are determined by the Illinois Endangered Species Protection Board to be threatened or endangered are referred to as state-listed species.

Consultation with FWS is required for any federal action that may "jeopardize the continued existence" of a federal-listed species or result in the "destruction or adverse modification" of places that FWS has designated as critical habitat for a particular species. (The Build Alternative is considered a federal action.) Consultation with the Illinois Department of Natural resources is required for all state-listed species.

The Illinois Natural Heritage Database and the FWS *Illinois List of Federally Endangered, Threatened, Proposed and Candidate Species by County* (FWS Illinois List, revised September 2007) were reviewed to establish which endangered and threatened species were likely to occur in the vicinity of the IL 336 project corridor. For birds the Illinois Breeding Bird Atlas was also reviewed. Flora and fauna surveys for federal- and state-listed species were completed in the project corridor between 2004 and 2006. Results of literature searches and protected species survey results are summarized below.

3.13.1 Affected Environment

3.13.1.1 Federal-Listed Species

Mammals

Indiana Bat (*Myotis sodalis*) (federal and state endangered). The endangered Indiana bat is the only federal-listed mammal species known to occur in central Illinois (Feist and Trester 2005). It is included on the FWS Illinois list for Fulton, Peoria and McDonough Counties. The following species information is from the FWS:

> The Indiana bat is a temperate, insectivorous, migratory bat that occurs in 20 states in the eastern half of the United States. The Indiana bat hibernates colonially in caves and mines during winter. In spring, reproductive females migrate and form maternity colonies where they bear and raise their young in wooded areas, specifically behind exfoliating bark of large, usually dead, trees. Both males and females return to hibernacula (i.e., the caves and mines where Indiana bats hibernate) in late summer or early fall to mate and enter hibernation. As of October 2006, the Service had records of extant winter populations of approximately 281 hibernacula in 19 States and 269 maternity colonies in 17

> States. The 2005 winter census estimate of the population was 457,000, which is a 15 percent increase from the 2003 estimate.

Critical habitat for the Indiana bat. Although FWS has identified approximately 281 Indiana bat hibernacula, only a few have very large numbers of the bats. These few sites host thousands or even tens of thousands of hibernating Indiana bats, in clusters that may have more than 300 bats per square foot. Each of these hibernacula, which are caves or mines, contains a substantial percent of the Indiana bat population concentrated in a small area, and the loss of any one of them will be a blow to the already vulnerable population. Thus, FWS has designated as critical habitat these several caves and two mines known to have large hibernating populations. One of these locations, a mine, is in La Salle County, Illinois (between Peoria and Chicago).[79]

FWS has designated no summer critical habitat for the Indiana bat. Its summer habitat is widespread: most, but not all, of the approximately 100 million acres of forested land in the Indiana bat's summer range is potential habitat.

Potential Indiana bat habitat within the study area. No caves and no open shafts leading to underground mines exist in the IL 336 corridor to provide hibernation sites for Indiana bats. Therefore, no potential Indiana bat winter habitat occurs in the project corridor (Feist and Trester 2005).

Potential summer habitat occurs statewide, however. Therefore, this species is considered to potentially occur in any areas with forested habitat (Nelson 2004). Maternity colonies may consist of a dozen or more roost trees. The tiny bats, which weigh less than ¼ ounce, roost primarily under loose tree bark, usually on dead trees. Indiana bats typically forage in semi-open to closed (open understory) forested habitats, forest edges, and riparian areas (FWS 2007).

The following description of Indiana bat roosting habitat is from the draft FWS Indiana Bat Recovery Plan (FWS 2007):

> In summer, most reproductive females occupy roost sites under the exfoliating bark of dead trees that retain large, thick slabs of peeling bark. Primary roosts usually receive direct sunlight for more than half the day. Roost trees are typically within canopy gaps in a forest, in a fenceline, or along a wooded edge. Habitats in which maternity roosts occur include riparian zones, bottomland and floodplain habitats, wooded wetlands, and upland communities.

Prior to 2004 there were no records of the Indiana bat from Peoria and Fulton Counties, but the Indiana bat had been found in McDonough County. In 1985 a pregnant Indiana bat was captured in McDonough County, along Camp Creek, about 10 miles from the western end of the project corridor, suggesting the presence of a maternity colony in that area. In 1980, 1981, and 1982,

[79] Federal Register, Vol. 41, No. 187, September 24, 1976.

three Indiana bats were found roosting on the outer walls of buildings in Macomb (Feist and Trester 2005). During 2002, an Indiana bat maternity colony was discovered along the edge of a bottomland clearing adjacent to Grindstone Creek near Industry. The maternity roost was located in a dead American elm and contained at least 46 bats.

The project corridor includes over 15,000 acres of forested habitat, which contains a suitable mix of tree species for roosting sites. Of the two live species FWS considers suitable for summer habitat, shellbark and shagbark hickory, shellbark was not a dominant tree in any of the forests, but shagbark hickory was one of the dominant species in 11 of the 25 forests (Table 3-45). All the trees FWS lists as potentially suitable habitat (dead) are dominant trees in the forests along the alignment, except for post oak (Section 3.13.1.1 and Table 3-45). These trees are common in forests throughout Illinois.

Mist-netting was conducted at two sites in 2004. The biological report noted that appropriate mist-netting sites were difficult to find because most streams are very narrow and the Spoon River is too wide and deep. Mist-netting was conducted at the following sites in and near the project corridor in 2004:

- Shaw Creek—a perennial stream tributary to the Spoon River. Mist-netting was done on four nights between July 27 and August 10, 2004 at two locations along Shaw Creek within the project corridor. One location (Site 1) was in the Spoon River floodplain, and the other (Site 2) was about two miles upstream of the Spoon River. At Site 1, there was a narrow strip of trees along the stream; Site 2 was at the edge of a forested area.

- Put Creek—a perennial stream tributary to the Spoon River, north of the project corridor. At the mist-netting location the stream is in an agricultural area. Except for a narrow strip of trees less than about 150 feet wide bordering the stream, the nearest forested areas are highly fragmented and over ¼ mile away. The nearest state highway is IL 95, about three miles south. Mist-netting was done on four nights between July 27 and August 10, 2004.

One little brown bat, 4 eastern red bats, and 1 big brown bat were captured at Shaw Creek Site 1. Three eastern red bats were captured at Shaw Creek Site 2. At the Put Creek site, ten bats representing four species were captured, including a post-lactating Indiana bat. The capture of a reproductively active female suggests that a maternity colony existed in the area, within about 1 ¼ miles of the capture, based on existing information about Indiana bat habits (Feist and Trester 2005).

In 2005, the area under study was refined based on identification of alignments. During the 2005 biological survey, forests greater than 20 acres near the study alignments were identified (Section 3.11.1.1 and Table 3-45). In 2006, mist-netting was conducted at the two locations near the alignments then under consideration where a perennial stream and a > 20 acre forest coincided:

- West Branch Copperas Creek—part of Forest 22 (Aerial Exhibit Sheet 24 and Table 3-45). Mist netting was done on the nights of August 2 and 3, 2006.[80]

- East Fork La Moine River—part of Forest 4 (Exhibit C-14 and Table 3-45). Mist netting was done on the nights of August 13 and 14, 2006.

One bat was captured at the West Branch Copperas Creek (eastern red) and 19 bats representing three species (eastern red, big brown and eastern pipestrelle) were captured at the East Fork La Moine River, but no Indiana bats were captured (Feist 2007). Monitoring with a bat detector at the West Branch Copperas Creek revealed very little bat activity (Feist 2007).

Plants

Eastern Prairie Fringed Orchid (*Platanthera leucophaea*) (federally threatened and state endangered). This plant is included for all three counties in the FWS Illinois List, but it is not included in the Illinois Natural Heritage Database for any of the counties. Eastern prairie fringed orchid occurs in wet tallgrass prairie and wet sedge meadows (FWS 2001). This plant was not observed in the botanical surveys conducted in the project corridor during 2004 to 2006, which included a single small sedge meadow (discussed in Sections 3.9, Wetlands and 3.11, Plant Communities). The project will not have an affect on the eastern prairie fringed orchid.

Prairie Bush Clover (*Lespedeza leptostachya*) (federally threatened and state endangered). This plant is included for all three counties in the FWS Illinois List, but it is not included in the Illinois Natural Heritage Database for any of the counties. Prairie bush clover is a tallgrass prairie plant known only in four Midwestern states, including Illinois. Known locations include prairie remnants and lightly grazed pasture (FWS 2000). This plant was not observed in the botanical surveys conducted in the project corridor during 2004 to 2006 (Section 3.11, Plant Communities). The project will not have an affect on the prairie bush clover.

Decurrent False Aster (*Boltonia decurrens*) (federally and state threatened). This plant is included in the FWS Illinois List and in the Illinois Natural Heritage Database for Fulton and Peoria Counties. In Illinois it is known to occur primarily along the Mississippi and Illinois River floodplains (Feist and Trester 2005). This plant was not observed in the botanical surveys conducted in the project corridor during 2004 to 2006 (Sections 3.9, Wetlands and 3.11, Plant Communities). The project will not have an affect on the decurrent false aster.

3.13.1.2 State-Listed Species

The Illinois Comprehensive Wildlife Conservation Plan & Strategy have identified several state-listed species as being critical to the Western Forest-Prairie Natural Division. Some of these species include the Franklin's ground squirrel, Henslow's sparrow, northern harrier, and the upland sandpiper.

[80] Mist-netting was terminated early (2112 h) on the night of August 2 because of an approaching thunderstorm.

Mammals

Franklin's Ground Squirrel (Spermophilus franklinii) (state threatened). Franklin's ground squirrel is a true hibernator and is active only from April to September. It is active during the day but spends less than 10 percent of its life above ground.

Illinois is in the southeastern part of the Franklin's ground squirrel's range, which extends west into Nebraska and north into Canada.[81] One observer noted Franklin's ground squirrels in Fulton and Peoria counties during the period 1931-1942, but the locations on his map do not lie within the IL 336 corridor. The only museum specimen from McDonough County was collected in 1965 near Colchester, about 10 miles from the project corridor. There are four specimens from Fulton County, all collected in 1950. They were obtained one mile northwest of Norris, four miles northwest of Canton, and three miles west of Canton. These three locations are within the IL 336 corridor. (Feist and Trester 2005).

Franklin's ground squirrel is thought to be declining in the eastern portion of its range, primarily as a result of habitat loss. Accordingly, it was listed as state-threatened by the Illinois Endangered Species Protection Board during 2004.

Although a characteristic species of tallgrass and mid-grass prairie regions, Franklin's ground squirrel does not inhabit only open prairie. It occupies the zone between woodlands and grasslands, forest openings, thickets, and marsh borders. The most important habitat requirement for Franklin's ground squirrel is a tall, dense vegetative cover of grasses, forbs, shrubs, and small trees. Accordingly, it prefers habitats that experience infrequent disturbance to vegetation or soil. Franklin's ground squirrel avoids the short grass of closely grazed pastures or mowed areas such as golf courses, cemeteries, and lawns. Franklin's ground squirrels occupy burrows year-round (for hibernation during winter) and the availability of suitable sites for burrowing is a limiting factor. Burrows must be sufficiently insulated to remain cool during summer and above freezing during winter, and well drained to avoid flooding. Thus, burrows are located in areas with well-drained soils and often on steep slopes. In the intensively agricultural Midwest suitable habitat for Franklin's ground squirrels occurs in fencerows, old fields, roadsides, prairie cemeteries, ditch banks, and railroad rights-of-way.

No Franklin's squirrels were seen or heard while driving roads in the corridor during the 2004 field season, but an extensive survey on foot was not undertaken. Potential habitat for Franklin's ground squirrel in the corridor may occur primarily along railroad embankments, roadsides, fencerows, and stream and lake banks. During the 2006 field season, INHS biologists trapped sections of the railroad embankment between Canton and Cuba and two sections of roadside along IL 95 between Marietta and Smithfield. No Franklin's squirrels were captured. Based on these results and the absence of observations of Franklin's ground squirrel in the corridor for

[81] Smithsonian National Museum of Natural History, 2007.

more than 50 years, the Franklin's ground squirrel is unlikely to be present in the project corridor (Feist and Trester 2005, Feist 2006). The project will not have an affect on the Franklin's ground squirrel.

Birds

Bald Eagle (*Haliaeetus leucocephalus*) (federally protected and state threatened). The bald eagle may occur in the project area year-round. During the winter (October through March) migrating bald eagles are present along the Illinois River and its adjacent lakes south of the project area. As a result of bans on certain pesticides and FWS' recovery efforts, the bald eagle is thriving in the lower 48 states, including Illinois. The bald eagle was removed from the list of federally endangered species effective August 8, 2007. However, it is still protected under the Bald and Golden Eagle Protection Act.

The bald eagle prefers tall trees near rivers or reservoirs. Mature floodplain trees, often cottonwoods, are considered prime habitat. Eagles feed primarily on small fish but also on small mammals, waterfowl, small birds, and carrion (INHS 2000).

No bald eagles were observed during the 2004 – 2006 biological surveys, but two were observed (December 2002 and January 2003) during a biological survey of Double T State Fish and Wildlife Area (Brucker 2003). Double T Conservation Area is discussed in Section 3.14, Designated Lands. Local residents have reported bald eagle observations in the wooded area along the Spoon River. The nearest known bald eagle nests are at the Emiquon Nature Conservancy Preserve, located along the Illinois River about 10 miles south of the Build Alternative. The project will not have an affect on the bald eagle.

Henslow's Sparrow (Ammodramus henslowii) (state threatened). The Henslow's sparrow has been one of the fastest declining songbirds in North America. In Illinois it may have declined by 94 percent between 1957 and 1979 (Heckert 1997). However, numbers may be increasing in Illinois over the past several years: annual spring bird count data for Illinois show only occasional sightings from 1975 to 1999, then a dramatic rise from 2000 to 2005.[82] At least 100 birds were observed in every year but one from 2000 to 2005, and the 2005 count was almost 200 (INHS 2006). The bird's status is "apparently secure" only in Ohio and Pennsylvania. Decline apparently is related to loss of habitat due to development, successional change to shrubland or forest, and use for row-crop agriculture. In the Midwest a switch in agriculture methods from hay production and grazing to intensive production of specialized crops (soybeans, corn, etc.) has been a major factor in habitat loss. Even when hay production is maintained, the movement to production of alfalfa, with frequent mowing and resulting nest losses, has been a factor. Fragmentation of suitable habitat into small widely scattered plots is another serious threat. For breeding the Henslow's sparrow needs at least 75 acres of unfragmented grassland, and grassland areas of 250 acres or more are most suitable (NatureServe 2006).

[82] The counts are normalized for the number of hours spent.

Tallgrass prairie was the original breeding habitat for Henslow's sparrow. Currently typical breeding (summer) habitat in the Midwest includes neglected grassy fields, pastures and meadows with scattered shrubby vegetation, or hayfields with dense cover, usually in damp or low-lying areas. A typical nest may be located at the base of a clump of grass. Two broods of young per breeding season (approximately May through August) are raised.

Former strip-mined areas may be important for Henslow's sparrows. Many former strip-mined areas have suitable habitat features: large areas of unmowed, unfragmented tall grass, with no trees (for predators or competitors), ample water and wet areas, and a dense layer of ground litter for nesting (NatureServe 2006). In Pennsylvania, one of only two states where the population appears secure, the Henslow's sparrow has been increasing in abundance over the last 20 years and colonizing grasslands created by the "reclamation" of surface coal mines. An Indiana study documented extensive use of grasslands on former strip-mined areas by breeding Henslow's sparrows (Bajema 2001). At Pyramid State Park in southern Illinois (Perry County), one of largest continuous areas of grassland in the state and a former strip-mined area, over 500 Henslow's sparrows have been documented. Encroachment of woody species has been identified as the greatest threat to this grassland habitat (Audubon 2004). Goose Lake Prairie State Natural Area in Grundy County, Illinois, which includes both the largest tract of native tallgrass prairie in Illinois and former strip-mined grasslands, is also important habitat for the Henslow's sparrow.

Multiple Henslow's sparrows (one to three individuals) were detected at reference site Prairie 3 on 21 and 28 April 2004 (Exhibit C-12). Prairie 3 was a ten-year-old prairie planting (reconstruction) that is part of the Kedzior Woodland Land and Water Reserve (Section 3.11.1.1). These birds were singing and therefore likely to be males attempting to set up breeding territories. However, these birds were not detected during the breeding season, so they may not have been successful in attracting mates. No Henslow's sparrows were detected at this site during the 2005 biological survey.

Searches were made in other potentially suitable grasslands for Henslow's sparrow during the breeding season in 2004, but no individuals were detected. During the 2005 avian census, a Henslow's sparrow was detected at a non-native grassland site north of Kedzior Woodland Land and Water Reserve, near the Spoon River. This bird was singing and was likely a breeding bird at this site. No Henslow's Sparrows were detected at Avian Census Point 4, where they had been seen in spring 2004. (Feist and Trester 2005; Feist 2006).

In a 2003 grassland survey of Double T State Fish and Wildlife Area commissioned by IDNR (Double T Survey), breeding Henslow's sparrows were reported on multiple dates in June 2003 (Brucker 2003). Most of Double T is a former strip-mined area.

Northern Harrier (*Circus cyaneus*) (state endangered). The northern harrier is a common migrant and winter resident, but endangered because of its breeding status in the state (INHS 2006). Decline is due mainly to loss of habitat (draining of wetlands, development, reforestation). The population has undoubtedly declined where large wetlands and moist grasslands have been lost.

Because they nest on the ground, their eggs and young are vulnerable to predation by skunks, dogs, raccoons, and minks, and to trampling by deer and humans (NatureServe 2006). Harriers breed in large marshes and prairies among low shrubs, tall weeds, or reeds rather than very open areas. During migration this species may be found far from its typical habitat. They feed primarily on small mammals and hunt by hovering over fields, pasture, and grassland (INHS 2006).

INHS biologists observed Northern Harriers during all three 2004 census periods. During the spring census, a northern harrier was observed at a marsh on 29 April 2004. (The marsh is located within the Double T State Fish and Wildlife Area.) This date is still within the migration period for northern harriers and this bird was not relocated during any of the summer censuses. A northern harrier was detected on 29 June 2004 near reference point Low Quality Forest 2 (west of Bardolph). This bird could not be relocated on later censuses; however, it is likely this species was breeding in the area given that this sighting was in the middle of the breeding season. A northern harrier was again detected at Marsh 1 on 21 October 2004 and this bird was likely to be a migrant or winter visitor (Feist and Trester 2005).

Two marshes, which are located with the Double T State Fish and Wildlife Area, appear to be potentially suitable breeding habitat for northern harriers. No birds were detected at these sites during the breeding season, but they were used as foraging habitat for northern harriers during the spring and autumn migration. The northern harrier detected on 29 June 2004 was seen flying over a pasture/hayland. This site might be suitable for breeding if mowing occurs late in the breeding season (Feist and Trester 2005).

There were seven reported sitings of the northern harrier from December 2002 to February 2003 in the Double T survey, but none during the breeding season (Brucker 2003).

Upland Sandpiper (Bartramia longicauda) (state endangered). Upland sandpipers generally arrive in mid-April in Illinois and begin to nest in May. The nest is a shallow depression in the ground, lined with dry grass. Breeding habitat is restricted primarily to extensive, open tracts of short grassland habitat. Upland sandpipers nest in native prairie, dry meadows, pastures, domestic hayfields, short-grass savanna, plowed fields, along highway rights-of-way and on airfields (NatureServe 2006). The bird's decline was initially from hunting and from plowing the native prairie. More recent declines have been from development, farming practices (type of hay and timing and frequency of mowing), increases in cropland, and reforestation (NatureServe 2006). Spring bird counts in Illinois showed a large decline from 1975 to 2000, with some modest recovery since 2000 (INHS 2006).

Prior to the 2004 biological survey, the Upland Sandpiper had been recorded at six sites in or near the project corridor, all near the center part of the corridor. One was west of Norris in agricultural land, well outside the corridor. The other six were in or very near the corridor, all in former strip-mined areas. Two sites were south of Canton, two were just west of Canton, and one was at Double T. and well outside the corridor. Of the three locations within the corridor, two had suitable habitat (short grass and pasture). However, visits and censuses at these

locations during the spring census season (April 21 to April 29) in 2004 did not detect the presence of this species (Feist and Trester 2005).

Seven visual observations of upland sandpipers were recorded in June 2003 in the Double T survey, and one day during breeding season the observer noted nine different birds calling. The birds were seen feeding in planted sunflower strips on the conservation area. The observer concluded that the nesting areas were in the taller grasses along the higher ridges (Brucker 2003). Double T Fish and Wildlife Conservation Area has been designated an Important Bird Area based on the presence of, and habitat for the upland sandpiper. (See Section 3.12 for a discussion of Important Bird Areas).

The upland sandpiper is listed in the Illinois Natural Heritage Database only for Fulton County. The June 2003 observation from Double T was the most recent observation.

Plants

During the 2004 biological survey, four threatened or endangered plant species were found within or near the project corridor as it was defined in 2004 (Exhibit C-15) (Feist and Trester 2005). In 2004, the entire corridor was reviewed. The area of study was refined prior to the 2005 biological survey, based on alignments under study. No endangered or threatened species were found within the revised study area based on the alignments under study in 2005 (Feist 2006). Based on modifications to alignments, additional surveys were conducted in 2006. No endangered or threatened species were found within the area of the revised alignments (Feist 2007). The species found in the corridor-wide study in 2004 are described below.

