Chapter 13

Environmental Mitigation

The transportation system affects and is affected by the natural environment. Beginning with SAFETEA-LU and continuing with the FAST Act, long range transportation plans need to discuss "potential mitigation activities and potential areas to carry out these activities, including activities that may have the greatest potential to restore and maintain environmental functions affected by the Plan," in consultation with pertinent wildlife, land management, and regulatory agencies. The purpose of the process is to identify possible impacts of proposed "improve and expand projects" on environmentally sensitive resources, list useful guidelines for mitigating these impacts, and share information with implementing agencies.

The FAST Act requires that the plan also addresses how storm water mitigation is addressed within the transportation system. MDOT, Jackson County, the City of Jackson and Jackson County Airport provided relevant manuals and plans. They are further reviewed in this section.

Natural, Agricultural, Aquatic, & Cultural Resource Analysis

The purpose of the analysis is to identify the projects that may have the potential to impact an environmentally sensitive area. Once a potential impact has been identified, general guidelines can be introduced for agency consideration during all phases of project planning, design, construction, and maintenance. Natural and Agricultural, Aquatic, and Cultural resource maps are shown on the next three pages. Buffers of a quarter of a mile were established around each proposed capacity improvement project. The proposed projects and their buffers were then overlaid on a series of maps identifying the locations of the following natural and cultural resources. The maps 13-1 – 13-3 are on the next three pages.

