3.16 Indirect Impacts and Cumulative Impacts

A comprehensive evaluation of the full range of impacts upon the resources within the project study area is required before state highway agencies, Federal Highway Administration (FHWA), and state and federal permitting agencies can make project decisions. Previous sections discussed the direct impacts upon the resources from the US 51 improvement. This section evaluates indirect and cumulative future effects upon the environment, not just the effects of building the project.

What are indirect and cumulative impacts?

Indirect impacts are impacts that occur because the project is built. An indirect impact of the US 51 project would be nearby land development resulting from improved accessibility and mobility provided by the project. An example of an indirect impact in the study area is commercial land development, like a gas station locating next to a new interchange, stimulated by the presence of a new roadway that otherwise would have remained in farmland (the predominant land use in the study area) or as a natural landscape.

Cumulative impacts encompass direct and indirect impacts and impacts from other projects of the past, present, and reasonably foreseeable future that are not related to US 51.

Cumulative impacts include the following:

1. **direct** impacts from the US 51 project (the land needed for the right of way (ROW)),
2. **indirect** impacts from future development due to the proposed US 51 project (some examples would be a gas station locating next to a new interchange or a new housing development being built near a new road where access was created), and
3. **other** impacts from past, present, and reasonably foreseeable development that would occur anyway with or without the project (some examples include lakes, stripe mines, industrial parks that would be built even if the US 51 project was not built).

The resources with potential indirect or cumulative effects are farmland, wetlands, wooded areas, and water quality. Figure 3.16-1 depicts the land cover in Kaskaskia River watershed that encompasses the US 51 study area that could be affected by indirect and cumulative impacts.

The year 2040 was selected as the planning horizon for the assessment of indirect and cumulative impact. The 2040 timeframe is most commonly used by

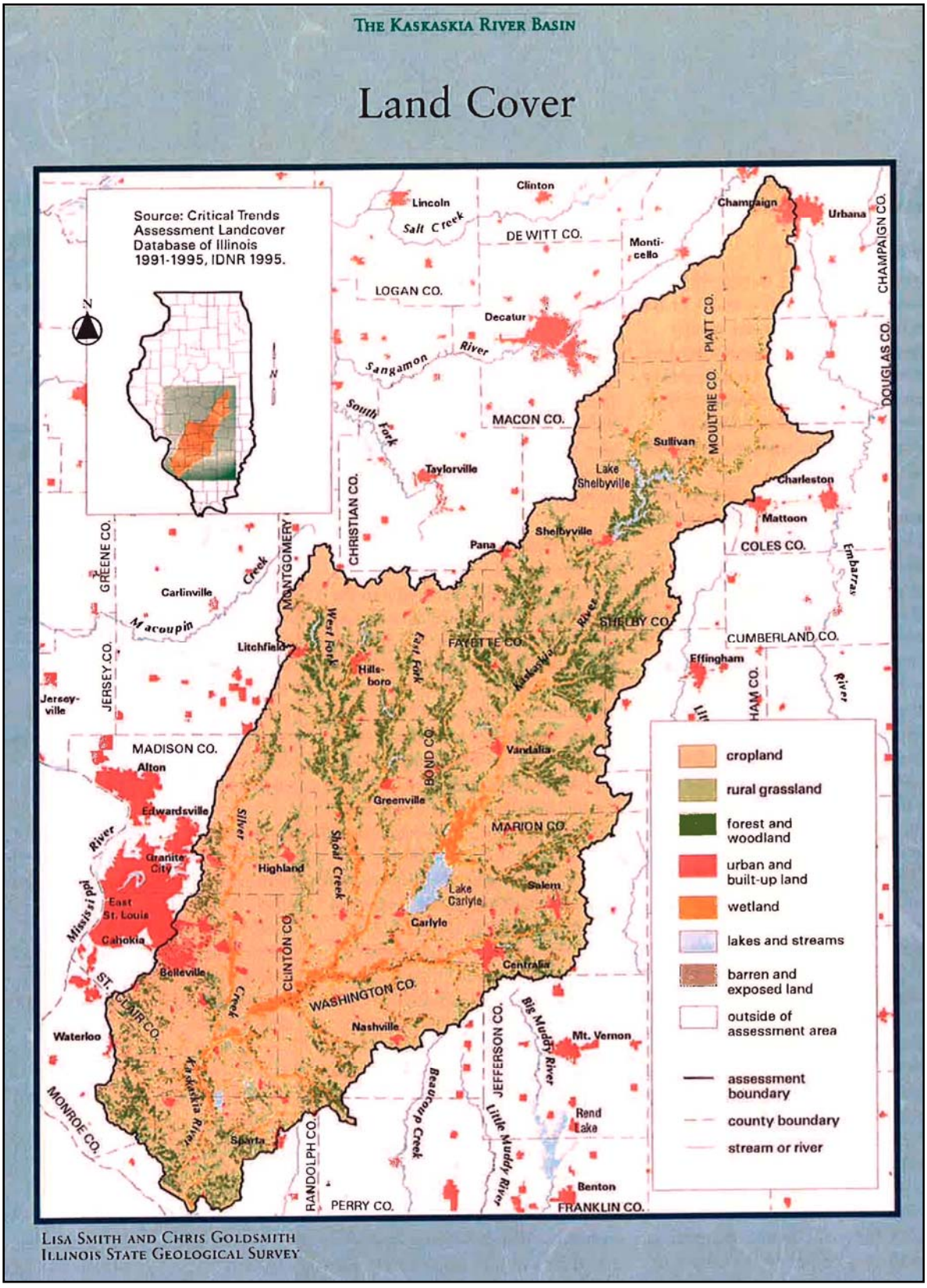
municipalities and regional planning agencies for forecasting future growth and planning growth location and characteristics. Thus, it is only within the planning horizon timeframe that reasonable and foreseeable future change can be identified.