Wolf's bluegrass (*Poa wolfii*) (state endangered). Wolf's bluegrass is a native cool-season grass, ranging generally from Arkansas to Minnesota and east to Ohio. It may be secure only in Missouri. Primary habitats in Illinois are open barrens-like areas within dry-mesic upland forest. It has also been found in more mesic situations, such as creek terraces, usually adjacent to barrens remnants (Feist and Trester 2005).

Prior to the discovery in the IL Route 336 study area, Wolf's bluegrass was known from five Illinois counties, where it is known mostly from small populations. This is the first report of Wolf's bluegrass from Fulton County in 144 years (Feist and Trester 2005).

In this study area Wolf's bluegrass was found in a high-quality barrens remnant that had been burned in recent years. The location is near the southern corridor boundary, south of Marietta, within the watershed of Badger Creek, a Spoon River tributary. At least 35 individuals were present, all in the zone between barrens and dry-mesic upland forest (Feist and Trester 2005).

Savanna Blazing Star (*Liatris scariosa var. nieuwlandii*) (state threatened). This blazing star is considered a reliable indicator of savanna. It is dependent on savanna habitats and generally absent from open prairie and closed forest. In Illinois, the savanna blazing star is found in the two northeastern counties of Cook and Will and also it is present in counties in west-central

Illinois primarily within the Western Forest-Prairie Natural Division, which includes the project area (Section 3.11). The population of savanna blazing star was found during an earlier IDOT survey (Handel 2004). Six individuals were observed along a road next to an abandoned railroad line southeast of Marietta, near the Spoon River floodplain, within the INAI site designated as Marietta Geological Area (Exhibit 3-11). The habitat is a mixture of prairie and savanna species including buffalo clover, another Illinois threatened species.

Buffalo clover (Trifolium reflexum) (state threatened). Buffalo clover is a biennial or winter annual herb that has been reported from a wide range of habitats. Habitats frequently noted include open woodlands, savannas, barrens, and native grasslands. A typical characteristic of these habitats appears to be low nutrient availability and at least seasonally dry conditions. Buffalo clover most frequently is described from lightly wooded or open woodland settings, or barrens, so partial shade, rather than full sun, may also be a general habitat characteristic. Given the reported association of occurrences of buffalo clover following burns, it is likely that this increased use of fire in Illinois has led to some recovery for the species.

In the project corridor two populations of buffalo clover occurred in a high-quality forest (HF 2, Exhibit C-12). Local trail disturbances in this forest may have stimulated germination of buffalo clover from a seed bank.

The other population occurred in the Marietta Geological Area with savanna blazing star in prairie-like vegetation on a road embankment next to a railroad disturbed by recent highline maintenance (see discussion in subsection above on savanna blazing star).

Virginia Bunchflower (*Melanthium virginicum*) (state threatened). Virginia bunchflower is a perennial plant of wet-mesic prairies. In Illinois, this species currently is known from thirteen populations in three counties. In the project corridor, Virginia bunchflower occurs along an old railroad alignment in a degraded prairie remnant. Four individuals were located adjacent to IL Route 95 east of the town of New Philadelphia. This site has been mowed. It is possible that other individuals occur in the vicinity, but could not be located because of the frequent mowing. This population is a new record for this species in Illinois. The next nearest known populations are near the town of Bushnell just north of the proposed IL Route 366 corridor (Feist and Trester 2005). A search for Virginia bunchflower was conducted in 2006 in the revised project area and none was found.

3.13.2 Environmental Consequences

Biological surveys conducted for the Build Alternative as well as previous biological surveys conducted in the area have detected the presence of several federal- or state-listed species within or near the project area. None of the locations are within or near the right-of-way for the Build Alternative.

The anticipated potential impacts to each identified species are discussed below.

3.13.2.1 Indiana Bat (federal and state endangered)

The location of the reproductively active female Indiana bat that was captured in 2004 was almost three miles from the Build Alternative. The roost for this bat is expected to be within about 1 ¼ miles of the capture site. A 1-¼ mile radius around the capture site will be about two miles from the Build Alternative, at the closest point. Therefore, it is highly improbable that the colony from which the captured bat originated was located in or near the Build Alternative alignment. No Indiana bats were captured at the other four sites that were mist-netted (Section 3.13.1.1).

A total of 91 acres of forested land will be impacted by the Build Alternative. This acreage includes isolated strips of trees. Discussed below are the 12 forested areas that will be impacted by the project that appear, based on their characteristics and position, to have the most potential for habitat of the 91 acres of forest impacted.

Of the 14 forested areas greater than 20 acres that will be impacted by the Build Alternative, four are bisected and seven are along existing highway rights-of-way and thus will have edge impacts only (Table 3-48 and Aerial Exhibits). Of all the impacted forests, only Forest 22 and 23 include perennial streams, the West Branch and Middle Branches of the Copperas Creek, respectively.

While no Indiana bats were captured during mist-netting activities in the project corridor, the potential exists for some of the forested area to be used for breeding. Tree clearing (both live and dead) in the following areas will be restricted to the time period of October 1 to March 31: forested areas in the vicinity of the Spoon River from the west side of Marietta to Smithfield (includes Forests 10, 11, 12, 13, 14, 15, 19 and 20) (Aerial Exhibit Sheets 8 through 10); Forest 22, at the West Branch of Copperas Creek (Aerial Exhibit Sheet 24); and Forest 23, at the Middle Branch of Copperas Creek (Aerial Sheet 25). With these tree clearing restrictions, the Build Alternative is not expected to have an impact on the Indiana bat.

3.13.2.2 Henslow's Sparrow (state threatened)

The single location where breeding Henslow's sparrows were found in the biological surveys is about a half-mile from the Build Alternative and thus will not be impacted. The breeding Henslow's sparrows found at Double T State Fish and Wildlife Area will not be impacted by the project. No other breeding Henslow's sparrows were found in the vicinity of the Build Alternative. No summer habitat suitable for Henslow's sparrows was found within or near the right-of-way of the Build Alternative. The project is not expected to impact the Henslow's sparrow.

3.13.2.3 Northern Harrier (state endangered)

Several northern harriers were observed within the project corridor and at Double T State Fish and Wildlife Area, just outside the corridor, but only one was observed during breeding season, at a location about one mile from the corridor. Northern harriers breed in large marshes, and

those found at Double T may provide habitat. The Build Alternative will not impact any marshes, large or small. The Build Alternative is unlikely to adversely affect the northern harrier.

3.13.2.4 Upland Sandpiper (state endangered)

Upland sandpipers were previously reported from several locations in the strip-mined areas near the Build Alternative, but none were found during the biological survey conducted for the project. The Build Alternative does not impact any of the locations of previous upland sandpiper sightings. Upland sandpipers are known to breed at the Double T State Fish and Wildlife Area, located just west of the Build Alternative. The Build Alternative will not affect Double T. Strip-mined areas may provide suitable habitat for upland sandpipers, and strip-mine lands extend from Cuba almost to Norris within the project area. Within this entire area, the Build Alternative either follows existing highway alignments through strip-mined areas or follows the edge of the strip-mined area. The Build Alternative is unlikely to adversely affect the upland sandpiper.

3.13.2.5 State-Listed Plants

As discussed in Section 3.13.1.2, four state-listed plants were identified within the project corridor during the 2004 biological survey. None of these, or any other listed plants, were found during the 2005 and 2006 surveys that focused on alignments under consideration. The following plants were found in 2004:

- Wolf's bluegrass (endangered)—associated with barrens-like remnants within forested areas. The site was located over three miles from the proposed IL 336 alignment.

- Savanna blazing star (threatened)—associated with savanna and found in an existing Illinois Natural Inventory site, about one mile from the proposed IL 336 alignment.

- Buffalo clover (threatened) —associated with savanna and found in an existing Illinois Natural Inventory site, and in a high-quality woodland site (HF-2). The high-quality woodland site is nearest the Build Alternative, at a distance of about ¼ mile.

- Virginia bunchflower (threatened)—a prairie species found along a railroad alignment about ½ mile from the proposed IL 336 alignment.

Based on the results of the biological surveys conducted within and near the Build Alternative area, we conclude that the Build Alternative will not impact any threatened or endangered plant species.

3.13.3 Measures to Minimize Harm and Mitigation

The federal act allows IDOT to carry out conservation programs on listed species even if there are no impacts. To avoid potential impact to roosting Indiana bats, tree clearing in several areas

will be seasonally restricted, as described in Section 3.13.2.1. Since other impacts to threatened or endangered species are anticipated, and no other measures to minimize harm and no mitigation are needed. The former strip-mined areas that are now grassland and lakes may provide suitable habitat for the upland sandpiper. Potential impacts to the upland sandpiper were avoided by staying along the edges of the strip-mined areas.

3.13.4 Indirect Impacts

The only location close to the Build Alternative where threatened or endangered species were detected was the Double T State Fish and Wildlife Area. The Build Alternative passes just on the east side of Double T. No development associated with the Build Alternative in the vicinity of Double T will affect any species at Double T because the property is protected.

3.13.5 Cumulative Impacts

While this project is not expected to have measurable direct or indirect impacts on threatened and endangered species, cumulative impacts could potentially result from the collective impact of this project combined with other actions. For example, while the tree removal associated with this project is not expected to impact the Indiana bat, it does make a small contribution to the on-going removal of trees related to various development activities throughout the bat's territory, that collectively could have an impact by reducing habitat. IDOT's tree replacement will mitigate for that impact. Several areas for tree mitigation have been identified: 27 acres within an environmental mitigation parcel near the Spoon River (Aerial Exhibit Sheet 10); 10 acres near the IL 336/IL 9 interchange (Aerial Exhibit Sheet 19); two parcels near the IL 336/IL 78 interchange, one at 11 acres and one at 10 acres (Aerial Exhibit Sheet 23). Except for the environmental mitigation area near the Spoon River, these parcels would be landlocked.

3.14 Designated Lands

3.14.1 Affected Environment

This section describes publicly owned land in the project area and privately owned lands identified as Illinois Natural Areas, Illinois Land and Water Reserves, Illinois Nature Preserve, National Wildlife Refuge, State Fish and Wildlife Areas, parks and other open space. Designated lands are shown in Exhibit 3-11 and summarized in Table 3-53. Exhibit 3-11 shows designated lands throughout the area; only those within the project corridor are discussed in this section.

3.14.1.1 Illinois Natural Areas

In 1963 the Illinois Nature Preserve Commission was established with the goal of identifying and preserving the remaining examples of high quality natural areas in the state. The Illinois Department of Natural Resources is responsible for developing an inventory of these natural areas. To be included in this INAI, a natural area must have at least one significant feature among several categories of significant features. Categories include high quality natural

communities, endangered species sites, relict species sites, outstanding geologic areas, outstanding aquatic areas, and unique natural features. The INAI was initially compiled the 1970s and is continually updated.

There are three designated natural areas within the project corridor, the Marietta Geological Area, the Seville Geological Area and the Seville Savanna (Table 3-53 and Exhibit 3-11). All three designated natural areas are in the vicinity of the Spoon River. At the Marietta Geological Area, a hillside, a road cut and a railroad cut expose an outstanding section of the Spoon Formation. After the designation of the Marietta Geological Area, threatened or endangered plants were found at the site, resulting in additional designation for the category of threatened and endangered species (discussed in Section 3.13). The Marietta Geological Area was included as an INAI site based on "outstanding geological features" (Category IV). Based on the presence of the two threatened species, the Illinois Nature Preserve Commission (INPC) added the designation of Category II (habitat with threatened or endangered species) to the site (INPC 2005). The Seville Geological Area is a bluff on the Spoon River that affords a good opportunity to study the Seville cyclothem. A cyclothem is a repetitive cyclic deposition of marine and non-marine sediment. The Seville Savanna Natural Area includes 2.2 acres of high quality mesic savanna and 8.0 acres of mesic/dry-mesic woodland. Dominant mesic savanna species include big bluestem, Indian grass and woodland brome. Woodland species include white oak, black oak, shagbark hickory and hazelnut (2005b).

3.14.1.2 Illinois Nature Preserves

Areas designated by the INPC as Illinois Nature Preserves are dedicated remnants of natural habitat included in *The Directory of Illinois Nature Preserves*, (INPC 1995, with updates). Illinois Nature Preserves are afforded the highest protection against future changes in land use by language in The Illinois Natural Areas Preservation Act. Generally, Illinois Nature Preserves are

Table 3-53
Designated Lands in the Project Corridor

County	Land Name	Ownership	Aerial Exhibit Sheet
Fulton	Marietta Geological Area	Private	Area not shown
Fulton	Seville Geological Area	Private	Area not shown
Fulton	Harper-Rector Woods	IDNR	9 and 10
Fulton	Kedzior Woodlands Land and Water Reserve	Private	11
Fulton	Seville Savanna	Private	11
Fulton	Putnam Township Park	Putnam Township	Area not shown
Fulton	Lakeland Park	Canton Park District	Area not shown
Fulton	Wallace Park	Canton Park District	Area not shown
Fulton	Big Creek Park	Canton Park District	Area not shown
Fulton	Double T State Fish and Wildlife Area	IDNR	21 and 22

Table 3-53
Designated Lands in the Project Corridor

County	Land Name	Ownership	Aerial Exhibit Sheet
Fulton	Farmington Township Park	Farmington Township	28

high-quality plant communities with a high degree of natural integrity and the potential to provide refuge for threatened and endangered species.

There is one dedicated Nature Preserve within the project corridor, Harper-Rector Woods (Table 3-53, Exhibit 3-11). This 37-acre old growth forest is a remnant representative of dry mesic and wet-mesic upland forest in the Western Forest-Prairie Natural Division. This site had been protected by the previous owner for over 50 years before it was acquired by IDNR in 1989.

3.14.1.3 Illinois Land and Water Reserves

The Register of Land and Water Reserves constitutes a land and water protection program wherein lands and waters supporting natural heritage resources or archaeological resources are recognized and given protection and stewardship. Land and Water Reserves are also designated by the Illinois Nature Preserves Commission.

Kedzior Woodlands is the only Land and Water Reserve in the project corridor (Table 3-53, Exhibit 3-11). It consists of two separate parcels. One parcel is approximately 120 acres in size and is located about 700 yards east of the Harper-Rector Woods Nature Preserve. The other parcel is approximately 33 acres and is cattycorner from Harper-Rector Woods, to the southeast. The 33-acre parcel lies between the 120-acre parcel and Harper-Rector Woods (Aerial Exhibit Sheet 11). Other land between the Kedzior Woodlands parcels and Harper-Rector Woods are a mixture of CRP-protected areas and wooded ravines, and are owned by the same individual who owns Kedzior Woodlands Land and Water Reserve. These properties have a buffering function with respect to Harper-Rector Woods Nature Preserve. Most of the land and water reserve is covered with second-growth forest that is representative of the Galesburg Section of the Western Forest-Prairie Natural Division. Small rock outcrops and a low-order stream system enhance the ecological importance of this site (INPC 2004a).

3.14.1.4 State Fish and Wildlife Areas

There is one Illinois Fish and Wildlife Area located partially within the project corridor, Double T Fish and Wildlife Area (Table 3-53, Exhibit 3-11). Double T is 1,931-acre tract located primarily in a former strip-mined area that was acquired by IDNR for use as a fish and wildlife area. The eastern part of the area is farmland and IDNR has constructed wetlands in this area. Of the total acreage, 377 acres are open to the public for dove, duck and goose hunting (IDNR 2006b). Double T has been designated an Important Bird Area for the presence of the upland sandpiper (see Section 3.13). At certain times it has a large population of Canada geese (Section 3.12).

3.14.1.5 National Wildlife Refuges

There are no National Wildlife Refuges or Fish and Wildlife Areas within the project corridor.

3.14.1.6 Parks

There are four publicly owned parks located wholly or partially within the project corridor: Putman Township, south of Cuba; Big Creek, Wallace and Lakeland, near Canton; and Farmington Township, south of Farmington (Table 3-53, Exhibit 3-11).

Putnam Township park, south of Cuba, is on former strip-mined land. It has playgrounds, playing fields, and picnicking.

Lakeland and Big Creek Parks are close together on the west side of Canton. The 450-acre Lakeland Park is in a reclaimed strip mine. The park features five stocked fishing lakes. It also has hiking paths, playgrounds, and shelters. Big Creek has playgrounds, playing fields, wooded areas with hiking paths, and picnic areas. Wallace Park is on Big Creek and has playground equipment and playing fields.

Farmington Township Park has tennis courts, ball fields, playgrounds and picnicking.

"Section 4(f)" is the term used to refer to the U.S. Department of Transportation (USDOT) restrictions on use of certain publicly owned land and historic sites.[83] Section 4(f) land includes "publicly owned land of a park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or land of an historic site of national, state, or local significance (as determined by the federal, state, or local officials having jurisdiction over the park, area, refuge, or site." USDOT may approve use of these lands for a project only if there is "no prudent and feasible alternative to the use of the land" and the project includes "all possible planning to minimize harm."[84] De minimus impacts as defined in 49 USC 303 are allowed.

3.14.2 Environmental Consequences

While the Build Alternative will pass close to the Seville Savanna, Kedzior Woodlands Land and Water Reserve and Double T State Fish and Wildlife Area (Aerial Exhibit Sheets 11, 21 and 22), it will not impact these designated lands, or any others. The Build Alternative will have no direct impacts on designated lands.

[83] "Section 4(f)" refers to Section 4(f) of the Department of Transportation Act of 1966. The language has since been amended and what is generally referred to as Section 4(f) is now codified in 49 USC 303, Policy on Lands, Wildlife and Waterfowl Refuges, and Historic Sites

[84] 49 USC 303(c)

3.14.3 Indirect Impacts

The Build Alternative passes very close to Double T State Fish and Wildlife Area, as shown in Aerial Exhibit Sheets 21 and 22. While there is currently traffic noise at Double T from the county highways within and adjacent to the area, the close proximity of an expressway will result in some increase in traffic noise at the west side of Double T. The roadway and traffic will also be visible at the west side of Double T. There may be some short-term effects on wildlife immediately adjacent to the Build Alternative during and immediately following construction. However, based on the presence of other highways within and near Double T, and on the presence of highways near other fish and wildlife areas in the general area, the Build Alternative is not expected to have long-term impacts on Double T State Fish and Wildlife Area.

The edge of the Build Alternative will be slightly closer than existing IL 95 to both the Seville Savanna and Kedzior Woodlands Land and Water Reserve (Aerial Exhibit Sheet 11), and increased traffic will probably result in higher noise levels at both locations. No indirect impacts to Harper-Rector Woods are expected.

The proximity of the Build Alternative to these lands could potentially result in the spread of undesirable plant species from the roadway ROW.

3.14.4 Cumulative Impacts

Other development, such as new residences that may occur in the vicinity of the three designated lands that are close to the Build Alternative (Double T, Seville Savanna and Kedzior Woodlands), together with the Build Alternative, will collectively contribute to the visual and aural impacts on the designated lands, and to the potential for spread of non-native and/or invasive plant species.

3.14.5 Measures to Minimize Harm and Mitigation

IDOT will develop a landscaping plan during a future engineering phase that will identify areas where native grasses, shrubs and trees will be planted on highway sideslopes and backslopes and in the median, except where clear vision needs to be maintained at intersections and median openings. Native planting will help reduce the potential for spread of non-native and/or invasive plant species to the nearby designated lands.

Where appropriate, the backslopes of the proposed roadway will be seeded with Class 4 (native grasses) and Class 5 (forb mixture) seed mixture. These are prairie seed mixes.

3.15 Special Wastes

3.15.1 Affected Environment

The ISGS conducted a Preliminary Environmental Site Assessment (PESA) for special waste (hazardous and nonhazardous wastes) in the project area. Findings are summarized below.

3.15.1.1 Hazardous

The ISGS reviewed the USEPA listing of potential, suspected, and known hazardous waste or hazardous substance sites in Illinois (that is, the Comprehensive Environmental Response Compensation and Liability Information System [CERCLIS]) dated October 27, 2005 and July 26, 2006, to ascertain whether the project will affect any listed sites. The reports noted nothing was found (ISGS 2006a and 2006b). The CERCLIS database, updated on April 11, 2007, was reviewed to identify new CERCLIS listings added since the reviews done as part of the PESA. No new CERCLIS sites in the project corridor were found. There is one site listed, UNR-ROHN, on IL 116 west of Maxwell Road, near the east end of the corridor. It has been on the CERCLIS list since before 2005. ISGS did not consider it near enough to the corridor to be of concern.

3.15.1.2 Nonhazardous

The Office of the State Fire Marshall's underground storage tank (UST) database dated April 15, 2005 and February 1, 2006 was reviewed for listings in the project corridor, as was the IEPA's leaking underground storage tank (LUST) database from January 9 and August 14, 2006. No records were found in the IEPA LUST database. ISGS identified 5 sites within the project corridor with records from the State Fire Marshall's office indicating underground storage tanks(s) had been installed at those sites. The IEPA's LUST database, updated April 23, 2007, was reviewed to identify new sites added to the database subsequent to the issuance of the PESA. No new database changes were found.

