

Chapter 3 - Natural Resources

Per State of Wisconsin Statute 66.1001 - Comprehensive Planning (2)(e), the Agricultural, Natural, and Cultural Resources element of a community's comprehensive plan is to be:

"A compilation of objectives, policies, goals, maps and programs for the conservation, and promotion of the effective management, of natural resources such as groundwater, forests, productive agricultural areas, environmentally sensitive areas, threatened and endangered species, stream corridors, surface water, floodplains, wetlands, wildlife habitat, metallic and non-metallic mineral resources consistent with zoning limitations under s.295.20 (2), parks, open spaces, historical and cultural resources, community design, recreational resources, and other natural resources".

For the purposes of this *Plan*, the Agricultural, Natural and Cultural Resources element has been divided into three separate Chapters, each with their own goals, objectives and policies. The Chapters are as follows:

- Section II: Chapter 2 - Agricultural Resources
- Section II: Chapter 3 - Natural Resources
- Section II: Chapter 4 - Historic and Cultural Resources

Each of the three Chapters also has a section that address issues and opportunities for that specific Chapter, however, tools for implementation that might apply to all three Chapters have been described only at the end of Section II: Chapter 2 - Agricultural Resources to avoid duplication as referenced in 3.4. of this Chapter.

3.1. Overview

Why plan for natural resources? A simple answer is that environmental health, measured by the quality and quantity of natural resources, is a cornerstone to human health and quality of life. Having thorough, documented knowledge of exactly what natural resources exist in Rock County, why they are important, and the measures needed to insure their quality helps to set the stage for future development decisions. Providing for methods of analysis and preservation of natural resources is vitally important, as it will ultimately impact the health and welfare of current and future Rock County residents who are now sharing or will inherit the use of the land. Understanding what currently exists on the land suggests advantages and disadvantages for particular land uses and leads to more conscientious use of land.

There are many programs, resources and policy mechanisms, addressed later in this Chapter, that make it possible for government and citizens throughout Rock County to preserve agricultural and natural resources. Funds from State and Federal sources, as well as increasing availability of non-profit funding creates increased preservation-related opportunities. This *Plan* can be the first step in providing education, information and

policies that can have a permanent affect on the future of Rock County's landscape and natural resources.

3.2. Existing Plans and Policies

Groundwater Protection Principles and Alternatives for Rock County

This 1985 report of the *Wisconsin Geologic and Natural History Survey (Special Report 8, September 1985)* prepared in cooperation with the Rock County Health Department, University of Wisconsin-Extension, and the Wisconsin Department of Natural Resources (WDNR) identifies groundwater resources, inventories potential groundwater risks, and develops groundwater protection strategies for Rock County. It is the intent of this *Plan* to uphold the intent of this document.

Rock County, Wisconsin 2009-2014 Parks, Outdoor Recreation and Open Space (POROS) Plan

The POROS Plan contains policies and recommendations for the maintenance and improvement of park and recreation facilities and the preservation of natural resources. The plan references and/or includes portions of the 2003 update of the plan titled *Parks, Outdoor Recreation and Open Space (POROS) Plan 2003-2008*. Of particular relevance to this Chapter is the ESOSA Map and policies. ESOSA policies are being reinforced in the POROS Plan and have been re-created, in their original form, within the goals, objectives and policies section of that plan. These policies identify and define fourteen physical characteristics or natural features in the County that are either in need of protection or that currently limit land availability for development.

It is the intent of Rock County to update the text and policies relevant to ESOSAs and for those updates to be taken out of the POROS Plan and instead, become part of this Chapter and/or part of the Rock County Land Division Regulations (Chapter 15 - Municipal Code of the County of Rock). If consistently enforced, ESOSAs will help to encourage development that is planned with sensitivity to natural resource preservation and conservation efforts (see 3.3. of this Chapter).

- *Subject Plans and Maps included as part of the POROS Plan*
 - *Rock County Bicycle and Pedestrian Routes and Trails Plan*
 - *River Trails Plan*
 - *Snowmobile Trails Plan*
 - *Ice Age Trail Corridor Plan*
 - *Environmentally Significant Open Space Areas Plan*
 - *Park Improvement Action Plans 2009-2014*

Rock County Land and Water Resources Management Plan (LWRMP)

The LWRMP serves as a long-term strategic conservation plan for the Rock County Land Conservation Department and Rock County residents. The plan provides guidance for conservation efforts within the County and assists in forming annual work plans for the Land Conservation Department. The LWRMP, in coordination with this *Plan* discusses issues related to land use, physiography, soils, surface water (including wetlands) and groundwater, within the framework of watershed management. The LWRMP also includes discussion of other natural resource concerns including threatened and endangered species, forests and woodlands, invasive species, identification of priority farms for agricultural preservation efforts, as well as State and local regulations used to implement the plan. It is the intent of this *Plan* to uphold the intent of the LWRMP.

Wisconsin Department of Natural Resources (WDNR)

The WDNR has many policies that directly affect natural resources in Rock County. The WDNR also administers many programs to help communities and individuals to effectively manage, improve and/or protect natural resources. For more information, visit the WDNR website at www.dnr.state.wi.us.

3.3. Natural Resources Inventory

There are many valuable natural features present in Rock County. There are many possible methods of inventorying those natural features. Currently, in Rock County several natural features that are particularly important to preserve have been identified and mapped. Map 3.1, Environmentally Significant Open Space Areas (ESOSAs), shows features that have previously been determined to have a significant effect on the landscape and/or health of the people of Rock County. Many of these ESOSA features, plus additional natural resources that are important to consider for further preservation or management are addressed in this Chapter.

Environmentally Significant Open Space Areas (ESOSA)

Once any land is developed, it can very rarely revert back to its natural state. Alternatively, the preservation or conservation of environmentally sensitive or significant areas protects and can even improve surface and groundwater quality, reduce the risk of flooding, protect wildlife and help to maintain scenic landscapes and rural character. In response to these facts, Rock County has analyzed and defined fourteen environmentally significant natural features termed environmentally significant open space areas (ESOSA) (see Figure 3.1) that are identified in the POROS Plan (Section II: Chapter 12 of this *Plan*). These natural features, considered green infrastructure for the County, may pose limits to development.

Some ESOSAs are already being protected through the Rock County land divisions process while others should be considered for future protection. Also included as ESOSAs are features that must be protected and monitored according to State or Federal mandate. These areas, when protected from development, serve to aid against the depletion of wildlife habitat, clean air and water, and open space. Map 3.1 shows the location of the composite area of all fourteen ESOSA features.

Not all of the ESOSA features will be addressed in this Chapter, however, natural features of importance that are not currently defined as ESOSAs will be discussed in 3.4. of this Chapter. Refer to the POROS Plan for more information on existing ESOSAs.

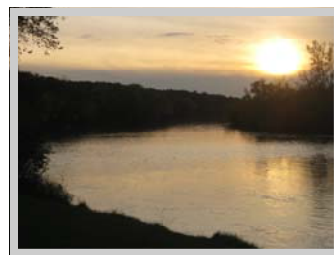
**Figure 3.1:
Environmentally Significant Open Space Area (ESOSA) Features**

State or Federally Protected ESOSA Features	Additional ESOSA Features
Surface water	Potential groundwater protection areas
Shorelands	Hydric soils
Wetlands	Kettles and depressional areas
Floodplains	Steep slopes
WDNR hunting lands	Natural areas
Federal lands	Town land, open spaces, and recreational areas
Airport open space areas	County parks

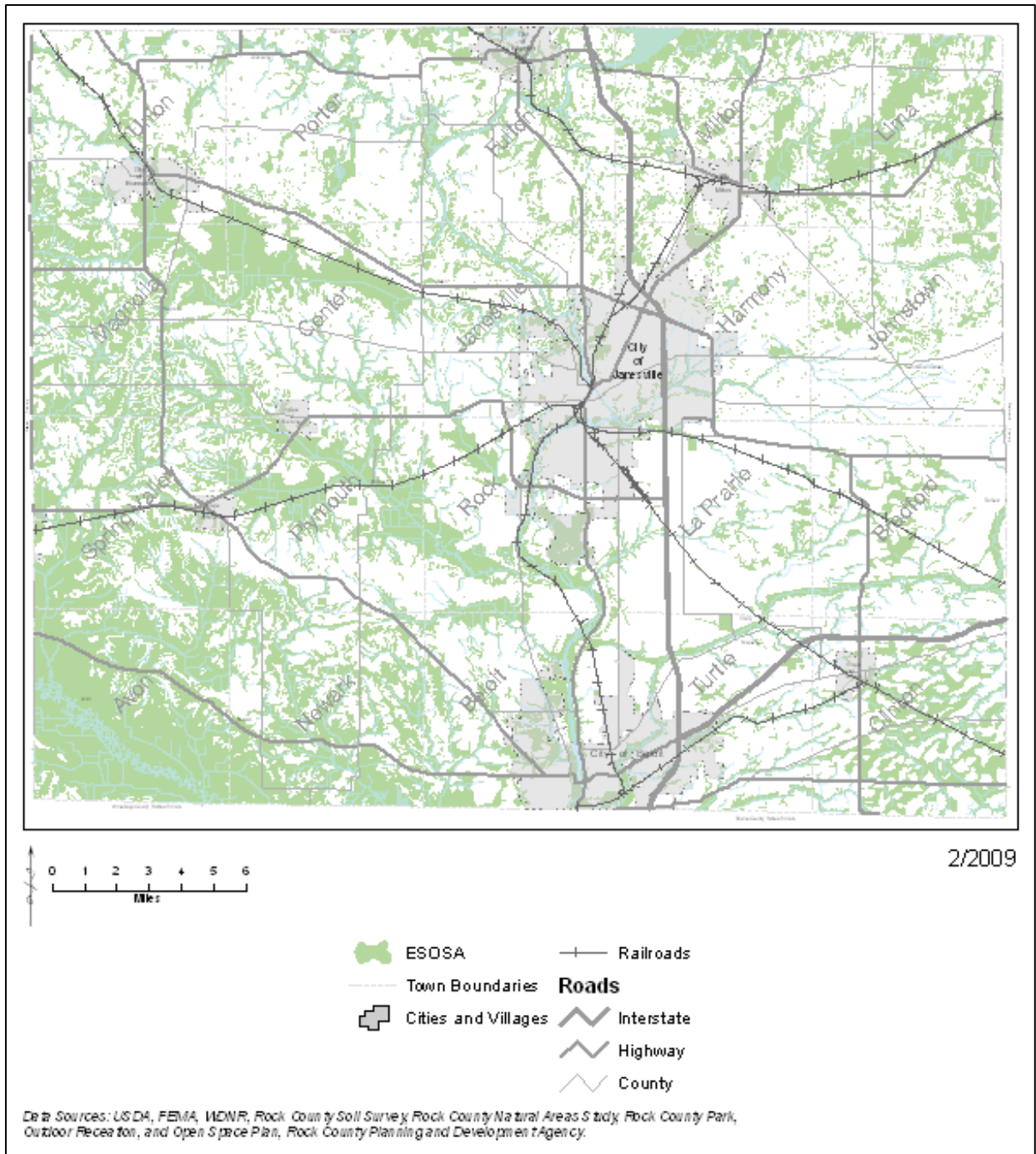
- Surface Water

Surface water mapping for Rock County includes delineation of all navigable and intermittent lakes, ponds, retention and detention basins, rivers and streams. Surface waters in Rock County total 3,549 acres, or 1% of the total area. There are three rivers in Rock County. Of the three, the Rock River is the largest major drainage basin in southern Wisconsin (see Map 3.2).