Figure 13-1
Watkins State Park

Figure 13-2 Natural Resources Map

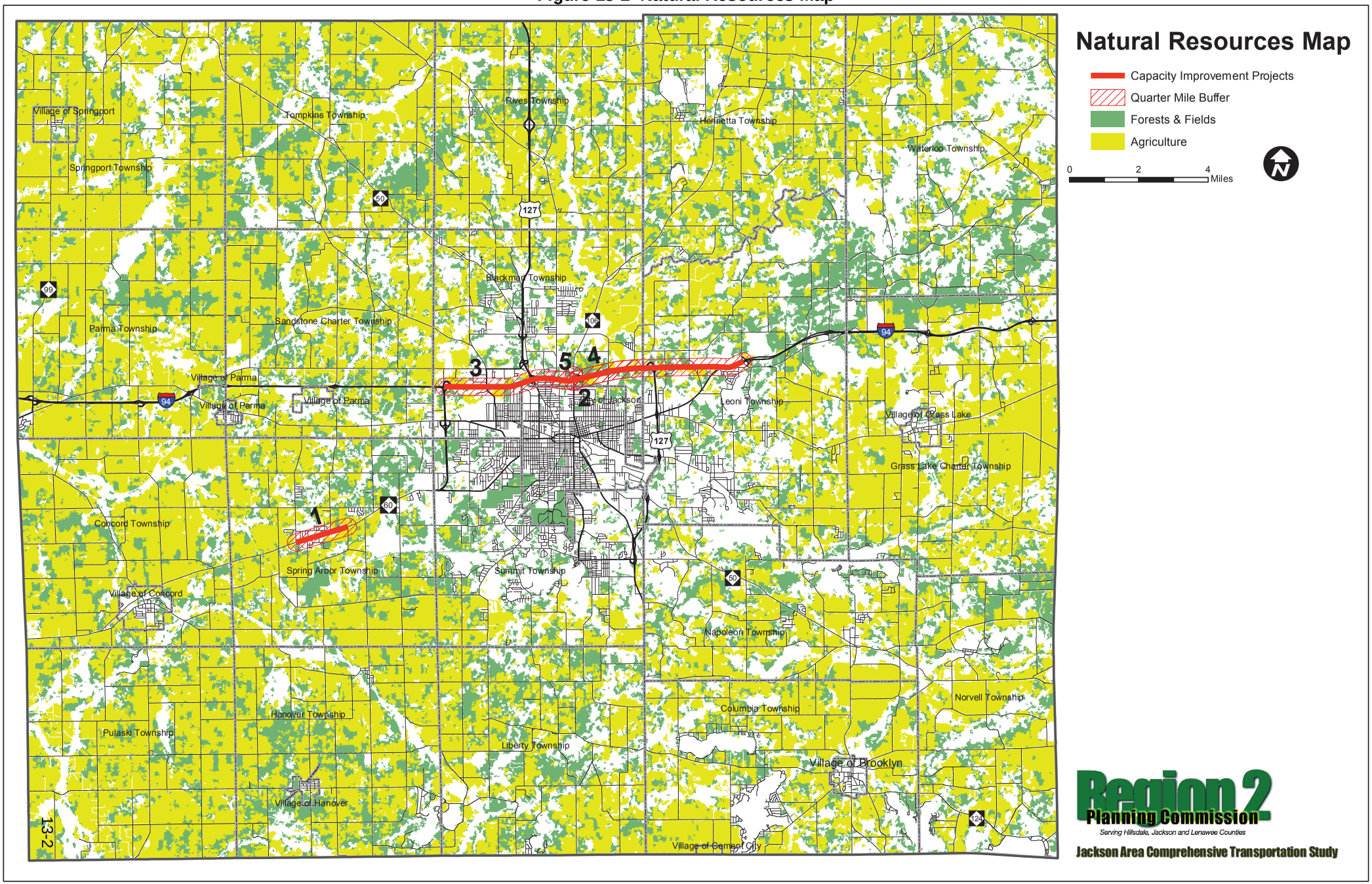


