
3.0 AFFECTED ENVIRONMENT

This section provides an overview of the natural, social, cultural and economic conditions within the area affected by the Preferred Alternative. A map of the Study Area showing the Preferred Alternative can be seen in **Figure 3.2**. Environmental constraints are depicted on aerial photographs at the end of **Section 4.0, Environmental Consequences**. In selected sections of the Final Environmental Impact Statement (FEIS), data may be identical to the information presented in the Draft Environmental Impact Statement (DEIS). This is to offer a basis for comparison or for clarity purposes.

The US-131 Improvement Study Area is located in St. Joseph County in southwestern Michigan, and Elkhart County in north central Indiana. The Study Area covers approximately 18 square miles, or approximately 11,500 acres. The US-131 Study Area is roughly one mile wide and begins at the Indiana Toll Road, approximately one mile south of the Michigan/Indiana State Border, extending north 17 miles to approximately one mile north of Cowling Road in Lockport Township. The corridor passes through York Township in Indiana, Mottville Township, White Pigeon Township, the Village of White Pigeon, Constantine Township, the Village of Constantine, Fabius Township, the City of Three Rivers and Lockport Township in Michigan. The Study Area is roughly bounded by the following roads:

- Southern Boundary: Indiana Toll Road
- Eastern Boundary: US-131
- Western Boundary: Blue School and Schaffer Roads
- Northern Boundary: Null Road

3.1 Land Use

Land use within the Study Area is primarily agricultural, with scattered single-family homes, multi-family homes, community facilities and farmsteads in or surrounding the Village of Constantine and the City of Three Rivers. Light industrial and commercial development can also be found along US-131, primarily at its intersections with M-60 and US-12, and within the Village of Constantine and the City of Three Rivers. South of M-60 the area relies heavily upon agricultural business and light manufacturing production for economic stability. Commercial development also contributes to the economy of the more urbanized sections of the Study Area. **Figure 3.1 St. Joseph County Land Cover**, **Figure 3.3 Existing Land Cover** and **Figure 3.4 Community Facilities** show the locations of land use within the corridor.

3.1.1 Existing Regional Land Cover

Agricultural land uses comprise over 234,823 acres or 64% of all land uses, within St. Joseph County, according to the 1997 St. Joseph County Master Plan.

The City of Three Rivers and the Village of Constantine contain the most dense residential development within the US-131 Study Area. However, residential uses

comprise only 3% of the overall land use within St. Joseph County. **Figure 3.3** illustrates the existing land cover within the Study Area.

3.1.2 Study Area Existing Land Uses

The Study Area land use patterns consist predominantly of farmland and scattered residential parcels outside of the residential development areas. Commercial and light industrial developments are also found along portions of US-131, US-12 and M-60 road frontage north of M-60. Within Three Rivers there are a large number of commercial developments fronting US-131. Other commercial development is centered around the US-131/US-12 intersection and along US-131 within the Village of Constantine. The Study Area includes a small portion of York Township in Elkhart County, Indiana that contains agricultural, light industrial, and commercial development along US-131 between the Michigan State Line and the Indiana Toll Road. A description of the primary land uses found within the Study Area follows.

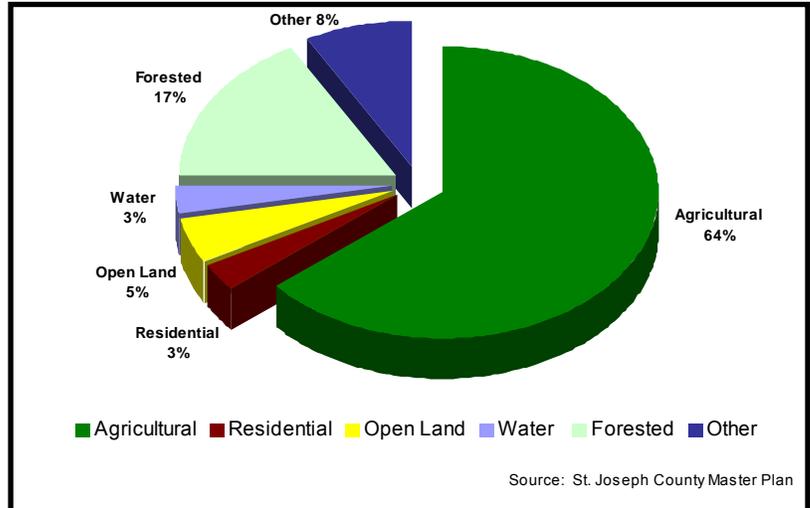


Figure 3.1 St. Joseph County Land Cover

3.1.3 Residential

Farmsteads and small groupings of single-family or subdivision housing are the primary residential uses in the Study Area. Exceptions to this pattern occur west of US-131 within Constantine, which has typical small-lot single-family dwellings. Adjacent to US-131 in Three Rivers there are several subdivisions and small-lot residences. Multi-family residential land uses are found within the more developed areas of Three Rivers and Constantine. There are some outlying multi-family complexes such as the Riverside Apartments located west of Constantine on Riverside Drive. Several manufactured housing subdivisions are located within the Study Area including the Colonial Estates development located on the east side of US-131 north of US-12 and the Whispering Pines development located south of the Village of Constantine, both currently have access off of US-131. Clusters of newer residential development are also found throughout the Study Area, most notably to the northwest of Constantine, and to the west of Three Rivers.

3.1.4 Commercial

Commercial land uses within the Study Area are located primarily adjacent to existing US-131. Small clusters of highway-oriented service developments (gas stations, fast-food restaurants and convenience stores) are located just north of the Indiana Toll Road and at the intersection of US-131 and US-12. Downtown Constantine features several small stores and two service stations.

(Insert Figure 3.2 Preferred Alternative Details, 1 of 2)

(Insert Figure 3.2 Preferred Alternative Details, 2 of 2)

(Insert Figure 3.3 Existing Land Cover)

A large retail development is located just north of M-60 on US-131. Several retail establishments (banks, restaurants, hotels/motels, auto parts and gas stations) exist along US-131 between Broadway Road and Coon Hollow Road in the City of Three Rivers. Downtown Three Rivers is located east of US-131 outside of the Study Area.

3.1.5 Industrial/Manufacturing

A number of light industrial mobile home and recreational camper fabrication facilities exist on US-131, north and south of the Indiana Toll Road (I-80/90) near the southern project terminus. A large grain elevator and gravel transfer facility exist just north of the Indiana/Michigan State Line within Mottville Township. Within White Pigeon Township and the Village of White Pigeon, two van-conversion businesses operate east of US-131. Located at the intersection of US-12 and US-131 is a recently vacated manufactured housing facility. Two large seed production plants operate within Constantine Township adjacent to US-131 south of the Village of Constantine. All of these facilities require access by commercial trucks making frequent deliveries. The US-131 highway also provides access to the Village of Constantine industrial park located five blocks east of US-131 on Sixth Street. US-131 also provides access to several industrial areas within the City of Three Rivers including:

- The Three Rivers Area Enterprise Park located at the southeast corner of the intersection of US-131 and M-60
- Several industrial facilities located along US-131 south of Michigan Avenue
- The American Axle plant located on the east side of US-131, just north of Hoffman Road

3.1.6 Recreation

Recreational land uses are discussed in **Section 3.22, Parks and Recreation**.

3.1.7 Institutional, Community Facilities and Services

Institutional land uses within the US-131 Improvement Study Area consist primarily of churches, schools, cemeteries and emergency service facilities. **Figure 3.4** illustrates community facilities located within the Study Area. A description of these facilities follows:

Churches: Several churches are located adjacent to US-131, including the Riverview Mennonite Church in White Pigeon, the First Congregational United Church of Christ located within the Village of Constantine, the Trinity Missionary Church in Constantine Township and the Charity Baptist Church located north of King Road on US-131 in Fabius Township. Within the City of Three Rivers four churches are located adjacent to the US-131/Coon Hollow Road intersection and include; the Church of the Nazarene, the Christian Reformed Church of Three Rivers, the Seventh Day Adventist Church and St. Peter's Evangelical Lutheran Church. The Three Rivers Missionary Church is also located west of US-131 on Hoffman Road and the Agape Family Church is located on Wilbur Road and backs up to US-131.

Police: A Michigan State Police post is located in the northeast quadrant of the US-131/US-12 intersection in White Pigeon. This post serves the Michigan portion of the Study Area. The St. Joseph County Sheriff's Department also serves the Study Area. The Village of Constantine and the City of Three Rivers each employ between

one and five officers to provide police protection within their respective jurisdictions. The Indiana State Police and the Elkhart County Sheriff's Department serve the portions of the Study Area within Indiana.

Fire: The Village of Constantine, Fabius Township, Lockport Township and the City of Three Rivers provide the majority of fire protection coverage within the Study Area. The remainder of the Study Area relies on assistance from these four departments, as well as assistance from surrounding communities. The Lockport/Fabius/Park Township Fire Station #3 is located within the Study Area one-tenth mile west of the intersection of Millard Road and US-131.

Emergency Services: The majority of the Study Area relies on various private and/or public organizations to provide emergency services. Although none of the providers of emergency services are headquartered within the Study Area, the Three Rivers Area Hospital that receives emergency patients is located one block east of US-131 on Broadway Road. The Village of Constantine and the City of Three Rivers Fire Departments provide emergency services for their respective communities and are assisted by private agencies.

Health Care: No private or public health care facilities are located within the Study Area. The Three Rivers Area Hospital is the only health care facility located within close vicinity of the Study Area (one block east of US-131 on Broadway). The hospital has 72 beds and employs a 24-hour emergency service.

Schools: The US-131 Study Area covers portions of the White Pigeon, Constantine and Three Rivers School Districts. White Pigeon Community Schools serve approximately 1,200 students at four facilities. Constantine Public Schools serve approximately 1,700 students at four schools. Three Rivers Community Schools manages seven schools serving approximately 3,000 students. Four school facilities exist within the US-131 Study Area. Constantine's Senior High, Middle School and Elementary School are all located two to four blocks west of existing US-131. In Three Rivers, the Johnnycake Pre-School is located west of US-131 on Millard Road within the Study Area.

Transit Services: The Constantine public school district provides transportation to children to and from school each day. There are 27 buses running 27 routes that provide service for approximately 950 students to four schools each week day during the school year.

The St. Joseph County Transportation Authority provides transit services anywhere within St. Joseph County. General Ridership includes visitors and residents within the county. Patrons provide 24 hours notice and can be picked up at their home or other identified location and provided with return service if they wish. Senior Citizens are carried at significantly reduced rates and they provide services for the physically and mentally disabled.

Cemeteries: The Broadstreet Cemetery located north of Zerbe Road in Constantine Township is the only cemetery located within the Study Area. This cemetery is located behind an existing single-family residence, approximately 70-feet west of the existing US-131 right-of-way.

(insert Figure 3.4 Community Facilities)

3.1.8 Utilities

The Village of White Pigeon, Constantine Village and Township and the City of Three Rivers all have functional water and sewage treatment systems. The remainder of the Study Area utilizes well and septic systems. The Village of Constantine no longer operates their treatment facilities, instead a ten-inch ductile iron sewer force main runs adjacent to US-131 on the west side and carries Constantine's waste to the Three Rivers treatment facility. Natural gas pipeline networks have been established throughout the corridor by Michigan Gas Utilities, Consumers Energy and Indiana-Michigan Power Company. A six-inch ANR pipeline is crossed by US-131 approximately one mile north of US-12, while a 24-inch ANR pipeline is crossed by US-131 at the Indiana State Line.

A six-inch Consumers Energy pipe is crossed by US-131 approximately two miles north of Constantine (near Garber Road) while a 30-inch Consumers Energy pipe is crossed just north of the Indiana State Line. Telephone service is provided by Verizon. American Electric Power (AEP) owns and operates hydroelectric dams on the St. Joseph River in Mottville Township and the Village of Constantine.

3.1.9 Land Use Planning and Zoning

In 1997, the South-Central Michigan Planning Council updated the St. Joseph County Master Plan. Most communities within the Study Area have either a Master Plan or Comprehensive Planning Document. **Figure 4.1 in Section 4.1, Land Use Impacts** combines the future land uses shown in the plans for each of the Study Area communities.