Other rivers in Rock County are the Yahara and Sugar Rivers. There are more than 50 creeks and streams of which Turtle, Raccoon, Bass, and Allen Creeks are of some recreational value. For the remainder, agricultural runoff and large fluctuations in high and low flow periods preclude any recreational use. In 1970 the WDNR identified 72 lakes and ponds. Of these 72, 48 are five acres or less and only 10 exceed 20 acres.



Map 3.1:
Environmentally Significant Open Space Areas (ESOSA)



The southern tip of Lake Koshkonong is located at the Rock, Dane and Jefferson County line. This 10,000 acre lake, which lies primarily in Jefferson County, offers numerous recreational opportunities not only for Rock County residents, but also people from all over Southern Wisconsin and Northern Illinois. Because of this, Lake Koshkonong should be considered a lake of Statewide significance.

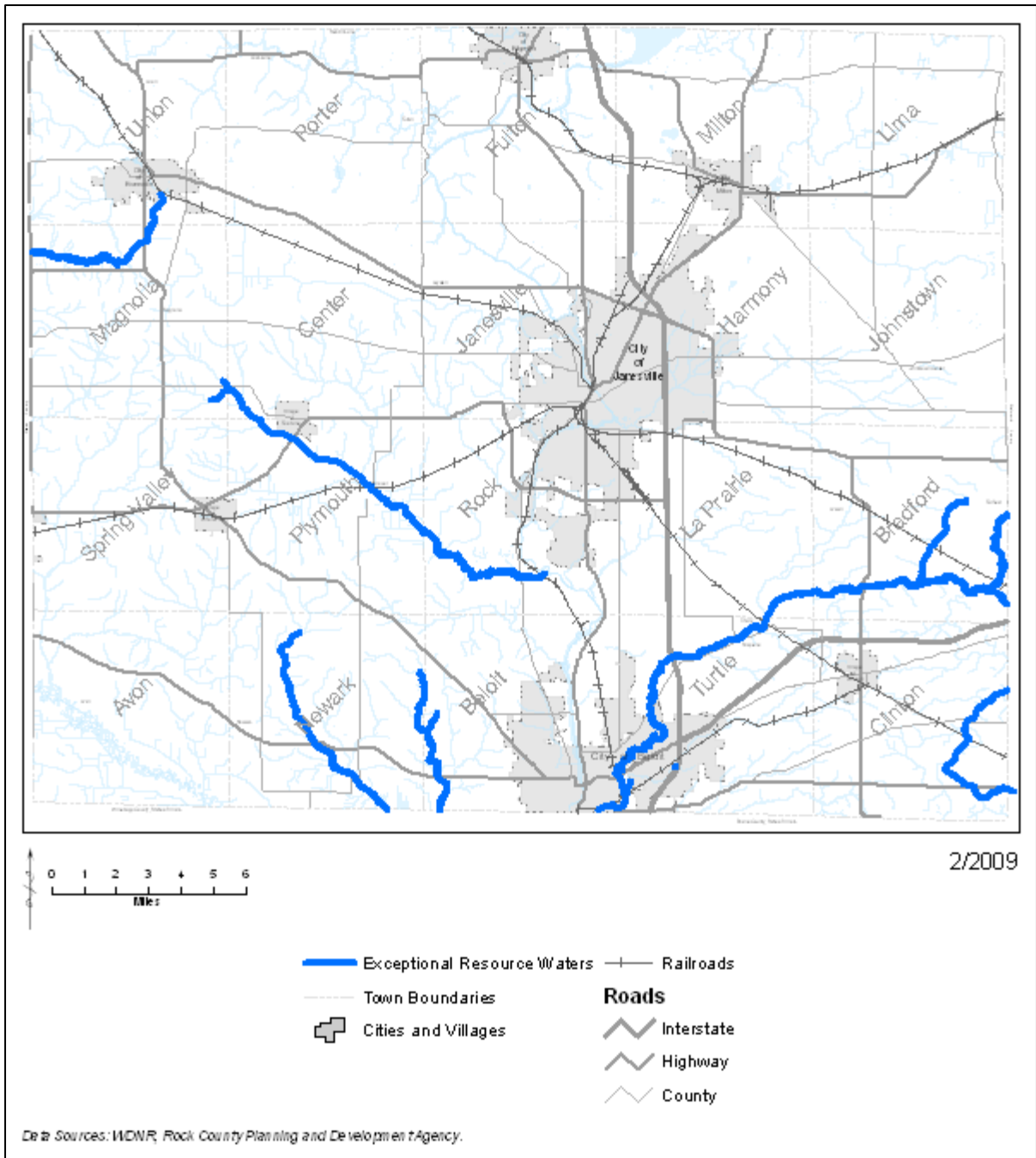


The Rock River Lagoon at City of Beloit's Riverfront

As a result of glaciation, the northern portion of Rock County contains many kettles, depressions, and lakes. Gibbs Lake, Storrs Lake, and Clear Lake are among the most recognized. The proximity to Dane, Jefferson, Walworth, and Green Counties, as well as Illinois, makes these areas attractive to potential users from outside Rock County. Although this proximity has an impact on the recreational pressure on these bodies of water, the use of these lakes does represent a positive impact on the local economy. People using Rock County's lakes and streams will spend dollars on gas, food and lodging.

WDNR's Outstanding and Exceptional Resource Waters Program provides a designation for Wisconsin's cleanest waters. An outstanding resource water is defined as a lake or stream that has excellent water quality, high recreational and aesthetic value, high quality fishing and is free from point source or non-point source pollution. An exceptional resource water is defined as a stream that exhibits the same high quality resource values as an outstanding resource water, but that may be impacted by point source pollution or that may have the potential for future discharge from a small sewer community. Exceptional resource waters in Rock County are Allen Creek (below the City of Evansville), Bass Creek, E. Fork Raccoon Creek, Little Turtle Creek, Raccoon Creek, Spring Brook (T2N, R14E S27), Turtle Creek and an unnamed creek (T2N R14E S31) (see Map 3.2).

Map 3.2:
Surface Water and Exceptional Resource Waters



- Shoreland Areas
Under State of Wisconsin Statute 59.692, Rock County administers a shoreland overlay district. The uses and standards established under the district apply to land within 1,000 feet of the ordinary high water mark of navigable lakes, ponds or flowages and within 300 feet of the ordinary high water mark of rivers or streams or to the landward side of the floodplain, whichever distance is greater. The district prohibits any construction

within 75 feet of the ordinary high water mark and these areas are included as ESOSA features. This regulation applies to rivers, streams and floodplains within Rock County. According to State of Wisconsin Statute 281.31, this district limits certain development activities in order to "further the maintenance of safe and healthful conditions and prevent and control water pollution, protect spawning grounds, and fish and aquatic life, control building sites, placement of structures and land uses, and preserve shore cover and natural beauty."

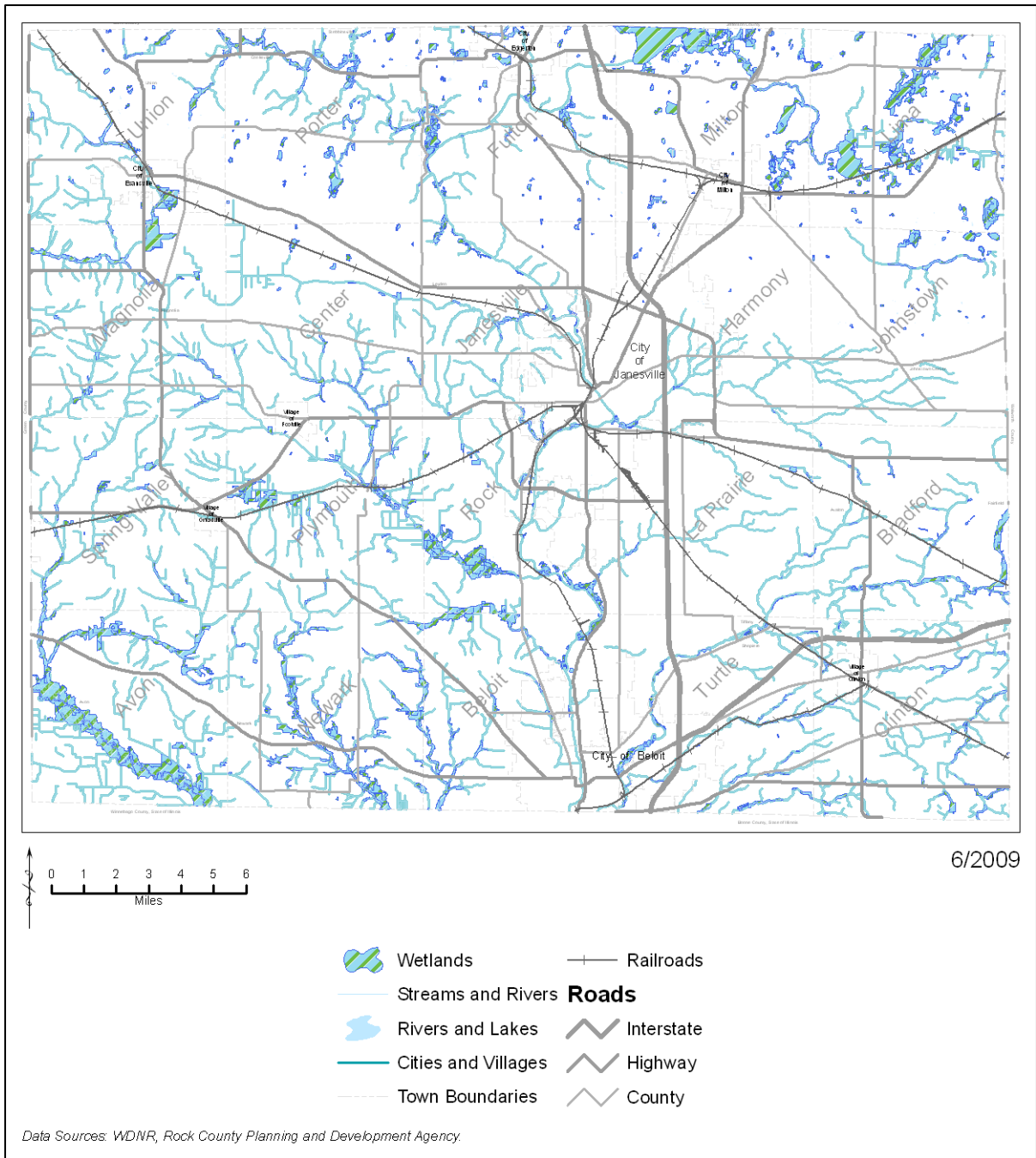
- Wetlands

Wetlands are those areas where water is at, near, or above the land surface long enough to support aquatic or hydrophilic vegetation or which have soils indicative of wet conditions. Wetlands support unique flora and fauna and are of limited human use.

WDNR wetlands in Rock County total 19,612 acres or 4.3% of the total area according to a 2003 inventory (see Map 3.3). Once viewed as wasteland, useful only when drained for agriculture or filled for development, wetlands are now understood to provide substantial and irreplaceable benefits for people and the environment. By filtering pollutants, nutrients, and sediments, wetlands help protect water quality in our lakes, rivers, streams, and wells. Storing runoff from heavy rains and snowmelts, wetlands reduce flood damage. Wetlands provide for recreational opportunities by providing essential habitat for fish, waterfowl and a variety of other animals. Acre for acre, wetlands usually support a greater variety and number of animals than any other biotic community. Acting as a shoreline buffer, wetlands protect against erosion from waves and currents. By providing natural open spaces, wetlands enhance quality of life, property values, and tourism.