What indirect impacts could occur?

The most notable indirect effect of the alternatives would be to channel development anticipated between now and 2040 to locations near interchanges and bypasses.

Studies indicate that the primary area of indirect (induced) development is within one to two miles from a project interchange for highway commercial and industrial uses and within five miles for residential development. Travel dependent businesses may relocate to new interchange locations on bypasses.

Figure 3.16-1: Land Cover



Farmland

Most of the undeveloped land in the study area consists of farmland. Thus the additional indirect development induced by the alternatives would almost exclusively come from farmland conversion.

Wetlands

Wetlands in the study area are protected by federal and state laws and regulations. Wetland laws protect wetlands by requiring "no net loss". Any affected wetlands would be mitigated or replaced at ratios greater than 1.5 to 1.0. This minimizes any potential impacts and mitigation can create more wetlands than are impacted when there is more than a 1:1 mitigation ratio.

Wooded areas

Pre-settlement forests were cleared for farmland. Forested land in large unfragmented tracts is scattered in the Kaskaskia River basin. Only 1,300 acres of high quality forest exist in the Kaskaskia River basin. These acres represent 0.28 per cent of the region's forests. The most extensive forested lands are near lakes and streams. Where development occurs adjacent to streams some additional forest lands would be used, further fragmenting the habitat.

Water quality

Population growth and the accompanying land uses of residential, commercial, institutional, and industrial land uses would be distributed in different patterns between the No Build Alternative and the Build Alternatives.

Indirect water quality changes are related to the difference in pollutant types and concentrations between agricultural runoff and that associated with developed land use, such as commercial and residential properties. Changes in water quality because of additional development can result in the reduction of some pollutants, such as soil runoff, and increases in others, such as heavy metals or salts. When agricultural land is converted to developed land there is usually less soil runoff into streams but an increase in the amount of salt, heavy metals, and other pollutants that runoff paved surfaces and into streams. The impacts on the aquatic species in the streams would be dependent upon the combination of site specific factors, such as existing land use, storm water management of developed uses, habitat requirements, and species sensitivity to pollution concentrations.