Zoning: All communities within the Study Area are zoned communities with the exception of York Township in Indiana. Zoning throughout the Study Area is administered at either a township or a village/city level. Land use plans and zoning ordinances were acquired from local officials for this study. The primary zoning districts and zoning setbacks for properties located within the US-131 Study Area are presented in **Section 4.1.1, Compatibility with Zoning/Official Plans**.

3.1.10 Committed Developments

The American Axle manufacturing plant located on the east side of US-131 north of Hoffman Road has added a 50,000 square-foot expansion to its manufacturing facility completed in 2004. In the City of Three Rivers construction for a Wal-Mart retail store began in October 2006. This Wal-Mart opened in August 2007 and employs 325 people. It is located at 101 South Tolbert Drive.

3.2 Farmland

According to the St. Joseph County Soil Conservation Service, agricultural farm operations constitute 65% of all land uses within the Study Area. This is slightly above the county average of 64%. Of the 234,823 acres of farmland within St. Joseph County, 3.3% is located in the Study Area.

The 1997 St. Joseph County Master Plan indicated that from 1987 to 1992 there was a 9.8% growth in agricultural land uses in St. Joseph County. Despite this growth, the number of active farms has been in decline over the last fifty years. This growth highlights the importance of agriculture to the region's economy as production in farming continues to increase. Within St. Joseph County there were 1,424 farms in operation in 1964; in 2002, 907 remained. However, the average farm size has increased over the years. From 1978 to 1992 farms with less than 500 acres declined by 26%, 500 to 999 acre farms remained constant, while those with 1,000 acres or more increased by 153%.

The 1997 Master Plan also states that St. Joseph County is the largest seed corn-producing county east of the Mississippi River. Within St. Joseph County, seed corn production accounts for nearly one-quarter of the agricultural acreage use, totaling 50,000 acres. Within the Study Area, a majority of the agricultural fields are utilized for seed corn production. Area farms also grow cash crops such as corn and soybeans.

Approximately 24% of the farmland within the Study Area is irrigated through the use of center-pivot irrigation systems. **Figure 3.5** shows the locations of these irrigation systems. No major feedlots or pasturelands exist within the Study Area.

3.2.1 Prime and Unique Farmland

The Farmland Protection Policy Act (PL 97-98) of 1981, modified in 1987, protects "prime farmland," "unique farmland," or "farmland that is of statewide or local importance". Since the supply of prime farmland is limited, actions resulting in its direct loss put pressure on more marginal lands. Excessive farming of marginal lands, which are generally more erodible and subject to drought and flooding, reduces productivity and places greater strains on the natural environment. Prime farmlands as defined by the Department of Agriculture's Natural Resource Conservation Service (NRCS) are found throughout the US-131 Study Area. **Figure 3.5** illustrates the locations of approximately 6,140 acres of prime farmland that have been identified within the Study Area. The Study Area total is 3.7% of the county prime farmland total.

The NRCS defines prime farmland as that land best suited for food, feed, forage, fiber and oilseed crops. It includes land used for cultivation, pasture and woodland. The soil must be of sufficient quality, with an adequate growing season and sufficient moisture to produce a high-yield crop. "Unique Farmland" is defined as land other than prime farmland that is used for the production of specific high-value food and fiber crops such as citrus, tree nuts, olives, cranberries, fruits and vegetables. No unique farmland has been identified within the Study Area.

The 250 acre Constantine Turf Farm, located along Miller's Mill Road, is prime farmland and is the only farmland within the Study Area that is classified as having statewide and local importance due to its distinctive use.

Within St. Joseph County, approximately 164,000 acres (37% of total land use) are considered prime farmland. An additional 34,000 acres would meet the prime farmland criteria with additional flood control measures. Prime farmland is primarily located in the northern, western and central sections of the county with the majority of the land being used for crops, pasture and hay.

Placeholder figure 3.5 existing farmland/agriculture

3.2.2 Farmland and Open Space Preservation Program

The Farmland and Open Space Preservation Program (Part 361 of the Natural Resources and Environmental Act of 1994, as amended) commits farmlands to agricultural use by the landowner for ten-year periods. The landowner enters into a contract with the Michigan Department of Agriculture where upon property tax credits are provided to the landowner as enticement to maintain the property in agricultural use. Farmlands enrolled in this program that are acquired for highway improvements in the public interest are released from the preservation program. According to Michigan Department of Agriculture records, 103 parcels occupying 3,662 acres in the Study Area are enrolled in the Farmland and Open Space Preservation Program.

In 2008 the St. Joseph County Farmland Preservation Program implemented a tool for farmland preservation called Purchase of Development Rights (PDR). Under a PDR program landowners are compensated for permanently limiting non-agricultural land uses on their property. A landowner voluntarily sells his/her development rights to the land to a protecting organization (State, County, Township, Conservancy, etc.) and the development rights are extinguished. PDR programs are based on the idea that a landowner holds a bundle of rights to the land, and the right to develop the land may be separated and sold to a purchaser who is committed to permanently retiring the development rights, while the landowner retains control of all other land rights. The purchaser of a farm's development rights gains a limited interest in the real estate as reflected by an easement, which is a deed restriction that runs with the land (not the landowner) and is recorded with the Register of Deeds. PDR programs create value for development rights, allowing the landowner to access a portion of the land equity while retaining ownership of the land. PDR is distinctly different from exclusive agricultural zoning, which limits the use of land to farming and essentially eliminates the development rights value of farmland.

State and Federal grant dollars are available to support the purchase of development rights in St. Joseph County. State grant funds require a local match of 25% of the value of a property's development rights and Federal funds require that 50% of the value of the development rights be provided by a local match. The required local match can come from the property owner by accepting less than the fair market value for the development rights, or contributions from a township, the County, a land conservancy, foundation, or private business, or any combination thereof. As this program has just begun there are currently no farms in Constantine participating in this program. **Figure 3.5** shows existing farmland within the Study Area.

Socio-Demographics

3.3.1 Population

United States census data indicates the Study Area population has increased steadily over the last fifty years, with modest growth occurring since 1980. **Figure 3.5** illustrates this growth within the Study Area communities since 1950.

Population Centers: Three developed areas (Villages of White Pigeon and Constantine and the City of Three Rivers) are located within or adjacent to the Study Area. The principal areas of development for these jurisdictions are located within or east of the Study Area.

Parts of six townships also lie within the Study Area. The townships generally exhibit rural development patterns. **Table 3.1** provides the historical population trends and future population projections for each local unit of government, as well as state and county growth trends.

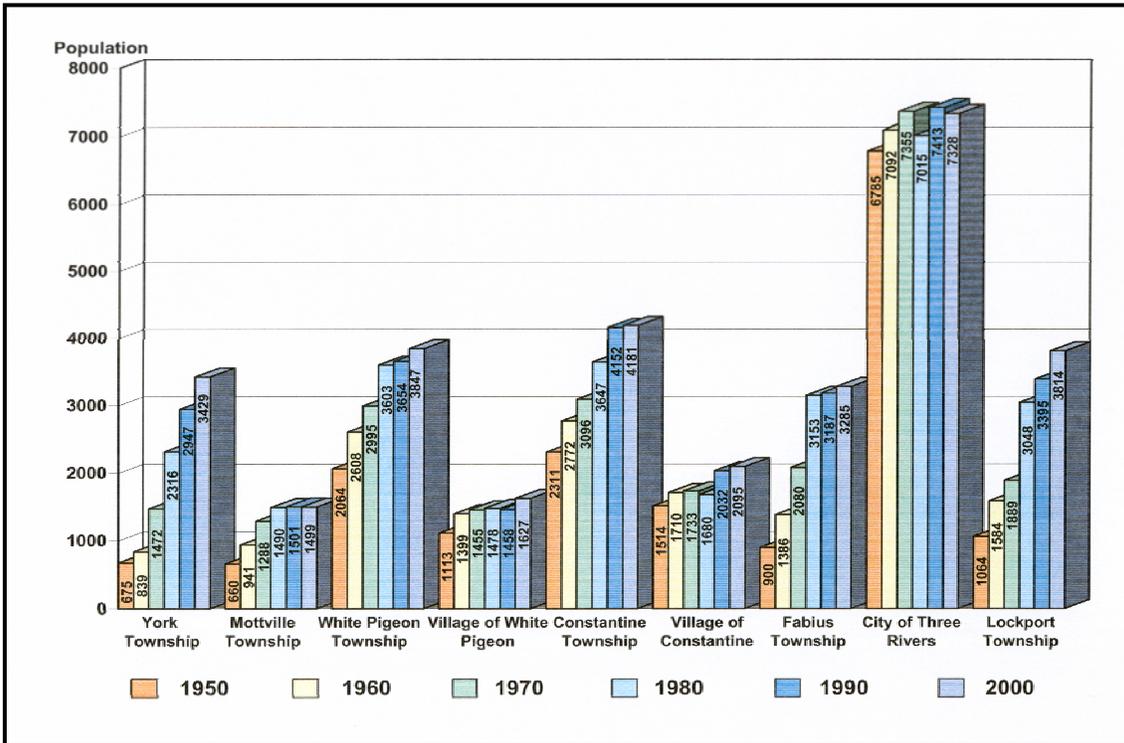


Figure 3.6 Historical Population Trends Over the Past 50 Years

Table 3.1 Population History and Growth Trends

Jurisdictions	1980 ¹	1990 ²	2000 ³	2025 ⁴	% Change 2000-2025
State of Indiana	5,492,730	5,555,090	6,080,485	7,336,183	20.65%
Elkhart County, IN	137,360	156,380	182,791	223,400	22.22%
York Township	2,316	2,947	3,429	4,191	22.22%
State of Michigan	9,262,078	9,295,287	9,938,444	11,519,690	15.91%
St. Joseph County, MI	56,083	58,913	62,422	74,370	19.14%
Mottville Township	1,490	1,501	1,499	1,786	19.13%
White Pigeon Township	3,603	3,654	3,847	4,583	19.13%
Village of White Pigeon	1,478	1,458	1,627	1,938	19.15%
Constantine Township	3,647	4,152	4,181	4,981	19.13%
Village of Constantine	1,680	2,032	2,095	2,496	19.14%
Fabius Township	3,153	3,187	3,285	3,914	19.15%
City of Three Rivers	7,015	7,413	7,328	8,731	19.15%
¹ Source: U.S. Census Bureau, 1980 Census Data. ² Source: U.S. Census Bureau, 1990 Census Data. ³ Source: U.S. Census Bureau, 2000 Census Data. ⁴ Source: Woods & Poole Countywide Population Projection interpolated for communities by WSA.					

3.3.2 Characteristics of Environmental Justice/Title VI population Groups

This section covers protections from discrimination under Title VI of the 1964 Civil Rights Act. It analyzes the potential adverse environmental impacts the proposed project may have on low-income and minority communities protected by Executive Order 12898 on Environmental Justice.

Title VI of the 1964 Civil Rights Act prohibits discrimination on the basis of race, color, sex and national origin in programs and activities receiving federal financial assistance. In the past, a number of federally funded projects affected minority and low-income populations more than other groups. Project development now addresses Environmental Justice (EJ) in an attempt to prevent such disproportionate impacts. The EJ policy stated in Executive Order 12898 has three major parts:

- Avoid, minimize, or mitigate disproportionately high and adverse human health or environmental effects, including social and economic effects of the project, on minority populations and low income populations.
- Ensure the full and fair participation by all potentially affected communities in the decision making process.
- To prevent the denial of, reduction in or significant delay in the receipt of benefits by minority and low income populations.

3.3.3 Groups Included in Environmental Justice/Title VI Analysis

In the Environmental Justice and Title VI analyses, minority persons are identified as Black, Hispanic, Asian American, American Indian, or Alaskan Native. Low-income populations are those, regardless of ethnicity, who are in households with annual incomes at or below the U.S. department of Health and Human Services poverty level of \$18,850 for a family of four, according to 2000 U.S. Census data. Whether or not they fit the definition of groups protected by the EJ regulations, all groups and individuals have the right to access and participate in the decision making process as provided by Title VI of the Civil Rights Act.

In order to determine if a minority population group or low-income population group is present in the Study Area, MDOT reviewed census tracts from the 2000 Census. MDOT also reached out to community leaders and groups, tribal governments, and local officials by conducting public information meetings and workshops (**Section 6 of the FEIS**), which helped identify Environmental Justice population groups in the Study Area.