3.15.2 Environmental Consequences

The Build Alternative will neither involve nor affect any CERCLIS sites. The ISGS conducted two PESAs for special waste, dated January 13, 2006 (ISGS #1572A) and August 16, 2006 (ISGS #1572B). Standards issued by the American Society for Testing and Materials (ASTM) indicate that property audits for special waste/regulated substance contamination should only be considered valid for a period of six months. Per BDE Manual, Chapter 27, Section 2.07, the district has re-evaluated the project area.

It has been determined that it is not necessary to complete a supplemental PESA for the project. This determination was based upon a review of the existing land use throughout the proposed corridor. In addition, the EPA CERCLIS Hazardous Waste Site database and the IEPA Lust Site database were reviewed to determine the presence of any new sites within the project corridor.

These searches did not uncover any new sites or significant land use changes within the project corridor; therefore, the PESAs dated January 13, 2006 and August 16, 2006 are revalidated. Appendix D contains the PESA review memoranda.

The PESA assessment concluded that the Build Alternative could involve sites potentially affected by regulated substances. Sites that cannot be avoided include Site 1572/A-4 and Site 1572/A-5. Both these sites are railroad vaults along the Cuba to Canton Blacktop (CH 5), near Hyatt Cemetery Road (1572/A-4) and CH 22 (1572/A-5) (Aerial Exhibit Sheets 17 and 18). Site 1572/A-7 is located at the entrance to an asphalt plant on IL 78 south of the proposed IL 336/IL 78 interchange. The only construction in this area will be a new entrance road for the plant, north of the current entrance. The two borings from the PESA (1572/A-7A and -7B) were on either side of the current entrance, which will not be impacted by the Build Alternative (Aerial Exhibit Sheet 23). Table 3-54 summarizes the ISGS findings and recommendations for these three sites. IDOT has issued a waiver for additional investigations during this phase of engineering design. In subsequent phases, the sites may be programmed and tasked for Preliminary Site Investigations.

Table 3-54
Special Waste Potential Impacts

Site and ISGS Number	Type of Site	Comment
1572/A-4 1572/A-5	Railroad site (battery vault) Railroad site (battery vault)	The PESA found detections of arsenic exceeding IEPA screening standards for residential areas at both locations and concluded that these areas may require further investigation for metals (ISGS 2006a, page 23). Both these location will be impacted by the Build Alternative. IDOT has placed no grading stipulations on these sites (see January 18, 2006 memo, Appendix D).
1572/A-7	Entrance road to asphalt plant	The PESA found detections of benzo(a)pyrene (a polyaromatic hydrocarbon) exceeding OEPA screening standards for residential areas at this location and concluded that this area may require further investigation for polyaromatic hydrocarbons (ISGS 2006a). This location may not be impacted by the Build Alternative, but the area to the north of the plant will be, to construct a new entrance road. IDOT has placed no grading stipulations on this site (see January 18, 2006 memo, Appendix D).

IDOT will manage and dispose of areas of contamination in accordance with applicable federal and state laws and regulations, and in a manner that will protect human health and the environment.

3.16 Permits / Certifications

Regulatory permits/certifications will be required with the proposed improvements. The permits include:

- Section 404 of the Clean Water Act from the USACE. Section 404 of the Clean Water Act regulates the deposition of fill or dredged material into waters of the U.S. A Section 404 Permit from the USACE is required for the construction, expansion, modification, or improvement of linear transportation crossings in waters of the U.S. including wetlands. The Section 404 permit will include the wetlands impacted (Section 3.9) and other bodies considered Waters of the United States.

- Section 401 of the Clean Water Act Water Quality Certification from the IEPA. States are granted authority to review activities in waterways and wetlands and to issue water quality certifications under Section 401 of the Clean Water Act. A Section 401 Water Quality Certification is issued by the IEPA for all activities requiring a dredge and fill permit (Section 404). Under the state's anti-degradation policy, individual water quality certifications are subject to public review. A project description and results of the anti-degradation analysis will be posted on the IEPA Website for comment.

- Illinois Interagency Wetland Policy Act of 1989. The act pertains to state-funded actions affecting wetland areas and establishes both procedures for agency coordination and a wetland mitigation policy for the State of Illinois. See Sections 3.8 and 3.9 for discussion of the impacts to water resources and wetlands from the Build Alternative.

- Section 402 of the Clean Water Act National Pollutant Discharge Elimination System (NPDES) Construction Permit from the IEPA. The Build Alternative will disturb more than one acre of land area. Accordingly, a NPDES permit for stormwater discharges from the construction site will be needed. Permit coverage for the project will be obtained either under the IEPA General Permit for Stormwater Discharges from Construction Site Activities (NPDES Permit No. ILR10) or under an individual NPDES permit. Contractors will follow the requirements applicable to such a permit, including the preparation of a Stormwater Pollution Prevention Plan. Such a plan will identify reasonably expected potential sources of pollution that could affect the quality of stormwater discharges from the construction site. It also will describe and ensure the implementation of practices used to reduce pollutants in the discharges associated with construction site activity. The plan will help to ensure compliance with the terms of the permit.

- A public body of water permit from IDNR, Office of Water Resources(OWR) for the Spoon River crossing.[85] The IDNR's Office of Water Resources issues permits for work within floodways, floodplains and public water bodies.

- Floodway construction permit from IDNR, Office of Water Resources. (for the Spoon River crossing and the crossing of the tributary of the East Branch of Copperas Creek) At the

[85] Public Waterways are listed in IDOT *Drainage Manual*, Appendix I.vi, June 1, 2004; taken from 17 IAC 3704 Appendix A. Public Waterways are defined at 17 IAC 3704.20.

Spoon River, because the construction is also over a public water body, the statewide permits are not applicable and application must be made for an individual permit.[86]

- A floodplain construction permit will also be required from IDNR-OWR at all locations where base floods will be impacted. According to the applicable regulation, "Permits will ordinarily be granted for construction which does not have significant flood damage potential and which will not increase present or future flood damages on upstream, downstream, or adjacent lands."[87]

- Notification of Demolition and Renovation permit from IEPA[88]

The Spoon River at the location of the proposed bridge is not considered a navigable waterway and is therefore not subject to the Section 9 (Coast Guard) and Section 10 (U.S. Army Corps of Engineers) permitting requirements of the Rivers and Harbors Act.[89]

If the project requires the removal of USTs, a UST permit must be obtained from the Office of the State Fire Marshall. See Section 3.15 for information on hazardous and non-hazardous special wastes.

3.17 Visual Resources

3.17.1 Affected Environment

This section discusses the visual resources in the project area, primarily from the perspective of receptors who may be impacted by the Build Alternative.

The project area can be divided into the following visual landscape units:

- Farmland, generally level, with primarily row crops (corn and soybeans predominating)

- Wooded land, mostly rugged and near larger streams

- Former strip mined land: hummocky grassland with lakes or depressions (some areas were underground mines)

- Small communities

[86] IDOT *Drainage Manual*, June 1, 2004. Section 1-403.03.

[87] 17 IAC 3706.230

[88] Required under 40 CFR Subpart M-61.145, Rev. Nov. 20, 1990

[89] Navigable Waterways in Illinois are listed in the IDOT *Bridge Manual*. Section 2.3.9.3, November 2006 and the IDOT *Drainage Manual*, Appendix I.v, June 1, 2004.

Beginning at the proposed Macomb Bypass on the west end, the views in the McDonough County portion of the corridor are dominated by fairly level crop land. It is a tranquil area with big sky, well-kept farmsteads, and the high-yield crops that grow on rich Illinois prairie soil. There is one small community in this area, Bardolph. There is some wooded land along the East Fork of the La Moine River in the northwest part of the McDonough County portion of the corridor. At the McDonough/Fulton county line, the terrain begins to change to include more rugged wooded drainages along the Spoon River. This terrain continues to beyond Smithfield, on the east side of the river. The Spoon River is considered an important local visual resource. Annual autumn scenic drives along the river and through the nearby small communities are major local events. East of Smithfield, farmland is more predominant, then, near Cuba, former strip mined land is a major part of the landscape. West of Cuba, population density is very low, with only the three villages of Smithfield, Marietta, and Bardolph in the project corridor. From Cuba to north of Norris, the landscape is dominated by former strip mined land, which, though unnatural, is a land of greenery, deep clear lakes, and abundant waterfowl. Population density increases in this area, and there are other development features: the Illinois River Correctional Center, Canton Airport, small industrial developments, other commercial establishments, and more residences. North of Norris to the east end of the corridor, fairly level farmland again becomes dominant, with development gradually increasing toward the east.

3.17.2 Environmental Consequences

The No-Build Alternative would not affect the visual characteristics of the project area. Construction of the Build Alternative would affect the visual characteristics of the project area, including travelers with views from the highway and receptors with views of the highway (adjacent residences, recreational sites). There are no particular scenic viewpoints that are likely to be of interest to travelers, or unappealing views that travelers may wish to avoid, therefore the visual impacts to travelers is not discussed further. This assessment focuses on the change in views to potentially sensitive visual receptors along the route, primarily from the designated lands along the Build Alternative, from the Spoon River, and from residences along the Build Alternative.

Except for bridge and interchange locations, the proposed roadway will be located fairly close to existing grade. The major visual features will be overpasses and interchanges, where the Build Alternative will be elevated and more visible.

The visual impacts on the landscape will tend to be greater at locations where the Build Alternative is on new alignment. Also, while more residences will be impacted in the more urban areas at the east end of the project, the perceived visual intrusion will probably be greater in the more remote rural areas, especially where the Build Alternative does not follow an existing highway alignment. For example, a farmer on a private road with only his farm, fields and woodlands in his viewshed will likely experience a nearby roadway as a much greater visual intrusion than will a resident in a built-up area where other buildings and roads are visible.

3.17.2.1 Impacts on Designated Lands and the Spoon River

The Build Alternative crosses the viewshed of a few designated lands, as discussed below (see Section 3.14 for a discussion of designated lands). The Spoon River, valued for its scenic qualities, is also included in this discussion. The recreational values of the Spoon River in the immediate vicinity of the bridge will be temporarily impacted during demolition of the old bridge and construction of the new bridge, as use of this part of the river will be restricted during that time period.

The Build Alternative will be visible from certain parts of the Kedzior Woodlands Land and Water Reserve and from the Seville Savanna Natural Area, and probably from a small part of Harper-Rector Woods (Aerial Exhibit Sheets 9, 10, and 11). The proposed bridge will be visible from the Spoon River. Since the project will be following the existing alignment of IL 95 through the section where it will be visible to these resources, additional visual impacts are expected to be very small. Since the proposed bridge will span the river and the existing bridge has piers in the river, the Build Alternative will result in a reduced visual impact for receptors at the Spoon River.

The Build Alternative will pass along the east side of Double T State Fish and Wildlife Area, and will be visible from some parts of Double T (Aerial Exhibit Sheets 21 and 22). However, there will be no elevated structures through this area and the roadway will be constructed close to existing grade, so the visual impact of the roadway itself will be very small. The visual impact from Double T of vehicles traveling on the roadway will be greater than the roadway itself. However, there are currently several roads adjacent to or within Double T. Double T is currently bounded by CH 19 on the west, Randolph Road on the south, Richardson Road on the north, and CH 22 on part of the west side. Cypress Road passes through Double T east-west and CH 22 (north-south) passes through the north part of Double T. The Build Alternative will follow the CH 22 alignment where it is adjacent to Double T on the south part of the west side. The Build Alternative will not substantively alter the visual impact in the CH22 alignment adjacent to Double T.

3.17.2.2 Impacts on Residences

Residences with views of the proposed improvements are summarized below, by Aerial Exhibit Sheets.

Aerial Exhibit Sheet 1

At the west end of the corridor, for the several rural residences within a mile of the proposed Macomb Bypass/IL 336 directional interchange, the multi-level interchange will be a visual intrusion.

Aerial Exhibit Sheet 2

East of East 1700 Street the several residences along Maryland Road within about a half-mile of the project will be visually impacted, especially by the proposed bridges over East 1700 Street and the railroad just to the east, as will the residence along Kepple Creek to the south of the Build Alternative.

Aerial Exhibit Sheets 3 through 7

The proposed IL 336 will follow generally the same route as North 1400 Road from East 1800 Street to a point just west of East 2400 Street. There are several residences along North 1400 Road that will be visually impacted, but, since these residences are currently on a public road, the visual intrusion will be less than that experienced by residences in remote areas.

East of East 2400 Street the proposed IL 336 alignment will move off existing routes and there will be a few rural residences for whom the Build Alternative will be a visual intrusion, especially those within about a half-mile of the proposed bridges over a railroad and Point Pleasant Road.

Aerial Exhibit Sheet 8

The Build Alternative will be a visual intrusion for residences along the south side of IL 95 in and around Marietta. For some the Build Alternative will be within about 0.1 mile, passing through an area that is currently forest and agricultural fields.

Aerial Exhibit Sheets 8 through 13

From east of Marietta to just under a mile east of the proposed IL 336/Howeter Road intersection, the Build Alternative will follow the alignment of IL 95. While the proposed four-lane project will be more intrusive than the existing two-lane IL 95, the visual impact to the several residences along this section will be much less than for remote rural residences.

Aerial Exhibit Sheets 13 through 15

From the point where the proposed IL 336 moves off the IL 95 alignment to the proposed IL 336/IL 97 intersection north of Cuba, the Build Alternative will be a visual intrusion to several rural residences.

Aerial Exhibit Sheet 15

East of IL 97 the Build Alternative will be a visual intrusion to several residences on the north side of Cuba.

Aerial Exhibit Sheets 15 through 19

East of Cuba IL 336 will follow this CH 5 alignment for a distance of about 4.5 miles, and then will follow the alignment of Lone Barn Road for about 1.4 miles. The few residences along this section will have a small additional visual impact beyond that resulting from the existing CH 5 and Lone Barn Road.

Aerial Exhibit Sheet 20

A farmstead northwest of the Canton Airport on CH 22 will be impacted by the Build Alternative, which will pass through farm fields west of CH 22.

Aerial Exhibit Sheet 20 and 21

North of the airport, where the Build Alternative follows the CH 22 alignment a few residences will be visually impacted, but they currently have the impact of a smaller highway in the same location.

Aerial Exhibit Sheet 23

The village of Norris is less than a half-mile from the proposed IL 336/78 interchange, and residences in and near the village will be visually impacted by the interchange, the railroad bridge east of the interchange, and to a lesser extent, by the proposed roadway east of the railroad bridge.

Aerial Exhibit Sheet 25

A few residences along Owens Road east of Norris will be visually impacted in the vicinity of the proposed IL 336 intersection with Owens Road.

Aerial Exhibit Sheets 25 and 26

North of Owens Road the Build Alternative follows the existing IL 78 alignment. The several residences along existing IL 78 will have some additional visual impact from the larger roadway and increased traffic.

Aerial Exhibit Sheet 27

An existing farmstead that will end up in a “V” between existing IL 78 and the Build Alternative as it leaves the IL 78 alignment will be visually impacted by the proposed roadway, and will, to a lesser extent, another residence to the north.

Aerial Exhibit Sheet 28

A cluster of residences near the intersection of Park and Lightfoot Roads, south of the Farmington public schools, will be impacted by the proposed IL 336/78 (Lightfoot Road) interchange.

Aerial Exhibit Sheet 29

East of the proposed IL 336/78 (Lightfoot Road) interchange, residences on Moul and Downs School Road will have some impact.

Aerial Exhibit Sheet 30

A few residences along Nelson Road will have some added visual impact along the section where the Build Alternative follows Nelson Road.

Aerial Exhibit Sheet 32

The cluster of farmsteads along Logan (Fisher) Road near the proposed IL 336/Logan Road intersection is currently fairly remote and will be visually impacted by the Build Alternative.

Aerial Exhibit Sheets 32 and 33

The cluster of residences along Eden Road will be visually impacted by the Build Alternative in the vicinity of its intersection with Eden Road.

Just east of Eden Road, a farmstead on the north side of Behrends Road will be visually impacted by the Build Alternative, which will pass just north of the farmstead. Several other residences along Behrends Road will be visually impacted to a lesser extent than the farmstead; the most notable impact for the other residences will be the proposed IL 336/Hanna City (CH 34) interchange to the east.

Aerial Exhibit Sheets 33 through 37

East of Hanna City Road the project area becomes more urban, and many residences will have some visual impact from the project. For most of these residents, though, the perceived intrusion will probably be less than that experienced by residents in remote locations.

3.17.3 Measures to Minimize Harm and Mitigation

The visual quality of the adversely affected areas will be improved by:

- Preservation of the existing vegetation as much as possible.

- Landscape planting, including trees and prairie plant species, and natural revegetation of cut and fill slopes.

3.18 Section 4(f) and Section 106 Applicability

3.18.1 Section 4(f)

"Section 4(f)" is the term used to refer to the U.S. Department of Transportation (USDOT) restrictions on use of certain publicly owned land and historic sites.[90] Section 4(f) land includes "publicly owned land of a park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or land of an historic site of national, state, or local significance (as determined by the federal, state, or local officials having jurisdiction over the park, area, refuge, or site." USDOT may approve use of these lands for a project only if there is "no prudent and feasible alternative to the use of the land" and the project includes "all possible planning to minimize harm."[91] De minimus impacts as defined in 49 USC 303 are allowed.

This project does not use lands from any property included under Section 4(f).

3.18.2 Section 106

Section 106 of the National Historic Preservation Act of 1966, as amended through 2000 (16 USC 470) requires any project receiving federal funds to "take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register."

As discussed in Section 3.4, no districts, sites, buildings, structures or objects included in or eligible for the National Register will be impacted by this project.

3.19 Short-Term Use and Long-Term Productivity

NEPA implementing regulations require a discussion of "the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity" if the Build Alternative is implemented.[92]

Highway construction projects require the investment or commitment of some part of resources found in the general study area. Short-term use refers to the immediate consequences of the

[90] "Section 4(f)" refers to Section 4(f) of the Department of Transportation Act of 1966. The language has since been amended and what is generally referred to as Section 4(f) is now codified in 49 USC 303, Policy on Lands, Wildlife and Waterfowl Refuges, and Historic Sites

[91] 49 USC 303(c)

[92] 40 CFR 1502.16

project, whereas long-term productivity relates to its direct or secondary effects on future generations.

Short-term use of the environment generally are those associated with construction of the highway. Construction of the project will involve the short-term use of resources such as labor and construction materials. The project will contribute to the enhancement of long-term productivity for the communities in the project area by providing improved travel efficiency, accessibility and reliability through the project area. This will reduce transportation costs for commuters, commercial trips, and other trips through the study area and improve safety and traffic flow.

Long-term economic benefits resulting from the Build Alternative include the potential for enhancing employment opportunities in the project area coupled with increased regional economic activity. The Build Alternative supports the industrial and agricultural interests in the project corridor. The improved access and transportation efficiency resulting from the construction of the Build Alternative is expected to enhance the state's economic advantage and to retain existing economic bases (including the viability of the agricultural sector) and employment in the project area. By improving access to the area, the proposed improvements may result in higher regional productivity. The local, short-term uses of resources for the Build Alternative are consistent with the maintenance and enhancement of long-term productivity.

3.20 Irreversible and Irretrievable Commitment of Resources

NEPA implementing regulations require a discussion of "any irreversible or irretrievable commitment of resources" if the Build Alternative is implemented.[93]

Impacts resulting from construction that can be neither mitigated nor replaced in the future include the following:

- Approximately 2,651 acres of new right-of-way will be committed to the construction of the Build Alternative. Although the land required to construct the project could be converted to another use in the future if the proposed roadway is determined no longer to be needed, there is no reason to expect that conversion will be desirable or necessary.

- With the Build Alternative, agricultural land will be removed from production and some farming operations will be adversely affected.

- Large amounts of natural resources, such as fossil fuels, sand and aggregates, concrete, asphalt, and steel, will be required to construct the Build Alternative. These materials

[93] 40 CFR 1502.16

generally are not retrievable. However, they are not in short supply, and their use in the project will not adversely affect future availability.

- State and federal funds and manpower used to build the Build Alternative represent an irretrievable monetary commitment. However, the long-term economic and traffic benefits expected to result from the project justify the initial investment.

3.21 Summary of Measures to Minimize Harm

NEPA implementing regulations require an evaluation of "means to mitigate adverse environmental impacts."[94]

The following section summarizes the measures to minimize harm and additional commitments for the Build Alternative. Discussions that are more detailed are provided in the referenced sections. Final mitigation plans will be incorporated into final engineering plans and specifications prepared for the Build Alternative.

3.21.1 Agriculture

- The alignments were designed to parallel property lines, where feasible, to minimize farm severances and uneconomical remnants.

- Where practical, field access roads will be constructed to maintain access to farm fields.

- Existing surface and subsurface drainage will be maintained.

- Subsurface field tiles draining to, or intersected by, the Build Alternative's right-of-way will be located by trenching and reconfigured where required to ensure that proper field drainage is maintained during construction.

- The design of the highway as an expressway rather than a freeway (except at the east ends, where freeway is required by IDOT policy) results in far less farm impact due to the greatly reduced right-of-way requirements of intersections rather than interchanges, the fact that the roadway can be directly accessed with and used by farm equipment, and the reduced adverse travel of an expressway compared with a fully access-controlled highway.

- In the area from the Illinois River Corrections Center (Prison, southwest of Canton) to Norris, the alignment was placed along the edge of farmland adjacent to strip mines, the Prison, Double T Conservation Area and the Canton airport, to reduce operational impacts and impacts on the farmland itself.