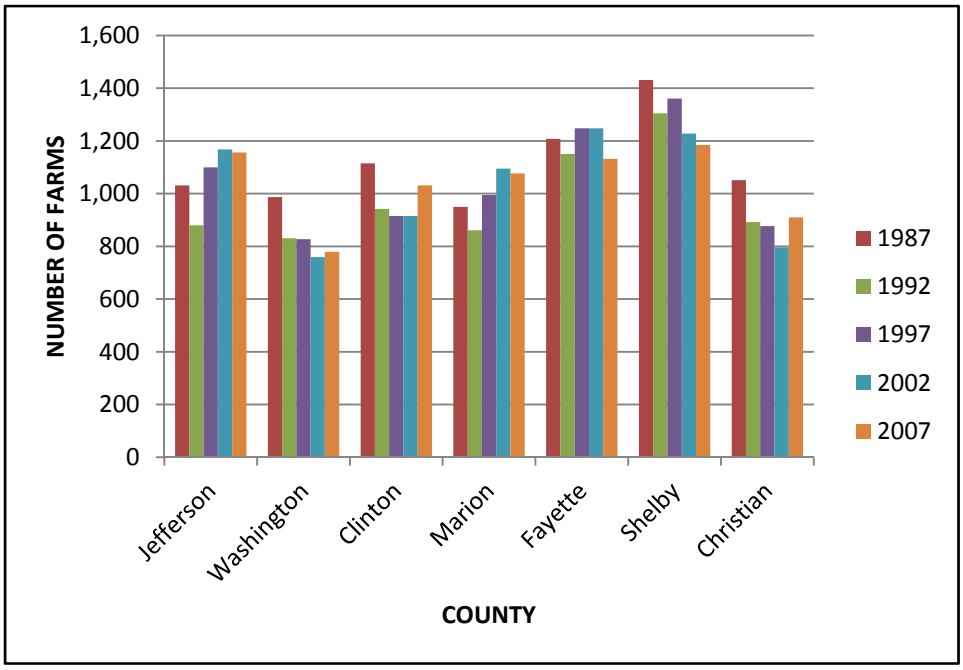
What cumulative impacts could occur from the alternatives?

Cumulative impacts include impacts from other projects, that are not related to US 51, from the past, present, and reasonably foreseeable future. Cumulative impacts are described by considering historical trends in resources as well as projections for future growth.

Farmland

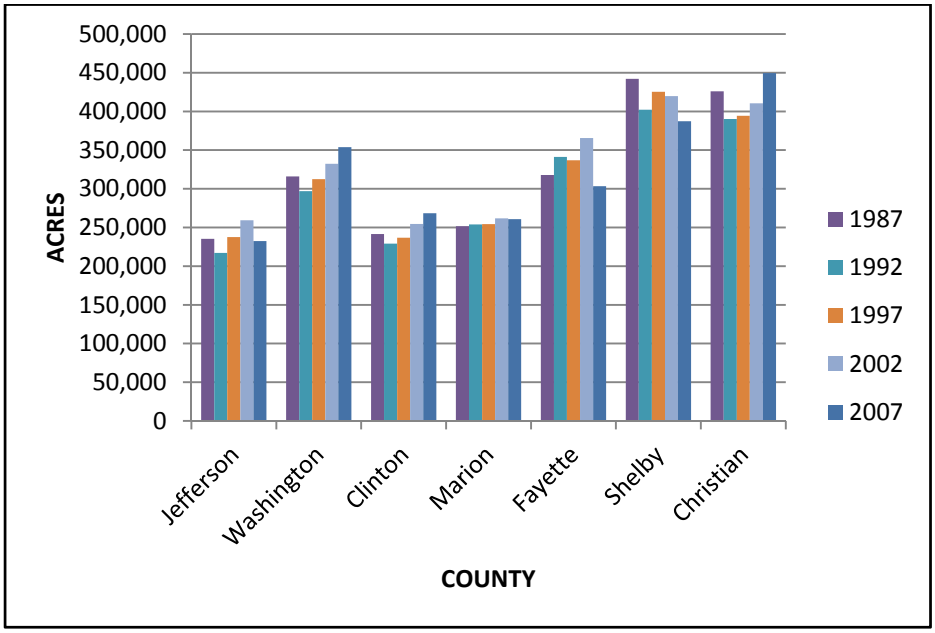
The trend in number of farms and acres in farm use is variable across the seven counties in the study area. The number of farms in Washington, Clinton, Fayette, Shelby, and Christian counties declined between 1987 and 2007, consistent with the statewide trend. The number of farms in Jefferson and Marion counties increased during the same time period. The total acres farmed in Jefferson, Fayette, and Shelby counties decreased between 1987 and 2007, consistent with the statewide trend; however, Washington, Clinton, Marion, and Christian counties reported a slight increase in acres farmed between 1987 and 2007. Figure 3.16-2 shows trends in the number of farms for each county; Figure 3.16-3 shows trends in the acreage of land in farms for each county.