3.3.4 Housing

Housing within the Study Area is comprised mostly of ranch-style homes on large lots except within the population centers where there are older homes on relatively small lots. According to 2000 census data, 61% of the US-131 Study Area population resides in either one-person or two-person households, which is above the national and state averages of 58.6% and 59.2%, respectively.

The assessed 2000 median housing value for the Study Area communities was \$85,892. Housing values tend to be higher in Fabius and York Townships, where the median values were \$115,800 and \$112,700 respectively.

3.4 Selected Population Characteristics

3.4.1 Gender, Age and Poverty Rate

An analysis of the U.S. Census data for 2000 along with field reviews of the Study Area determined the presence of minority and low-income populations within the Villages of White Pigeon and Constantine and the City of Three Rivers. The minority population of the Study Area (7.2%) is similar to that of many of the surrounding communities, but significantly lower than that of the City of Three Rivers (18.4%), Elkhart County (22.5%), the State of Michigan (21.4%) and the State of Indiana (16%). **Table 3.2** lists the gender, age and minority population characteristics.

A review of the U.S. Census data (2000) also indicated that the number of people who are limited in English proficiency (LEP) is less than 5 percent in St. Joseph County. During the project development phase of this project, MDOT has not received any requests for an interpreter to be present at meetings, or to have any of the documents translated into another language other than English.

The median age of the population within the Study Area (35 years) is similar to those of the surrounding communities. The average household size of 2.7 persons for the Study Area is similar for all Study Area jurisdictions.

Income characteristics of the communities within the Study Area and the associated state and county jurisdictions are presented in **Table 3.3**. On average, the per capita income within the Study Area is slightly higher than that of St. Joseph County, but lower than those of Elkhart County and the States of Indiana and Michigan. The poverty rate for the Study Area is approximately 8.2%, which is lower than those of St. Joseph County (11.3%), the State of Michigan (10.5%) and the State of Indiana (9.5%), but slightly higher than that of Elkhart County, Indiana (7.8%).

Table 3.2 Selected Population Characteristics

Population (Pop.) Characteristics	Study Area*	Lockport Township	Fabius Township	City of Three Rivers	Constantine Township	Village of Constantine	White Pigeon Township	Village of White Pigeon	Mottville Township	York Township	St. Joseph County	Elkhart County	Michigan	Indiana
Total Persons	--	3,814	3,285	7,328	4,181	2,095	3,847	1,627	1,499	3,429	62,422	182,791	9,938,444	6,080,485
Median Age (Years)	35	35	42	32	35	30	38	33	37	35	36	33	36	35
Males as a % of All Persons	49.7%	49.4%	50.6%	48.0%	50.2%	49.1%	48.4%	46.0%	50.7%	50.5%	49.4%	49.5%	49.0%	49.0%
Females as a % of All Persons	50.3%	50.6%	49.4%	52.0%	49.8%	50.9%	51.6%	54.0%	49.3%	49.5%	50.6%	50.3%	51.0%	51.0%
Persons 65 and Over as % of All Persons	12%	11.3%	15.3%	13%	10.9%	10.3%	12.7%	10.2%	10.9%	6.9%	13.0%	10.9%	12.3%	12.4%
Persons Under 18 Years as a % of All Persons	26%	28.7%	22.7%	28.9%	28.6%	32.0%	25.4%	29.1%	25.9%	31.6%	27.5%	28.9%	26.1%	25.9%
Total Households	--	1,451	1,304	2,910	1,560	763	1,505	602	570	1,149	23,381	66,154	6,485	2,336,306
Average Household Size	2.7	2.6	3.0	2.0	3.0	3.0	3.0	3.0	3.0	2.9	3.0	2.7	2.5	2.5
% Family Households	75.0%	73.6%	75.5%	60.8%	73.8%	73.1%	71.2%	71.6%	74.0%	81.5%	71.0%	72.0%	65.1%	68.6%
Total Minority as a % of All Persons	7.2%	15.8%	4.3%	18.4%	5.0%	6.0%	5.1%	7.9%	3.9%	4.1%	8.7%	22.5%	21.4%	16.0%
White Pop. as a % of All Persons	92.8%	84.2%	95.7%	81.6%	95.0%	94.0%	94.9%	92.1%	96.1%	95.9%	92.0%	77.5%	78.6%	84.0%
African American Pop. as a % of All Persons	2.8%	10.4%	0.9%	10.5%	0.5%	0.6%	0.2%	0.2%	0.3%	0.3%	2.6%	5.2%	14.1%	8.4%
American Indian Pop. as a % of All Persons	0.5%	0.4%	0.4%	0.4%	0.2%	0.1%	0.6%	1.1%	0.7%	0.7%	0.4%	0.3%	0.5%	0.3%
Asian Pop. as a % of All Persons	0.3%	0.0%	0.5%	0.7%	0.7%	0.9%	0.7%	0.6%	0.1%	0.3%	0.6%	0.9%	1.8%	1.0%
Hispanic (all races) Pop. as a % of All Persons	1.5%	2.2%	1.0%	2.7%	1.1%	1.4%	1.6%	2.6%	1.0%	1.0%	1.5%	8.9%	3.3%	3.5%
Other Race Alone Pop. as a % of All Persons	0.6%	0.9%	0.3%	1.7%	0.5%	0.5%	1.0%	2.0%	0.3%	0.1%	1.5%	5.4%	0.1%	1.6%
Two or More Races Pop. as a % of All Persons	1.4%	1.8%	1.1%	2.3%	2.0%	2.5%	1.0%	1.5%	1.5%	1.7%	1.5%	1.8%	1.6%	1.2%

Source: U.S. Census Bureau, 2000 Census Data
 *Based on the average for the communities located within the study area, weighted by population

3.5 Relocations

The average selling price of residential homes in the Study Area in 2005 was \$119,683, according to the St. Joseph County Association of Realtors (a 28.5% increase over the 2000 average selling price). This indicates that housing prices within the Study Area have risen substantially in the past five years. A detailed relocation analysis is provided in **Section 4.5, Relocation Impacts**.

3.6 Economics

The local and regional economy is heavily dependant upon agriculture and light industrial facilities located throughout the Study Area. Commercial and industrial land uses have historically had a high turnover rate within the Study Area and within St. Joseph County, Michigan. As of September 2006, the county unemployment rate of 6.5% was below the State of Michigan's average of 7.1%. The county's unemployment rate has risen from a 2005 average of 6.3% (Michigan Department of Labor and Economic Growth).

3.6.1 Regional Income Levels

The most recent township level estimates of household income within the US-131 Study Area are provided in **Table 3.3**. The Study Area communities' populations were too small to be included in the 2005 American Community Survey. The most recent income and poverty data is from the 2000 Census. The St. Joseph County median household income was \$40,355 according to the 2000 U.S. Census, 9.7% lower than the State of Michigan's median of \$44,667. The Elkhart County median household income, \$44,478 (2000 U.S. Census) is 7% higher than the State of Indiana's median of \$41,567. The 2000 Census poverty rates for St. Joseph County and the State of Michigan were 11.3% and 10.5%, respectively.

3.6.2 Employment

Manufacturing employs the most people of any job classification with an average employment of 8,470 in 2005; retail trade was second with an average employment of 2,395 (Michigan Economic Development Corporation). Agriculture also employs many individuals within the Study Area communities, employing 1,188 according to the 2002 USDA Census of Agriculture. Sixty four percent of the population is a member of the civilian labor force (any employed person over the age of 16). The American Axle plant in Three Rivers is the largest single facility employer within the Study Area with over 1,150 employees (Three Rivers Area Chamber of Commerce).

Table 3.3 Study Area Income Data

Jurisdictions	Median Household Income	% Difference from 2000 State Median	Per Capita Income	% of Population Below Poverty
State of Indiana	\$41,567	N/A	\$20,397	9.5%
Elkhart County	\$44,478	7.0%	\$20,250	7.8%
York Township	\$49,634	19.4%	\$19,325	6.1%
State of Michigan	\$44,667	N/A	\$22,168	10.5%
St. Joseph County	\$40,355	-9.7%	\$18,247	11.3%
Mottville Township	\$43,421	-2.8%	\$17,917	10.0%
White Pigeon Township	\$44,844	0.4%	\$26,715	10.5%
Village of White Pigeon	\$41,292	-7.5%	\$16,895	13.1%
Constantine Township	\$46,827	4.8%	\$18,316	8.0%
Village of Constantine	\$40,428	-9.5%	\$15,542	15.5%
Fabius Township	\$50,888	13.9%	\$23,474	3.6%
City of Three Rivers	\$32,460	-27.3%	\$16,279	19.3%
Lockport Township	\$43,931	-1.6%	\$21,184	9.9%
Study Area*	--	--	\$19,288*	11.4%*

Source: U.S. Census Bureau, 2000 Census Data
 *Based on the average for the communities located within the Study Area, weighted by population

3.6.3 State Equalized Value (SEV) and Taxes

On average, land and property values are lower in St. Joseph County than elsewhere in Michigan. St. Joseph County had an estimated 2006 per capita State Equalized Value (SEV) of \$34,893 and a per capita taxable value of \$26,020. The respective State of Michigan averages were \$43,121 and \$33,648. The 2006 SEV average for all parcels in the Study Area communities was \$60,572, while the average taxable value was \$46,664 (St. Joseph County Equalization Report).

3.6.4 Business Operators Survey

In September 2001, a business operators' survey was conducted to assess: the economic stability of existing businesses along the US-131 Corridor, the estimated customer base and the perceived importance of US-131 for business operators. A total of 136 surveys were distributed to existing businesses along US-131. Of these, a total of 110 surveys were completed and returned, which represents an 81% return rate. Key findings of the business survey included:

- Greater than 55% of businesses surveyed felt that 10% or less of their business came from unplanned stops, while only 4.5% felt that more than 50% of their customers were drive-by patrons
- 70.9% of the businesses surveyed stated their general outlook for business activity over the next ten years was very good and that they would consider expansion, with 25.5% saying their outlook was fair
- 47.3% of the business owners indicated the ability to cross over US-131 to get to their business was a key problem with the existing US-131 facility

- Traffic congestion was cited by 36.4% of the business operators as a key constraint on their future business activity

3.6.5 Patron Survey

In September 2001, a business patron survey was conducted at businesses located adjacent to US-131. Over 400 patrons were surveyed at over 20 locations to identify the origins and destinations of patrons, the reason they chose to stop, which other businesses they had visited and how much money they had spent at local businesses that day. Key findings of the patron survey included:

- 32.9% of the survey respondents were from the Three Rivers area
- 55.2% of the trips made by the business patrons were entirely within the Study Area communities
- 16.8% of the trips made by business patrons were through trips originating outside of the Study Area and ending outside of the Study Area (i.e., pass-through trips)
- A majority of survey respondents (334) visited a retail and/or restaurant facility within the Study Area on the day that they were surveyed
- 91.1% of the patrons were already aware of the business they were visiting, while 6.4% saw roadside advertising and then decided to stop
- 58% of survey respondents spent \$25 dollars or less at their planned business stop

The full 2001 business operator and patron survey and associated analysis is contained in a separate Technical Memorandum.

3.7 Joint Development Initiatives

There are no current joint development initiatives to enhance non-motorized facilities or transit services or to provide new parkland in the Study Area.

3.8 Non-Motorized Facilities

The only sidewalks located within the US-131 Study Area are located within the Village of Constantine. The current US-131 facility is used minimally by bicyclists and does not feature non-motorized lanes. The relatively large percentage of heavy and wide load (mobile home) trucks on this segment of US-131 limits its attractiveness as a bicycle route. There are no planned developments that would create demand for non-motorized facilities. There are a series of local "Bicycle Tour" routes however that exist on adjacent roads that cross US-131. These routes are unmarked but are published by the St. Joseph County Parks and Recreation Commission and are shown in **Figure 3.4**.

3.9 Air Quality

The Clean Air Act of 1970, as amended in 1990, mandated a reduction in emission of the following six criteria pollutants: nitrogen dioxide (NO₂), sulfur dioxide (SO₂), carbon monoxide (CO), lead (Pb), ozone (O₃) and particulate matter (which includes PM_{2.5}, which is fine particulate matter 2.5 microns or less in size and PM₁₀, inhalable coarse particulate matter 2.5 to 10 microns in size, both as solid or liquid particles suspended in

air). Of these, only ozone is not a direct pollutant, it is formed when nitrogen oxides and reactive organic gases (hydrocarbons) combine in the presence of sunlight.