[94] 40 CFR 1502.14(f) 1502.16(h)

- The interchange next to the prison was designed as a partial cloverleaf (with all loops on one side) rather than a conventional diamond to minimize farmland impacts.

- IDOT worked with individual farmers to identify locations where cattle crossings will help reduce impacts on farm operations; and locations where median crossings for farms may be added, to reduce adverse travel.

- Consistent with Illinois Department of Agriculture recommendations made at Agency NEPA meetings, IDOT is evaluating a site for mitigation that could potentially be used for multiple purposes: compensatory flood storage, tree replacement, and wetland replacement. While this site is in farmland, it is adjacent to the existing/proposed roadway, partially wooded, and the portion suitable for crops is irregularly shaped. Topsoil could be saved and re-used on site.

3.21.2 Cultural

FHWA and IDOT, in consultation with the Illinois State Historic Preservation Officer (SHPO), have identified more than 30 archaeological habitation sites (Sites) that appear to be eligible for the National Register of Historic Places under Criterion D and that will be adversely affected by the Preferred Alternative. The Sites include both prehistoric and historic habitation sites that cannot be affliliated with historic Indian Tribes and the Sites are important for the scientific data they likely contain; however, the sites do not require preservation in place. FHWA has completed the Section 106 consultation process, and, along with IDOT, has entered into a Memorandum of Agreement (MOA) with the SHPO that stipulates how the data are to be recovered and how any post-review discoveries will be handled. The MOA also requires IDOT to prepare a detailed data recovery plan. The MOA is included as Appendix E.

3.21.3 Noise and Air Quality

- To reduce the potential for noise impacts during construction, IDOT will require contractors to adhere to the construction noise restrictions outlined in Section 107.35 of the latest edition of the *Standard Specifications for Road and Bridge Construction*.

- Special provisions will require that motorized construction equipment not be operated between 10 P.M. and 7 A.M. without prior written approval of the project engineer.

- Dust control during construction will be accomplished in accordance with Section 107.36 of the *Standard Specifications for Road and Bridge Construction*.

- The location of aggregate supply sources (borrow pits) and pavement material batch plants will be in accordance with the Standard Specifications or any special provisions

developed during coordination with the IEPA regarding air quality standards and emissions.

- Open burning of construction waste or brush will be done in accordance with state regulations, and, if applicable, local ordinances.

- Demolition and disposal of structures is regulated under the Standard Specifications for Road and Bridge Construction.

3.21.4 Geology, Soils, and Surface Water Resources

- In areas susceptible to landslides cut slopes will be designed with appropriate drainage and slope angles to minimize slide potential.

- Principles and standards from the 2002 IDOT *Bureau of Design and Environment Manual* Section 59-8 will be used to minimize soil erosion. An erosion control plan will be developed during the design phase that will reflect IDOT's erosion control practices. The plan to be implemented during construction will include the following concepts:

  - Temporary Ditch Checks
    - Ditch check material will vary according to velocity of flow in ditch.
    - Spacing of ditch checks will be adjusted according to ditch slope.

  - Ditch Linings
    - Temporary linings (excelsior blankets) will be installed as needed based on flow velocity during construction activities (prior to revegetation).
    - Permanent linings (paved ditches, riprap) will be installed as appropriate, based on flow velocity after construction activities (after revegetation).

  - Culverts - Downstream channels will be protected as required using riprap, energy dissipater basins, and related erosion control devices, according to culvert outlet velocities.

  - Perimeter Erosion Barrier will be installed in areas where sediments run off the construction area in sheet flow.

  - Inlet and Pipe Protection will be installed immediately after inlets and pipes are constructed until surrounding area is paved or revegetated.

  - Stormwater Detention will be incorporated into the drainage ditches to avoid taking additional land for detention structures.

- All deck drainage from the Spoon River bridge will be routed to infiltration basins, grassed swales, or other routes that facilitate the assimilation of pollutants into the landscape prior to discharge.

- A storm water and sediment erosion control plan will be in effect and readily accessible onsite for the entire project/disturbance period.

- Appropriate sediment/storm water controls will be installed prior to grading or other land disturbing activities. The use of straw bales will be prohibited.

- All erosion control devices will be inspected daily and maintained throughout the duration of the project. Accumulated sediments will be cleaned out of erosion control devices, and worn out or deteriorated materials will be replaced on a regular basis.

- Disturbed/exposed areas in the Spoon River riparian corridor (slope and banks) will be properly stabilized (seeded, mulched, or otherwise) immediately after grading to prevent erosion and establishment of invasive plant species. Appropriate native tree and shrub species will be planted to replace trees and shrubs removed along the river bank.

- At the Spoon River, except in the immediate area around abutments, bulldozers will not be used to knock trees/stumps/root wads out of the ground. Trees not in the immediate around the abutment located within the construction work limits and that are 25 feet or less from the toe of the slope of the river may be cut flush to the ground with the roots remaining intact.

- At the Spoon River, all motorized equipment will be conducted from a bank and/or barge. No machinery (trucks, cranes, backhoes or excavators) may work or otherwise operate from within the riverbank unless absolutely necessary.

- Excavation of the Spoon River stream bed will be prohibited except to remove existing piers. Excavation associated with pier removal will be kept to a minimum. Channel modifications will be avoided and the stream bottom will be returned to preconstruction elevations and contours using the natural substrate.

- Underwater blasting and water jetting will be prohibited.

- No wastewater will be discharged to the Spoon River.

- At the Spoon River, any concrete and/or asphalt slabs, chunks, or other existing road construction debris will be removed and taken to an appropriate disposal facility located outside the floodplain and not within 1,000 feet of a river. No scrap cement or other construction debris will be used for stream bank armor.

- Basic erosion control principles and best management practices that will be used on the project include the following:

  - The size of disturbed area exposed at any one time and the duration of exposure will be minimized. Construction contracts could include limits on the amount of soil that can be exposed at any one time, measures to prevent erosion during spring thaw if construction is not completed before winter, and specifications to complete grading as soon as possible and re-vegetate with temporary and permanent cover.

  - Control methods will be used to prevent erosion and sedimentation in sensitive areas. Such methods include proper design of drainage channels with respect to width, depth, gradient, side slopes, and energy dissipation; protective ground cover such as vegetation, mulch, erosion mat, or riprap; dikes and intercepting embankments to divert sheet flow away from disturbed areas; and sediment control devices such as ditch checks, erosion bales, and silt fences, and retention or detention basins. If a stream enhancement was impacted during construction it will be replaced in-kind.

3.21.5 Wetlands and Floodplains

- Alignments with notable wetland impacts, such as the North alignment at the west end of the Build Alternative (section designated Section 1) and the East alignment near Canton (section designated Section 4) were eliminated from consideration. Alignments with notable floodplain impacts, such as the North-North alignment at the west end of the Build Alternative (section designated Section 1) and the North alignment at the east end (section designated Section 5) were eliminated from consideration (refer to Section 2).

- A 46-acre environmental mitigation parcel has been identified, near the Spoon River. This parcel could provide an area for compensatory floodplain storage; it could provide approximately 27 acres for tree mitigation; since it lies adjacent to the Harper Rector Woods Nature preserve, it could serve as a buffer for the nature preserve; and the irregular shape makes it less desirable for farming. The area that could be used for tree planting is shown in Aerial Exhibit Sheet 10.

- The Build Alternative incorporates alignment shifts where practicable to minimize wetland impacts.

- No wetlands considered to be environmental assets for the quality of their plant community will be impacted.

- Wetland impacts and mitigation are summarized in Tables 3-39 and 3-40.

- The Build Alternative bridge at the Spoon River will improve the flood flow on the Spoon River. The existing IL 95 bridge, which will be removed after construction of the Build Alternative bridge, has piers in the river and thus impacts the floodway, and it has

insufficient clearance to pass floods of 50-year frequency. The Build Alternative bridge will have no piers in the river and no impacts on the floodway. It will have sufficient clearance to safely pass a 50-year flood and extended length wildlife movements.

- The Build Alternative crossing of the Spoon River will be adjacent to the existing IL 95 crossing, thus avoiding additional new floodplain impacts.

- All fueling operations, lubrication, hydraulic topping off, fuel tank purging, and equipment maintenance/repairs will be performed at upland sites outside the 100-year floodplain. These activities will take place on an approved pad with spill control/collection devices in place.

- All construction equipment shall be inspected daily for hydraulic and fuel leaks; leaks will be repaired prior to operation within 1,000 feet of the Spoon River. When not in use, fuel and hydraulic fluids will be stored at an upland site outside the 100-year floodplain.

3.21.6 Plant Communities and Wildlife Resources

- The Build Alternative will avoid all areas designated as INAI Sites and all areas identified as having the potential to qualify as INAI sites.

- The area around the Spoon River has the only high-quality forests in the project area, the only savannas, and the only prairies that are not highly degraded. Through this area, the Build Alternative follows the existing IL 95 alignment to minimize impacts to these resources.

- Large expanses of former strip-mined areas may provide habitat for the Illinois-endangered upland sandpiper and for several conservation priority species of (Refer to Sections 3.13.1.2 and 3.12.1.2). Alternatives that passed through large expanses of strip-mined land (such as the East and Middle alignments near Canton, shown in Exhibit 2-6) were eliminated. In the vicinity of strip-mined lands the project follows almost entirely along edges or along existing roadway alignments, minimizing impacts to these species.

- Protective measures for woodlands and wetlands as identify in the 2002 IDOT *Bureau of Design and Environment Manual* Section 59-6.02 will be employed.

- In accordance with the 2002 IDOT *Bureau of Design and Environment Manual* Section 59-7.15 IDOT may consider seeding slopes with Class 4 and Class 5 seed mixture where appropriate. These are prairie seed mixes.

- In accordance with the 2002 *IDOT Bureau of Design and Environment Manual* Section 59-7.03, impacted forest will be mitigated by planting trees of native species. The 46-acre environmental mitigation parcel near the Spoon River could provide approximately 27 acres for tree mitigation. Other parcels identified for tree mitigation are as follows: 10

acres near the IL 336/IL 9 interchange (Aerial Exhibit Sheet 19); two parcels near the IL 336/IL 78 interchange, one at 11 acres and one at 10 acres (Aerial Exhibit Sheet 23). The total area shown in the aerial exhibit sheets is 62 acres. Additional mitigation locations may be needed to compensate for the 157 acres of forest that will be impacted.

- All trees removed, or otherwise severely damaged, from the Spoon River bank/riparian corridor (including ordinary high water mark to the bank top and 25 feet beyond) within the project construction limits of the river must be replaced, at the location they were removed, as follows:

  - Trees less than 12 inches in diameter at breast height (DBH) will be replaced with bare root tree seedlings at a 1:1 ratio.

  - Trees between 12 and 20 inches DBH will be replaced with bare root tree seedlings at a 2:1 ratio.

  - Trees greater than 20 inches DBH will be replaced at a 1:1 ratio with tree saplings that are at least 2 inches DBH and 2 feet in height.

  - Native shrubs will be planted randomly throughout the area.

- Replacement trees will be planted by qualified staff at the appropriate time of the year (late fall or early spring) and in a random fashion to avoid crowding or a plantation appearance. Qualified individuals include arborists, foresters, or trained staff with similar expertise and experience in river restoration projects. Staff from the IDNR will be consulted prior to planting in order to determine species selection, spacing, care, and cultivation (locations within the riparian corridor, riverbanks).

- Planted tree seedlings/saplings will be cultivated and monitored for 2 years to ensure success. Planted stock showing signs of mortality shall be promptly replaced. In riparian zones, only local native trees/shrubs/grasses naturally occurring within the riparian zone, will be planted. At all locations, plant selection (species and size) will reflect the natural mixture/diversity of the immediate area, flood frequency (where applicable) and browse pressures. Watering and provisions for replacement of trees/shrubs in the event of mortality will be addressed. Fertilizers and herbicides will not be used in the riparian corridors.

- No in-stream work in the Spoon River will be permitted between April 15 and June 30 of any given year to protect fish spawning activities.

3.21.7 Special Waste

If contaminated soils are encountered during construction, contaminated materials will be removed in compliance with federal and state policies and procedures for their safe removal, handling and disposal.

3.21.8 Visual Resources

Landscaping features within and adjacent to the proposed right-of-way will minimize adverse effects. A landscaping plan that will be developed during the engineering design phase could include the following provisions:

- Preserve the existing vegetation as much as possible.
- Perform landscape planting, including trees and prairie plant species, and natural revegetation of cut and fill slopes.
- Replace vegetation cleared from the existing or proposed rights of way with grasses.

3.21.9 Additional Commitments

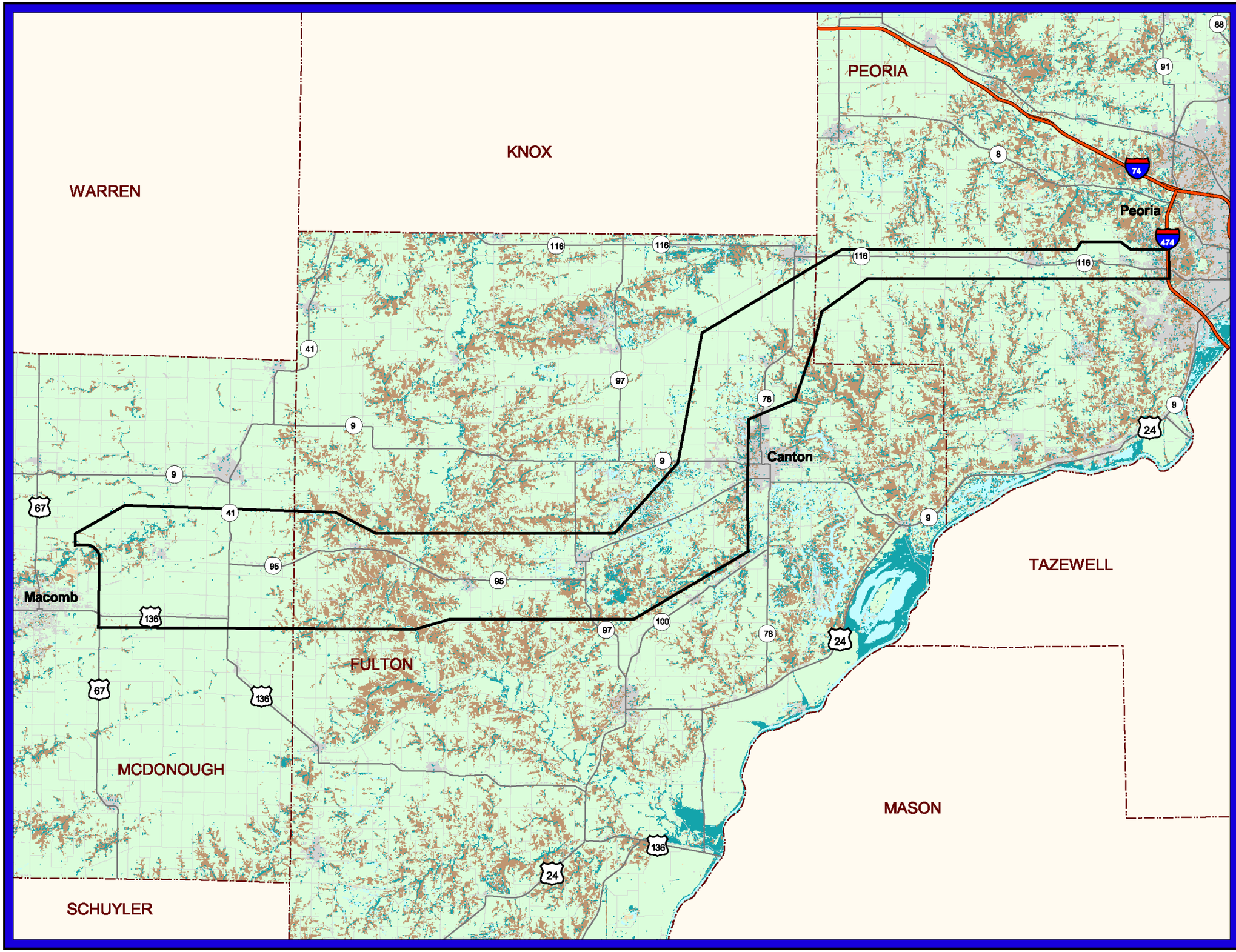
3.21.9.1 Traffic

A traffic management plan will be developed and implemented during the construction phase of the project to provide reliable access to agricultural fields, residences, businesses, community facilities and services, and local roads. Local roads intersected by the Build Alternative will remain open to traffic with minor interruptions during construction. Local roads that are proposed to be closed or relocated will be reconfigured prior to disruptions due to construction of the Build Alternative. IDOT will coordinate construction activities, sequencing, and traffic management plans with fire, police, and emergency rescue services to minimize delays and response times during the construction period. Lengthy detours will be minimized, but it is expected that, for various durations, side road connections will be closed to accommodate construction activities.

3.21.9.2 Property Acquisition

The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, provides for payment of just compensation of private property acquired for a federal-aid project. Offers of just compensation for residential and business properties will be based upon approved estimates of fair market value supported and documented by professional real estate appraisals obtained by the acquiring agency, the IDOT. In addition to the just compensation for the acquired property, the Act also provides for certain relocation assistance and payment to displaced homeowners, residential tenants, and businesses that are required to relocate because of the project. IDOT will offer and provide relocation assistance to each displaced family and business. Each displaced family and business will be contacted by IDOT to address specific needs and problems that it may have. Displaced families will be eligible for

moving costs and may also be eligible for replacement housing payments. Displaced businesses will be eligible for searching and moving costs to relocate to a replacement business site. IDOT's acquisition and relocation agents will be available to present and explain both the acquisition program and the relocation program to each displaced family and business. Septic tanks, drain fields, irrigation systems, or wells on acquired properties will be abandoned in accordance with state regulations and local zoning standards.



Legend

1999-2000 Land Cover

- Agricultural Land
- Forested Land
- Other
- Urban & Built-Up Land
- Wetland
- Surface Water

- Project Area
- Interstate
- US Highway or State Highway
- Local Road
- Macomb Bypass
- County Boundary

N

Source(s): Illinois Natural History Survey (Illinois Department of Natural Resources), Illinois Department of Transportation (IDOT), and URS Corporation

1:270,000

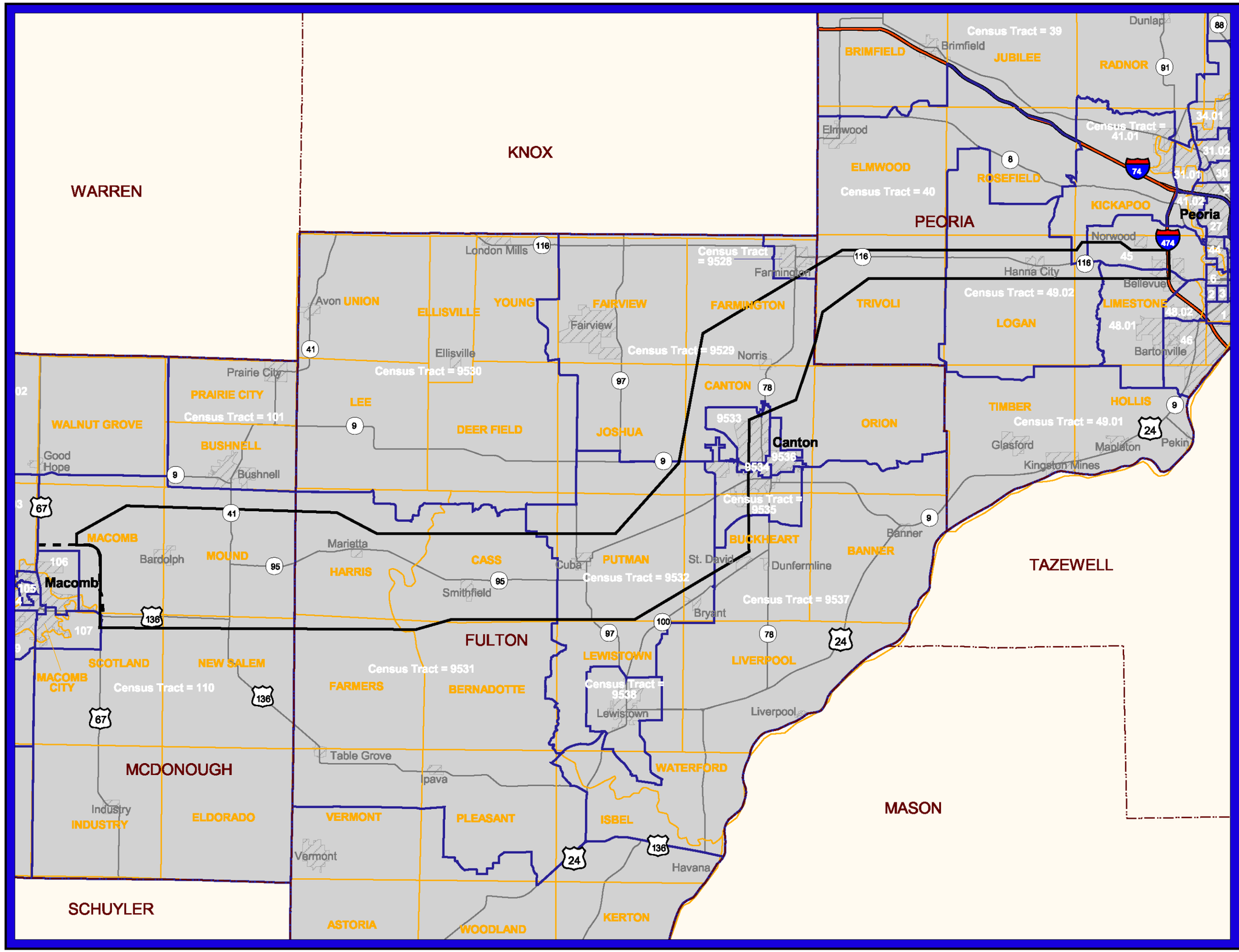
2 0 2 4 Miles

Peoria to Macomb EIS
FAP 315 (IL 336)