Figure 13-3 Aquatic Resources Map

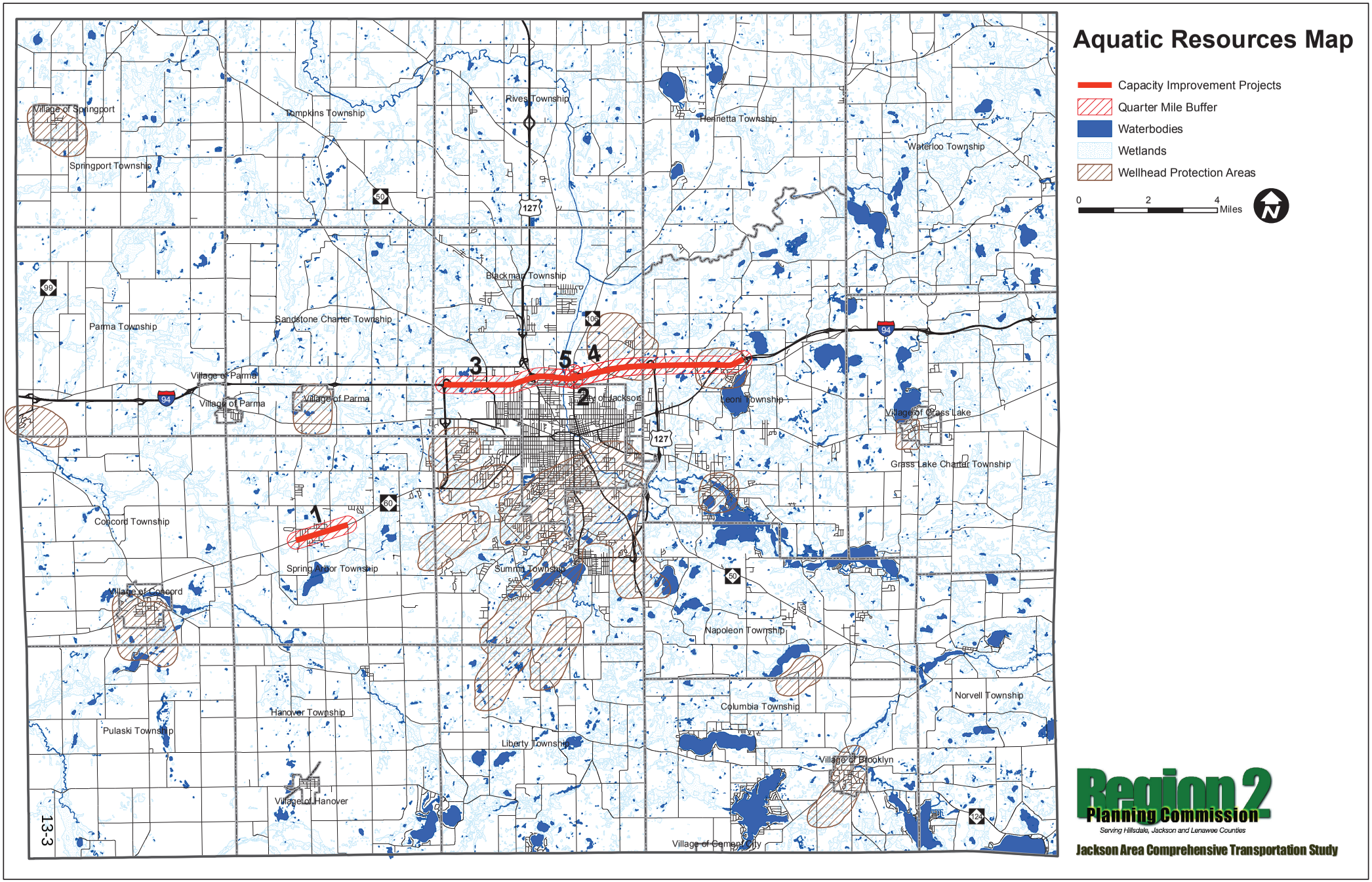
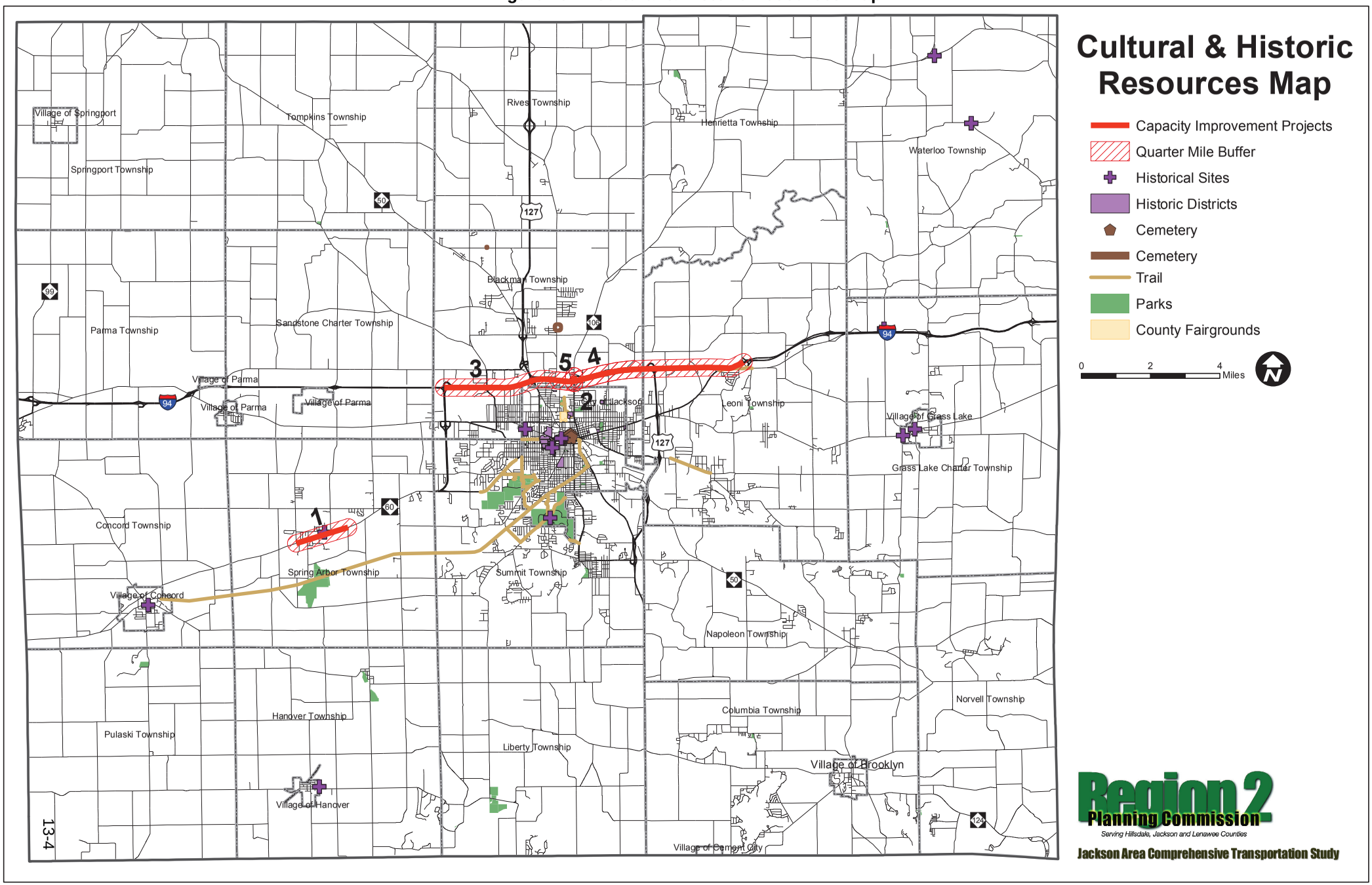