The United States Environmental Protection Agency (USEPA) is responsible for the National Ambient Air Quality Standards (NAAQS). Under the authority of the Clean Air Act (CAA) as amended in 1990, maximum pollutant concentration limits for attainment of primary and secondary ambient air quality standards were established. The primary standards are levels intended to protect the public health; secondary standards are intended to protect the public welfare and are based on a pollutant's effect on vegetation and other materials. See **Table 3.4** for the National Ambient Air Quality Standards.

The USEPA has designated St. Joseph County to be in attainment for all NAAQS pollutants. This means the county, which includes the Study Area, is below the designated standards and does not have air quality that is a threat to public health.

3.9.1 Microscale Analysis for Carbon Monoxide (CO), PM_{2.5} and PM₁₀

Since carbon monoxide (CO) is a site-specific pollutant and is normally recognized as a precursor to air quality problems, a microscale air quality analysis for CO was conducted to assess the impacts of this improvement project on local CO levels for a maximum level at a "worst case" location for traffic impacts as defined in 40 CFR 93.123(a). The major sources of CO emissions are passenger cars and trucks, with the highest concentrations of CO found immediately adjacent to highways. The "worst case" location is the property with the highest volume of traffic closest to a residential type receptor, where occupants could be expected to remain for eight consecutive hours. The "worst case" location evaluated for this study is a motel in the northeast quadrant of the intersection of US-131 and Broadway Road.

The microscale air quality analysis CO concentrations were determined with USEPA computerized mathematical models (MOBILE5b and CAL3QHC). These models were used to calculate the "worst-case" CO levels for the peak hour time period that corresponds to the averaging periods of the federal and state ambient CO standards. While the model's output was based on a one-hour period, if the model demonstrates that there will be no exceedance of the eight-hour standard, there is no need to separately model for an eight-hour period as the standards for eight-hour CO is lower than for one-hour. The default background CO concentration of 3.0 parts per million (ppm) was used for the analysis. For future year analysis (shown in **Section 4.8, Air Quality Impacts**), no rollback was used to adjust the background concentrations.

The maximum existing 2002 CO concentration (3.6 ppm) was calculated at the right-of-way line in the southeast quadrant of the intersection of US-131 and Broadway Road. For the "worst case" receptor, the value is 3.1 ppm. Neither concentration of CO exceeds the NAAQS eight-hour standard of 9.0 ppm. The complete microscale CO analysis for the existing and future maximum and "worst case" locations and conditions is presented in **Section 4.8, Air Quality Impacts**.

The EPA and the FHWA issued a joint guidance March 29, 2006 on how to perform qualitative hot-spot analyses in PM_{2.5} and PM₁₀ nonattainment and maintenance areas. St. Joseph County, Michigan is in attainment for PM_{2.5} and PM₁₀. In addition, the project is not a "project of air quality concern" under 40 CFR 93.123(b)(1). Therefore, neither a PM_{2.5} nor PM₁₀ hotspot analysis is required to demonstrate transportation conformity.

Table 3.4 National Ambient Air Quality Standards

Pollutant	Primary Standard¹	Averaging Times	Secondary Standard²
Carbon Monoxide (CO)	9 ppm (10 mg/m ³)	8 – Hour ³	None
	35 ppm (40 mg/m ³)	1 – Hour ³	None
Lead (Pb)	1.5 µg/m ³	Quarterly Average	Same as Primary
Nitrogen Dioxide (NO ₂)	0.053 ppm (100 µg/m ³)	Annual (Arithmetic Mean)	Same as Primary
Particulate Matter (PM ₁₀)	Revoked ⁴	Annual ⁴ (Arithmetic Mean)	
	150 µg/m ³	24 – Hour ⁵	
Particulate Matter (PM _{2.5})	15 µg/m ³	Annual ⁶ (Arithmetic Mean)	Same as Primary
	35 µg/m ³	24 – Hour ⁷	
Ozone (O ₃)	0.08 ppm (157 µg/m ³)	8 – Hour ⁸	Same as Primary
Sulfur Dioxides (SO ₂)	0.03 ppm (80 µg/m ³)	Annual (Arithmetic Mean)	
	0.14 ppm (365 µg/m ³)	24 – Hour ³	
		3 – Hour ³	0.5 ppm (1300 µg/m ³)

Note: Footnotes above are in *italics*. Measurements in cubic meters (m³) are not footnotes.

¹*“Primary air standard” means the level of air quality, which provides protection for public health with an adequate margin of safety.*

²*“Secondary air standard” means the level of air quality, which may be necessary to protect welfare from unknown or anticipated adverse effects.*

³*Not to be exceeded more than once per year.*

⁴*Due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution, the EPA revoked the annual PM₁₀ standard in 2006 (effective December 17, 2006).*

⁵*Not to be exceeded more than once per year on average over 3 years.*

⁶*To attain this standard, the 3-year average of the weighted annual mean PM_{2.5} concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m³.*

⁷*To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m³ (effective December 17, 2006).*

⁸*To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.*

Source: <http://www.epa.gov/air/criteria.html>, last updated March 2, 2007

3.10 Noise

Noise is defined as unwanted sound. Sound becomes noise when it interferes with everyday activities such as sleeping, reading and conversation. Sound intensity is

measured in decibels (dB), based on a logarithmic scale. The human ear does not respond identically to sound levels of different frequencies, being more sensitive to middle and high frequencies than low frequencies. When sound is described in terms of the frequencies humans are capable of hearing, the term “dBA” is used. This refers to an “A-weighted” scale, which only considers those frequencies within the human hearing range. Some common sound levels are shown in **Figure 3.7**.

Several rules of thumb about traffic noise:

- Since decibels are measured on a logarithmic scale, traffic noise levels do not follow a linear progression. A doubling of sound energy yields a three dBA increase in sound level, not a doubling of the dBA
- Extensive tests have shown that a three dBA change in noise level is barely perceptible to the average human
- A five dBA change is clearly perceptible, and a ten dBA increase is perceived as twice as loud
- Doubling or halving the distance between a roadway and the listener generally reduces or increases the sound level by three dBA

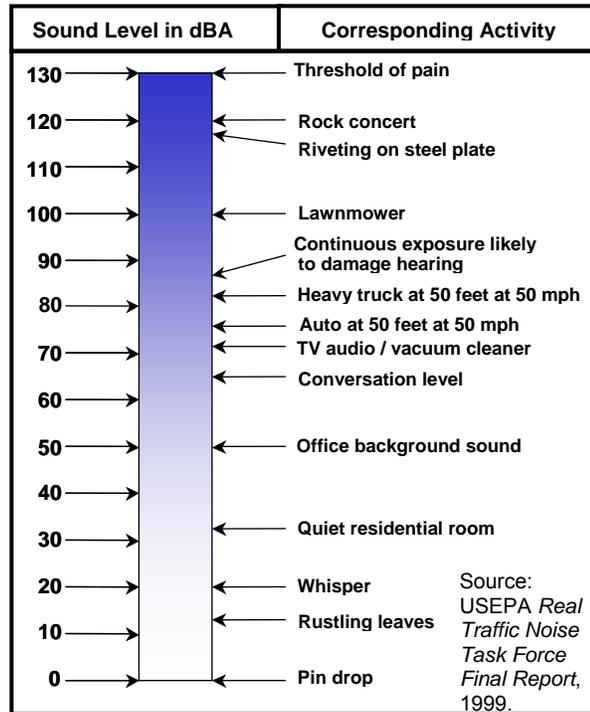


Figure 3.7 Common Sound Levels

The FHWA uses a statistical noise descriptor called the equivalent sound level (L_{eq}) to portray the time-varying character of traffic noise. A one-hour L_{eq} , or $L_{eq}(1h)$ is the measurement used to determine noise impacts; the $L_{eq}(1h)$ has the same cumulative noise energy as the average of the varying noise levels measured continuously over 60 minutes. In essence, the L_{eq} value covers all of the “peaks and valleys” associated with continuously varying noise levels; the result is a single comparable value that can be used to establish noise evaluation criteria. Noise levels are measured and predicted for evaluation purposes at a height of five feet above the ground, or about the same height as a human ear.

Existing condition

The initial step in the noise analysis involves measuring ambient noise levels at various locations throughout the study corridor. Ambient noise comes from natural and mechanical sources and human activity that is present in the study area. The noise levels and sources in the US-131 study area are varied and wide ranging. Above-average volumes of commercial truck traffic in downtown Constantine have resulted in Constantine residents expressing concerns about excessive traffic noise and

vibration. In contrast, the area outside of the downtown is more pastoral and is a mixture of farmland and scattered residences. The FEIS will present the results of transferring much of the traffic from downtown Constantine to the two-lane bypass of the village.

Noise measurements were taken in the vicinity of the project to determine existing background noise levels and to assist in validating the computer noise model. The purpose of the noise level information is to quantify the existing acoustic environment and provide a baseline for assessing the impact of the project future noise levels on noise receptors in the vicinity of the proposed project resulting from increased or decreased traffic in the study area. Noise measurements were taken at 13 locations in the study area and receptors were placed 5 feet above the ground level of the noise source. Test periods were 15 minutes at each location and actual classified vehicle counts were recorded during each test period. Any unusual events affecting the noise level at each location were recorded. The noise levels recorded at the receptor locations range from 46 dBA to 75 dBA.

3.10.1 Noise Regulations

Potential traffic noise impacts for US-131 improvements were evaluated in accordance with FHWA and MDOT traffic noise assessment guidelines, specifically FHWA's Highway Traffic Noise Analysis and Abatement Policy (June 1995) and MDOT's Procedures and Rules for Implementation of State Transportation Commission Policy 10136 – Noise Abatement (MDOT, 2003). The FHWA guidelines established traffic Noise Abatement Criteria (NAC) for different land uses and outdoor activities. The guidelines codify the level at which there is a recognized noise impact. The NAC are provided in **Table 3.5**. MDOT noise abatement guidelines are found in **Appendix A.5 of the DEIS**.

Table 3.5 FHWA Noise Abatement Criteria, Hourly A-Weighted Sound Level - decibels (dBA)

Land Use Category	L_{eq} [hour] (dBA)	Description of Land Use Category
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.
* Use of interior noise levels shall be limited to situations where exterior noise levels are not applicable, i.e., where there are no identified exterior activities to be affected by traffic noise, or where exterior activities are far from or physically shielded from the roadway in a manner that prevents an impact on exterior activities.		

3.10.2 Noise Abatement Impacts

The NAC are noise impact thresholds for considering abatement. Abatement is considered for new roadway construction when predicted traffic noise levels for the design year “approach” (i.e., are within one decibel of) or exceed the noise abatement criteria. Abatement is also considered when the predicted traffic noise levels are “substantially higher” (defined by MDOT as more than ten decibels greater) than the existing noise level. The NAC are not attenuation design criteria or targets. The goal of noise abatement measures is to achieve a substantial reduction in future design year noise levels. The reductions may or may not result in future noise levels at or below the NAC.

See **Section 4.9, Noise Impacts** for a discussion of existing noise levels, as well as noise receptor locations and future noise level forecasts.

3.11 Groundwater and Irrigation

There are no sole source aquifers in the State of Michigan as defined by Section 11424 (e) of the Safe Drinking Water Act. The U.S. Environmental Protection Agency (USEPA), however, has identified a sole source aquifer south of the Indiana Toll Road. The St. Joseph Aquifer is located along the alluvial deposits of the St. Joseph River in Indiana. Wellhead protection programs are required for sole source aquifers to prevent the contamination of drinking water sources.

Groundwater resources within the Study Area are found in coarse to medium glacial till. These materials result in well-drained soils that allow precipitation to percolate to deeper groundwater areas. Depth to groundwater within the glacial till is relatively shallow and varies from 15 to 60 feet. The major aquifers in the Study Area are found in Pennsylvanian-era Saginaw Sandstone, which ranges from 100 to 200 feet thick, and in Mississippian-era Marshall Sandstone, which underlays the Saginaw formation at a greater depth.