Map 3.3:
Wetlands



- Floodplains

Floodplains are lands that have been, or may be, covered by floodwater during a regional flood and include the floodway and the floodfringe. A floodway is defined as the channel of a river or stream and those portions of the floodplain adjoining the channel required to carry the regional flood discharge. A regional flood, commonly called a 100-year flood, is based on historical data and describes a flood that is expected

to have a 1% chance of occurring in a given year (shown as floodfringe-100 on Map 3.4). The floodfringe-100 (approximate) is where the 1% chance of flooding has been estimated because of a lack of an engineering study in that location, and the floodfringe-500 is where there is a .2% chance of flooding in any given year (see Map 3.4).

The concept that development should avoid floodplains seems almost self-evident. Yet these areas, even when accurately identified, continue to attract homeowners and developers. Floodwaters need not be fast or deep to quickly damage homes, businesses, or other development. Public facilities such as wells, sewage treatment plants, and roads can quickly be rendered unusable and unsafe. Rock County has experienced flooding along the Rock River and its tributaries frequently, at a significant cost to its citizens. With continuing urbanization within the river basin and increasing runoff from impervious surfaces, floods will certainly continue.

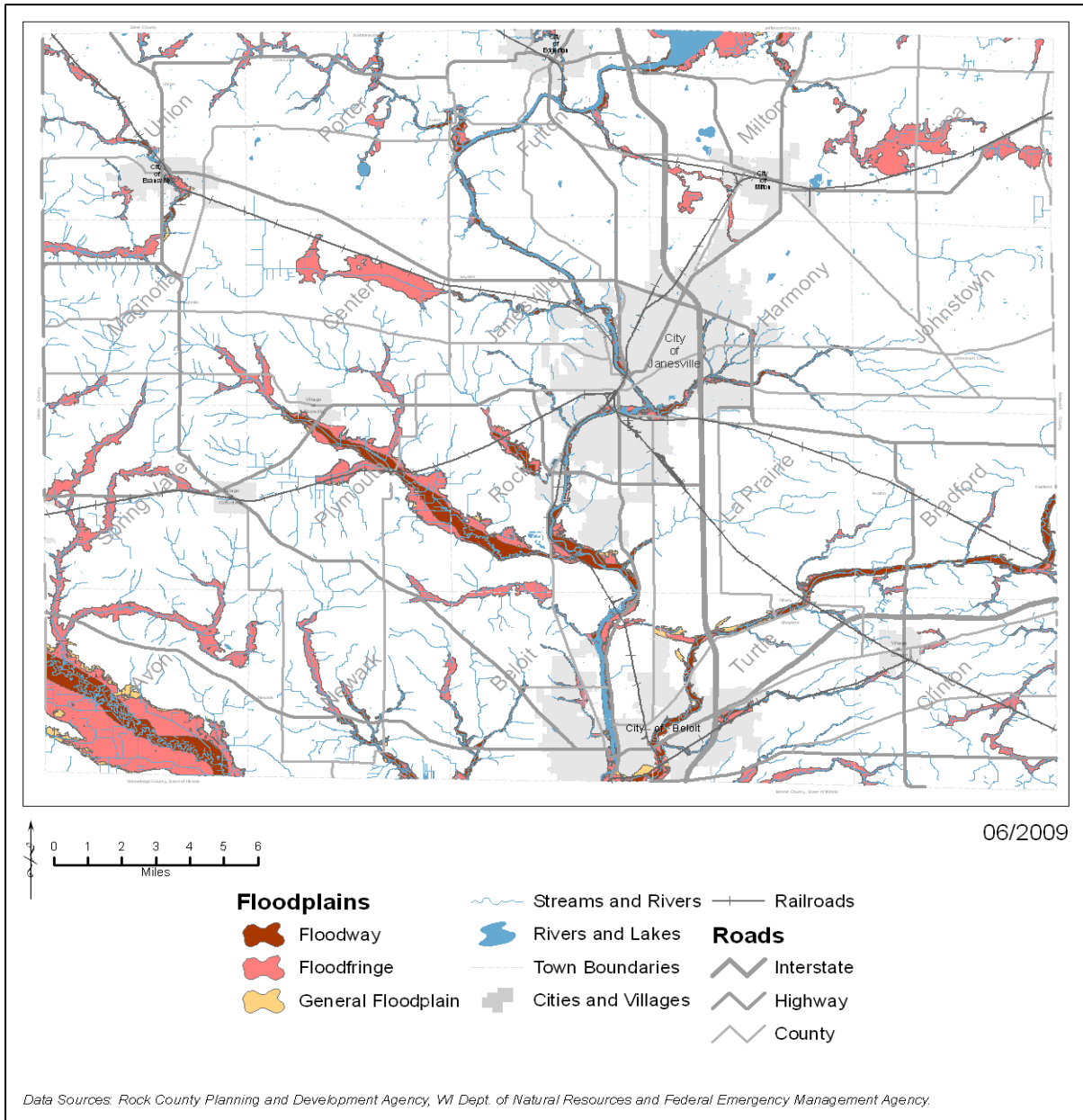
Traditional public responses to floods have included cleanup assistance, financial aid to victims, engineered flood control structures, and insurance programs. However, as these repetitive events have become better understood, and the costs tallied, land use controls are frequently recognized as a better way to manage flood risks and costs.

Chapter 32, Rock County Code of Ordinances establishes the floodplain overlay district. Required by State of Wisconsin Statute 87.30 (1), this ordinance provides for the identification of floodplains within the County and establishes development limits. While not mentioned in the State statute as a purpose for these controls, the environmental value of floodplains has long been recognized. Developed with these factors in mind, floodplains serve important natural functions, serving as shoreline buffers, wildlife corridors, and recreational areas.

Additional information regarding floodplains and their management can be obtained within the *Rock County Natural Hazard Mitigation Planning Manual and Plan* published in September 2004 by the Rock County Planning, Economic & Community Development Agency in cooperation with the Rock County Department of Emergency Management. The plan is available for viewing at the Janesville Hedberg Public Library or the Rock County Planning, Economic & Community Development Agency at the Rock County Courthouse.



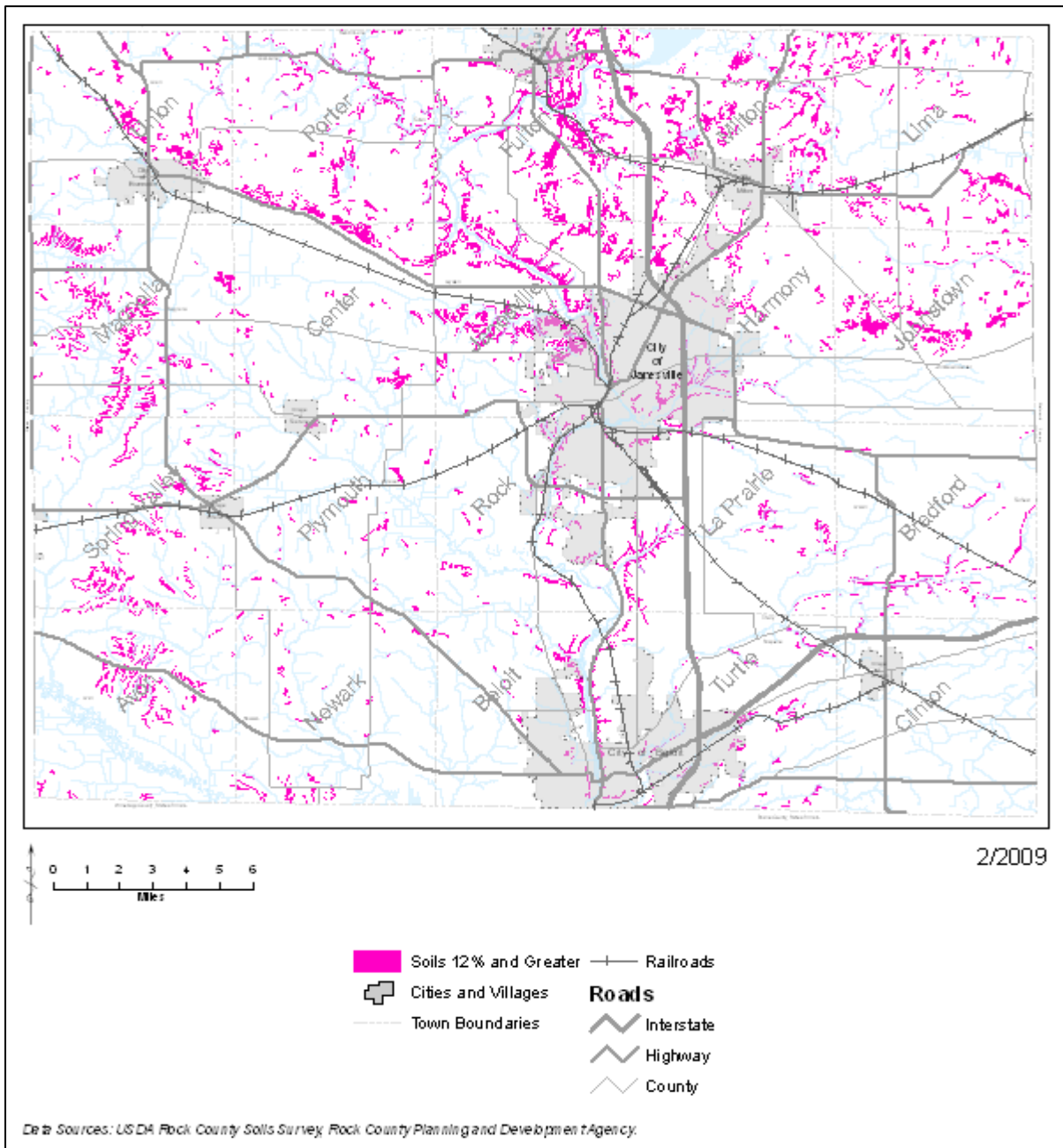
Map 3.4:
Floodplains



- Steep Slopes

Steep slopes are defined as being 12% or more, the generally accepted division between lands topographically suitable or unsuitable for most human uses (see Map 3.5). As slope increases farming or construction projects encounter more restraints, costs, and likelihood of associated environmental degradation. Unless conducted with care using best management practices, farming on steep slopes can result in erosion of topsoil, the exposure of more erodible subsoils or bedrock, and reduction of water quality in adjacent streams. Construction activities on steep slopes typically require more site preparation, increased building costs and too often result in severe erosion and sedimentation problems.