Figure 13-4 Cultural & Historic Resources Map



The table below identifies the data sets that were used to create each map.

Table 13-1 Natural, Agricultural, Aquatic, & Cultural Resource Map Data

Map	Resources	Data Source
Natural & Agricultural Resources	forest, open space, agricultural areas	US Geological Survey National Land Cover Database
	endangered species	US Fish & Wildlife Service
Aquatic Resources	rivers, drains, lakes, ponds, wetlands	Jackson County GIS Hydrology layer
	wellhead protection areas	Wellhead Protection Area Delineation report
Cultural Resources	parkland, trails	Joint City of Jackson/Jackson County Recreation Plan
	historic districts & properties	City of Jackson and Jackson County Historic Districts & Properties GIS layers
	cemeteries	City of Jackson and Jackson County Land Use GIS layer

Results

A potential impact was recorded on the Natural & Cultural Resources Matrix whenever a mapped resource intersected with a proposed project within the quarter-mile buffer. That table is on the next page.

The purpose of this analysis is to identify the projects that may have the potential to impact an environmentally sensitive area. However, it does not mean that the project cannot be implemented. Once a potential impact has been identified, general guidelines can be introduced for agency consideration during all phases of project planning, design, construction, and maintenance.

Table 13-2 Capacity Improvement Projects Resource Matrix

	Project	Limits	Rivers & drains	Lakes & ponds	Wetlands	Wellhead protection areas	Forests	Areas of farmland preservation	Endangered species	Parkland & trails	Historic districts & properties	Cemeteries
1.	Resurface & wid-ening of M-60	Chapel Road to Emerson Road			x							
2.	Reconstruction & realignment of the Cooper Street interchange				x		x					
3.	Reconstruction of I-94	M-60 to Sargent Road			x		x					
4.	Reconstruction of I-94 interchange at Elm Avenue				x	x	X					
5.	Realignment & bridge structure replacement over JAIL Railroad & the Grand River		x		x		x		x			

Storm water

Long range transportation plans need to address how communities reduce or mitigate storm water impacts to transportation. MDOT, Jackson County, the City of Jackson and the Jackson County Airport have guidelines for this issue.

Michigan Department of Transportation Drainage Manual 2006

The MDOT 2006 Drainage Manual provides guidance to administrative, engineering, and technical staff and consultants for the design of MDOT drainage facilities. Developed under the guidance of the TEA-21 federal transportation bill and AASHTO's Model Drainage Manual, Metric Version, 1999, the MDOT manual was developed to give a design engineer a working knowledge of hydrology, hydraulics, and storm water management. The manual provides general operational guidelines with the flexibility to adapt recommendations to individual project needs.

The manual addresses MDOT's policy, design criteria, design guidance, procedure, and maintenance of the following topics:

- Hydrology
- Natural Channels and Roadside Ditches
- Culverts
- Bridges
- Road Storm Drainage Systems
- Storm water Storage Facilities
- Pump Stations
- Storm Water Best Management Practices

The intent is to give specific guidance that is applicable to most projects, and enable MDOT to practice good storm water management. MDOT University Region engineers use the manual as a starting point to ensure good engineering storm water management practice is used for state projects.