Groundwater in the Study Area is potable, although there are pockets that have high levels of nitrates. Within the Study Area, potable water is obtained from private wells, four municipal wells in the Village of Constantine and four municipal wells in the City of Three Rivers drilled to depths of 25 to 100 feet. Information on wells located within the Village of White Pigeon was unavailable.

Irrigation is a common practice in the St. Joseph River basin. In Michigan, 85% of irrigated water is utilized for agriculture. Many of the center-pivot irrigation systems depicted in **Figure 3.5** utilize groundwater wells.

3.12 Wetlands

Development within wetlands in Michigan is regulated by Part 303, Wetlands Protection, of the Natural Resources and Environmental Protection Act of 1994, and by Section 404 of the 1973 *Clean Water Act*, which regulates the discharge of materials into “Waters of the United States”. State and federal laws require MDOT to provide mitigation for unavoidable losses to wetland resources. In addition, under Federal Executive Order 11990 MDOT must comply with the federal “no net-loss” of wetlands.

Five field investigations were initially conducted within the Study Area for the purpose of identifying and delineating wetlands in the fall 2000, spring 2001, fall 2001 and spring 2002. In these earlier phases of the project, the entire study corridor was traversed within both the Indiana and Michigan portions of the Study Area. As the project was scaled back in scope and the area of impact was limited to the bypass of the Village of Constantine along with selected intersection improvements and truck climbing lanes, subsequent field investigations were performed in the fall 2006 and spring 2007. The descriptions of wetlands in **Section 3.12.1, Identification Methodology** are limited to those areas that are affected by the Preferred Alternative; other areas previously studied but are no longer affected have been removed from the discussion.

3.12.1 Identification Methodology

The United States Department of Agriculture (USDA) Soil Survey for St. Joseph County and the USFWS National Wetland Inventory (NWI) maps, were reviewed to identify potential wetlands within the Study Area. Field maps identified approximate sizes and locations of wetland complexes within the Study Area.

Wetland boundaries were identified and flagged in the Study Area in the fall of 2006 following the MDEQ Wetland Identification Manual. The Cowardin Classification System (Cowardin et al., 1979) was used to classify each wetland. In cases where a wetland complex was composed of more than one type of wetland, the dominant wetland type was identified with reference to the presence of additional wetland types.

Two wetland complexes were delineated and surveyed within the Study Area (**Figure 4.5**). Visual signs of wetland hydrology and a predominance of wetland vegetation were the primary wetland indicators used during the delineations. In the absence of visual signs of hydrology, soils were examined to assess whether hydric soils were present or signs of hydrology were present within the soil profile. Areas lacking these wetland criteria were classified as upland.

Wetland Complex 1, part of the larger delineated wetland #16, is located within the vicinity of the proposed southbound truck passing lane and continues beyond the Study Area to the west (**Figure 4.5**). Based on assessment of aerial photographs, the entire wetland complex is approximately four acres in size, with 0.3 acre within the Study Area. Wetland Complex 1 is an emergent wetland complex containing scrub-shrub, forested and emergent wetland plant species. The wetland complex is classified as a Palustrine Emergent Wetland Persistent, with inclusions of Palustrine Scrub-Shrub Wetland around its outer edges. The dominant herbaceous species within the northern and southern sections of this wetland complex included reed canary grass (*Phalaris arundinacea*), arrow leaved tear thumb (*Polygonum sagittatum*) and jewelweed (*Impatiens capensis*). The dominant shrub species included gray dogwood (*Cornus foemina*) and American elm (*Ulmus americana*). The overstory is dominated by box-elder (*Acer negundo*).

Wetland Complex 2, part of the larger delineated wetland #8, is located on the south bank of the St. Joseph River and extends to the east and west of the proposed crossing (**Figures 4.5 and 4.6**). The entire wetland is approximately 15 acres in size based on assessment of aerial photographs and NWI data, 1.2 acres of which lie within the project boundaries. The wetland is bordered by upland forest on the south.

Wetland Complex 2 is a forested wetland with an emergent wetland understory. Less than 5% of the understory consists of scrub-shrub wetland. The wetland complex is mainly comprised of Riverine Emergent Wetland Non-Persistent, Palustrine Forested Wetland and Palustrine Emergent Wetland Persistent. The wetland has a few small areas of Palustrine Scrub-Shrub Wetland. The dominant herbaceous species within this wetland complex include watercress (*Nasturtium officinale*), rice cut-grass (*Leersia oryzoides*) and Virginia wild-rye (*Elymus virginicus*). The dominant tree species are silver maple (*Acer saccharinum*) and green ash (*Fraxinus pennsylvanica*). Silky dogwood (*Cornus amomum*) and green ash (*Fraxinus pennsylvanica*) are the dominant shrub species.

3.12.2 Wetland Functional Methodology

Qualitative assessments (U.S. Army Corps of Engineers) were used to describe functions, values, benefits and uses that each wetland provides to both biotic resources (including threatened and endangered species) and to humans. The qualitative assessments were based on observations, professional judgment and the experience of the reviewing biologists.

Wetland Complex 1: The relatively small size, homogeneous plant community structure and proximity to the existing highway reduce the number of functions/values that this isolated wetland can provide. Groundwater Recharge/Discharge, Sediment/Toxic Retention and Nutrient Removal were determined to be the principal functions/values of this wetland.

The presence of groundwater seeps along the western boundaries of this wetland complex and in the vicinity of the proposed Study Area is evidence of a groundwater function. In addition, this wetland complex is located at a higher elevation than the St. Joseph River and its associated wetlands, indicating that Wetland Complex 1 is a perched wetland system. As such, water would be expected to slowly filter through this wetland as it flows toward the river. This filtering process, along with the proximity of this wetland to the roadway, also allows it to filter sediment, nutrients, oils and other pollutants from the water.

Wetland Complex 2: The principal functions and values identified for this wetland complex are Floodway Alteration, Nutrient Removal, Production Export, Wildlife Habitat and Endangered Species Habitat.

Wetland Complex 2 provides an approximate 300-foot buffer between the river and the upland to the south. The wetland is very low in elevation; it was no more than 12 inches above the water elevation of the river on the date of inspection. In addition to filtering stormwater flowing toward the river from the south, the wetland complex is within both the floodway and floodplain of the river and it serves to attenuate and dissipate erosive flows, capture sediment and uptake nutrients.

Wildlife habitat is present in the form of a diverse plant community and high diversity of habitats, including various wetland types, woody debris, cavities and standing water. While no data was collected regarding wildlife use, this area is likely to provide habitat for small and large mammals, amphibians and reptiles and songbirds, among others. The wetland also has the capacity to harbor threatened and endangered species, as evidenced by the presence of the water-willow.

3.13 Aquatic Resources

The Study Area is wholly located within the 4,685 square-mile St. Joseph River watershed which includes the sub-watersheds of the Rocky River and the White Pigeon River. This watershed has been subdivided into five sections, based on major changes in hydrology, catchment land cover, surficial geology and channel shapes. This project is wholly located within Section Three, the middle section, of the watershed. The Study Area includes the White Pigeon River, St. Joseph River and the Rocky River tributaries. The three rivers were evaluated for surface water quality and the quality of fish, mussel and macroinvertebrate habitat. The information gathered for this evaluation was acquired from the Michigan Department of Natural Resources (MDNR) St. Joseph River Assessment, September 1999, and during a site reconnaissance in April, 2002.

The entire St. Joseph River is designated as a migratory route for trout (*anadromous salmonids*), meaning that permitted discharges into the system must not increase water temperature or decrease dissolved oxygen content to the point that migrations of these fish would be adversely impacted. Information related to fish species within the Study Area was obtained from the MDNR and the Michigan Department of Environmental Quality (MDEQ) Water Bureau.

The St. Joseph River was historically navigable well beyond the Study Area, but currently the U.S. Army Corps of Engineers does not exercise jurisdiction beyond Berrien Springs, far downstream and outside of the Study Area. Dams are located on the St. Joseph River downstream and immediately upstream of US-131. The upstream hydroelectric dam in Constantine was built in 1873 and has fragmented the river system and turned the high gradient habitat into still-water habitat. The dam also traps sediment and woody debris, disrupts seasonal flow variations and dramatically increases daily flow variations based on electricity use.

3.13.1 Surface Water Quality

The following is a discussion of the water quality currently found within the three rivers located within the Study Area. Currently, water quality is being impacted by a variety of sources. Within the project vicinity, water quality is primarily impacted by non-point sources such as stormwater runoff from agricultural land and to a lesser degree, stormwater runoff from roadways. Stormwater runoff from roadways can contribute heavy metal contaminants, oils and deicing chemicals such as chlorides. The MDEQ Water Bureau is responsible for water quality in the state waterways. Regulations dictate the water quality standards and use designation for each water body.

St. Joseph River. Unregulated discharges by industries and municipalities have contributed to the historically “poor” water quality in the St. Joseph River basin. However, water quality in many water bodies has improved and water quality in the basin can now be described as “good”, according to the St. Joseph River Assessment, 1999. However, combined sewer overflows (CSOs), non-point source flows and adjacent sites of contamination are contributing to on-going water quality degradation. Open-ended public health warnings exist in several segments of the St. Joseph River. Animal feed lots, pasture runoff and untreated sewage water deposition into the St.

Joseph River account for the presence of the bacteria *E. coli*. These potential sources of *coliform* bacteria are located upstream and within the Study Area.

White Pigeon River: A 1995 study near the Study Area along the White Pigeon River listed the water quality as “acceptable”. Levels of phosphorus, ammonia, arsenic, selenium, mercury and copper were elevated as compared with the normal ranges in this area.

Rocky River: An undated study reported that alkalinity, hardness, magnesium and pH were all above normal within the Study Area.

3.13.2 Fisheries and Aquatic Habitat

Aquatic habitat includes all of the instream and riparian habitat that influences the structure and function of the aquatic community in a stream. The purpose for evaluating the physical habitat features of the selected stream locations was to ascertain the condition and quality of the instream and riparian habitat. Two EPA evaluation tools, Aquatic Habitat assessment and Benthic Macroinvertebrate Communities assessment, were used to determine potential habitat suitability for threatened and endangered species within the portions of the Study Area that are not covered by other data (e.g., studies by MDNR in the St. Joseph River). The summary of these assessments are provided in the *Threatened and Endangered Species Technical Memorandum*, available through MDOT.

Existing habitat conditions for fish, mussel and macroinvertebrate were assessed at the White Pigeon, St. Joseph and Rocky Rivers. The following is a discussion of gradient, substrate, bank cover, channel morphology and flow at the various crossings of the three rivers. The St. Joseph watershed originally had 97 species of fish and now contains 114 species. Although the diversity remains high, there has been a change in fish community structure. As silt and warm water tolerant fish species have increased, fish species dependent on gravel substrate and aquatic vegetation have declined. Introduction of non-native species has also influenced the community structure due to predation and consumption.

All of the rivers in the Study Area are listed as at least top-quality warm water streams, which is defined as a waterway containing self-sustaining populations of warm water and cold water sport fish.

White Pigeon River: The MDNR has identified fish habitat in the area as “fair” or “good” and improved between 1990 to 1995 due to improvements in bottom substrate, bottom deposition, bank stability, and overall habitat diversity. A 1995 fish sampling location in the White Pigeon River identified 71 individual fish from 14 species, including honeyhead, shiner, bluntnose minnows, suckers, bullhead, pirate perch, sunfish, bass, bluegill and darters. As a part of the same site visit, the macroinvertebrate community on the White Pigeon River at three locations in the Village of White Pigeon upstream and downstream of US-131 was rated “acceptable” or “excellent” by the MDNR, though overall biological quality ranged from “poor” to “acceptable”.

St. Joseph River: The MDNR classifies the substrate of the St. Joseph River in the vicinity of the project as sand and gravel with some silt. Sand and gravel substrates provide better macroinvertebrate and fish spawning habitat than silt substrates. In the

Study Area, the St. Joseph River is characterized as a low-gradient river, with water flows of 0-2.9 cubic-feet per second. Low-gradient rivers consist primarily of run habitat with very little riffle or pool habitat, thereby providing poor diversity of habitat for macroinvertebrates or fish. The MDEQ Water Bureau conducted a biological assessment of the St. Joseph River at Mottville in July 1990. The Mottville sampling location is where US-12 crosses the St. Joseph River and is the closest sampling station to the Study Area. This study determined that elevated levels of turbidity and sedimentation have resulted in minor habitat degradation in the Study Area. Fish species identified included gars, minnows and carp, suckers, catfish, sunfish and perch. A total of 24 taxa were identified, with 17% of taxa noted to be intolerant of pollution and 15% of the taxa tolerant of pollution. Macroinvertebrate sampling indicated that 13 taxa were identified, including mayflies, caddisflies, beetles, flies, limpets, bivalves and mussels. Mayflies and caddisflies made up 64% of the total number of individuals collected, indicating good water quality.