Figure 3.16-2: Trends in Number of Farms



Source: USDA-NASS, U.S. Census of Agriculture, 1987, 1992, 1997, 2002, and 2007.

Figure 3.16-3: Trends in Farm Acres



Source: USDA-NASS, U.S. Census of Agriculture, 1987, 1992, 1997, 2002, and 2007.

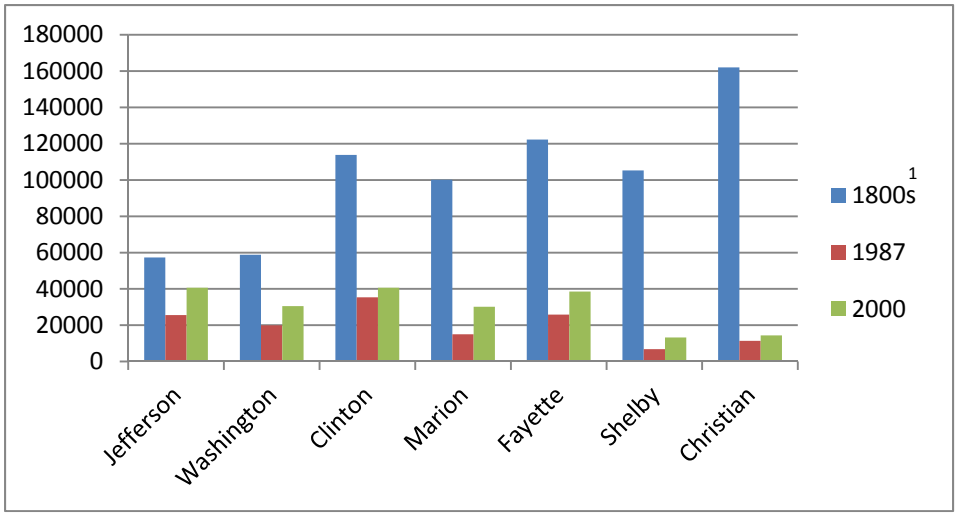
As with indirect (US 51 induced) impacts, the majority of other future development and associated infrastructure, that is not caused by US 51, would primarily be built on farmland, the predominant use of undeveloped land in the study area.

Wetlands

There are currently approximately 700 acres of high quality wetlands remaining in the Kaskaskia River watershed. Most wetlands in the study area are associated with streams and rivers and are not isolated. Again, wetlands under the jurisdiction of the USACE in the study area are protected by federal and Illinois laws and regulations. Any affected wetlands would be mitigated or replaced at ratios greater than 1.5 to 1.0. This minimizes any potential impacts and mitigation can create more wetlands than are impacted when there is more than a 1:1 mitigation ratio.

Clinton County contains more wetlands than any other county in Illinois with 40,683 acres, or 12.6% of the county's land cover acreage. Figure 3.16-4 shows trends in the acreage of wetlands for each county.

Figure 3.16-4: Trends in Wetland Acres



Source: Suloway and Hubbell, 1994 and the Illinois Natural Resources Geospatial Data Clearinghouse; University of Illinois, Urbana-Champaign, 2000. Data is not available for all years and counties.

[1] Number estimated from acres of hydric soils identified from county soil surveys.

Wooded areas

Figure 3.16-1 depicts the distribution of wetlands and forest and woodland in the Kaskaskia River watershed. As with indirect impacts, the bulk of additional land used for other non US 51 related development would come from agricultural lands. Where development occurs adjacent to streams some additional forest lands could be used, further fragmenting the habitat. The potential spreading of development that could occur with the alternatives would increase the potential impact.