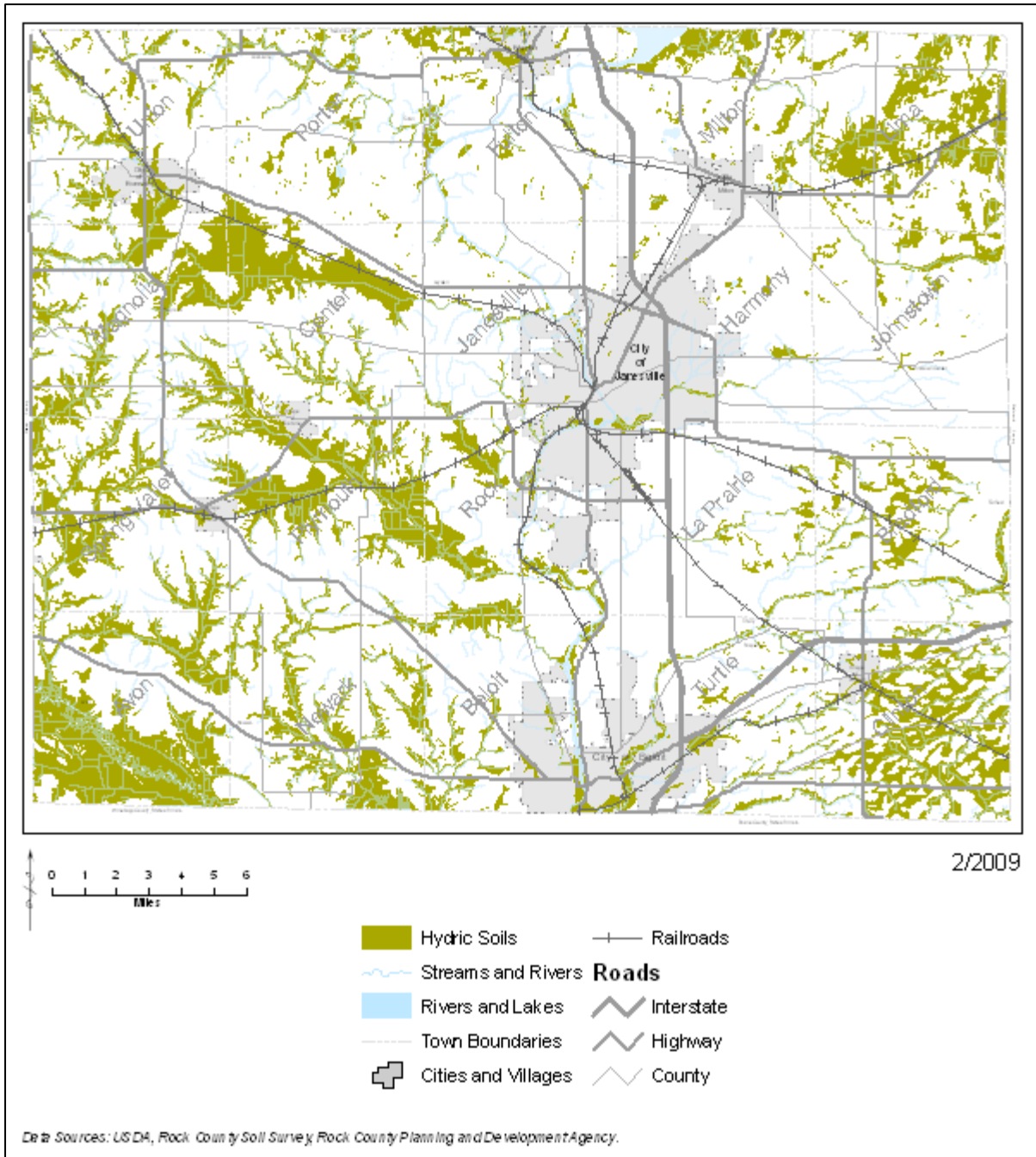
Map 3.5:
Steep Slopes



- Hydric Soils**

Hydric soils are formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions (see Map 3.6). The presence of hydric soils are one of the criteria, along with hydrophilic vegetation and wetland hydrology, which are required to exist before an area can be classified as a wetland. Although human activities, such as ditching, tiling, and grading, can remove enough moisture in many places to permit farming, true hydric soils are not conducive to development activities. Rock County currently has a soil survey showing where all types of soils exist as well as which types of soils are insufficient for development.

Map 3.6:
Hydric Soils



- Natural Areas (Ranked 5 or greater)

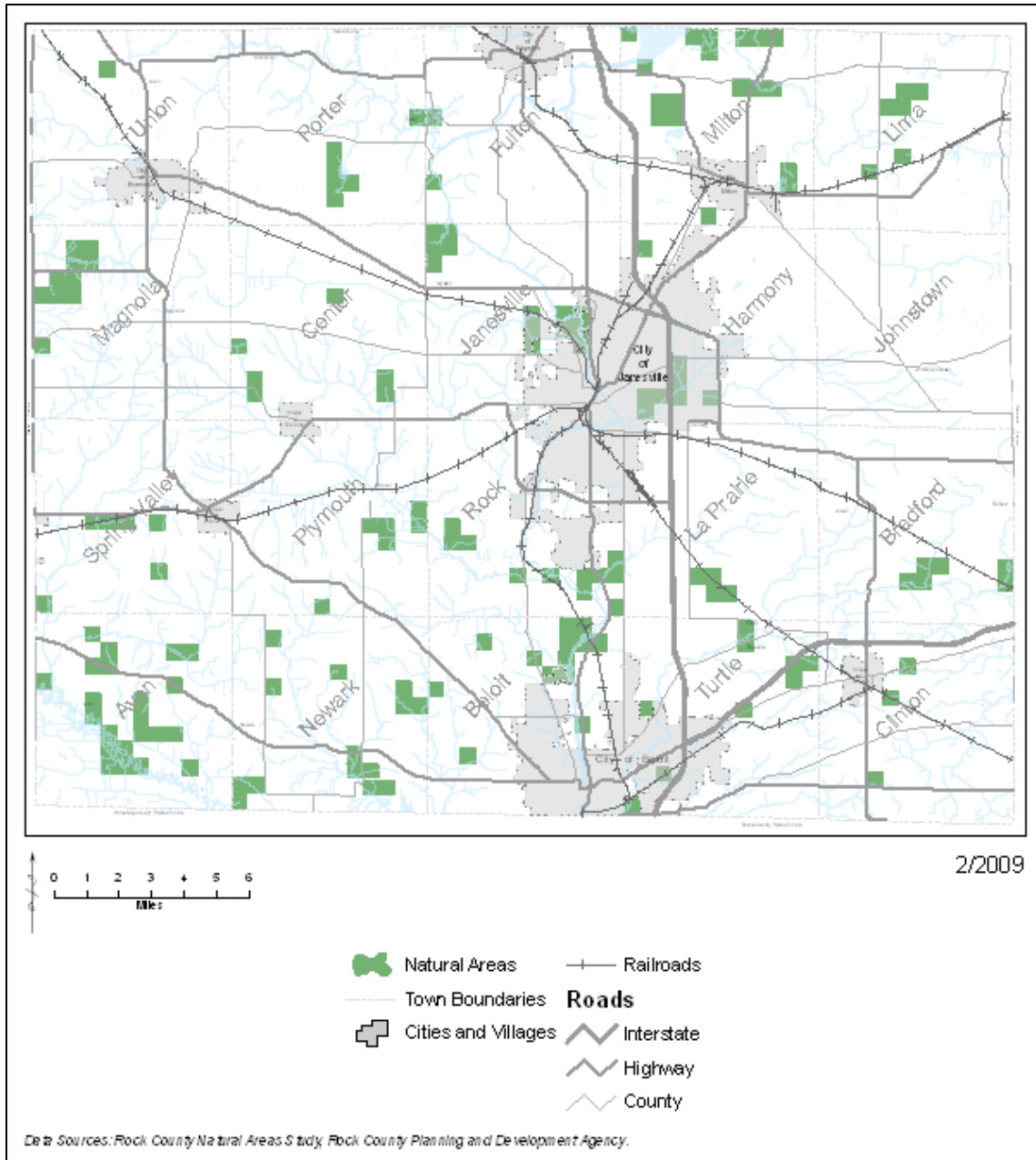
In 2001, ecologist Robert Baller evaluated natural areas in Rock County on behalf of the Rock County Planning, Economic, & Community Development Agency. Sites were derived from the WDNR natural area inventories for Rock County from 1969 and 1986. Baller and others added additional sites. Primary habitats included prairie, savanna, woodland, wetland, and cliff communities. Site evaluations involved mostly floristic assessments. All sites were ranked on a scale of 1-10 (10 being the best site) for their quality and

condition, size, and context. These constituent rankings were combined into an overall rank of 1-10 for each site. A rank of 5 or above denoted an ecologically significant site for Rock County. The 2001 survey involved 114 private and 55 public sites (169 total). Individual site acreages varied from 0.1 to 142 acres. 138 sites were given an overall rank of 5 or greater. The total acreage of sites ranked 5 or greater was 2,686.2 acres or 0.58% of Rock County.



All sites, regardless of ranking, were mapped on the Rock County geographic information system (GIS) for future reference (see Map 3.7). All sites ranked 5 or greater were recommended for conservation. Of these, 39 were recommended for immediate, proactive landowner contact leading to conservation and nine were selected as the highest priorities for conservation. The data in the survey was compiled after re-visiting previously known sites. Presently, there is no complete inventory of the entire County. Future surveys may need to be conducted.

Map 3.7:
Natural Areas



- Groundwater

Rock County obtains all of its domestic drinking water from groundwater sources, including both municipal and private wells. In addition, numerous high capacity wells exist in the County to serve agricultural and industrial uses. Recharge of the County’s aquifers is derived almost entirely from locally occurring precipitation, giving our citizens control over, and responsibility for, their groundwater. As reported in the report, *Groundwater Protection Principles and Alternatives for Rock County*, the County’s aquifers are close to the land surface and their limited natural protection make

them vulnerable to pollution. In order for Rock County to plan for the future, it is essential to protect groundwater quality and quantity.

Although Rock County is fortunate to have an abundant supply of groundwater, long-term planning is needed to assure that increasing demands do not deplete the groundwater. It is estimated Rock County consumes 20 million gallons of groundwater a day. This rate of groundwater use is the third largest in the State (Dane County uses 48 million, and Waukesha County uses 27 million gallons a day, according to United States Geological Survey (USGS) estimates. Evidence in neighboring counties of Dane and Walworth have identified considerable drawdown of the water table in some locations. Rock County may be susceptible to some of these same influences as water demands increase, especially in areas with large numbers of high capacity wells, and areas with increased demand on the sandstone aquifer. Monitoring of potential depletion should be conducted to evaluate possible adverse impacts.

In 2002, the USGS created a groundwater simulation model of all municipal wells in the County that identified zones of contribution for each well (see *Wisconsin Geological and Natural History Survey Open File Report 2002-02 Delineation of Zones of Contribution for Municipal Wells in Rock County, Wisconsin: Final Report*. S. Gaffield, M. Gotkowitz, and K. Bradbury, 2002, 47p.). These zones of contribution identify land areas that contribute infiltration and recharge to a particular well. Recognizing that it is much easier and less expensive to protect supplies than remove pollutants, land use controls and land preservation provide an opportunity to protect these identified groundwater contribution areas. Further information on the zones of contribution and well locations within Rock County can be obtained by contacting the Rock County Health Department, or the Rock County Planning, Economic & Community Development Agency.

Over one-fourth of private wells tested in Rock County exceed the health enforcement level of 10 mg/liter for nitrate-nitrogen. Nitrates are present naturally in groundwater at low levels, but can be elevated due to leaching of agricultural fertilizers, livestock manure, lawn fertilizers or septic system. High nitrate levels have a significant economic impact on the residents of Rock County. Map 3.8 shows areas where contaminants do not have far to go before they reach groundwater because the groundwater is close to the surface of the ground. For this reason, these areas are particularly susceptible to groundwater contamination. Wells with high nitrates sometimes need costly treatment systems or new deeper wells costing thousands of dollars each. Municipalities faced with high nitrates have had to replace high capacity sand and gravel wells with multiple low producing sandstone wells at costs in the millions of dollars. Options available to reduce nitrate impacts include nutrient management plans for agricultural lands, septic system design and maintenance programs, locating new developments in areas with sewer service, and land preservation. In cases of areas already identified as having high nitrate in the well water, the designation of special well casement areas would assist in ensuring that new wells are constructed in a manner as to avoid high levels of nitrates.