Rocky River: A 1995 MDEQ Staff Report indicated that in the vicinity of the US-131 project, just upstream of the Rocky River's confluence with the St. Joseph and Portage River at Three Rivers, an overall biological quality rating of "excellent" was recorded, with an "excellent" fish community, "good" habitat availability and "high" macroinvertebrate diversity. In the 1995 survey, 149 individual fish from 15 species were collected, including species of lamprey, pike, shiners, minnow, sculpins, suckers, bullhead, bass, perch and darters. The MDNR classifies the substrate of the Rocky River as mostly rock rubble, gravel and sand, with some silt.

3.13.3 Water Bodies

Other than the rivers, the only other water body of consequence in the Study Area is Stag Lake. It is located in the southwest quadrant of the Study Area and contains a bog. More information on the bog is available in **Section 3.12, Wetlands**.

3.14 Hydrological Characteristics

The river systems within the southern portion of the Lower Peninsula of Michigan are slow-moving, low-gradient systems. These types of river systems tend to produce wider, flatter floodplains. The Study Area is located within the St. Joseph River watershed, which includes the Rocky River and White Pigeon River sub watersheds.

"Floodplains" are defined as any area susceptible to being inundated by floodwaters from any source. The 100-year floodplain is the area which has a 1% chance of being flooded in a given year. The Federal Emergency Management Agency (FEMA) maps 100-year floodplains on Flood Insurance Rate Maps (FIRMs). Development in floodplains is discouraged without purchase of flood insurance, a program administered by FEMA's National Flood Insurance Program.

A Hydrological Survey and HEC-RAS analysis was performed in May 2007. See **Section 4.13, Hydrological Impacts** for more information on the survey and on the Federal Energy Regulatory Commission process and permits.

The 100-year floodplains within the Study Area are illustrated in **Figure 4.5 (sheets 1-4)** at the end of **Section 4.0, Environmental Consequences**.

3.14.1 Floodplains

Flooding is common within the St. Joseph River basin, with large floods periodically occurring. In 1950, flooding impacted urban areas in the City of Three Rivers and Village of Constantine. The City of Three Rivers is situated at the confluence of the Rocky, Portage and St. Joseph Rivers and seasonal flooding occurs regularly, but is generally confined to the 100-year floodplain.

3.14.2 Stream Crossings

Bridges currently cross the White Pigeon, St. Joseph and Rocky Rivers on existing US-131. Except for Kerr Creek, a tributary of the Rocky River, there are no stream tributaries of the three rivers within the Study Area.

3.15 Wild and Scenic Rivers

There are no Federal Wild or Scenic River systems within the Study Area. The Study Area does contain the section of the St. Joseph River from Berrien Springs to Jonesville that has been designated as a component of the Nationwide Rivers Inventory (NRI). The NRI is the register of rivers that may be eligible for inclusion in the National Wild and Scenic River System. To be nominated to the NRI, a river must have an outstanding remarkable value (ORV). This stretch of the St. Joseph River was nominated based on its recreation value. There are no state-designated Natural Rivers, as defined in the Natural Rivers Act (Act 231 of 1970), within the Study Area.

3.16 Coastal Barriers/Critical Dunes

The Study Area contains no federally-designated coastal barriers or critical dunes, as defined in the Coastal Barriers Act of 1982 (P.L. 97-348).

3.17 Coastal Zones

The Study Area is not located within a federal coastal zone management boundary, as defined by the Coastal Zone Management Act of 1972.

3.18 Geological Resources

St. Joseph County lies within the Kalamazoo glacial moraine, a large deposit of unstratified glacial till over bedrock. Bedrock consists of limestones, sandstones and shales covered by unconsolidated tills, gravels, sands, silts and clays. The Soil Survey of St. Joseph County Michigan identifies six different soil associations located within the Study Area. They are: Adrian-Granby, Oshtemo-Spinks, Elston, Sebewa-Cohoctah, Kalamazoo-Oshtemo and Hillsdale-Riddles associations. There are no Karst formations and no earthquake hazard zones within the Study Area.

The topography of the Study Area varies. Rolling terrain is present in Fabius Township south of M-60. In the remainder of the Study Area, the prevailing landform is nearly level to undulating outwash plains.

3.19 Wildlife and Vegetation

Major biotic communities observed within the US-131 Study Area include wet floodplain, upland hardwood forests, marshes and bogs; although the predominant land cover is agricultural cropland.

3.19.1 Vegetation

According to the U.S. Geologic Survey, the Study Area is located within the Battle Creek Outwash Plain ecosystem. This ecosystem is made up of broad, flat outwash plains with small lakes, wetlands and small ridges of ground moraines scattered throughout. Presettlement vegetation consisted primarily of tall grass prairie or oak savannas (*Regional Landscape Ecosystems of Michigan, Minnesota, and Wisconsin: A Working Map and Classification*; Dennis A. Albert, 1995). The more poorly drained outwash areas adjacent to rivers and streams contained extensive swamp forests dominated by black ash or wet meadows. Oak-hickory forest dominated on steep or irregular topography in the Study Area.

Within the Study Area, tall grass prairie, wet prairie, oak savanna and prairie fen are now all rare. Most of the upland areas have been converted to agriculture. Many of the wetlands have been drained for agricultural purposes, and those still existing are often used for pasture. Where natural areas still exist, forests are dominated by oak-hickory communities. These communities are found within drier areas and contain red, black, white and bur oaks, as well as shagbark and pignut hickories, black cherry, black walnut and sugar maple. In more mesic areas, the forests are dominated by beech-maple communities. These communities contain American beech, sugar maple, black cherry, red oak and white oak. Wetlands found within the floodplain forests are dominated by American elm, green ash, black ash, red maple and sugar maple. Wetlands found outside of the floodplain often contain ash, red maple, pin oak and swamp white oak.

Bank cover of the St. Joseph River consists of floodplain forest on the south side of the river. This forested area consists of high quality forest with a diverse understory. Minor disruptions occur due to scattered residences. On the east north side of the river, the banks have undergone residential development and the bank cover is disturbed. Vegetation on the north banks consists primarily of mowed lawn with scattered trees. On the west side of the Study Area, the bank cover on the north bank of the St. Joseph River consists of high quality floodplain forest. A floristic quality assessment of the entire St. Joseph River floodplain area indicated a high quality vegetative community. Best professional judgment was used to identify the area located on the west side of the Study Area as a very high quality forest because of its diverse understory and the backwaters previously described. Bank cover on the south banks of the St. Joseph River in this location consists of a steep slope which is forested. No floodplain exists on the southern bank, but bank cover does exist in the form of trees.

3.19.2 Natural Areas

The one-mile wide Study Area is adjacent to the Fabius State Game Area. The Fabius State Game Area is located 60 feet from the existing US 131 alignment. Two other state game areas are located within St. Joseph County. These are the 2,100-acre Three Rivers State Game Area and the 80-acre Spring Creek State Game Area, located three

miles west and two miles east of the Study Area respectively. No state parks, privately owned nature preserves or federally owned forests are located within the vicinity of the study corridor. Information related to natural areas within the Study Area was obtained from telephone conversations with the MDNR.

3.19.3 Vertebrates

Thirty-two species of amphibians and reptiles are known to occur within the Study Area, primarily associated with the rivers and wetlands. Very little published information is available regarding distribution or abundance of amphibians and reptiles elsewhere within the St. Joseph River watershed.

The St. Joseph River watershed is within the Mississippi Flyway, a major migratory pathway. Due to its riparian nature in an otherwise predominantly agricultural area it is an important resource for migrating waterfowl. The area is home, for at least part of the year, to many birds including songbirds, ducks, geese, hawks, owls and herons. There is a heron rookery located west and outside of the Study Area on the White Pigeon River. Hardwood stands in river lowland areas are crucial to many songbirds such as the state-threatened species yellow-throated warblers.

The Study Area contains numerous mammals, most of which occur adjacent to rivers and streams within the St. Joseph River basin.

3.20 Threatened and Endangered Species

The Endangered Species Act of 1973, as amended, protects endangered and threatened species. The State of Michigan, the State of Indiana and the U.S. Fish and Wildlife Service (USFWS) all maintain lists of state and federal threatened and endangered species for both plants and animals. "Endangered" Species are defined by USFWS as an animal or plant in danger of extinction within the foreseeable future throughout all or a significant portion of its range. "Threatened" is defined as an animal or plant likely to become endangered within the foreseeable future throughout all or a significant portion of its range. These terms also apply at the state level.

States often list additional species as "special concern", meaning that while they are not officially designated as endangered or threatened, these species should be monitored because of relative rarity or lack of information to ensure that they do not eventually become threatened or endangered. The "special concern" designation does not have any formal regulatory protection.

In earlier phases of the project, the entire study corridor was traversed within both the Indiana and Michigan portions of the Study Area. As the project was scaled back in scope and the area of impact was limited to the bypass of the Village of Constantine along with selected intersection improvements and truck climbing lanes, subsequent field investigations were performed fall 2006 and spring 2007.

Threatened, endangered, special concern and candidate species identified by the United States Fish and Wildlife Service, Michigan Natural Features Inventory, Michigan Department of Transportation and the Michigan Department of Natural Resources as potentially occurring with the Study Area are shown in **Table 3.6**.

A literature review was performed for each species of interest, and where appropriate, field inventories were performed. Since spring and summer inventories were not conducted, the fall 2006 floristic assessments were extensive. Only one of the MDNR state-listed Threatened and Endangered species was identified, the purple wartyback mussel (*Cyclonaias tuberculata*). However, the study team did identify two additional species that were not listed by the MDNR or USFWS. As discussed above in **Section 3.12.1, Identification Methodology**, several state-threatened water willow (*Justicia americana*) were identified along the edge of the St. Joseph River at the southwestern corner of the proposed crossing. In addition, an approximately two-inch diameter red mulberry (*Morus rubra*), a state-listed threatened species, was identified within the northern limits of the northbound truck passing lane.

The discussions that follow focus on the literature review and field assessment performed for the species inventoried in this project.

Table 3.6 Threatened, Endangered, or Special Concern Plant and Animal Species Potentially Occurring in Study Area

Species	Federal Status	Michigan Status
Plant Species		
Wild Rice (<i>Zizania aquatica</i> var. <i>aquatica</i>)	-	ST
Prairie Birdfoot Violet (<i>Viola pedatifida</i>)	-	ST
Hairy Ruellia (<i>Ruellia humilis</i>)	-	ST
Prairie Coreopsis (<i>Coreopsis palmata</i>)	-	ST
Leadplant (<i>Amorpha canescens</i>)	-	SSC
White or Prairie False Indigo (<i>Baptisia lactea</i>)	-	SSC
False Boneset (<i>Kuhnia eupatoriodes</i>)	-	SSC
Water Willow (<i>Justicia americana</i>)*	-	ST
Red mulberry (<i>Morus rubra</i>)*	-	ST
Animal Species		
Indiana Bat (<i>Myotis sodalis</i>)	FE	SE
Copperbelly Water Snake (<i>Nerodia erythrogaster neglecta</i>)	FT	SE
Eastern Massasauga Rattlesnake (<i>Sistrurus catenatus catenatus</i>)	FC	SSC
River Redhorse (<i>Moxostoma carinatum</i>)	-	ST
Spotted Gar (<i>Lepisosteus oculatus</i>)	-	SE
Prothonotary Warbler (<i>Protonotaria citrea</i>)	-	SSC
Yellow-Throated Warbler (<i>Dendroica dominica</i>)	-	ST
Purple Wartyback Mussel (<i>Cyclonaias tuberculata</i>)	-	SSC
Snuffbox Mussel (<i>Epioblasma triquetra</i>)	-	SE
Key:		
ST - State Threatened		
SE - State Endangered		
SSC - State Special Concern		
FT - Federal Threatened		
FE - Federal Endangered		
FC - Federal Candidate		
*Species not targeted but found during field visits as discussed in text below		

3.20.1 Copperbelly and Eastern Massasauga Snakes

The historic range for the copperbelly water snake (copperbelly) was throughout much of Michigan, Indiana, Illinois, Ohio and Kentucky. However, copperbelly populations have diminished over time due to the loss of preferred habitats. Suitable habitat for the species was observed in several southern Michigan counties in 2002; however, no copperbellies were observed (MNFI, 2002). In 2004, MNFI and MDNR found copperbellies in several southern Michigan counties, including St. Joseph and Branch Counties (MDNR, 2005). Copperbelly habitats in Michigan can change with the season. Springtime habitat is wetter, and can include shrub swamps, ponds, lakes, oxbow sloughs, fens and slow-moving streams, and is usually associated with either mature or second-growth woodlands, but is sometimes in more open situations. In the summer, copperbellies have been observed both along permanent waters (lakes, streams, rivers) and in dry upland areas. In the winter, this species usually occupies burrows or lies beneath debris piles higher than nearby wetlands.