Figure 13-5
Flooded Grand River in Downtown Jackson

Jackson County

The Jackson County Department of Transportation uses the Jackson County Drain Commissioner's Storm Water Management Policy for site development. The policy is as follows:

Retention (adequate outlet not available)

- 100 year frequency storm
- 3 hour duration
- 1.5"/hour rainfall intensity*

Detention (outlet available, but with limited capacity)

- 50 year frequency storm
- 1 hour duration
- 2.5"/hour rainfall intensity

*based upon Grand River Basin intensity-duration frequency curves

Jackson County is part of the Upper Grand River Watershed Alliance, which is a coalition of municipalities, agencies, businesses and individuals dedicated to improving water quality in the headwater region of the Grand River. The group developed the 2003 Upper Grand River Watershed Management plan, which provided recommendations on how agencies could continue to support the health of the upper Grand River watershed. The 2006 update to the plan is an addendum to fulfill the EPA's 319 Nine Minimum Elements of Water Shed Planning and the National Pollutant Discharge Elimination System (NPDES) Phase II requirements. The plan doesn't explicitly address how storm water is affected by and affects the transportation system, however, the following goal and objectives relate to the mitigation of storm water impacts of surface transportation:

Goal: All new development projects to be water quality friendly.

Objective: Increase regional planning efforts and implementation among local units of government.

Objective: Develop a standards manual which outlines economically viable water quality friendly development practices and requirements.

Objective: Incorporate water quality friendly practices into community development master plans.

These are important measures that the Jackson County Department of Transportation uses to help guide the development of projects, under guidance of the Drain Commissioner.

Jackson County Department of Transportation also uses the MDOT 2006 Drainage Manual.

City of Jackson

Figure 13-6
An Example of Storm Water Management in the City of Jackson

The 2012 City of Jackson Storm Water Management Manual provides specific information to the City of Jackson for design standards to address storm water quantity and quality and flood control. The City of Jackson adopted the *Low Impact Development (LID) Manual for Michigan* to guide the design of proposed best management practices. The Department of Public Works reviews all storm water-related projects. The technical guide is used by City of Jackson Engineering in dealing with storm water for all transportation related projects that meet the minimum requirements.

The previously mentioned 2016 City of Jackson Community Master Plan sites the need to address storm water runoff, especially in the downtown and urban core of the community, which includes maintaining an open and working transportation system. The City of Jackson is also part of the Upper Grand River Watershed Alliance.

Jackson County Airport-Reynolds Field

The Jackson County Airport has a Storm Water Pollution Prevention Plan that was developed in 2006 as a requirement under Part I.B of Michigan's National Pollutant Discharge Elimination System (NPDES) general permit for storm water discharges from industrial activities and in accordance with good engineering practices. The plan describes the facility and its operations, identifies potential sources of storm water pollution associated with industrial activities at the facility, and recommends appropriate best management practices or pollution control measures to reduce the discharge of pollutants in storm water runoff. Additionally, the plan covers all the industrial activities conducted by commercial businesses at the airport including vehicle maintenance, fueling, cleaning, and deicing. Many private hangars exist at the airport owned by private individuals or corporations that are not considered commercial businesses nor industrial related activities, and therefore, are not included in the plan.

The goal of the storm water permit program is to improve the quality of surface waters by reducing the amount of pollutants potentially contained in the storm water runoff being discharged from industrial activities. The objectives of the plan are as follows:

1. To identify potential sources of pollution at JXN [Airport].
2. To describe best management practices which are to be used at JXN [Airport].
3. To provide other elements such as a facility inspection program and record keeping and reporting program that will help JXN comply with the terms and conditions of their storm water discharge permit.

All future airport facility improvements will be designed and constructed with best management practices that further improve the quality of surface waters around the airport.