The second leading cause of unsafe wells in Rock County is bacterial contamination. Every year 15% to 30% of private wells in Rock County test positive for bacteria. In most cases, the contamination is related to poor well construction issues, especially the existence of well caps that are not vermin-proof. In most cases, bacteria problems are localized to an individual well, however in some cases, local geology and land use can have a broader impact on bacteria contamination of wells. Annual testing can identify this problem and in areas of chronic problems, and again special well casement areas can promote the safe construction of new wells in impacted areas.

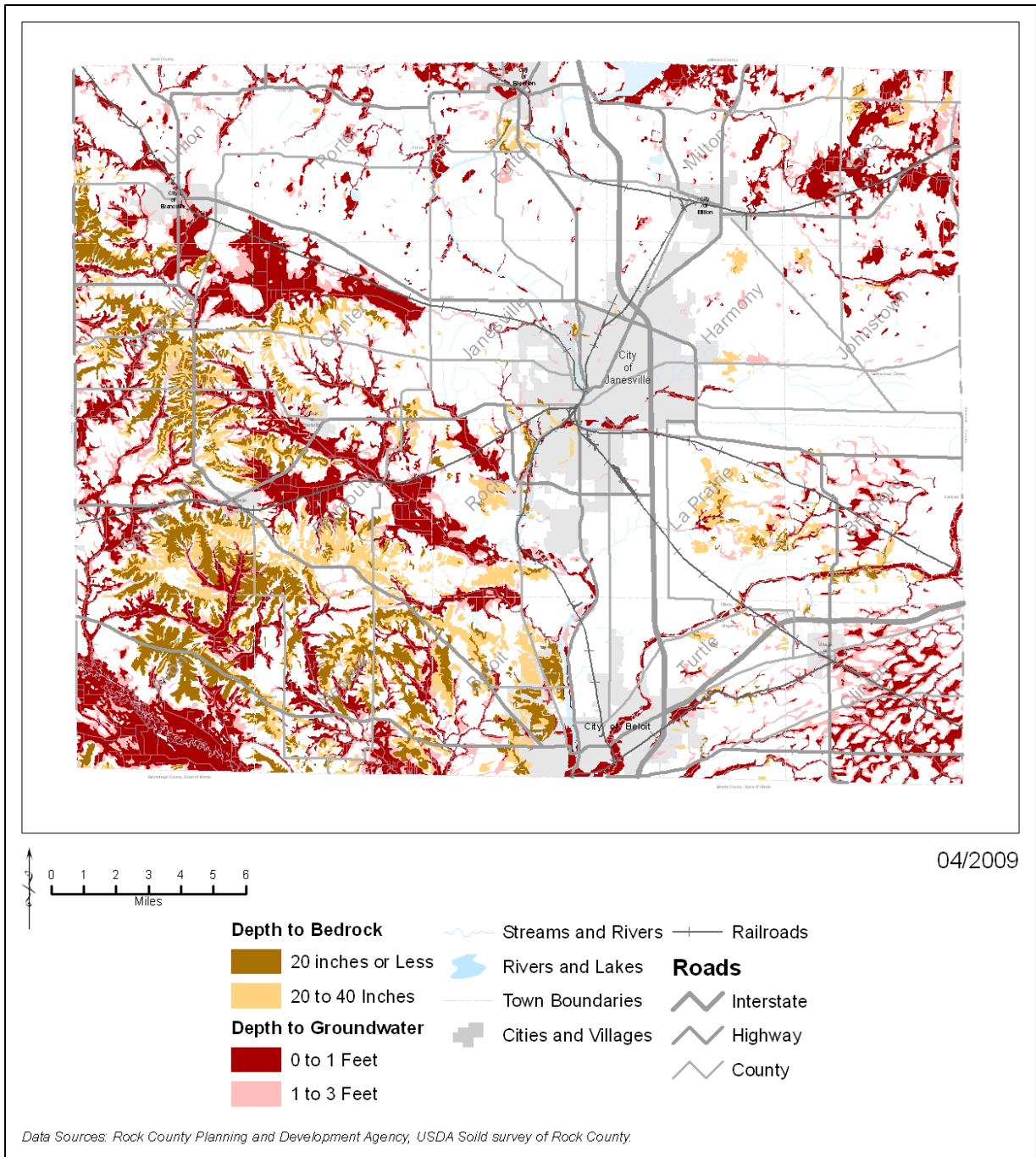
Other known or potential sources of groundwater contamination include underground storage tanks, pesticide applications, salvage yards, solid waste disposal sites, pharmaceutical wastes, and spills of hazardous substances. Programs such as residential and agricultural clean sweeps and pharmaceutical drug collection programs assist the community in removing chemicals from potentially ending up in the waters of Rock County.

It is estimated that there may be over 500 wells in Rock County that are no longer in use but have not been properly abandoned. These wells pose as a potential risk as direct conduits for contamination to enter the groundwater. A County well abandonment ordinance along with cost sharing for proper abandonment should be utilized to eliminate these wells.

Map 3.8 shows areas where there is shallow depth to groundwater and also shows areas where there is shallow depth to bedrock, indicating that groundwater may be threatened due to the limited amount of filtration that can take place before surface water gets to the bedrock where groundwater is stored (bedrock is solid rock made up of carbonated rocks such as limestone or dolomite). Additionally, shallow depth to bedrock areas are areas where it may be advisable to discourage development because fracturing of the bedrock (i.e. through digging a foundation) can also reduce the ability surface water to be filtered before joining the underlying aquifers and can introduce interconnected fractures that serve as conduits for spreading pollutants over a large area.

Educating the public about groundwater concerns is an essential tool in reducing negative impacts to the groundwater of Rock County. Well testing programs, planned development and interagency coordination of community awareness are needed as tools to prevent further degradation of the groundwater.

**Map 3.8:
Depth to Bedrock and Groundwater**

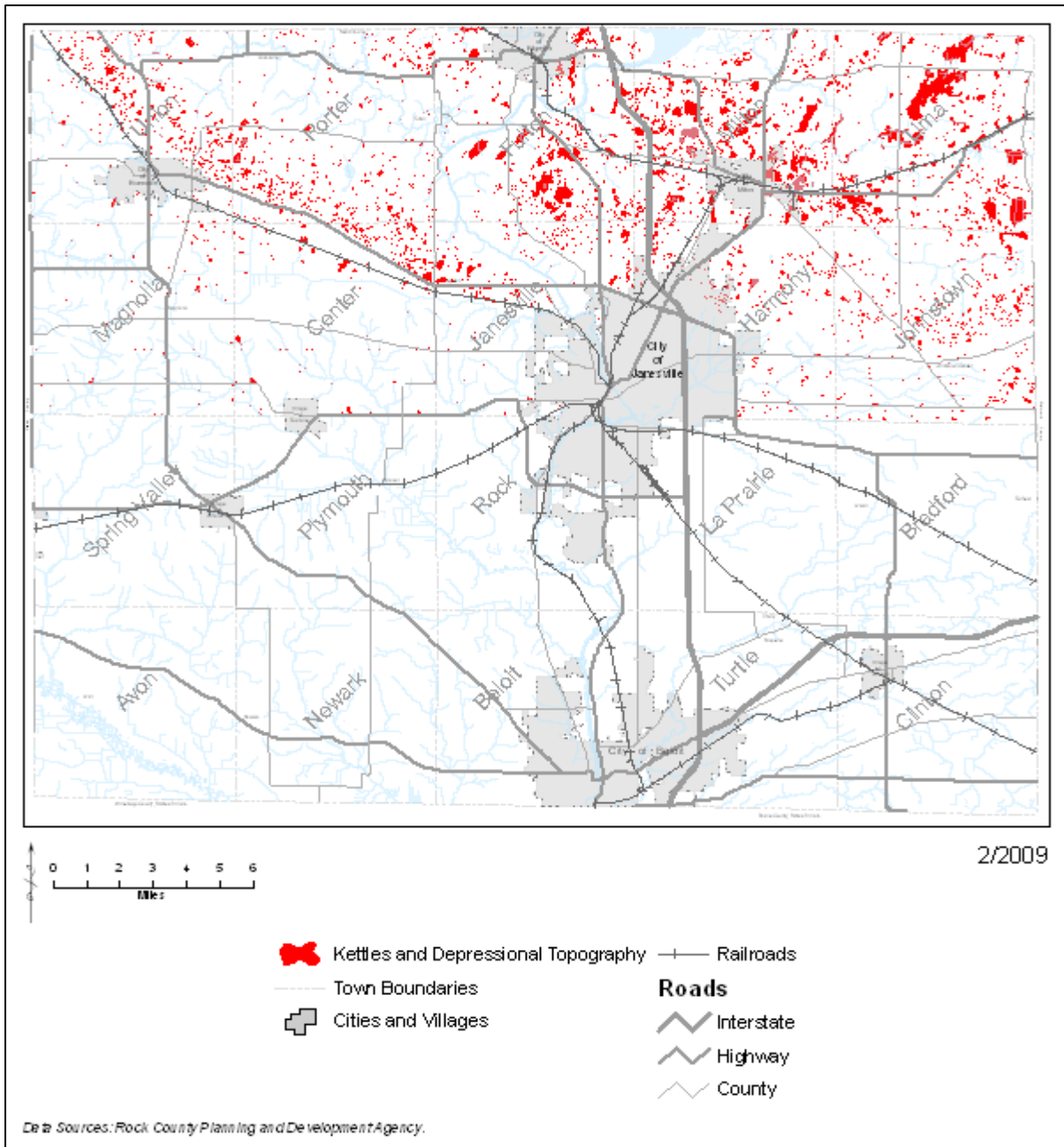


- **Kettles and Depressional Topography**

A kettle is a bowl shaped basin or depression. They are formed by the melting of a large detached block of stagnant ice left behind by a retreating glacier. Rock County has many kettles that were formed during the last ice age. These kettles and depressions vary considerably in size, and although they may exist throughout Rock County, locational data only exists in the northern portion of the County where they are known to be more

numerous (Map 3.9). It is the lack of surface drainage that gives kettles their unique natural characteristics and makes them generally unsuitable for development. Subject to periodic flooding not generally identified in floodplain studies, building sites within kettles often also contain soils that do not offer sufficient foundation support. Kettles frequently contain unique plant and animal communities not found in the surrounding area. These natural depressions can also collect stormwater creating natural recharge areas. If development within or adjacent to kettles concentrates pollutants into stormwater, groundwater quality could be affected.