Historical MNFI records show that the closest sighting for the copperbelly in relation to the project site is approximately three miles to the northwest in Section 19 of Constantine Township (St. Joseph County) back in May, 1997. Thus, it has been ten years since a copperbelly sighting was documented in the vicinity of the project site.

For these two species, an initial assessment was performed to identify potential habitat for the copperbelly water snake and Eastern massasauga rattlesnake, followed by a comprehensive assessment to target the areas with general habitat attributes required by either species. The assessment determined that the majority of the project site is upland, far removed from wetlands, including open farm fields, roads, roadsides and scattered buildings. Two wetland complexes were identified as discussed in detail in **Section 3.12.1**; Wetland Complex 1 is located within the area of the proposed southbound passing lane and Wetland Complex 2 is south of the St. Joseph River.

Based on the literature and field review, the study team concluded that the upland and wetland communities identified within the Study Area do not contain sufficient acreage or the specific attributes necessary to support either the copperbelly or massasauga.

3.20.2 Indiana Bat

The Indiana bat can be found from the Ozark region in Oklahoma, north to southern Wisconsin, northeast to Vermont and south to northern Florida. However, the range shifts seasonally; in summer, the Indiana bat is absent south of Tennessee (USFWS, 1991) and ranges into the southern half of Michigan, including most of the western coastal counties of the Lower Peninsula of Michigan (Czarnecki, 2006). Indiana bats have been reported from several counties in southern Michigan, including St. Joseph and Branch (MNFI, 2001). In Michigan, Indiana bats are often found in palustrine forested wetlands with an open understory.

An initial assessment determined that most of the Study Area has been denuded of significant tree growth; it consists of open farm fields, roads and scattered buildings. These areas lack suitable roosting or foraging habitat and, therefore, were not included in a comprehensive level assessment. A portion of the Study Area from the St. Joseph River to just south of Riverside Drive was found to have enough trees and natural cover

to be considered potential roosting and forage habitat. This area was included in the comprehensive level assessment.

The comprehensive level assessment focused on upland woodlands, woodland adjacent to the river and trees that had exfoliating bark or other features suitable for use as roosting or foraging habitat. The comprehensive level assessment area contains approximately 8.3 acres total and extends from the St. Joseph River to the southern margin of the woodlot on the south side of Riverside Drive. It includes four areas: a riverine forested wetland overstory with an emergent wetland understory, a young upland forest, residential property with scattered large trees and a mature hardwood forest.

In response to the habitat suitability assessment and requirement by the USFWS, a mist netting survey was performed on the evenings of May 18 and 19, 2007. (See *A Netting Survey for Bats at the Proposed US-131 Bypass of the Village of Constantine, St. Joseph County, Michigan*). No Indiana bats were captured with mist nets or recorded during acoustical surveys.

3.20.3 River Redhorse

Only twelve specimens of river redhorse, from five river basins, have been documented in Michigan (Stagliano, 2001). The fish was once considered to be extirpated, but with recent observations the species status has changed to state threatened (Becker 1983). It is believed that the species may have historically been more populous in its southern Michigan range, human disturbance from siltation, channelizing and impounding rivers may have caused its disappearance before full documentation was achieved.

Fish distribution maps in Wesley and Duffy (1999) indicate that the river redhorse could occur in the St. Joseph River near the Study Area; however, Stagliano (2001) indicates that the species has only been documented in the Berrien County waters of the St. Joseph. Sampling large river habitats for river redhorse has proven difficult and may contribute to the relatively few numbers of the species having been documented.

Based on results of the literature review, it is doubtful that the river redhorse currently inhabits the Study Area, although suitable habitat is present.

3.20.4 Spotted Gar

The spotted gar is considered to be secure through most of its range, although it is listed as a species of special concern in Michigan. Michigan is considered to be on the margin of its range and the fish has only been documented in the southwest part of the state, from the southern border north to Muskegon County. Wesley and Duffy (1999) indicate that the spotted gar could occur near the Study Area; however, Carman (2002) reports that the spotted gar has not been documented in St. Joseph County. The spotted gar was just recently found in the St. Joseph River in Berrien County (Carman, 2002).

Suitable habitat was found in the Study Area for the spotted gar. The south side of the St. Joseph River, which appears to be most appropriate for the spotted gar, contains calm, clear water with submerged and emergent vegetation. The north side of the river has moderate current over a dominantly coarse bottom.

3.20.5 Purple Wartyback Mussel

In Michigan, the historic range of the purple wartyback includes the St. Joseph, Kalamazoo, Grand, Huron, Raisin and Detroit River drainages, as well as Lake St. Clair. Live individuals have recently been documented in both the St. Joseph and Grand Rivers (Badra, 2004). The purple wartyback neared extirpation from the Huron River in 1975, when it was listed as a species of special concern in Michigan.

The north side of the St. Joseph River contains a mix of sand, gravel and cobble that appears to be suitable for the purple wartyback; two dead specimens were collected. The specimens consisted of well-worn shells, which indicate that the organism has been dead for a relatively long period of time and the shells had been exposed to the environmental conditions of the river. An intensive search for live mussels was unsuccessful. While it is probable that these mussel shells originated upstream of the Study Area, the river is free-flowing for only approximately one mile between the Study Area and the dam in Constantine. Thus, the mussels either originated from this reach of river, or were washed over the dam.

3.20.6 Snuffbox Mussel

The snuffbox mussel ranges from western New York and southern Ontario west to eastern Nebraska and south to Oklahoma and northern Alabama. In Michigan, the snuffbox has been found throughout the southern Lower Peninsula. They have been found in the St. Joseph River in both St. Joseph and Berrien Counties. The snuffbox prefers small to medium-sized rivers, though specimens have been taken from larger rivers (Carman and Goforth, 2000).

No snuffbox were observed or collected, and while the north side of the Saint Joseph River contains a mix of sand, gravel and cobble, no swift current was observed within the Study Area.

3.20.7 Prothonotary Warbler

Breeding populations have been documented in Michigan, with most of the sightings in southwest Michigan, including St. Joseph County. The birds are present from approximately the first week of May through the end of July. Prothonotary warblers are considered to be fairly common in St. Joseph County (Brewer et al., 1991). The bird is found in wooded bottomlands, most often along the banks of rivers. Preferred breeding areas are along streams 70-130 feet wide bordered by red maple. The species nests in cavities and holes of trees, and is also known to utilize bird houses placed in suitable breeding habitat (Brewer et al., 1991).

Observation of this bird was not possible due to seasonal timing; however, the habitat requirements were reviewed in detail prior to site assessment and compared to existing conditions in the Study Area. Suitable habitat was found to exist on the south shore of the St. Joseph River. This wooded floodplain and adjacent upland woods contains silver maple and associated trees. Cavities are present within this area.

3.20.8 Yellow-Throated Warbler

This species is primarily considered a breeding species of the southeastern United States, but its range does expand to the southern Great Lakes. A small, disjunct breeding population occurs in extreme southern Michigan. Considered to be extirpated from Michigan for over 60 years, a self-sustaining breeding population has been found in the Galien River Valley of Berrien County (Brewer et al., 1991). This is the only known population in Michigan. Recent census of the bird resulted in an estimated population of 14 to 21 territorial pairs. The only observation in St. Joseph County was likely a solitary singing male or a single pair (Brewer et al., 1991).

Observation of this bird was not possible due to seasonal timing; however, the habitat requirements were reviewed in detail prior to site assessment and compared to existing conditions in the Study Area. No suitable habitat was observed for this species. No sycamore trees were identified in the floodplain of the St. Joseph River or in the immediate area.

3.20.9 Wild Rice

Wild rice is known to occur in rivers, streams, lakes and ponds, usually in water less than two-feet deep in larger water bodies. It is most commonly found in areas of slow current over mucky or silty bottom in areas with little competition from other plant species. Wild rice is somewhat widespread, occurring on the Atlantic Coast from southern Quebec to Florida, and ranging inland as far as Wisconsin and southern Illinois. In Michigan, Manistee and Iosco Counties are the confirmed northern limits of the species. Approximately ten populations have been discovered or confirmed since 1960 (Penskar et al., 2000).

The species does occur in St. Joseph County and was documented in the Study Area in 2002 field surveys for this project within the wetlands of the St. Joseph River floodplain. At that time, it was found to be growing in a small stream with a narrow sedge border, backed by a zone of poison sumac (*Toxicodendron vernix*), tamarack (*Larix laricina*) and willow (*Salix sp.*) (V3 2002).

In the 2006 surveys, the entire near shore area of the Study Area, on both the north and south banks of the St. Joseph River, was inspected for wild rice, with specific attention given to areas in which the species had previously been reported. In addition, habitat requirements for wild rice were compared to physical and hydrological characteristics presently occurring within the Study Area. Wild rice was not observed within the proposed right-of-way crossing along the St. Joseph River while surveying during the optimal time period. This area did not appear suitable for this species during the current assessment due to dense ground vegetation and shading of over 60% of the ground cover. In addition, species typically associated with this species were not observed.

3.20.10 Additional Plants

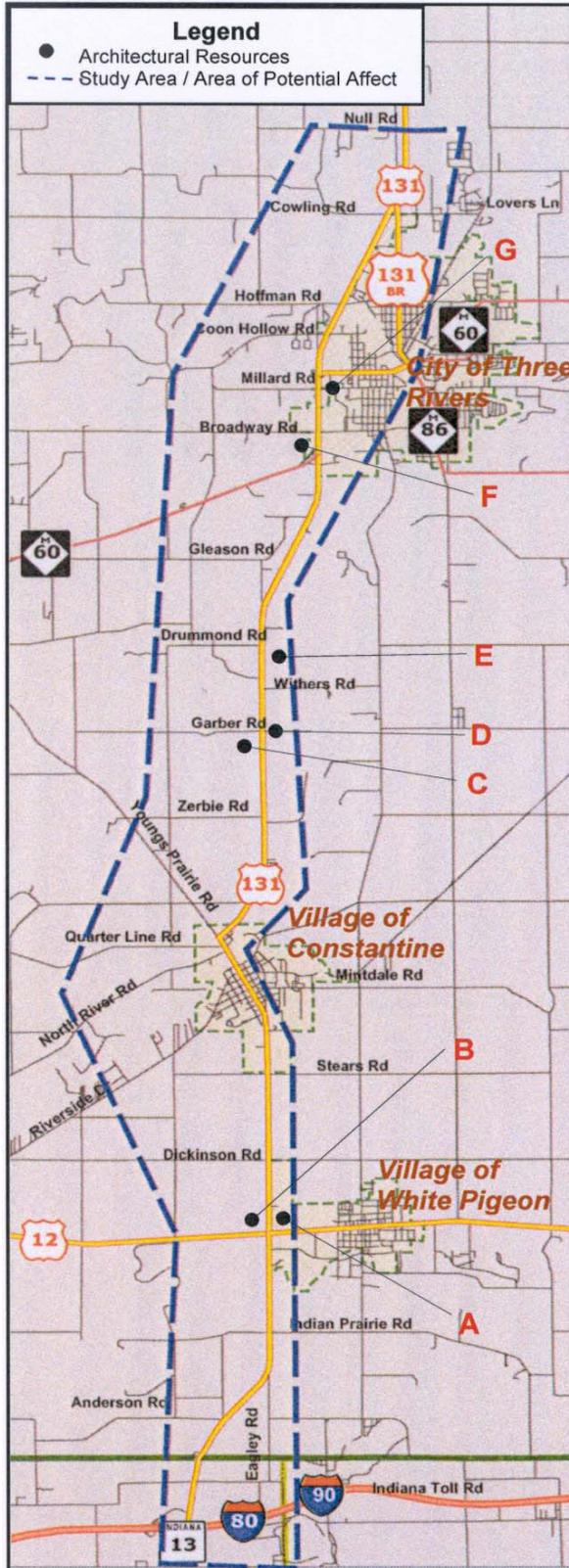


Figure 3.8 Cultural Resource Locations

The MDNR identifies prairie birdfoot violet (*Viola pedatifida*), hairy ruellia (*Ruellia humilis*), prairie coreopsis (*Coreopsis palmata*), leadplant (*Amorpha canescens*), white or prairie fringed indigo (*Baptisia lactea*) and false boneset (*Kuhnia eupatoriodes*) as having occurred in or near the Study Area. To determine the presence of these species, a complete inventory of vegetation present and identifiable within all habitat types of the Study Area, with the exception of active agricultural fields and maintained residential properties, was compiled. The key habitat areas for these species, all or in part, include mesic prairies, dry sand prairies, oak openings, oak barrens and hillside prairies. None of these species or their preferred habitats were identified within the Study Area. In addition, few of the plant species typically associated with the threatened and endangered species were observed.