Intergovernmental Cooperation

MDOT, County, and City staff typically work together as needed to resolve storm water issues at the site level on a project basis. With Jackson's unique soils and drainage issues, local leaders and staff collaborate to develop cost-effective, environmental-sound solutions using storm water best management practices. There has been talk between the City of Jackson and Jackson County to develop a set of guidelines that are complimentary and/or similar to help with the successful adherence to storm water management policies, standards and guidelines for engineers and developers across jurisdictional boundaries.

Air Quality

On May 12, 2012, the United States Environmental Protection Agency (EPA) revoked the 1997 eight-hour 0.080 parts-per-million (ppm) Ozone standard for the purposes of regional transportation conformity. On May 21, 2012, the US EPA issued designations for the new 2008 eight-hour 0.075 ppm Ozone standard. Jackson is designated attainment under the 2015 standard. Jackson is not required to demonstrate conformity to the NAAQS at this time.

Projects included in the Long Range Transportation Plan should be analyzed more closely as they move further into the stages of development to determine whether negative environmental impacts will be realized by the surrounding area. R2PC staff will continue to use the environmental mitigation analysis process and to consult with the appropriate local, state, and federal agencies to minimize the impact the transportation projects may have on the environment.

Planning Guidelines

Regardless of the type of project or the resource that may be impacted, the guidelines deserve consideration during the planning, design, construction, and maintenance of transportation projects. Guidelines developed by the Southeast Michigan Council of Governments (SEMCOG) and AASHTO are presented below for reference. Jackson can only recommend that these guidelines be followed by the implementing agencies during the project planning and development process. The following "best practice" guidelines will help to ensure good planning practices that will assist in the overall quality of the area's environment:

Planning & Design Guidelines

- Utilize Context Sensitive Solutions (CSS) throughout the planning and project development process. CSS identifies the physical, visual, and social context in which a project is situated while involving all stakeholders in a collaborative process in developing transportation projects.
- Identify the area of potential impact as it relates to each transportation project, including the immediate project area as well as related project development areas.
- Continue to update the environmental sensitive inventory to determine if any of the identified resources may be impacted by proposed projects.

- Coordinate with the Jackson County Hazard Mitigation Plan.
- Coordinate the transportation projects with local comprehensive and master plans, watershed management plans, recreation and non-motorized plans, etc.
- Prior to project construction, collaborate with local community officials, contractors, and other relevant stakeholders to review and discuss environmental issues and goals.
- If it all possible, avoid impacts to environmental resources through project design and/or through the implementation of all possible mitigation measures.
- Incorporate storm water and erosion control management into the project design.
- Reduce the size and need for culverts when and where possible.

Construction & Maintenance Guidelines

- Include all special requirements that address environmentally sensitive resources into plans and estimates used by contractors and subcontractors. Bring to attention the types of activities that are not appropriate in environmentally sensitive areas.
- Minimize the size of the construction and staging area with clearly marked boundaries using fencing or flagging around sensitive areas as necessary to prevent intrusions.
- Utilize the least intrusive construction materials and techniques.
- Avoid disturbing the construction site as much as possible by:
    - Protecting established vegetation and natural habitat. If disruption is unavoidable, replace with native species as soon as possible.
    - Implementing sediment and soil erosion control measures as required.
    - Not stockpiling materials in sensitive areas.
    - Protecting water quality by controlling direct runoff, sweeping streets to reduce sediment, implement salt management techniques, and control storm water drains from construction debris.
    - Protecting cultural and historic resources.
    - Minimizing noise and vibration.
    - Providing for solid waste disposal.
    - Conducting on-site monitoring during and after construction to ensure protection of environmental resources as planned.
    - Maintaining equipment in good working condition and avoid fueling or maintenance near environmentally sensitive areas.
    - Reducing land disturbances through the efficient organization of construction activities.

Conclusion

The purpose of this process is to identify potential impacts the proposed capacity expansion projects may have on the area's environmentally sensitive resources and to provide useful guidelines for mitigating the impacts to the implementation agencies. The projects included in the plan should be analyzed closely as they move further into the stages of development to determine whether negative environmental impacts will affect the surrounding area.