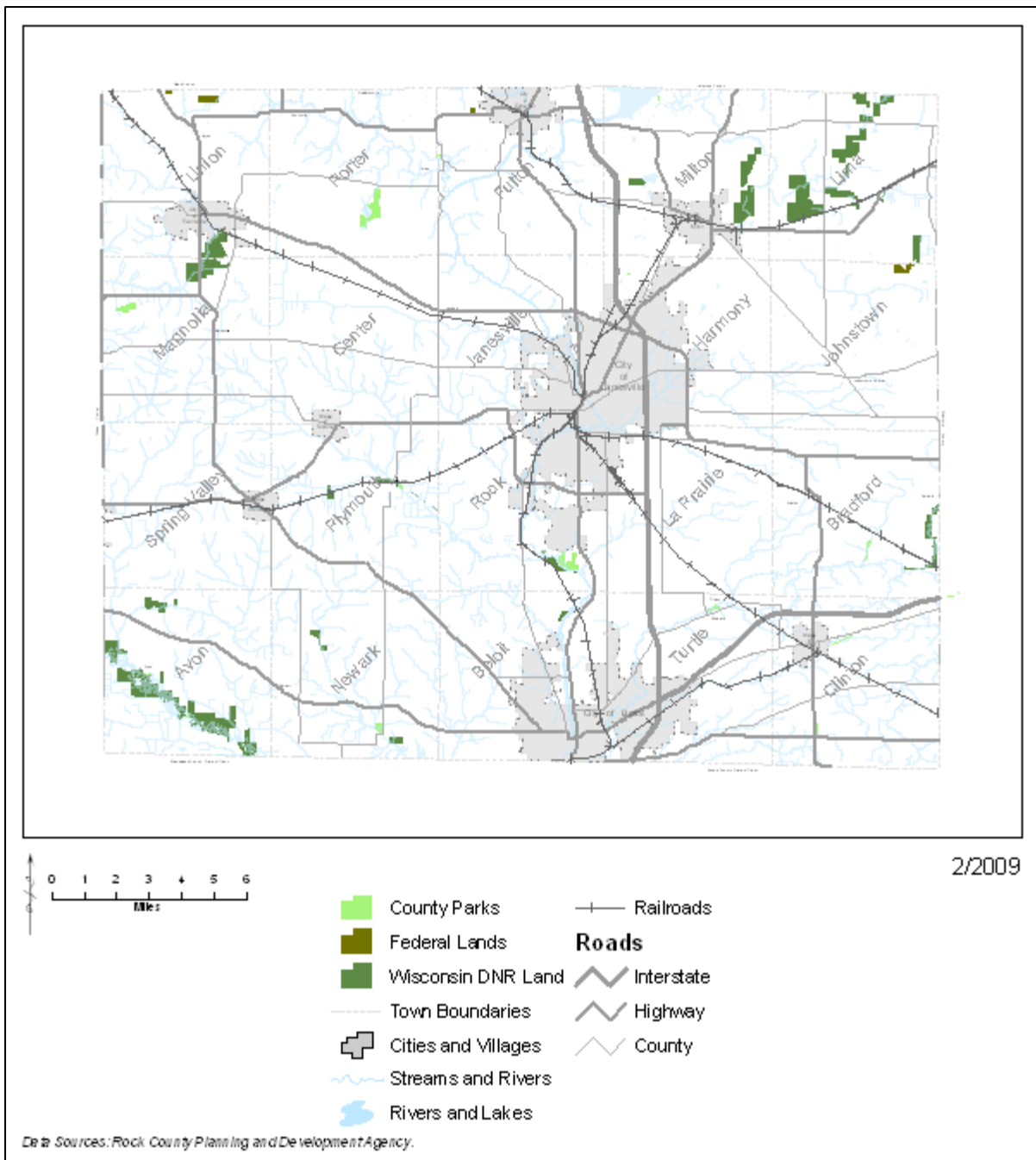
Map 3.9:
Northern Kettles and Depressional Topography



- Parks and Open Space

With increasing pressure for residential, commercial, and industrial development, outdoor recreation and open space areas have become important ingredients to preserving quality of life in Rock County. Accessible and adequate parks and outdoor recreation areas contribute to the overall appeal and livability of Rock County. Map 3.10 shows the location of WDNR hunting lands, County Parks and other State and Federal lands (refer to specific Town comprehensive plans for location of Town parks).

Map 3.10:
Parks and Open Space



The POROS Plan (Section II: Chapter 12 of this *Plan*) is an expression of the County's objectives, needs, and priorities for park and outdoor recreation facilities. The focus of the plan is on assessing existing conditions of County parks and providing policy guidelines for the improvement of outdoor recreational opportunities for Rock County residents. The need for additional parkland has been addressed as one of the objectives of the plan as well. The plan provides for continued eligibility for matching funds from the State of Wisconsin and shows Rock County is setting a course of action for continued improvement of its fine park system.

3.4. Natural Resources Issues and Opportunities

This section lists the County's natural resource issues and opportunities.

- **Environmentally Significant Open Space Areas (ESOSAs):** The Rock County Planning, Economic & Community Development Agency is committed to providing the best possible methods and processes for the protection of natural resources. To that end, in a process for including ESOSAs into the Rock County Land Division Regulations (Chapter 15 - Municipal Code of the County of Rock), a public review and recommendation process will be held for the possible update and modification of the way ESOSAs are defined and used. Several natural features that are not currently identified as ESOSAs, such as depth to bedrock and woodlands, should be considered for identification and protection as ESOSAs because of their environmental significance.
- **Floodplain Enforcement:** The flood of 2008 has brought the issue of improved identification and enforcement of the shoreland overlay (SO) district of the County's Zoning Ordinance (Chapter 32 - Municipal Code of the County of Rock): . Rock County is committed to making those improvements during the term of this *Plan*.
- **Fish and Wildlife Habitat:** A diverse range of water resources in Rock County is reflected in the diversity of the fishery resource. The most significant water resource in the County is the Rock River, which includes approximately 800 acres of Lake Koshkonong. Over 50 species of fish have been identified in the Rock River. The sport fishery is comprised of catfish, smallmouth bass, northern pike, walleye, white bass, crappies, bullheads, bluegills and perch. Carp present problems especially in Lake Koshkonong, but the population is held in check with an aggressive commercial harvest. The WDNR stocks Lake Koshkonong and the Rock River with northern pike, walleye and muskellunge.

The large size of the Rock River Basin combined with high levels of natural fertility, intensive agriculture and municipal development has put a strain on the waters. High levels of phosphorus and sediment combined with algae blooms result in low dissolved oxygen. Periodic testing of fish for contamination has found low levels of PCBs. A health

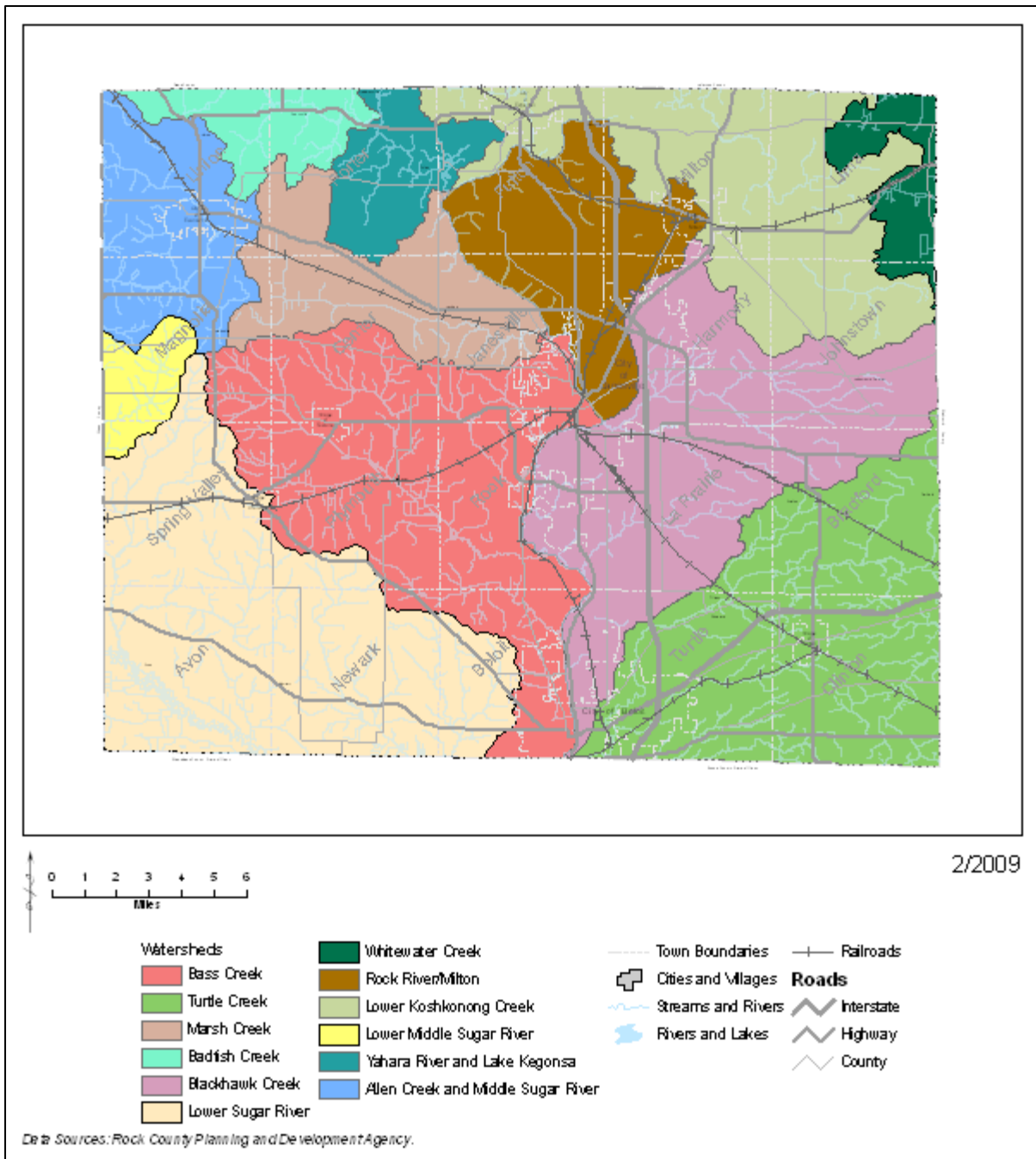
advisory has been issued on eating fish. Lake Koshkonong and the Rock River are on the United States Environmental Protection Agency (EPA) list (303d) of impaired waters. The County has three trout streams, Allen Creek, Spring Creek and the East Fork of Raccoon Creek. Of these, the East Fork of Raccoon Creek was recently determined to be supporting a naturally reproducing population of brook trout. Special regulations are in place to protect this population.

A loss of wildlife habitat due to human encroachment and population growth has historically impacted several wild game species in Rock County. Historically, wildlife populations such as pheasants, quail, and cottontail rabbits rise and fall based on several factors, but there is a direct correlation existing between populations and the number of acres of rural land actively enrolled in conservation reserve programs. These lands now number in the thousands of acres within Rock County.

- **Drainage Basin and Watersheds:** The WDNR delineates water quality management units known as basins, which are further divided into watersheds. Rock County lies within the Lower Rock River Basin and is split into twelve distinctive watersheds (see Map 3.11). These watersheds have differing characteristics that may suggest different management practices for the protection of ground and surface water. The Blackhawk Creek Watershed, for instance, has high susceptibility to groundwater contamination whereas the Lower Koshkonong Creek Watershed has medium susceptibility to groundwater contamination. These areas should be taken into account when considering criteria for protection of groundwater. Various management and conservation programs and assistance may be available to landowners within these watershed areas (see the Rock County Land Conservation Department website).
- **Scenic and Visual Resources:** As population and development densities increase, management of scenic and visual resources will become important considerations for planners, administrators, developers, and citizens of Rock County. Issues such as maintaining aesthetically pleasing viewsheds, landmarks, and transportation corridors will prove challenging. Efforts should be made to analyze all positive and negative visual attributes associated with the site development of such features as cell towers, wind generators, advertising billboards, electrical distribution lines and towers, and water towers. In some cases, County and Town governments may want to explore the use of ordinances to control or standardize the quality of important viewshed areas.