Section: Various
Peoria, Fulton, McDonough Counties
Job No. P94-025-00
Catalog No. 032258-00P
Contact: Mike McLuckie

Exhibit 3-1

1999 - 2000 Land Cover


WARREN
KNOX
PEORIA
TAZEWELL
MASON
FULTON
MCDONOUGH
SCHUYLER
MACOMB
UNION
ELLISVILLE
YOUNG
FAIRVIEW
FARMINGTON
LEE
DEER FIELD
JOSHUA
CANTON
PRAIRIE CITY
BUSHNELL
WALNUT GROVE
TRIVOLI
ORION
LOGAN
TIMBER
HOLLIS
LIMESTONE
BRIMFIELD
JUBILEE
RADNOR
ELMWOOD
ROSEFIELD
KICKAPOO
HARRIS
CASS
PUTMAN
BUCKHEART
BANNER
LEWISTOWN
LIVERPOOL
WATERFORD
ISBEL
MOUND
SCOTLAND
NEW SALEM
MACOMB CITY
FARMERS
BERNADOTTE
VERMONT
PLEASANT
INDUSTRY
ELDORADO
ASTORIA
WOODLAND
KERTON
Census Tract = 9528
Census Tract = 9529
Census Tract = 9530
Census Tract = 101
Census Tract = 9531
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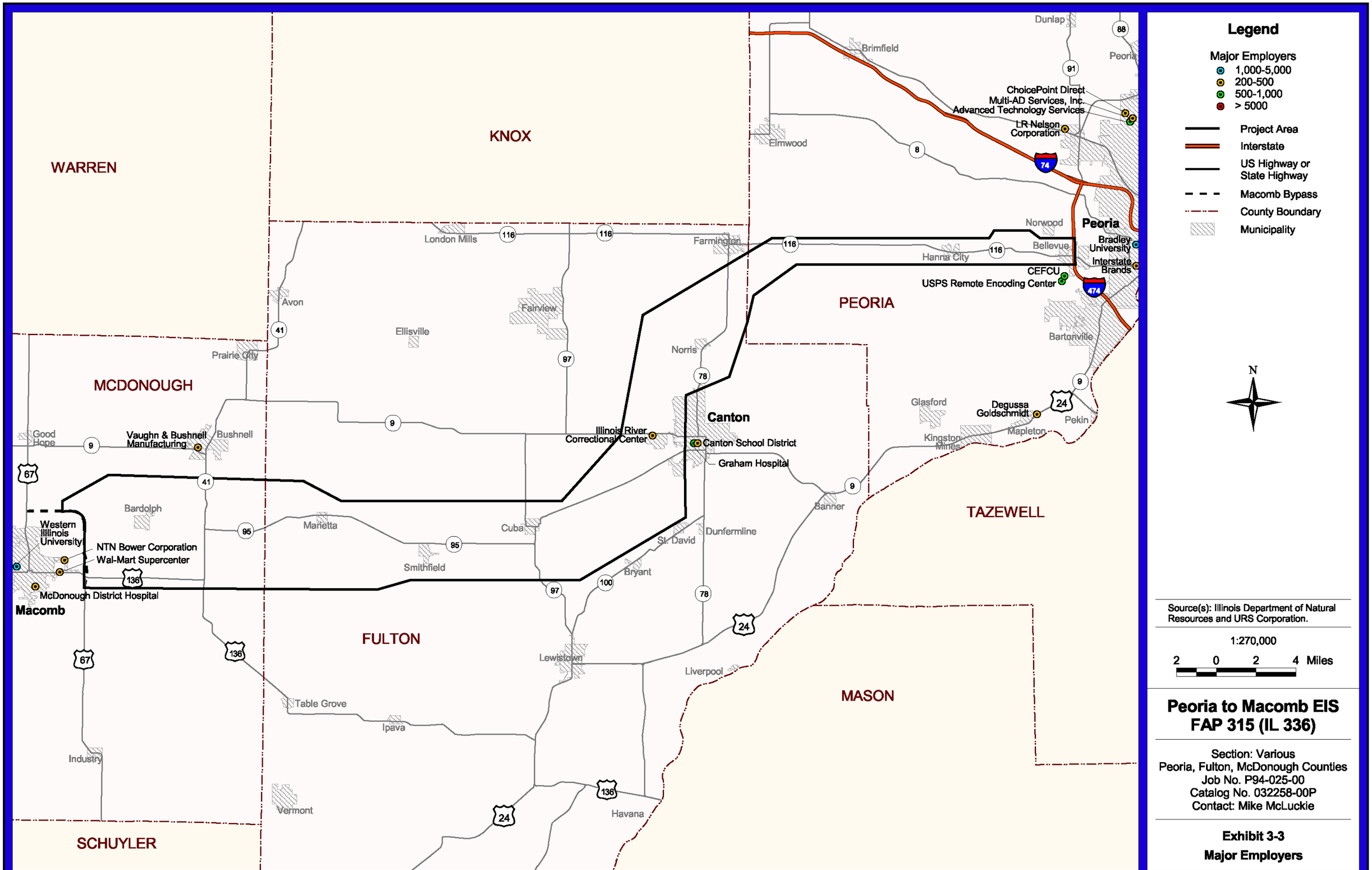
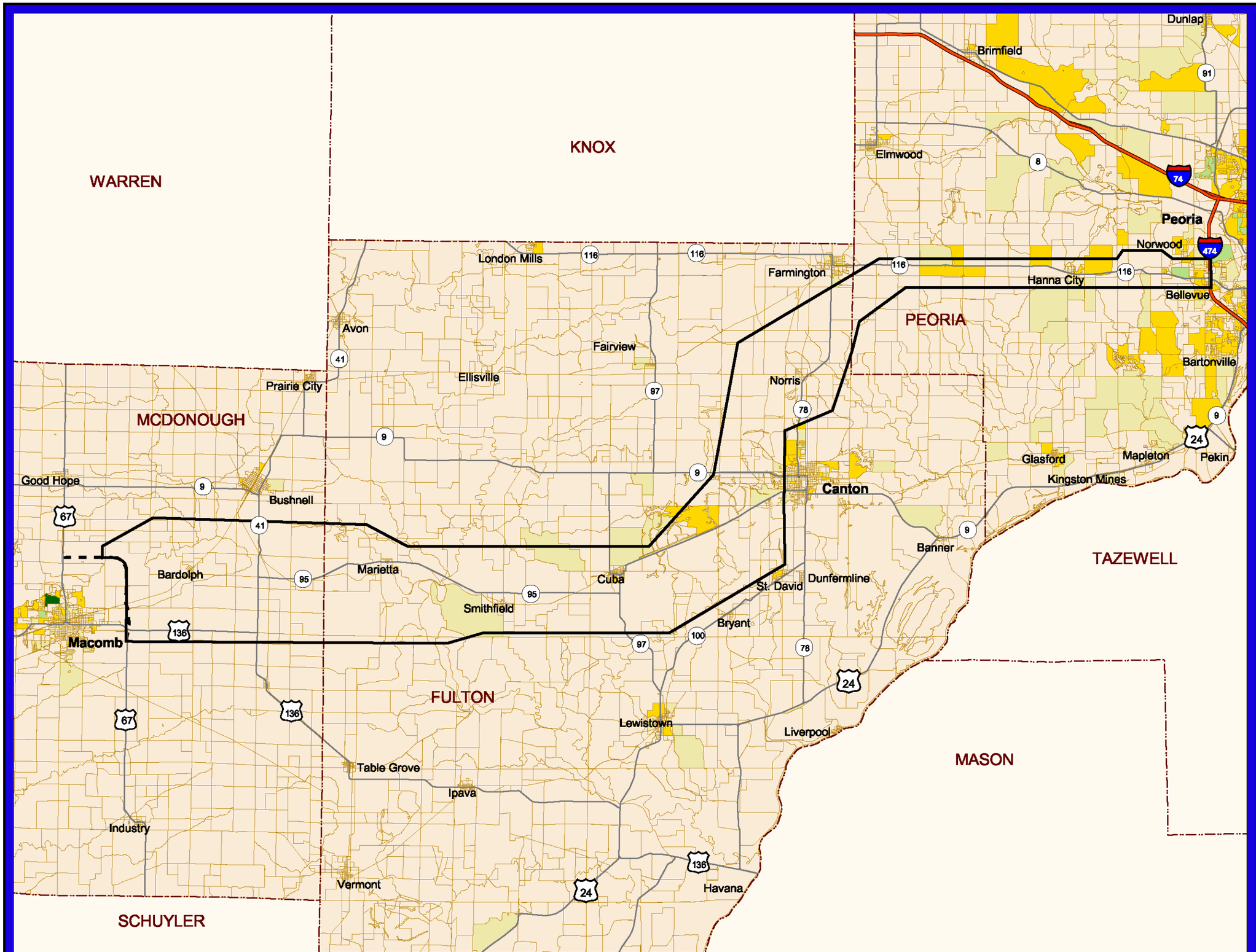
9533
9534
9535
9536
London Mills
Avon
Farmington
Fairview
Ellisville
Norris
Prairie City
Hanna City
Bellevue
Norwood
Peoria
Dunlap
Brimfield
Elmwood
Glasford
Mapleton
Pekin
Kingston Mines
Bartonville
Good Hope
Bushnell
Bardolph
Marietta
Macomb
Smithfield
Cuba
St. David
Dunfermline
Bryant
Banner
Table Grove
Ipava
Lewistown
Liverpool
Industry
Vermont
Havana
Canton
Census Tract = 34.01
Census Tract = 31.02
Census Tract = 31.01
Census Tract = 30
Census Tract = 41.02
Census Tract = 27
Census Tract = 45
Census Tract = 48.02
Census Tract = 48.01
Census Tract = 46
Legend
Census 2000 Tract
Political Township Boundary
Municipality
Project Area
Interstate
US Highway or State Highway
Macomb Bypass
County Boundary
N
Source(s): Illinois Department of Natural Resources (IDNR), Illinois Department of Transportation, US Census (TIGER data), and URS Corporation.
1:270,000
2 0 2 4 Miles
Peoria to Macomb EIS
FAP 315 (IL 336)
Section: Various
Peoria, Fulton, McDonough Counties
Job No. P94-025-00
Catalog No. 032258-00P
Contact: Mike McLuckie
Exhibit 3-2
Political Boundaries


WARREN
KNOX
MCDONOUGH
PEORIA
FULTON
TAZEWELL
MASON
SCHUYLER
Dunlap
Brimfield
Peoria
Elmwood
ChoicePoint Direct
Multi-AD Services, Inc.
Advanced Technology Services
LR Nelson
Corporation
Norwood
Peoria
Bradley
University
Interstate
Brands
Bellevue
Hanna City
CEFCU
USPS Remote Encoding Center
Bartonville
London Mills
Farmington
Avon
Fairview
Ellisville
Prairie City
Norris
Canton
Illinois River
Correctional Center
Canton School District
Graham Hospital
Glasford
Degussa
Goldschmidt
Pekin
Kingston
Mines
Mapleton
Good
Hope
Vaughn & Bushnell
Manufacturing
Bushnell
Bardolph
Western
Illinois
University
NTN Bower Corporation
Wal-Mart Supercenter
McDonough District Hospital
Macomb
Marietta
Smithfield
Cuba
St. David
Dunfermline
Bryant
Banner
Lewistown
Liverpool
Table Grove
Ipava
Industry
Vermont
Havana
Legend
Major Employers
1,000-5,000
200-500
500-1,000
> 5000
Project Area
Interstate
US Highway or
State Highway
Macomb Bypass
County Boundary
Municipality
N
Source(s): Illinois Department of Natural Resources and URS Corporation.
1:270,000
2 0 2 4 Miles
Peoria to Macomb EIS
FAP 315 (IL 336)
Section: Various
Peoria, Fulton, McDonough Counties
Job No. P94-025-00
Catalog No. 032258-00P
Contact: Mike McLuckie
Exhibit 3-3
Major Employers



Legend

Population Distribution per Census Block

- 0 - 50
- 51 - 100
- 101 - 500
- 501 - 1500
- 1501 - 2400

- Project Area
- Interstate
- US Highway or State Highway
- Macomb Bypass
- County Boundary

N

Source(s): Illinois Department of Natural Resources, U.S. Census Bureau (2000 Census Blocks) and Illinois Department of Transportation (IDOT).

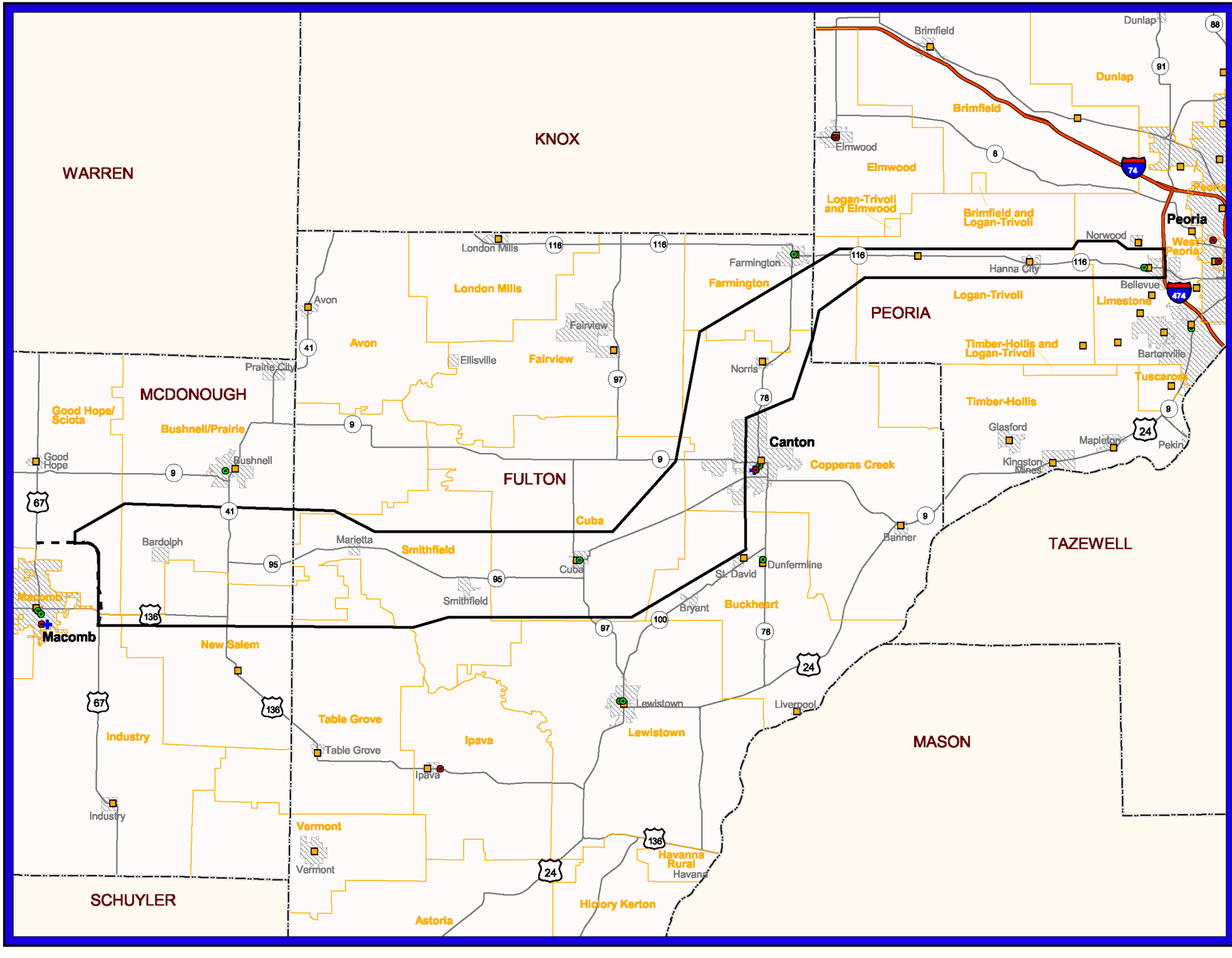
1:270,000

2 0 2 4 Miles

Peoria to Macomb EIS
FAP 315 (IL 336)

Section: Various
Peoria, Fulton, McDonough Counties
Job No. P94-025-00
Catalog No. 032258-00P
Contact: Mike McLuckie

Exhibit 3-4
Population Distribution



Legend

- Hospital
- Ambulance Facility
- Fire Station
- Law Enforcement
- Fire Protection District
- Project Area
- Interstate
- US Highway or State Highway
- Macomb Bypass
- County Boundary
- Municipality

N

Source(s): Illinois Department of Natural Resources, Peoria County Emergency Communications Center, City of Peoria Fire Dept., Peoria County Sheriffs Dept., Fulton County Emergency Telephone Systems Board, Canton Fire Dept., Fulton County Sheriffs Dept., McDonough County GIS Center, Macomb Fire Dept., McDonough County Sheriffs Dept., and URS Corporation.

1:270,000

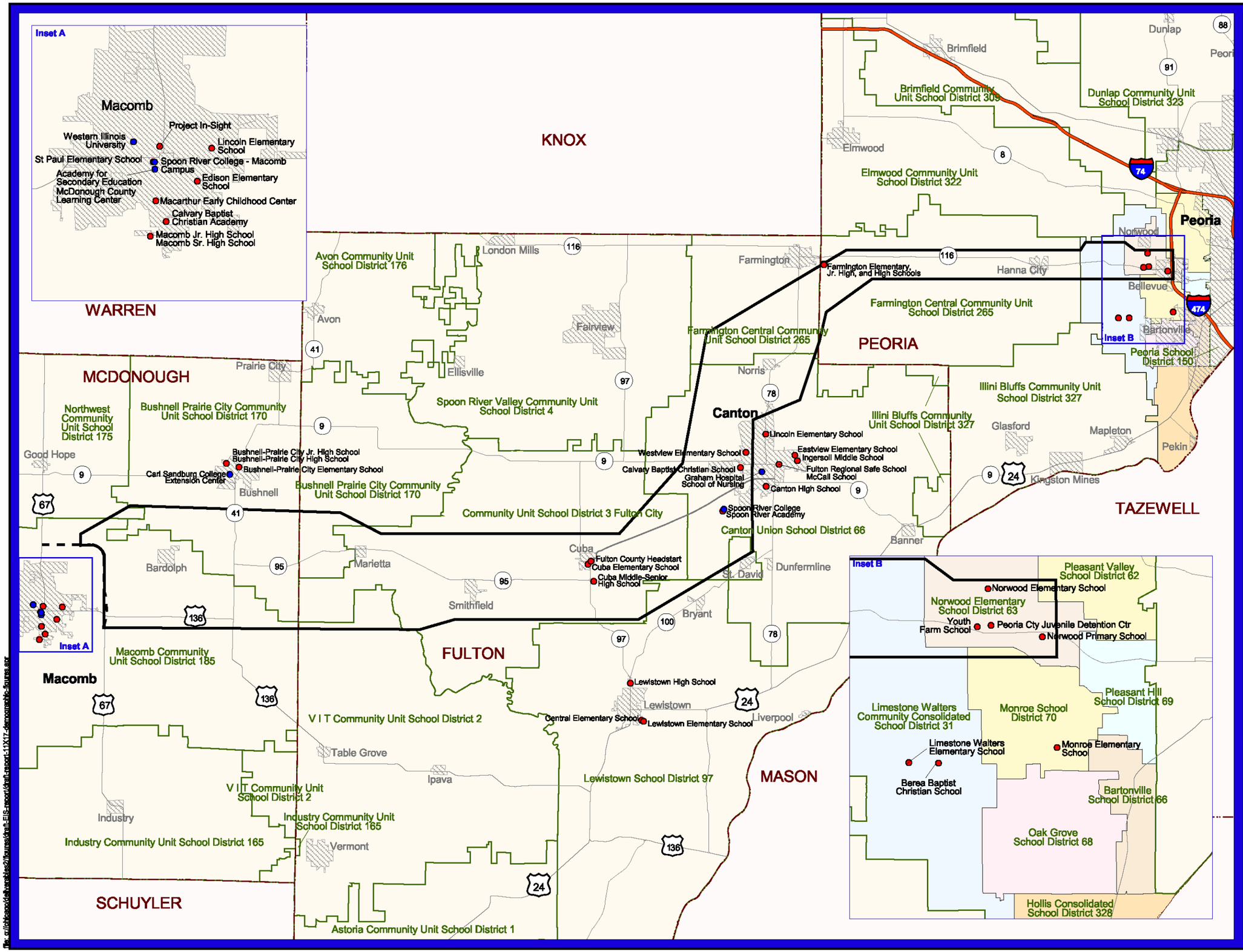
2 0 2 4 Miles

Peoria to Macomb EIS
FAP 315 (IL 336)