3.21 Cultural Resources

To satisfy Section 106 of the National Historic Preservation Act and Section 4(f) of the Department of Transportation Act, the Michigan Department of Transportation (MDOT) coordinated with the Michigan State Historic Preservation Office (SHPO) to identify an Area of Potential Effects (APE) for the project. The SHPO recommended that MDOT conduct historic above-ground and archaeological surveys to locate sites eligible for listing on the National Register of Historic Places (NRHP). Information was also sent to local preservation groups and Native American tribes to assist in identifying historic resources.

3.21.1 Above-Ground Resources

A Phase I Reconnaissance Survey of above-ground resources was conducted to identify properties within the Study Area that potentially meet the minimum criteria of eligibility for listing on the NRHP. Above-ground resources may include buildings, structures and a district within a community or a site within the Study Area.

The area examined in the Reconnaissance Survey corresponds to the area within which Practical Alternatives for the proposed project have been developed. The study areas, shown in **Figure 3.8**, have generally been determined as the limits of the APE. In rural areas, the APE includes those properties within one-quarter mile of the Illustrative Alternatives, but does not extend east of existing US-131. Properties falling within the APE and adjoining existing US-131 were considered as a part of this analysis. North of M-60, the APE includes areas east of existing US-131, but west of the Penn Central railroad tracks. Within Constantine and Three Rivers, the APE is limited to properties adjoining existing US-131. This APE is reasonable because the Study Area encompasses all of the Practical Alternatives considered for the US-131 Improvement Study, and no impacts associated with constructing any of the alternatives would extend beyond the limits of the Study Area.

The Reconnaissance Survey listed 15 potentially historic properties, one monument listed on the NRHP and one historic district on the NRHP that could be affected by the proposed project.

The project team and the SHPO visited these sites August 22, 2002. Of the 17 potential sites, the field visit determined that six of the properties are not eligible for the NRHP. Four have a “no effect” determination as a result of the field visit. The results of the field visit are shown below in **Table 3.7**.

Table 3.7 August 22, 2002 SHPO Site Tour Results

Properties Not Eligible for the NRHP	Properties NRHP Eligible, No Effect
14558 Indian Prairie Road	Constantine Downtown Historic District
14870 Indian Prairie Road	200 Locust Road
13577 Quarterline Road	14760 Millers Mill Road
484 N. Washington	63941 US-131
62501 US-131	
15352 Gleason	

Of the seven sites that were determined to be potentially affected by the proposed project, six have been determined to be eligible for listing on the NHRP while one site is already listed on the NRHP. The seven sites are listed in **Table 3.7** and their locations are depicted on **Figure 3.7**.

Table 3.8 Historic or Potentially Historic Properties that could be Affected by the Proposed Project

Site	Property Location	Township/ Village	Property Type	Possible Eligibility Criteria
A	101 N. US-131	White Pigeon	Michigan State Police Post	A, C
B	Wahbememe Memorial Park (NW quadrant US-12 and US-131)	White Pigeon	Monument and Park	Placed on NRHP in 1995
C	63280 US-131	Constantine	Farmhouse not including outbuildings	A, B, C
D	63000 US-131	Constantine	Entire property	A, C
E	62249 US-131	Constantine	Farm including outbuildings	A, C
F	15303 W. Broadway	Three Rivers	Entire property	A, C
G	59019 US-131	Three Rivers	Factory building	A, C

3.21.2 Archaeological Resources

A total of 211 archaeological sites are listed within St. Joseph County, according to the archaeological site files housed at the Office of the State Archaeologist (OSA) in Lansing, Michigan. A file search conducted at the OSA determined that no known archaeological sites are listed within the Study Area.

Given the elevated potential of the area to preserve intact archaeological sites and that their had not been any previous archaeological surveys of the area, the State Historic Preservation Office required an archaeological survey be performed, including deep testing at the location proposed for the new crossing of the St. Joseph River.

Phase I and phase II archaeological reconnaissance surveys were conducted for the Preferred Alternative. The surveys of the PA-5 (Preferred Alternative) Archaeological APE resulted in the discovery of 13 previously undocumented archaeological sites. None of the 13 identified sites were recommended for listing on the National Register. The SHPO and OSA have concurred with this determination. A SHPO letter providing confirmation of these findings will be added to Appendix A when it is received.

Deep testing in the vicinity of the St. Joseph River on the north bank revealed deeply buried soil horizons. However, no artifacts or cultural material was discovered in this horizon. The geomorphic potential for finding intact deeply buried horizons is relatively low across the remainder of the examined area.

3.21.3 Traditional Cultural and Religious Properties

The Study Team received coordination letters from Citizen Potawatomi Nation, Little Traverse Bay Bands of Odawa Indians and Wyandotte Nation. There are no known traditional cultural and/or religious properties claimed or reported by any other cultural group within the area of potential effect. Subsequent to tribal notifications, no requests for consultation or identification of any traditional cultural and/or religious properties were received from any of the twelve federally recognized Tribes. Therefore, since there are no reported impacts to traditional cultural and/or religious properties and no requests for consultation caused by this undertaking regarding any such properties, *no historic properties are affected* and the Section 106 process pertaining to traditional cultural and/or religious properties has been completed.

3.22 Parks and Recreation

Existing recreational land uses within the Study Area are illustrated on **Figure 3.4 (page 3-8)** and an overview of these facilities follows.

Wahbememe Memorial Park: Situated on one acre in the northwest quadrant of the US-131 and US-12 intersection, this park is owned and operated by the St. Joseph County Parks Commission. This park is listed on the National Register of Historic Places and is a monument to Chief White Pigeon, who is buried at the site. A monument provided by the Alba Columbia Club in 1909 is located on the site. The park is maintained by the neighboring Welders Supplies and Gas Inc., under a 1986 agreement with the St. Joseph County Parks Commission (St. Joseph County Park & Recreation Master Plan, 2000).

St. Joseph County Parks: The St. Joseph County Parks Commission maintains 14 parks within the County, one of which is located within the Study Area. This park, which contains the Wahbememe Historical Monument, is described above. Adjacent to the Study Area is the Constantine Portage Park. It is located within the St. Joseph River in Constantine, east of US-131, and is accessible only by boat. It is used as a location for canoeists to rest (St. Joseph County Park & Recreation Master Plan, 2000).

Fabius State Game Area: Located on the east side of US-131 approximately one-quarter mile north of Drummond Road, the Fabius State Game Area is managed by the Michigan Department of Natural Resources (MDNR). This facility is used primarily for hunting as full access to the property and the St. Joseph River is limited due to terrain and foliage impediments. There are no other state parks or recreation areas within the Study Area.

Village of Constantine Parks: Several community parks are located adjacent to existing US-131, including Tailwater Park, Shelby Park, and Rotary Park. Tailwater Park and Shelby Park are located east of US-131 and on the north side of the St. Joseph River. Tailwater Park is a 0.2-acre park, with limited recreation facilities, and Shelby Park (one acre) consists of an open space with benches and picnic tables. Rotary Park is located immediately east of US-131, and provides two acres of recreational land within the Village of Constantine. Facilities at Rotary Park include a playground and benches.

Other Community Parks: The townships located within the Study Area do not offer any parks and recreation programs, with the exception of White Pigeon Township, which partners with the Village of White Pigeon to offer programs and facilities. No parks within the Three Rivers or White Pigeon parks systems are located within the Study Area.

Waterways: US-131 crosses the White Pigeon, St. Joseph, and Rocky Rivers within the Study Area. These rivers provide quality recreational fishing opportunities. In addition to acting as a major fishery resource, the St. Joseph River is becoming an established canoeing/boating route. Riverview Park (four acres in Constantine) and a boat launch above the Constantine reservoir dam offer canoe/boat launch facilities on the St. Joseph River. This segment of the St. Joseph River is not classified as a navigable waterway by the U.S. Army Corps of Engineers, and larger recreational boats, like pontoon boats, are not able to pass beneath the existing US-131 Bridge. There is also a hydroelectric dam immediately east of US-131 on the St. Joseph River that limits navigation.

St. Joseph County "Bicycle Tour Routes": Within the Study Area, US-131 crosses four locally suggested "Bicycle Tour Routes" that utilize existing local roads. These routes are not designated as bicycle routes. None of these routes are marked with signs and public knowledge of these routes is limited (St. Joseph County Park & Recreation Master Plan, 2000).

School Facilities: The Constantine High School and Middle School facilities on West Sixth Street in Constantine provide playing fields, outdoor basketball courts, and a track accessible to the public. Members of the general public utilize the track on a regular basis and both formal and informal groups use the playing fields. Rental fees are not charged. Other school districts do not have recreational facilities within the Study Area.

3.23 Potential Contaminated Sites

A search for potential contaminated sites within the Study Area was conducted by reviewing the databases of regulatory agencies such as MDEQ and EPA that monitor hazardous materials and by performing on-site inspections. The database review and the on-site investigations were conducted for the geographical areas suggested by the American Society for Testing and Materials (ASTM) Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (Standard E1527-00). Site reconnaissances were conducted April 2, 2000, May 4, 2000, June 17 - 19, 2000 and May 16, 2001. The site reconnaissances were conducted in order to locate the sites identified from the database review and to locate any sites not identified through the database review.

Based upon site and database review, 143 potential contaminated sites within recommended ASTM distances were identified within the Indiana and Michigan portions of the Study Area. Each of these sites may be impacted by one or more sources of potential contamination or hazardous materials.

3.24 Aesthetics and Visual Character

FHWA Technical Advisory T6640.8A (October, 1987) was reviewed. Much of the Study Area, especially south of M-60, has a distinct rural character. The combination of

farmland and rolling hills provides a countryside view for many of the residents in the Study Area. Wooded areas east of Stag Lake provide a contrast for residents living on primarily agricultural and open land south of US-12. Although farmland dominates much of the southern part of the Study Area, a number of points of high elevation provide contrast to the landscape. West of US-131, Garber Road rises substantially, providing a distant vista overlooking the fields to the southeast. Steep, forested hills run along both sides of US-12 near King Road, providing the local residents with some seclusion.

The Village of Constantine has an established downtown, which includes a historic commercial district. Downtown Constantine features several small stores and two service stations. US-131 is routinely utilized by commercial truck vehicles which cause heavy commercial traffic through downtown Constantine. The truck traffic results in increased noise and vibration in the downtown and obstructs the view of the area.

The area north of M-60 is a mixture of small town, suburban and rural visual characteristics. Although the streetscape along US-131 through the City of Three Rivers is busy, properties located a few blocks to the west feature a calmer, more serene countryside view. A restaurant near the intersection of Hoffman Road and US-131 has a view of the Rocky River, although it is somewhat obstructed by vegetation.

The Study Area provides both residents and travelers with a contrast between the busy nature of the developed areas along US-131 and the more rural character of the neighboring landscape with scattered farmsteads, drains, hills and wooded areas found among the farm fields.