Criteria (such as design and location) for allowing structures on highly visible hilltops and ridgelines should be carefully considered. Although viewsheds are often not addressed as areas for preservation, decision makers should consider the possible negative effects of development in areas that are easily seen from hilltops and ridgelines. In addition, any development along roads or pathways that provide for expansive views of the landscape should be carefully reviewed. At a minimum, visual

Map 3.11:
Watersheds

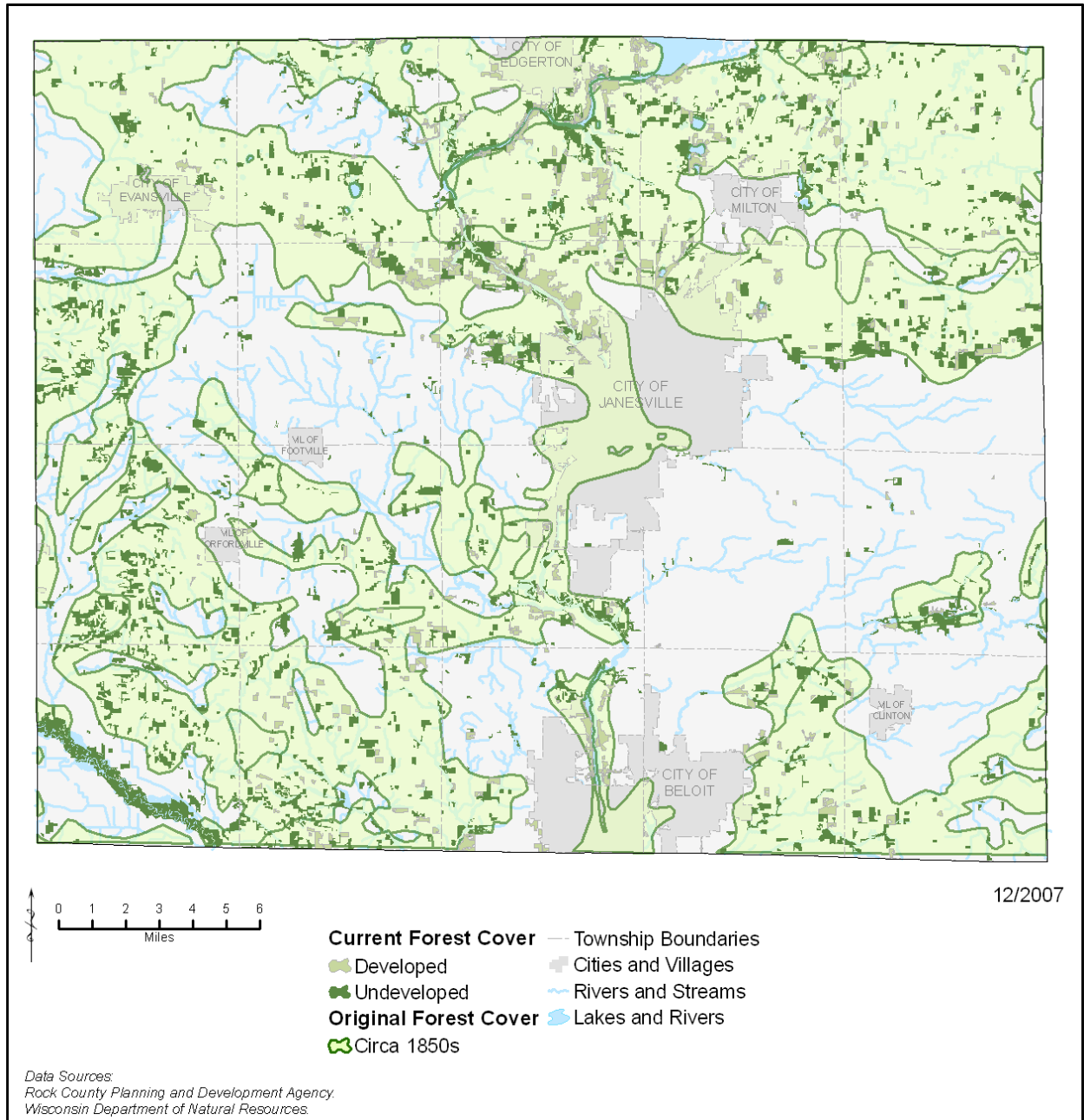


buffer areas around key landmarks within the County should be considered. Uninterrupted scenic views and viewsheds are features that add to the quality of life for residents and contribute to the perception of the quality rural character of the County.

- **Forests and Woodlands:** According to the WDNR, in 2004, Rock County forested area comprised 58,551 acres or 12.6% of the total County land area. Of this acreage, 55,198

are privately owned with the remainder being public lands. Approximately two-thirds of the total acreage is in tracts of less than 40 acres. The total acreage of land enrolled in WDNR's Managed Forest Law (MFL) Program (see Section II: Chapter 5 - Land Use of this Plan) as of January 2006 was 5,607 acres.

Map 3.12:
Forests and Woodlands



One of the problems facing forests and woodlands nationwide is fragmentation (see Map 3.12). Fragmentation is the conversion of large contiguous areas of forest and woodlands into relatively small patches in ways that reduce or eliminate the ability of the forests

and woodlands to provide ecological, economic, and social benefits.

Originally, factors such as agricultural management practices (clearing the land for farming was an accepted practice), fires, and lumber use contributed to the decline of this limited resource. Today, the number of non-industrial private owners of forested land is increasing thereby causing the division of existing forested lands into smaller private parcels. In Rock County, wooded land has drastically increased in value for use as home sites, recreational uses and investment, not typically for forest products. Development of forested or wooded lots has the potential to alter the landscape in ways that can have long-term ecological impacts and can spur greater fragmentation through the establishment of roads, utilities, etc.

Rock County should work with local communities to identify and establish a method to protect or more effectively manage forests, woodlands and valued trees that may be in the path of development.

- **Non-Metallic Mining Reclamation Sites:** Non-metallic mining is a widespread activity in Rock County due to unique geologic features formed thousands of years ago. Much of the sand and gravel in the area was brought here by a series of glaciers. Over time, as the glaciers moved south from what is now Upper Michigan and Canada, rock and other material accumulated within the glacier. As the glaciers melted, most recently around 10,000 years ago, a mixture of sand, gravel, and boulders was deposited in southern central and eastern Wisconsin. Some areas of the County have consolidated rock (limestone or dolomite) at or near the surface. This material has been in place much longer than the sand and gravel and dates back 400 to 600 million years ago.

An ample local supply of these materials provides a lower cost for construction and building supplies, road building and maintenance as well as for agricultural use as lime. While these sites provide a valuable resource to the community, many exhausted or abandoned nonmetallic mining sites have been left in a condition that prevents them from being of further use or, at a minimum, a safe landscape. Rock County now has regulations in place to ensure that all active nonmetallic mine sites comply with standards relating to regrading, re-vegetating, and conversion to the best post-mining land use.

A 1995 State law creating Chapter 295 of State of Wisconsin Statutes, and later Administrative Code NR 135, establishes the framework for statewide regulation of non-metallic mining reclamation. It does this by establishing uniform reclamation standards and setting up a locally administered reclamation permit program. The law is intended to create a reclamation program only. It neither regulates active mining processes nor has any effect upon local zoning decisions such as those related to the approval of new mine sites.

Those people considering opening a new nonmetallic mine site in Rock County should contact the local zoning authority (City, Town or Village) for the procedures necessary

for zoning and mine operation approval. The Rock County Land Conservation Department should also be contacted regarding the procedures necessary for developing a reclamation plan and obtaining a reclamation permit. These processes are independent of each other and may be done concurrently (one approval is not necessarily required prior to obtaining the other) but both are needed prior to mine operation.

Any non-metallic mining site operating after August 2001 is required to have an approved reclamation plan and a reclamation permit to ensure that the mine site is restored following the completion of mining. As of 2006, Rock County currently administers reclamation permits for 44 active sites, consisting of approximately 1,140 active mine acres (see Map 3.13). With another 1,300 acres planned for mining, the area has reserves available for many years to come.

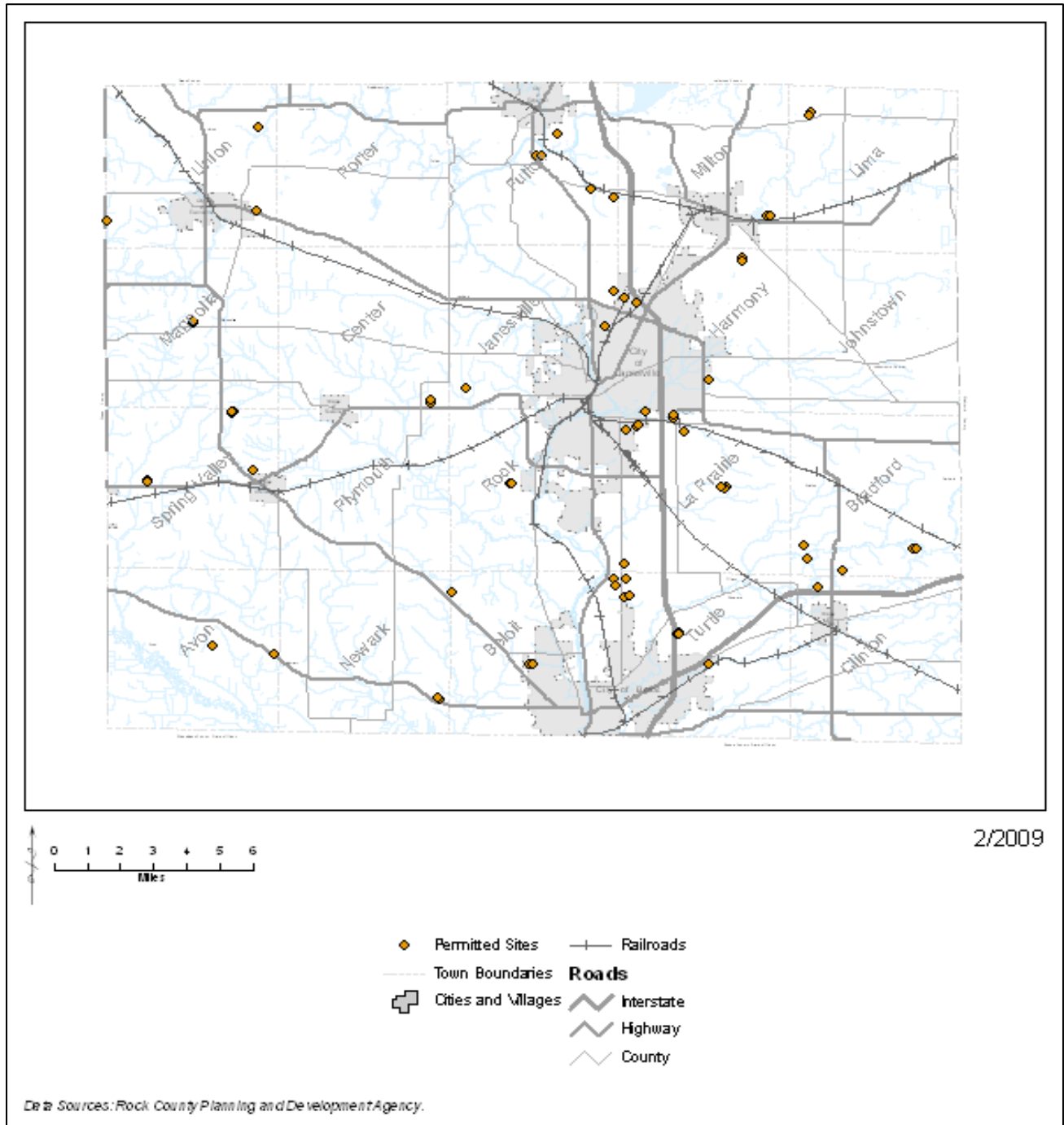
- **Threatened and Endangered Species:** Both the State and Federal governments prepare their own separate lists of threatened and endangered plant and animal species but do so working in cooperation with one another, as well as with various other organizations and universities. The WDNR Endangered Resources Program monitors endangered, threatened, and special concern species and maintains the State's Natural Heritage Inventory (NHI) database. This program maintains data on the locations and status of rare species in Wisconsin and these data are exempt from the open records law because of their sensitive nature.