Section: Various
Peoria, Fulton, McDonough Counties
Job No. P94-025-00
Catalog No. 032258-00P
Contact: Mike McLuckie

Exhibit 3-5

Public Safety and Medical Services


Inset A
Macomb
Project In-Sight
Western Illinois University
Lincoln Elementary School
St Paul Elementary School
Spoon River College - Macomb Campus
Academy for Secondary Education
Edison Elementary School
McDonough County Learning Center
Macarthur Early Childhood Center
Calvary Baptist Christian Academy
Macomb Jr. High School
Macomb Sr. High School
WARREN
KNOX
Brimfield
Dunlap
Brimfield Community Unit School District 309
Dunlap Community Unit School District 323
Elmwood
Elmwood Community Unit School District 322
Peoria
Norwood
Avon Community Unit School District 176
London Mills
Farmington
Farmington Elementary, Jr. High, and High Schools
Hanna City
Bellevue
Farmington Central Community Unit School District 265
Avon
Fairview
Farmington Central Community Unit School District 265
PEORIA
Inset B
Bartonville
Peoria School District 150
MCDONOUGH
Prairie City
Ellisville
Norris
Illini Bluffs Community Unit School District 327
Northwest Community Unit School District 175
Bushnell Prairie City Community Unit School District 170
Spoon River Valley Community Unit School District 4
Canton
Illini Bluffs Community Unit School District 327
Glasford
Mapleton
Pekin
Good Hope
Bushnell-Prairie City Jr. High School
Bushnell-Prairie City High School
Bushnell-Prairie City Elementary School
Carl Sandburg College Extension Center
Lincoln Elementary School
Westview Elementary School
Eastview Elementary School
Ingersoll Middle School
Calvary Baptist Christian School
Graham Hospital School of Nursing
Fulton Regional Safe School
McCall School
Canton High School
Kingston Mines
Bushnell
Bushnell Prairie City Community Unit School District 170
Community Unit School District 3 Fulton City
Spoon River College
Spoon River Academy
TAZEWELL
Canton Union School District 66
Banner
Cuba
Fulton County Headstart
Cuba Elementary School
Cuba Middle-Senior High School
Bardolph
Marietta
St. David
Dunfermline
Smithfield
Bryant
Inset A
Macomb Community Unit School District 185
Macomb
FULTON
Lewistown High School
Lewistown
Central Elementary School
Lewistown Elementary School
Liverpool
V I T Community Unit School District 2
Table Grove
Ipava
Lewistown School District 97
MASON
V I T Community Unit School District 2
Industry
Industry Community Unit School District 165
Industry Community Unit School District 165
Vermont
SCHUYLER
Astoria Community Unit School District 1
Inset B
Pleasant Valley School District 62
Norwood Elementary School
Norwood Elementary School District 63
Youth Farm School
Peoria Cty Juvenile Detention Ctr
Norwood Primary School
Pleasant Hill School District 69
Limestone Walters Community Consolidated School District 31
Monroe School District 70
Limestone Walters Elementary School
Monroe Elementary School
Berea Baptist Christian School
Bartonville School District 66
Oak Grove School District 68
Hollis Consolidated School District 328
Legend
Primary Education Facility
Secondary Education Facility
Project Area
Interstate
US Highway or State Highway
Macomb Bypass
County Boundary
School District Boundary
N
Source(s): URS Corporation, IL State Board of Education, and the National Center for Education Statistics
1:270,000
2 0 2 4 Miles
Peoria to Macomb EIS
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Section: Various
Peoria, Fulton, McDonough Counties
Job No. P94-025-00
Catalog No. 032258-00P
Contact: Mike McLuckie
Exhibit 3-6
Educational Facilities
file: o:\chicago\deliverables2\figures\draft-EIS-report\draft-report-11X17-demographic-figures.apr

Sciota
Good Hope
Bushnell
Bardolph
Macomb
New Philadelphia
Marietta
Smithfield
Table Grove
Ipava
Industry
MCDONOUGH
FULTON
41
9
67
95
136

Legend

- Agricultural
- Agricultural Preservation
- C.B.D.
- Conservation
- General Business
- General Business Special Use
- General Manufacturing
- Heavy Industrial
- Light Industrial
- Local Shopping
- Multiple Family
- Multiple Family Special Use
- Residential Mobile Home
- Rural Community Conservation
- Rural Residential
- Single Family
- Single Family Residential Spec
- Two Family

- Project Area
- County Boundary
- Macomb Bypass
- Interstate
- U.S. Highway or State Highway
- Local Road
- Municipality

Source(s): Fulton County Zoning Ordinance, IL Dept. of Natural Resources and URS Corporation

1:125,000

1 0 1 2 Miles

Peoria to Macomb EIS
FAP 315 (IL 336)

Section: Various
Peoria, Fulton, McDonough Counties
Job No. P94-025-00
Catalog No. 032258-00P
Contact: Mike McLuckie

Exhibit 3-7

Land Use - McDonough County

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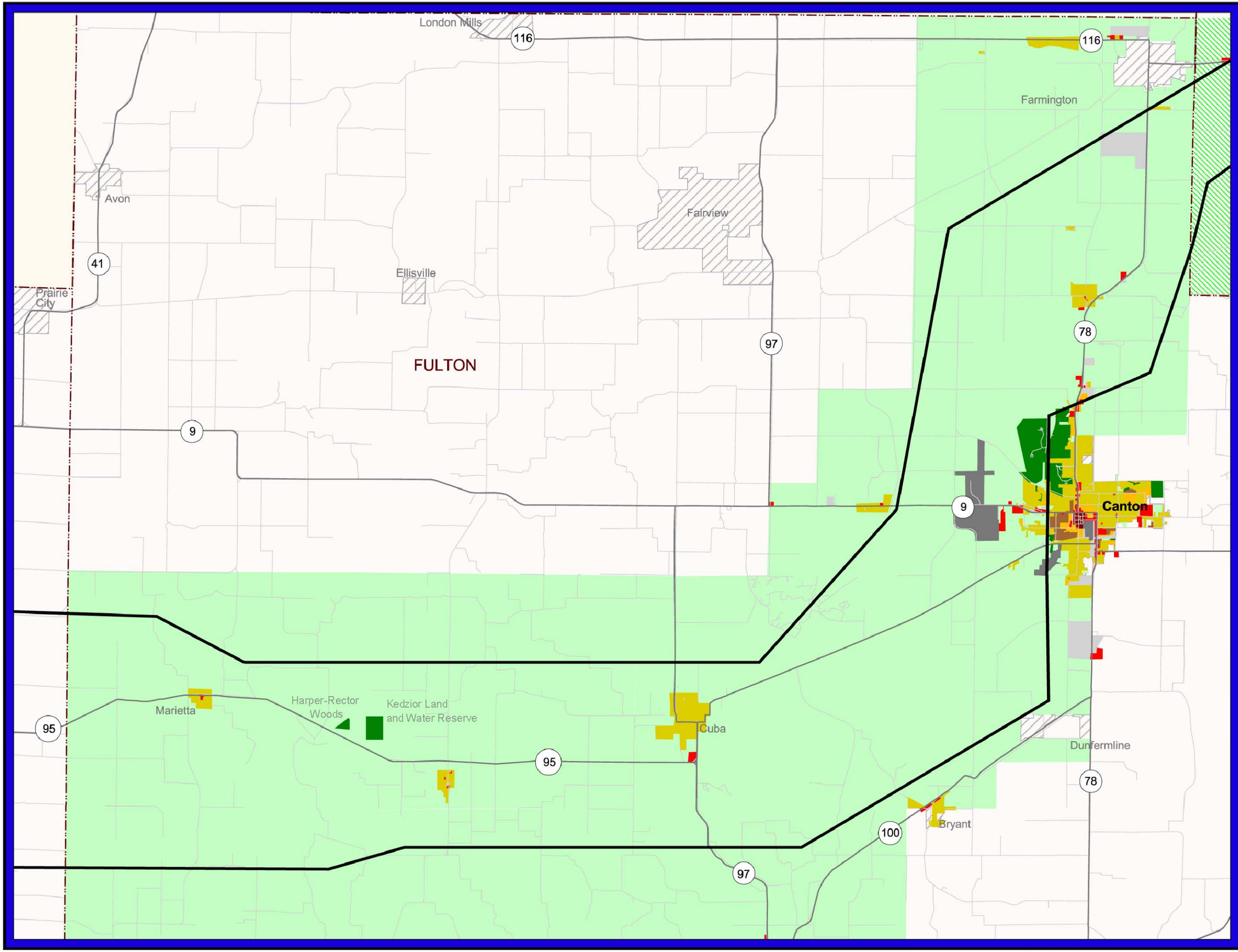


Legend

- Agricultural
- Agricultural Preservation
- C.B.D.
- Conservation
- General Business
- General Business Special Use
- General Manufacturing
- Heavy Industrial
- Light Industrial
- Local Shopping
- Multiple Family
- Multiple Family Special Use
- Residential Mobile Home
- Rural Community Conservation
- Rural Residential
- Single Family
- Single Family Residential Spec
- Two Family

- Municipality
- Project Area
- Interstate
- US Highway or State Highway
- Local Road
- Macomb Bypass
- County Boundary

N

Source(s): Fulton County Zoning Ordinance, IL Dept. of Natural Resources and URS Corporation.

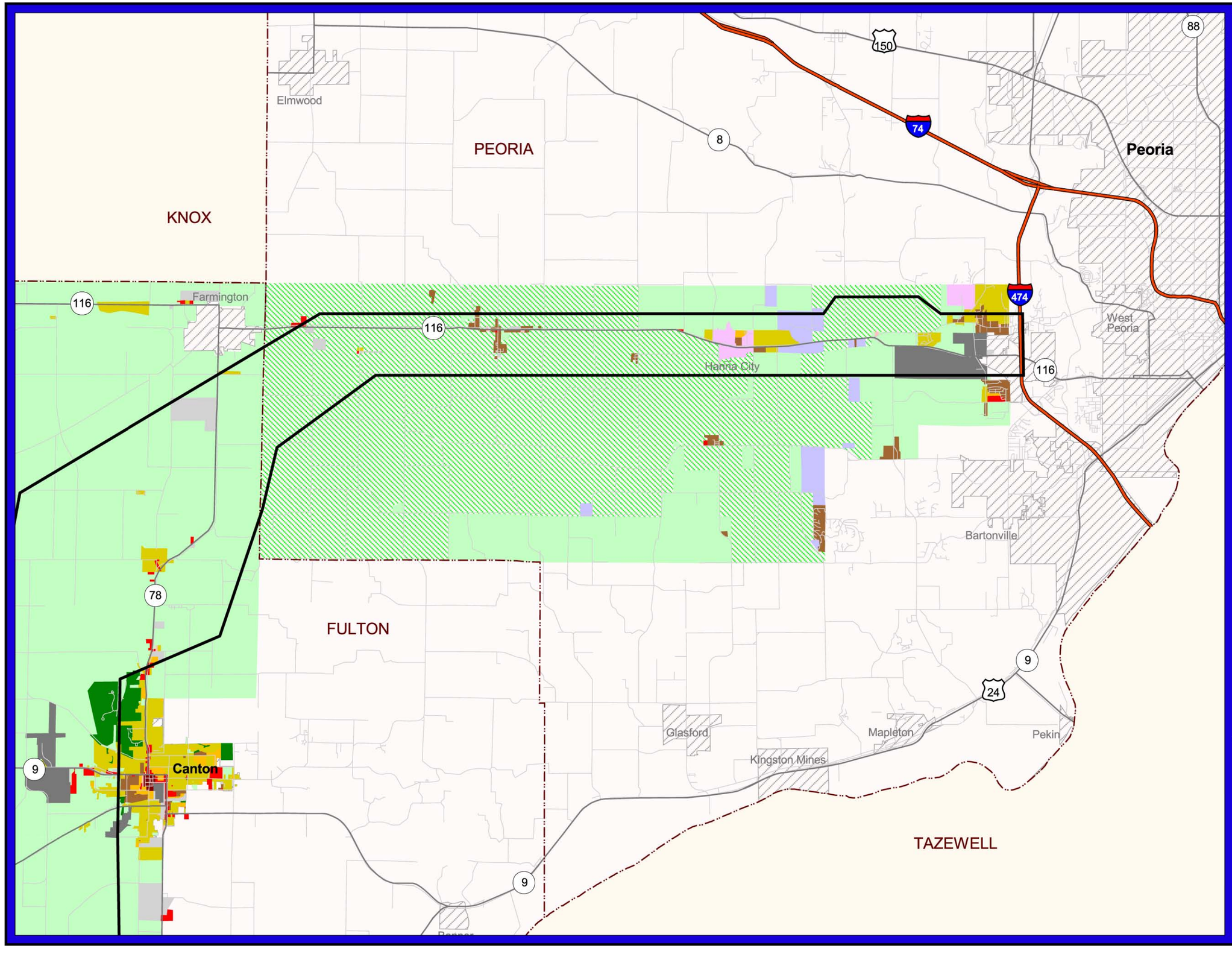
1:125,000

1 0 1 2 Miles

Peoria to Macomb EIS
FAP 315 (IL 336)

Section: Various
Peoria, Fulton, McDonough Counties
Job No. P94-025-00
Catalog No. 032258-00P
Contact: Mike McLuckie

Exhibit 3-8
Land Use - Fulton County



Legend

- Agricultural
- Agricultural Preservation
- C.B.D.
- Conservation
- General Business
- General Business Special Use
- General Manufacturing
- Heavy Industrial
- Light Industrial
- Local Shopping
- Multiple Family
- Multiple Family Special Use
- Residential Mobile Home
- Rural Community Conservation
- Rural Residential
- Single Family
- Single Family Residential Spec
- Two Family

- Municipality
- Project Area
- Interstate
- US Highway or State Highway
- Local Road
- Macomb Bypass
- County Boundary

N

Source(s): Fulton County Zoning Ordinance, IL Dept. of Natural Resources and URS Corporation.

1:125,000

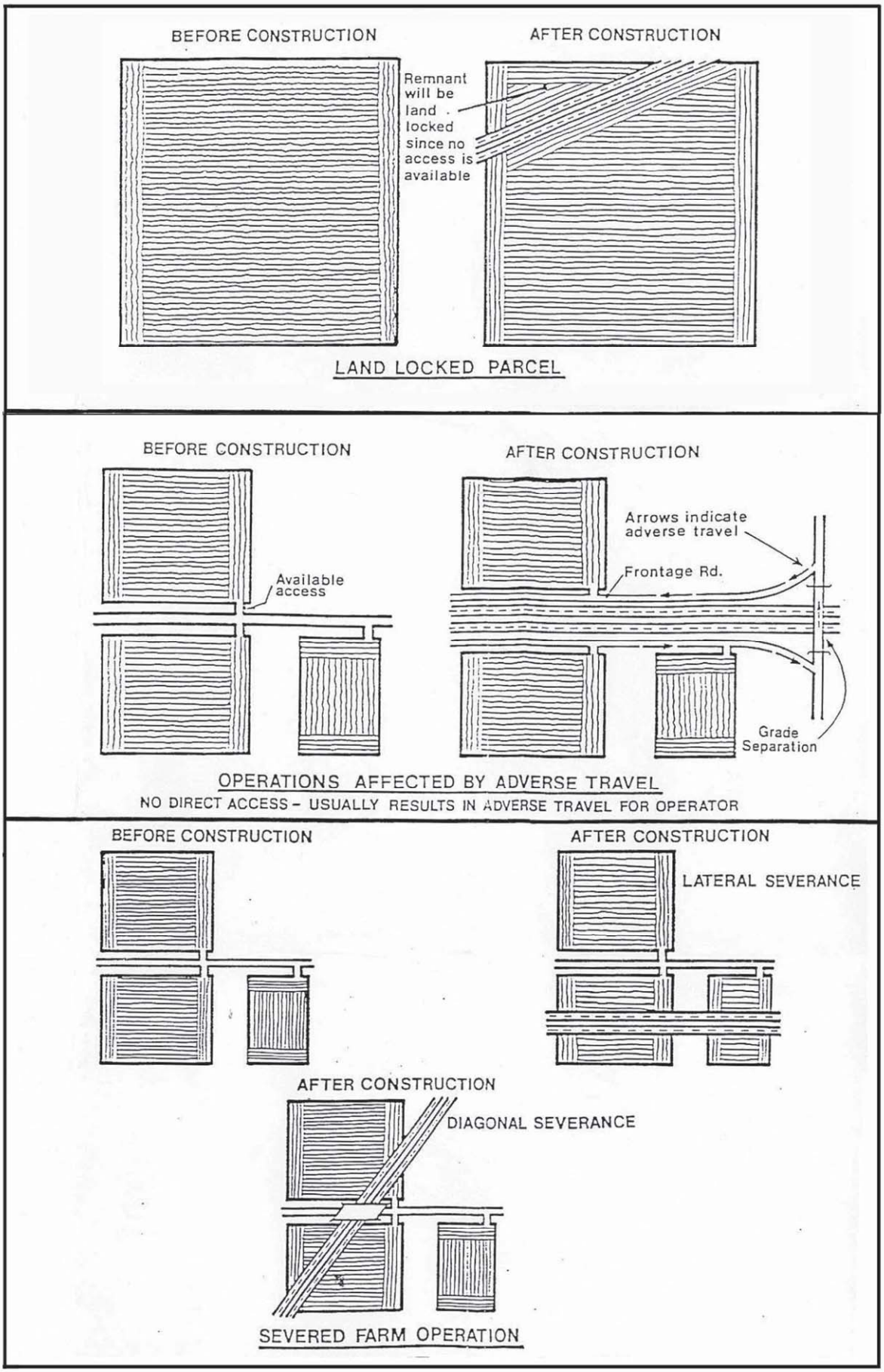
1 0 1 2 Miles

Peoria to Macomb EIS
FAP 315 (IL 336)

Section: Various
Peoria, Fulton, McDonough Counties
Job No. P94-025-00
Catalog No. 032258-00P
Contact: Mike McLuckie

Exhibit 3-9

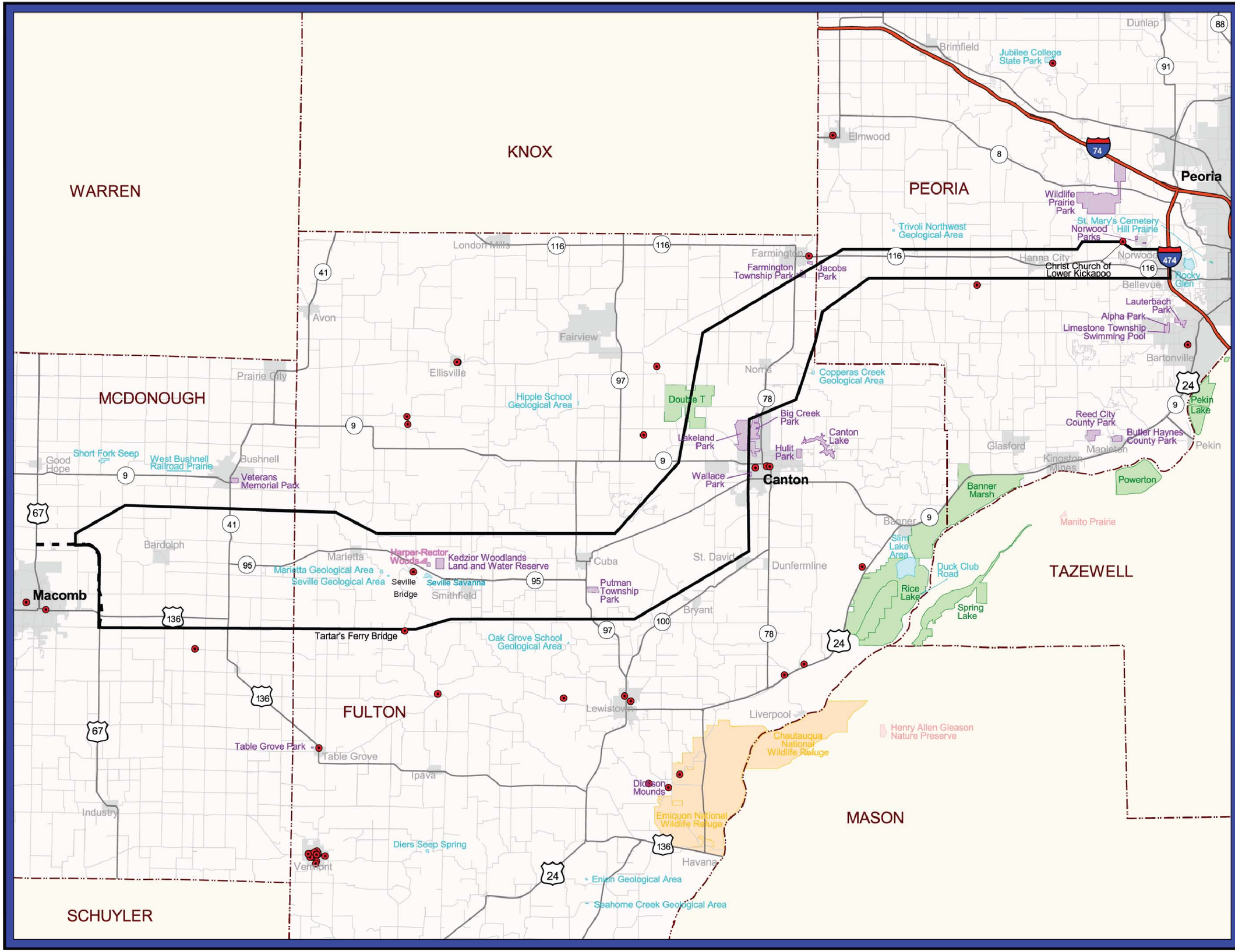
Land Use - Peoria County



Source: IDOT

Exhibit 3-10

Illustration of Terms Used for Agricultural Impact Analysis



Legend

- National Register Site
- State, County, or Local Park
- Nature Preserve
- State Fish and Wildlife Area
- Federal Land
- Natural Area
- Project Area
- Interstate
- US Highway or State Highway
- Macomb Bypass
- County Boundary
- Municipality

N

Source(s): Illinois Department of Natural Resources (Illinois Natural History Survey and Illinois State Geological Survey), Illinois Department of Transportation, Illinois Historic Preservation Agency and URS Corporation.