Water quality

The Kaskaskia River watershed has remained rural in nature compared to the rest of Illinois. In 120 years the population in the watershed has only grown by 30% compared to a state population increase of over 300%. The water quality in the watershed has been primarily affected by agricultural practices rather than development. The Illinois Environmental Protection Agency has been documenting water quality since 1986. In 1986 59.4% of the watershed supported all potential water uses and has held relatively constant over the next 30 years. In 2010 IEPA did not evaluate as many streams and changed the evaluation criteria. The Kaskaskia River is reported to support all uses in only 27% of the watershed with 44.7% not assessed and 28% not supporting human and aquatic uses. The lower Kaskaskia River is impaired due to nutrients and siltation; the upper Kaskaskia where the project is located does not support

human or aquatic uses due to a variety of pollutants including low dissolved oxygen level, sedimentation, phosphorus, and metals.

The state and federal regulations require that water quality improvements occur in the Kaskaskia River watershed and studies are underway to develop plans for improvement, regardless of this US 51 project. Future water quality should improve with these requirements for treatment of storm water and wastewater.

What other, non US 51 related, major present and reasonably foreseeable future actions have or will affect resources?

Centralia Industrial Parks: Centralia is home to three industrial parks with a combined area of more than 280 acres. Centralia Industrial Park comprised of 174 acres, is used by over 13 industries, with 32 acres remaining. Principal Meridian Business Park, located 5.5 miles north of I-64 and adjacent to the Canadian National rail line, has 100 acres available on each side US 51. The 200 acres at the Principal Meridian Business Park are primarily farmland with a small amount of woods. The park was recently designated as a Tax Increment Financing District. Aaron Business Park starting at 50 acres is adjacent to Norfolk Southern rail line. It is a mixture of farmland and woods. The industrial parks are all within an Enterprise Zone and future growth would likely occur in these areas.

City of Vandalia Owned Industrial Park: There are 155 acres zoned Industrial-Light. This industrial park has not yet been developed and is currently farmland.

US 51 add lanes to the north (Christian County): The 35 miles immediately north of the Christian/Shelby County line have been upgraded to or are planned to be upgraded to a four-lane section. Most recently, an Environmental Impact Statement was completed in 1992 for US 51 between Decatur and Pana. A four-lane US 51 south of Moweaqua opened to traffic in the fall of 2007. The next section to be constructed is a four-mile long bypass around Assumption. Another four-mile straight line section from south of Assumption to north of Pana and a bypass extending seven miles around Pana are being designed and will be constructed when funding becomes available.

What measures are proposed to minimize indirect and cumulative impacts?

During the planning of the US 51 project, alternatives were developed and refined to avoid, minimize, or mitigate adverse effects. The alternatives were advanced over other alternatives, which would have greater direct impacts on community and natural resources. Potential planning measures that have been used by local government in the United States to mitigate the effects of growth on the environment also can be used by local jurisdictions in the study area to

mitigate impacts associated with both the No Build Alternative and the Build Alternatives. These measures include:

- Develop local comprehensive plans in areas that do not have them
- Update zoning districts to identify areas for development near the proposed project.
- Plan and develop additional parks and open spaces focused on preserving valued natural resources.

Wetlands in the study area are protected by federal and Illinois laws and regulations. Wetland laws protect wetlands by requiring "no net loss". Mitigation can create more wetlands than are impacted when there is more than a 1:1 mitigation ratio.

With additional development in the watersheds, contributions from point sources, such as wastewater treatment plants, would be subject to the effluent standards established by the Illinois Pollution Control Board to protect water quality. In addition, the IEPA conducts anti-degradation analyses to insure stream water quality is protected. Local governments, such as municipalities and counties, regulate non-point sources through implementation of storm water ordinances. These ordinances determine release rates and storm water management criteria for future development. In addition, as previously described, the change in storm water quality between existing and future land uses would include both increases and decreases in pollutant concentrations.

In response to stream degradation in Illinois, the IEPA developed the Total Maximum Daily Load (TMDL) process to assess stream impairments and to determine the pollution reduction necessary to improve water quality. Portions of the Kaskaskia River are being studied for TMDLs.