According to the NHI and the WDNR there are 24 plant, six bird, six fish, three reptile/amphibian, three insect/invertebrate, and two mammal species listed on the Federal or State threatened or endangered species listed in Rock County (see the *Rock County Land and Water Resources Management Plan (LWRMP)*). As development occurs many species of both flora and fauna are forced to move and adapt to new and different environments. This movement can create strain on the species and affect populations via reproduction cycles, feeding and hunting patterns, or adaptability based on soils, water, and human proximity.

The Wisconsin Endangered Species Law was enacted to afford protection for certain wild animals and plants that the Legislature recognized as endangered or threatened and in need of protection as a matter of general state concern. The Federal Endangered Species Act also protects animals and plants that are considered endangered or threatened at a national level. While the conservation of plants, animals and their habitat should be considered for all species, this is particularly important for threatened, endangered, or special concern species. A threatened species is one that is likely, within the foreseeable future, to become endangered. An endangered species is one whose continued existence is in jeopardy and may become extinct. A special concern species is one about which some problem of abundance or distribution is suspected but not yet proven. The main purpose of the special concern category is to focus attention on certain species before they become endangered or threatened.

Implementation of endangered species laws is usually accomplished during the state permit review process, but is ultimately the responsibility of a project proponent and property owner to ensure that they are not in violation of the laws. WDNR is available to provide information on endangered and threatened species. See the WDNR website for the Endangered Resources Program.

Map 3.13:
Permitted Non-Metallic Mine Reclamation Sites



3.5. Natural Resources Goals, Objectives, and Policies

This section states the County's natural resource goal, objectives, and policies.

Natural Resources Goal

3.1. Preserve and protect Rock County's natural resources and open space.

Natural Resources Objectives and Policies

- 3.1.1. Utilize existing policies and ordinances and consider new policies, efforts, mechanisms and ordinances for the purpose of protecting natural resources and open space.
 - 3.1.1.a. Rock County shall continue to enforce the *Rock County, Wisconsin 2009-2014 Parks, Outdoor Recreation, and Open Space (POROS) Plan* for the purpose of preserving environmentally significant open space areas.
 - 3.1.1.b. Rock County shall continue to enforce the Rock County Stormwater Management Ordinance (Chapter 28 - Municipal Code of the County of Rock), the Construction Site Erosion Control Ordinance (Chapter 27 - Municipal Code of the County of Rock), and the Shoreland Zoning Ordinance ((Chapter 32 - Municipal Code of the County of Rock) in accordance with State of Wisconsin Administrative Codes NR 151 and NR 115 for the purpose of preserving and protecting the quality of surface water and shorelands within Rock County.
 - 3.1.1.c. Rock County shall continue to enforce the Shoreland Zoning Ordinance (Chapter 32 - Municipal Code of the County of Rock) in accordance with State of Wisconsin Administrative Code NR 115 and 116 and will continue to oppose building and construction within any designated wetland within Rock County.
 - 3.1.1.d. Rock County shall continue to enforce the *Rock County Hazard Mitigation Plan* and the Rock County Floodplain Zoning Ordinance (Chapter 32 - Municipal Code of the County of Rock) in accordance with State of Wisconsin Administrative Code NR 116 and will continue to oppose building and construction within any designated floodway within Rock County.
 - 3.1.1.e. Rock County shall continue to monitor, prevent and/or oppose development on 16% slopes or greater unless properly engineered to mitigate downstream impacts.
 - 3.1.1.f. Rock County shall continue to monitor, prevent and/or oppose development on hydric soils.

- 3.1.1.g. Rock County shall continue to enforce the Rock County Stormwater Management Ordinance (Chapter 28 - Municipal Code of the County of Rock) and Construction Site Erosion Control Ordinance (Chapter 27 - Municipal Code of the County of Rock) in accordance with State of Wisconsin Administrative Code NR 151 to preserve and protect the quality of groundwater in Rock County.
- 3.1.1.h. Rock County shall support efforts and ordinances that preserve and protect natural areas ranked 5 and above as defined in the *Rock County Natural Area Survey*, June 2002.
- 3.1.1.i. Rock County shall support efforts and ordinances that preserve and protect bedrock and groundwater.
- 3.1.1.j. Rock County shall support efforts and ordinances that preserve and protect the quality of kettles and depressions, the unique habitat they provide and their ability to act as natural recharge areas.
- 3.1.1.k. Rock County shall support efforts and ordinances that preserve and protect parks and open space for the enjoyment of the citizens of Rock County.
- 3.1.1.l. Rock County shall support efforts and ordinances that preserve and protect the Lower Rock River Drainage Basin and associated watersheds.
- 3.1.1.m. Rock County shall support efforts and ordinances that preserve and protect forests, woodlands and valued trees.
- 3.1.1.n. Rock County shall support efforts and ordinances that preserve and protect all species identified, either at the local, State, or Federal level as threatened or endangered.
- 3.1.1.o. Rock County shall support efforts and ordinances that preserve and protect fish and wildlife habitat.
- 3.1.1.p. Rock County shall support efforts and ordinances that preserve and protect the visual quality of scenic and visual resources such as hilltops, ridgelines and vistas.
- 3.1.1.q. Rock County shall consider amending those Rock County documents referenced within the Policies under Objective 3.1.1, *Rock County Comprehensive Plan 2035*, for the purpose of making them consistent with the intent of Section II: Chapter 3 - Natural Resources of the *Rock County Comprehensive Plan 2035*.

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- 3.1.1.r. Rock County shall consider developing a land evaluation and site assessment (LESA) system as a means to objectively measure soil quality, presence of natural features, proximity to urban services and other measures.
- 3.1.1.s. Rock County shall research financial mechanisms to support natural resource and open space preservation efforts.
- 3.1.2. Promote conservation and preservation of farmland, natural resources and open space through consistent land division decisions.
- 3.1.2.a. Rock County shall consider amending the Land Division Regulations (Chapter 15 - Municipal Code of the County of Rock) for the purpose of protecting environmentally significant open space areas (ESOSA).
- 3.1.2.b. Rock County shall consider amending the Land Division Regulations (Chapter 15 - Municipal Code of the County of Rock) to:
- Require developers to incorporate and preserve environmentally significant open space areas (ESOSA) within the designs and scope of their projects.
 - Require identification of all forests, woodlands and species on all building site proposals and land divisions.
 - Include a list of encouraged and discouraged vegetative species.
 - Require builders/developers to review, analyze and identify environmental issues affecting the safety (as related to flooding) and design of new development.
 - Require identification of natural features and agricultural soil capability present at all proposed development sites.
 - Require identification of natural features that may be affected by development that are not directly on the development site.
 - Specify criteria for the level of protection of natural features and open space present in the County.
 - Specify a procedure for discussing, collaborating on, and submitting development designs prior to the application approval process.
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- 3.1.2.c. Rock County shall consider other amendments to the Land Division Regulations (Chapter 15 - Municipal Code of the County of Rock) that are consistent with the intent of Section II: Chapter 3 - Natural Resources of the *Rock County Comprehensive Plan 2035* .
- 3.1.3. Encourage, educate and assist local Rock County governments and/or organizations in the responsible management and preservation of natural resources and open space.
- 3.1.3.a. Rock County shall provide, when available, information, mapping and policy recommendations to other jurisdictions for the responsible analysis, management, and preservation of rural character, natural resources, open space, farmland and cultural resources.
- 3.1.3.b. Rock County shall educate local units of government and the public on the use of cluster development, conservation subdivision, landscape and sign ordinances and any other policies or ordinances that encourage the preservation of natural resources and/or farmland cultural resources and/or rural character (see Section II: Chapter 3 - Natural Resources, 3.5., *Rock County Comprehensive Plan 2035*).
- 3.1.3.c. Rock County shall consider creating the following model ordinances for local government use and implementation:
- Cluster development ordinance
 - Conservation subdivision ordinance
 - Landscape ordinance
 - Sign ordinance
 - Ordinance regulating cell towers and any other unnatural, tall structures as needed to preserve the rural character of the landscape
 - Wind generating device ordinance
- 3.1.3.d. Rock County shall assist local governments in the development of the Ice Age National Scenic Trail in the County.
- 3.1.3.e. Rock County shall continue to work cooperatively with the Ice Age Park and Trail Foundation and/or other appropriate organizations to determine possible locations for Ice Age Trail and/or other parks and trails for designation or development within Rock County.
- 3.1.3.f. Rock County shall meet with the Cities, Villages and Towns within the County to explore the viability of regional preservation programs such as purchase of agricultural conservation easements (PACE)/purchase of development rights (PDR) and/or transfer of development rights (TDR)
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- 3.1.4. Support efforts and ordinances to further protect the quality of groundwater in Rock County.
 - 3.1.4.a. Rock County shall consider establishing well testing programs as tools to prevent further degradation of the groundwater.
 - 3.1.4.b. Rock County shall educate local units of government and the public on groundwater concerns and issues.
 - 3.1.4.c. Rock County shall consider adopting a County well abandonment ordinance that provides for cost sharing for proper well abandonment.
 - 3.1.4.d. Rock County shall consider re-establishing an acceptable number of groundwater monitoring wells within the County through collaboration with the United States Geological Survey (USGS) or other appropriate agency.
 - 3.1.4.e. Rock County shall investigate and consider implementing procedures for designating special well casement areas in areas already identified as having high nitrate or bacteria levels in the well water in order to ensure the safety of new wells.
 - 3.1.4.f. Rock County shall consider collecting data regarding the quality and quantity of groundwater within Rock County.
 - 3.1.5. Support efforts and ordinances to further protect floodplains and floodways in Rock County.
 - 3.1.5.a. Rock County shall support and assist all entities in the delivery of information and mapping regarding floodplains within Rock County.
 - 3.1.5.b. Rock County shall identify, document and maintain data regarding structures located within floodplains in an effort to mitigate future hazards associated with flood prone areas within Rock County.
 - 3.1.5.c. Rock County shall educate County residents who have structures located within floodplains on flood probability and other issues associated with floodplains in an effort to mitigate future hazards associated with flood prone areas.
 - 3.1.6. Continue to support responsible management and reclamation of non-metallic mining sites in Rock County.
 - 3.1.6.a. Rock County shall continue to administer, monitor, and document non-metallic mining sites and reclamation plans within Rock County.
 - 3.1.6.b. Rock County shall provide assistance to local governments for analysis, planning and reclaiming of non-metallic mining sites.
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