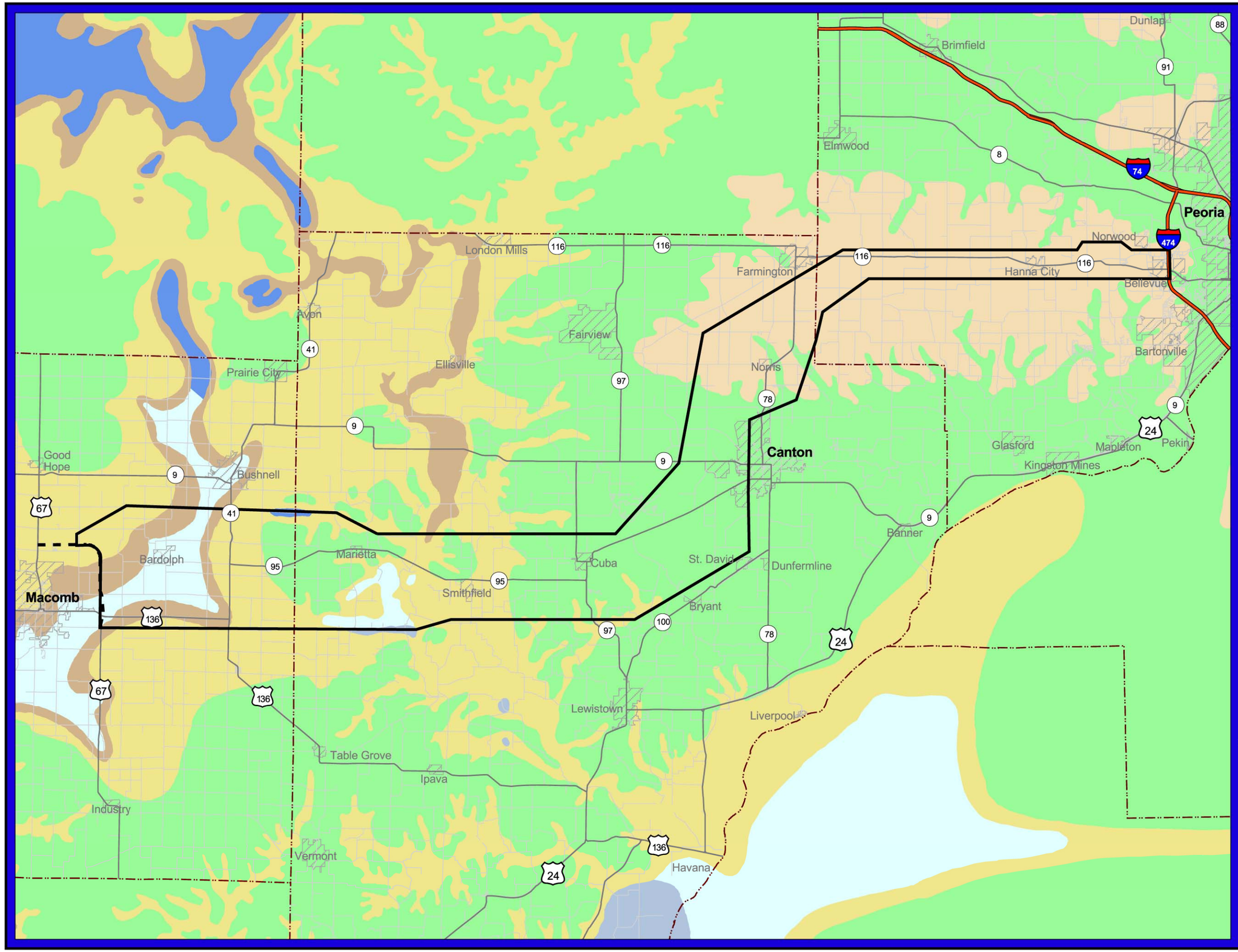
1:270,000

2 0 2 4 Miles

Peoria to Macomb EIS
FAP 315 (IL 336)

Section: Various
Peoria, Fulton, McDonough Counties
Job No. P94-025-00
Catalog No. 032258-00P
Contact: Mike McLuckie

Exhibit 3-11
Designated Lands and National Register Sites



Legend

Geologic Unit

Pennsylvanian
- Modesto
- Carbondale
- Spoon
- Abbott

Mississippian
- Upper Valmeyeran
- Middle Valmeyeran
- Lower Valmeyeran

- Municipality
- Project Area
- Interstate
- US Highway or State Highway
- Local Road
- Macomb Bypass
- County Boundary

N

Source(s): Illinois Department of Natural Resources (Illinois State Geological Survey), Illinois Department of Transportation and URS Corporation.

1:270,000

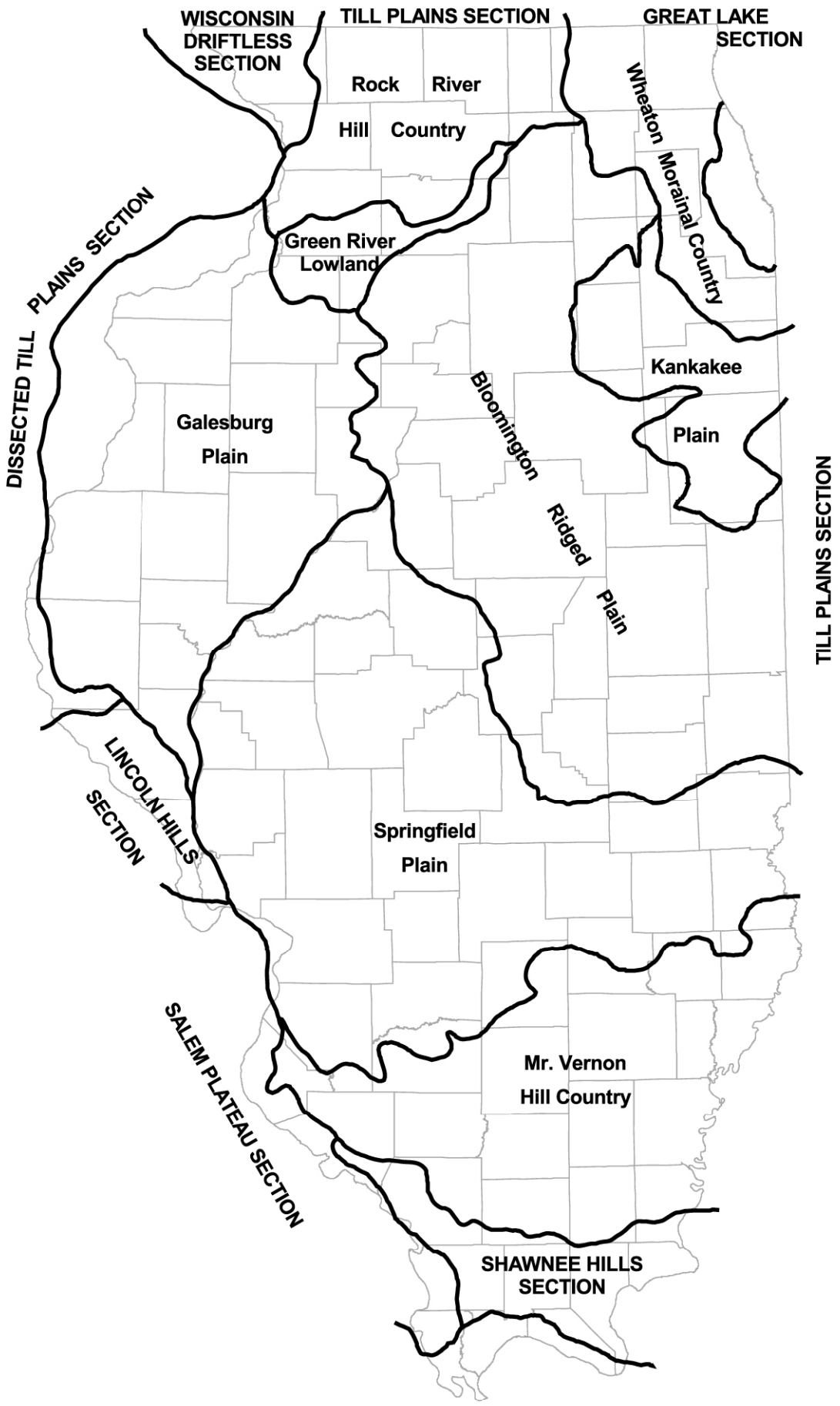
2 0 2 4 Miles

Peoria to Macomb EIS
FAP 315 (IL 336)

Section: Various
Peoria, Fulton, McDonough Counties
Job No. P94-025-00
Catalog No. 032258-00P
Contact: Mike McLuckie

Exhibit 3-12

Bedrock Geology



Legend

Physiographic Division
County Boundary

N

Source(s): Illinois Department of Natural Resources and URS Corporation

1:2,600,000

10 0 10 20 30 Miles

Peoria to Macomb Study
FAP 315 (IL 336)

Section: Various
Peoria, Fulton, and McDonough Counties
Job No. P94-025-00
Catalog No. 032258-00P

Exhibit 3-13
Physiographic Divisions

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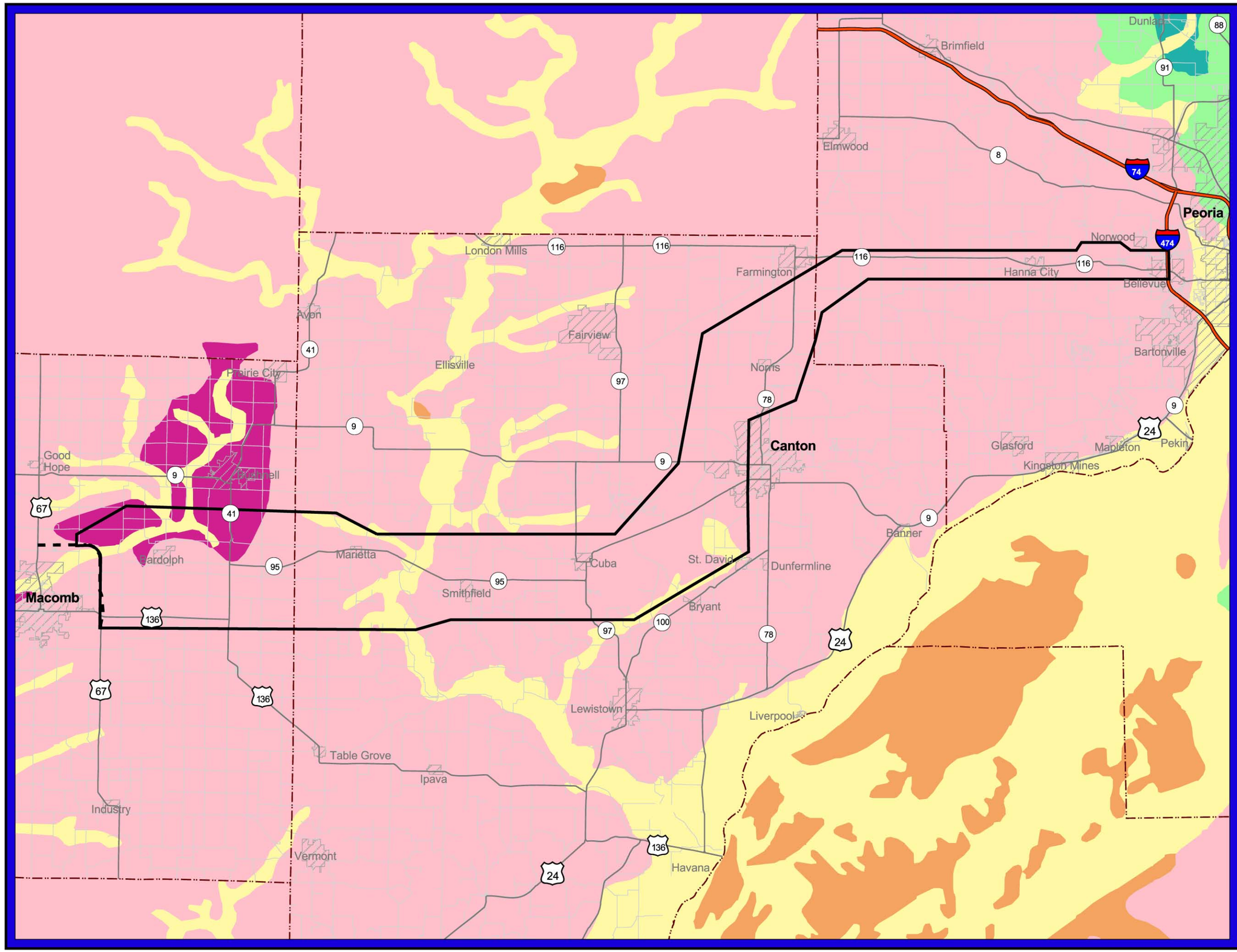


Legend

Quaternary Deposits

- Cahokia and/or Henry Formation
- Cahokia and/or Henry Formation
- Wedron Group (end moraine)
- Wedron Group (ground moraine)
- Glasford Formation
- Pearl Formation

- Municipality
- Project Area
- Interstate
- US Highway or State Highway
- Local Road
- Macomb Bypass
- County Boundary

N

Source(s): Illinois Department of Natural Resources (Illinois State Geological Survey), Illinois Department of Transportation and URS Corporation.

1:270,000

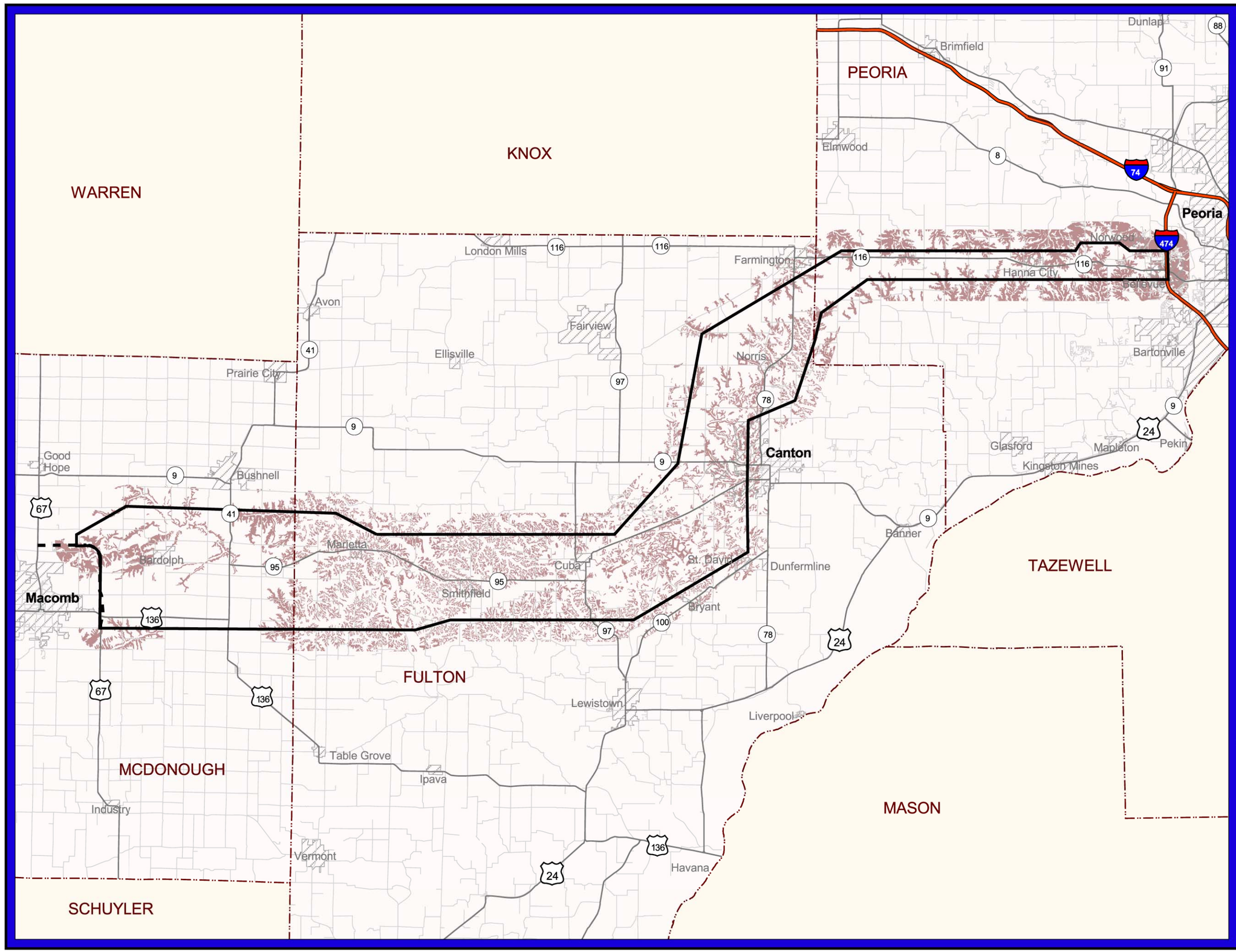
2 0 2 4 Miles

Peoria to Macomb EIS
FAP 315 (IL 336)

Section: Various
Peoria, Fulton, McDonough Counties
Job No. P94-025-00
Catalog No. 032258-00P
Contact: Mike McLuckie

Exhibit 3-14

Surface Geology



Legend

- Highly Erodible Soils
- Municipality
- Project Area
- Interstate
- US Highway or State Highway
- Local Road
- Macomb Bypass
- County Boundary

N

Source(s): USDA Natural Resources Conservation Service, Illinois Department of Transportation and URS Corporation.

1:270,000

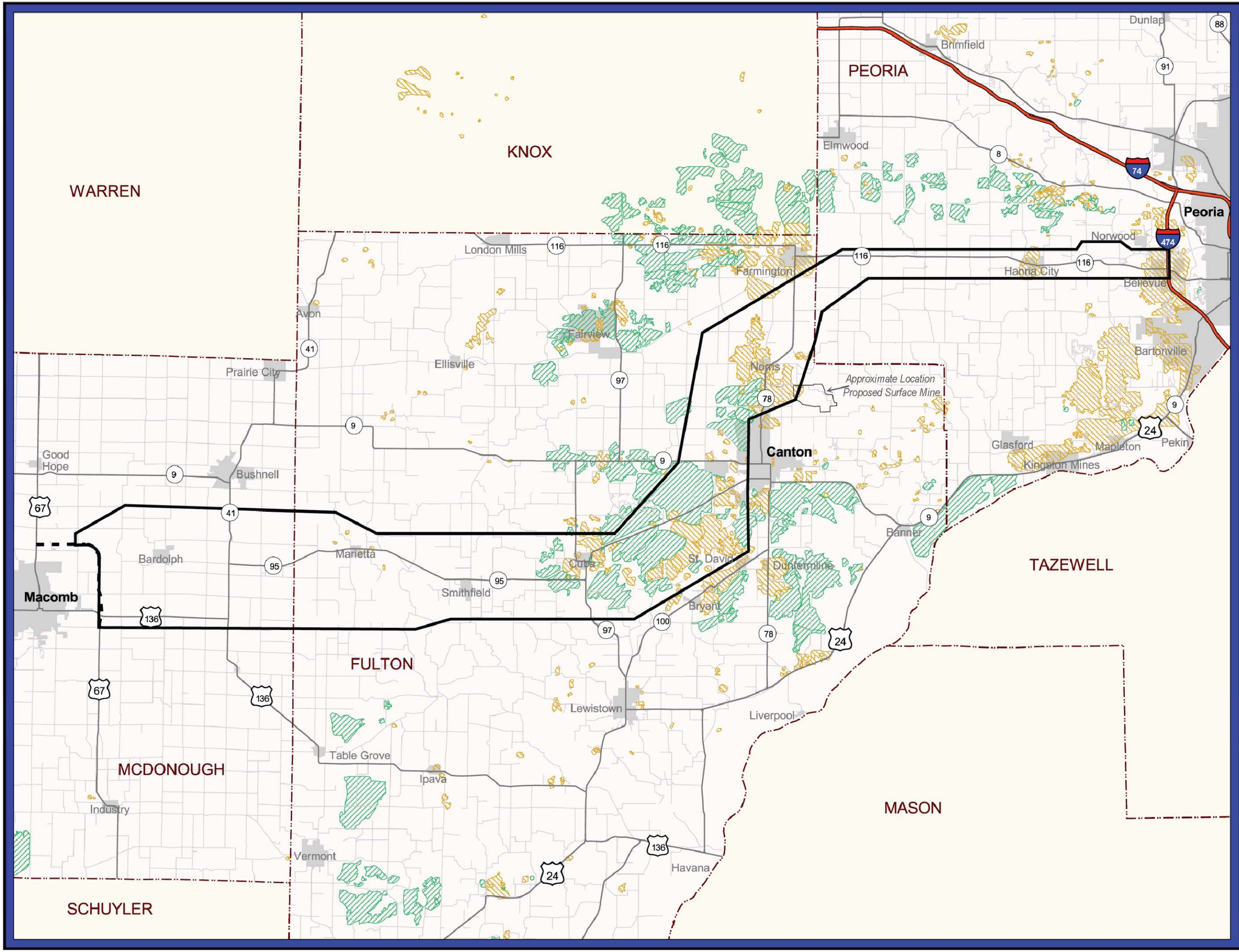
2 0 2 4 Miles

Peoria to Macomb EIS
FAP 315 (IL 336)

Section: Various
Peoria, Fulton, McDonough Counties
Job No. P94-025-00
Catalog No. 032258-00P
Contact: Mike McLuckie

Exhibit 3-15

Highly Erodible Soils



Legend

- Inactive Surface Mined Area
- Inactive Underground Mined Area

**There are no active mines within the study area.

- Municipality
- Project Area
- Interstate
- US Highway or State Highway
- Local Road
- Macomb Bypass
- County Boundary

N

Source(s): Illinois Department of Natural Resources (Illinois Natural History Survey and Illinois State Geological Survey), Illinois Department of Transportation and URS Corporation.

1:270,000

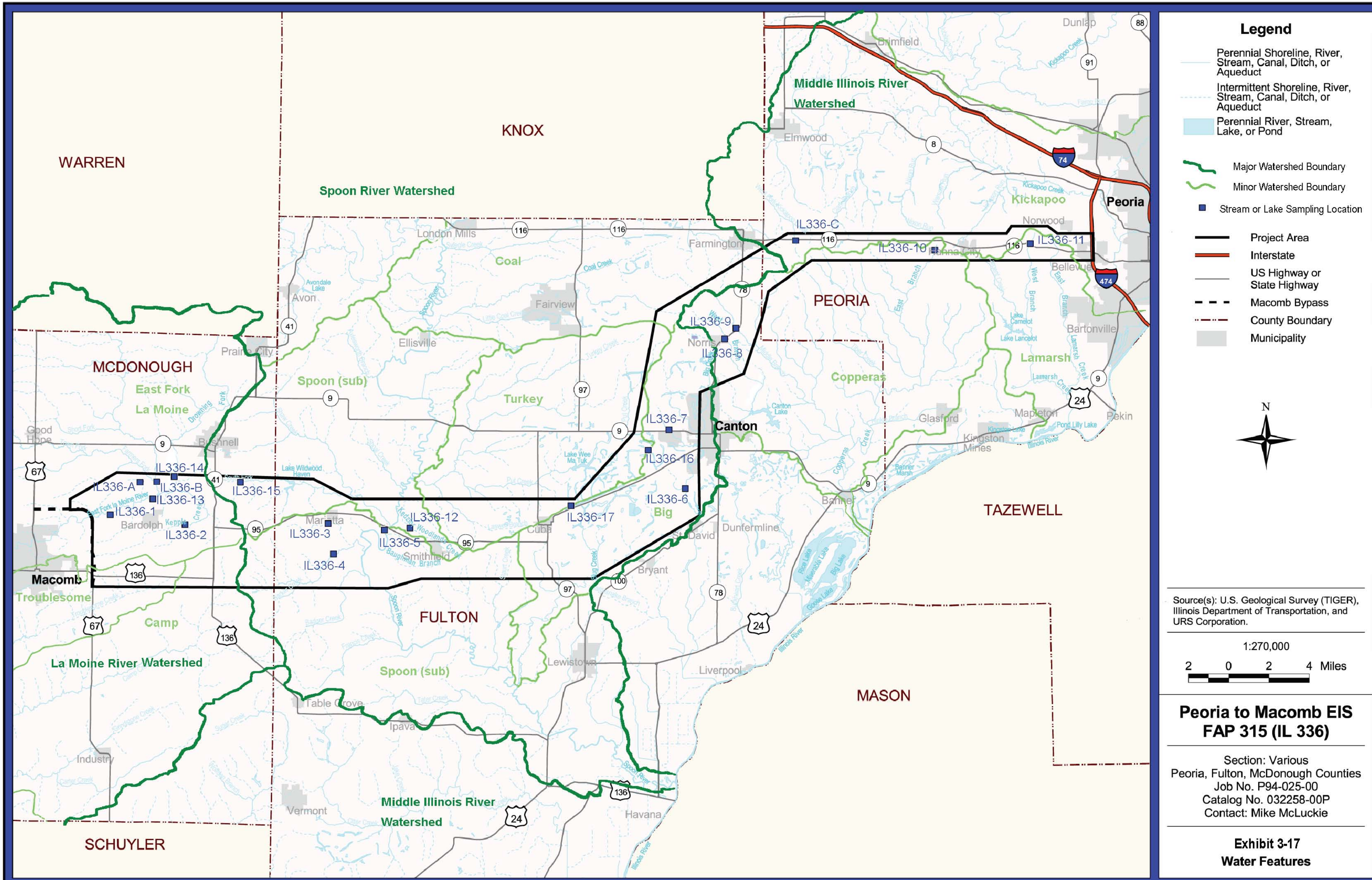
2 0 2 4 Miles

Peoria to Macomb EIS
FAP 315 (IL 336)

Section: Various
Peoria, Fulton, McDonough Counties
Job No. P94-025-00
Catalog No. 032258-00P
Contact: Mike McLuckie

Exhibit 3-16

Surface and Underground Mines


Legend
Perennial Shoreline, River, Stream, Canal, Ditch, or Aqueduct
Intermittent Shoreline, River, Stream, Canal, Ditch, or Aqueduct
Perennial River, Stream, Lake, or Pond
Major Watershed Boundary
Minor Watershed Boundary
Stream or Lake Sampling Location
Project Area
Interstate
US Highway or State Highway
Macomb Bypass
County Boundary
Municipality
N
Source(s): U.S. Geological Survey (TIGER), Illinois Department of Transportation, and URS Corporation.
1:270,000
2 0 2 4 Miles
Peoria to Macomb EIS
FAP 315 (IL 336)
Section: Various
Peoria, Fulton, McDonough Counties
Job No. P94-025-00
Catalog No. 032258-00P
Contact: Mike McLuckie
Exhibit 3-17
Water Features
WARREN
KNOX
PEORIA
MCDONOUGH
FULTON
TAZEWELL
MASON
SCHUYLER
Spoon River Watershed
Middle Illinois River Watershed
La Moine River Watershed
Spoon (sub)
East Fork
La Moine
Coal
Turkey
Big
Copperas
Kickapoo
Lamarsh
Camp
Troublesome
Macomb
Canton
Peoria
Dunlap
Brimfield
Elmwood
London Mills
Farmington
Norwood
Bellevue
Bartonville
Avon
Fairview
Ellisville
Prairie City
Norris
Glasford
Mapleton
Pekin
Kingston Mines
Good Hope
Bushnell
Bardolph
Marietta
Smithfield
Cuba
St. David
Dunfermline
Banner
Bryant
Lewistown
Liverpool
Table Grove
Ipava
Industry
Vermont
Havana
IL336-A
IL336-B
IL336-C
IL336-1
IL336-2
IL336-3
IL336-4
IL336-5
IL336-6
IL336-7
IL336-8
IL336-9
IL336-10
IL336-11
IL336-12
IL336-13
IL336-14
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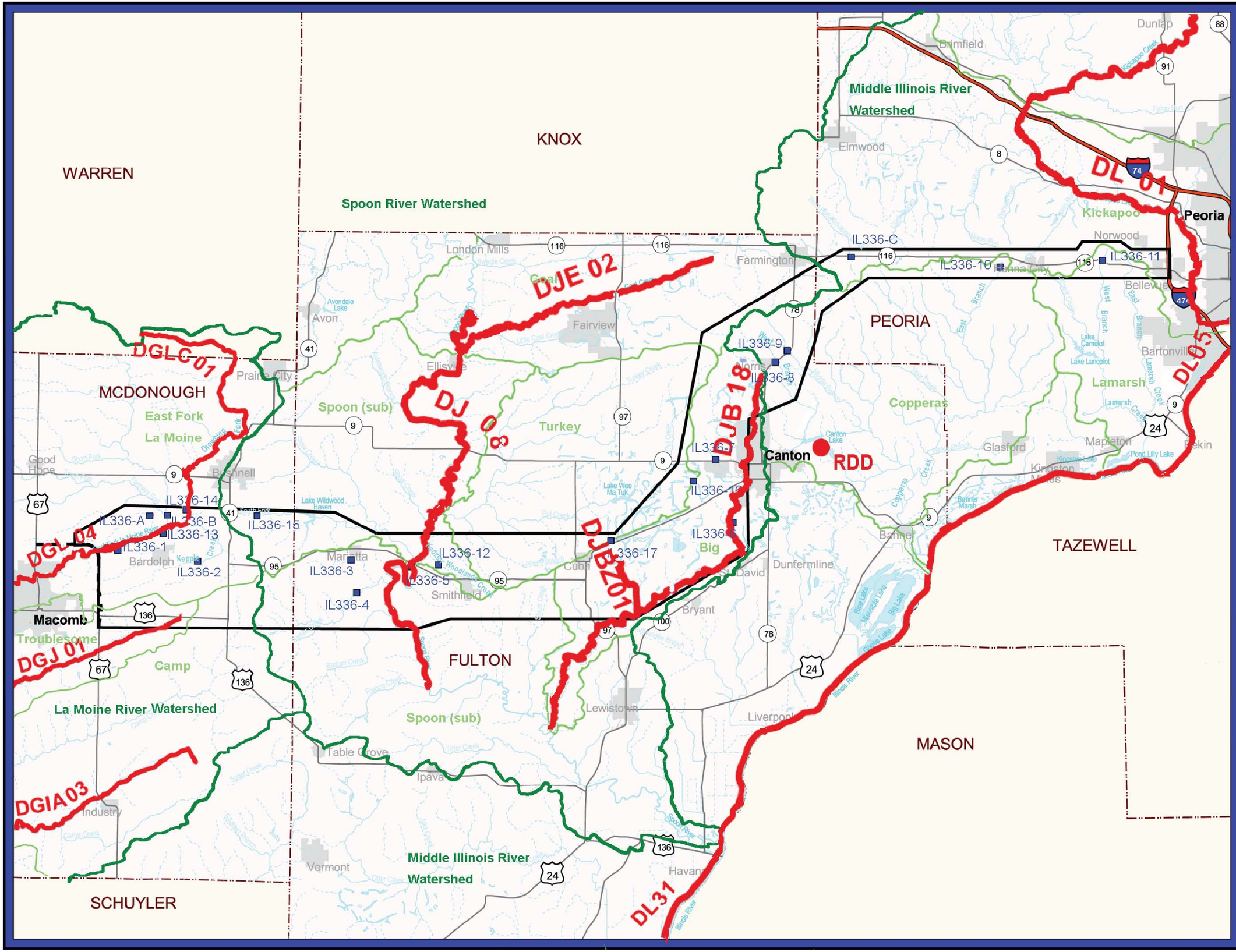
67
78
88
91
95
97
100
116
136



Legend

- Perennial Shoreline, River, Stream, Canal, Ditch, or Aqueduct
- Intermittent Shoreline, River, Stream, Canal, Ditch, or Aqueduct
- Perennial River, Stream, Lake, or Pond
- Major Watershed Boundary
- Minor Watershed Boundary
- Stream or Lake Sampling Location
- Project Area
- Interstate
- US Highway or State Highway
- Macomb Bypass
- County Boundary
- Municipality

N

See Table 3-35 for names and descriptions.

Source(s): U.S. Geological Survey (TIGER), Illinois Department of Transportation, and URS Corporation.

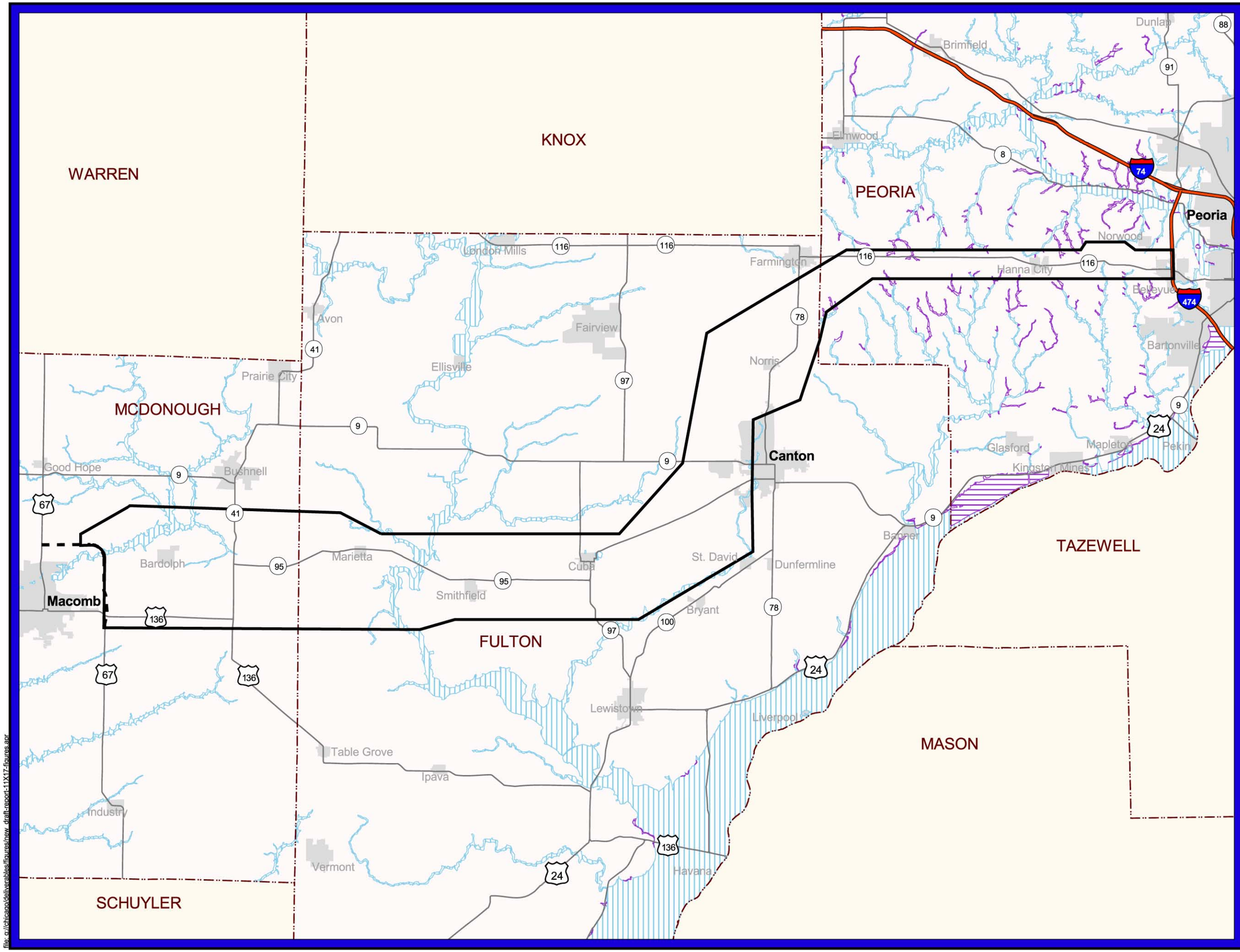
1:270,000

2 0 2 4 Miles

Peoria to Macomb EIS
FAP 315 (IL 336)

Section: Various
Peoria, Fulton, McDonough Counties
Job No. P94-025-00
Catalog No. 032258-00P
Contact: Mike McLuckie

Exhibit 3-18
Illinois EPA 2006 Section 303(d) Impaired Waters



Legend

- 100 Year Floodplain
- 500 Year Floodplain
- Project Area
- Interstate
- US Highway or State Highway
- Macomb Bypass
- County Boundary
- Municipality

N

Source(s): Illinois State Water Survey, Illinois Department of Transportation, and URS Corporation.

1:270,000

2 0 2 4 Miles

Peoria to Macomb EIS
FAP 315 (IL 336)

Section: Various
Peoria, Fulton, McDonough Counties
Job No. P94-025-00
Catalog No. 032258-00P
Contact: Mike McLuckie

Exhibit 3-19
Floodplains

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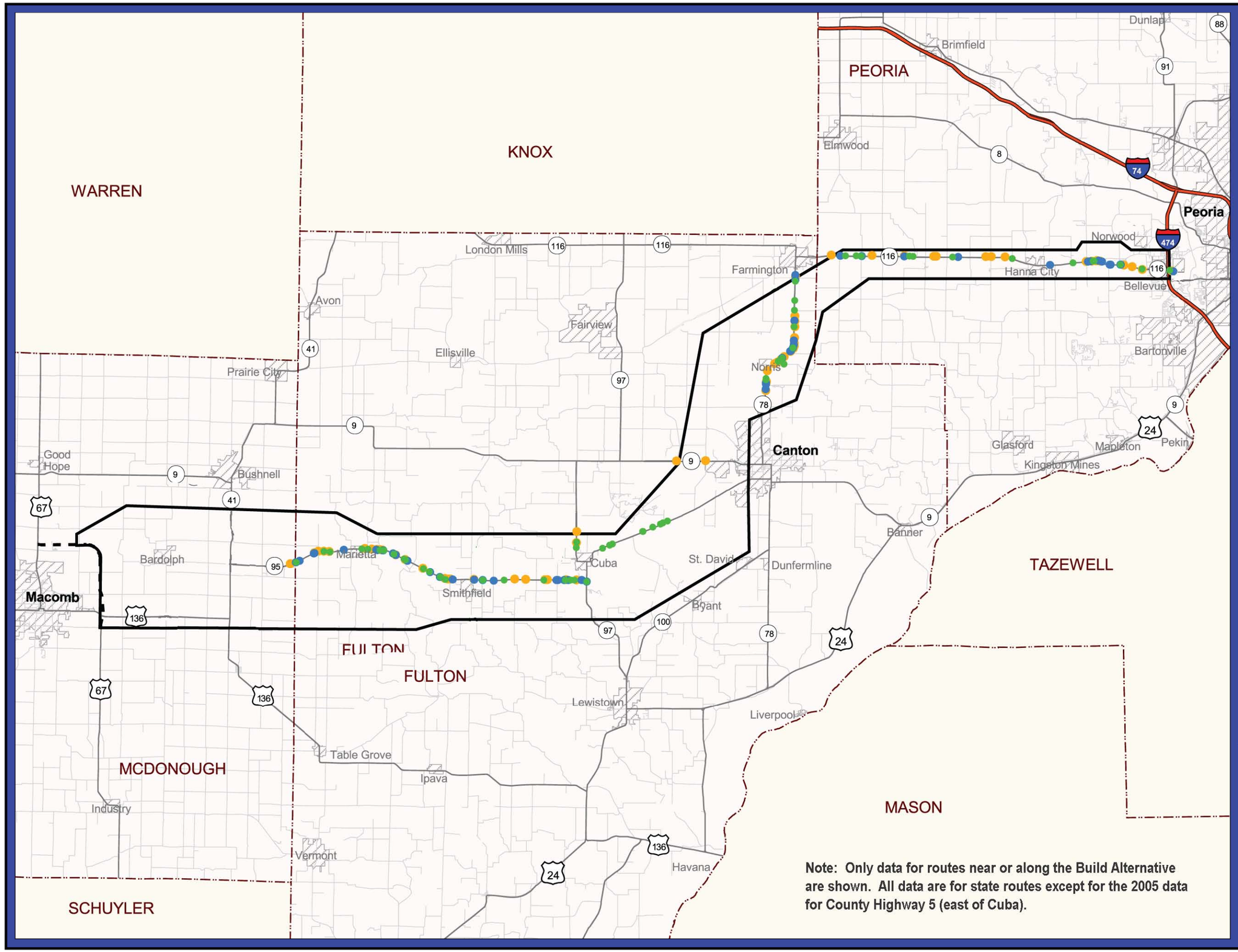

Note: Only data for routes near or along the Build Alternative are shown. All data are for state routes except for the 2005 data for County Highway 5 (east of Cuba).

Legend

- 2003 Animal/Vehicle Crash
- 2004 Animal/Vehicle Crash
- 2005 Animal/Vehicle Crash
- Municipality
- Project Area
- Interstate
- US Highway or State Highway
- Local Road
- Macomb Bypass
- County Boundary

N

Source(s): Illinois Department of Natural Resources, Illinois Department of Transportation - Division of Traffic Safety, and URS Corporation.

1:270,000

2 0 2 4 Miles

Peoria to Macomb EIS
FAP 315 (IL 336)

Section: Various
Peoria, Fulton, McDonough Counties
Job No. P94-025-00
Catalog No. 032258-00P
Contact: Mike McLuckie

Exhibit 3-20
Animal Crashes
2003 - 2005