8. NATURAL RESOURCES

NATURAL RESOURCES VISION

By 2035, St. Croix County has maintained and enhanced its natural resource base. The water quality for drinking and recreation is excellent. The streams, rivers and lakes are clean and vibrant with healthy fish and recreational opportunities. The air quality is excellent in part because green energy is produced by solar, wind, and geothermal power.

St. Croix County has a healthy diversity of natural land resources – lakes, rivers, streams, woods, wetlands, prairie – that contribute to the quality and abundance of wildlife and to the beauty of the county. The County has conducted a natural resources inventory to provide a basis for exploring new policies such as preservation and transfer of development rights. The County works to maintain the lake and river water quality in particular in the St. Croix River, Willow, Apple and Bass Lake watersheds, and to preserve and enhance wildlife corridors along streams and rivers and through woods and prairies. Enhancing water quality has occurred by preventing contaminated runoff from agricultural lands and impervious surfaces like highways and driveways. The County has worked to give the public access to many of these natural areas for walking, nature study and quiet contemplation in coordination with the DNR and in some cases private landowners. The County has promoted the use of purchase of development rights through a land trust, has incentives to preserve viewsheds and open space and continues to examine new techniques as they are created.

The County has identified a network of natural resource corridors that provide various activities like hunting, fishing and walking when appropriate. The County has identified in conjunction with these corridors a network of bike trails and other recreational opportunities.

INTRODUCTION

St. Croix County's history and development is rooted in its natural resources. Prior to settlement by those of European heritage, St. Croix County was covered in a variety of different ecosystems including prairie, forest, and marshland. The early settlers included loggers, traders and farmers, who made a living from the natural resources of the land.

This section describes the existing conditions of the natural resources of St. Croix County.

This element is further organized into four sub-sections:

Natural Resources - Physical Features
Natural Resources - Sensitive Lands
Environmental Corridors
Natural Resources – Issues & Concerns
Summary

NATURAL RESOURCES – PHYSICAL FEATURES

The following primary physical features of St. Croix County are discussed in this subsection:

- Topography
- Geology
- Mineral Resources
- Soils
- Water Resources
- Air Quality

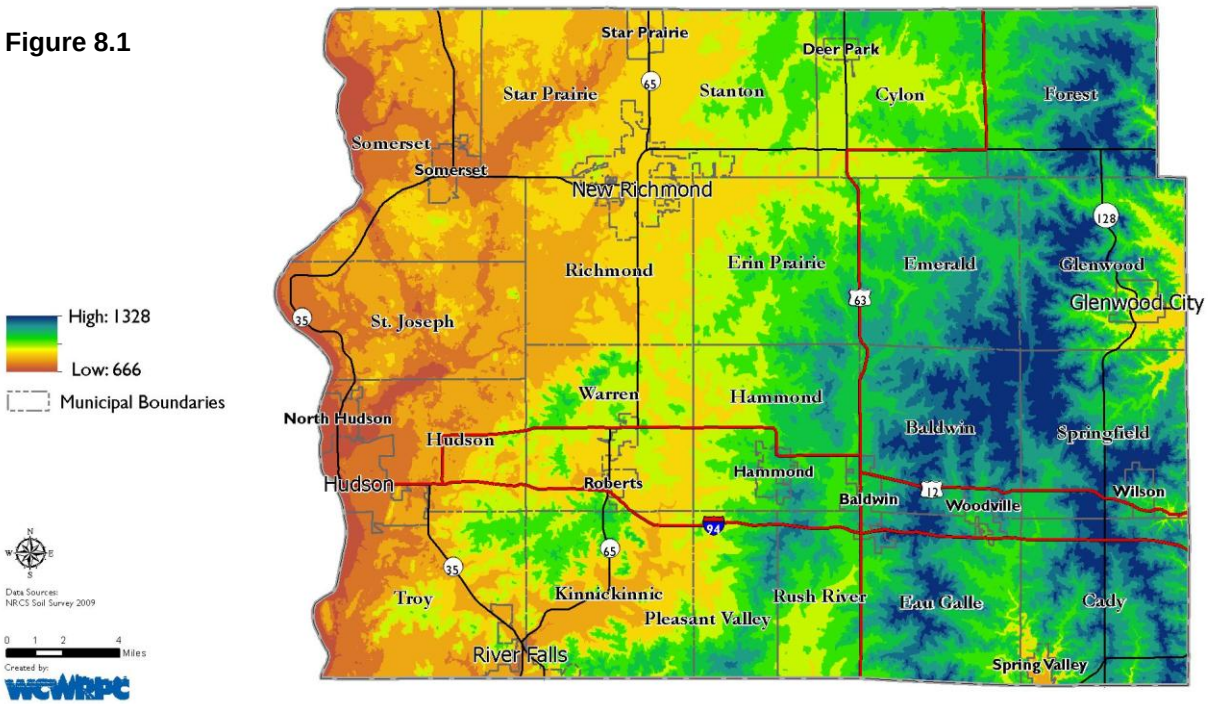
TOPOGRAPHY

Surface topography in St. Croix County ranges from gently rolling to steep ridges along deeply incised stream valleys. Much of the central portion of the County is a rolling plain, while mesas and resistant dolomite formations break the plain. Areas of more rugged topography are found in the northwestern portion and along the eastern fringes of the County. The scenic character of the County landscape was strongly influenced by two principal factors: the landforms created by glacial deposits and the effects of water in creating stream channels, lakes, and valleys.

Local relief in the County is over 600 feet and ranges from almost 1,300 feet in the eastern hill area near Glen Hills Park down to 675 feet in the southwest as shown in Figure 8.1. Generally, the more rugged topography can be found in southern parts of the County and along the eastern edge, while the central part of the county is a gently undulating plain. Topographic elevation data is available on USGS 24,000 Quad topography maps, generally showing 20 foot contour intervals. Digital two foot contour data are available but are sporadic throughout the County.

Elevation

Figure 8.1



source: NRCS Soil Survey 2009

GEOLOGY

Surface Geology

Geology is the foundation of the landscape. It defines the topography of the land, determines the location of springs and rivers, and provides drinking water from its bedrock aquifers. The surface geology of St. Croix County has been influenced by several periods of glaciation, the last one ending approximately 10,000 years ago. Landforms produced by glacial deposition include end moraine, ground moraine, and outwash plains. The first glacier covered the entire County while the second, the Wisconsin Stage, covered only the land northwest of the Willow River.

End moraines are formed by deposition at the margin of a glacier during a standstill of the glacial front, when the rate of melting equals the rate of glacial advance. They form either at the point of maximum ice advance or during the recession of the glacier. The northwest corner of the County is covered by end moraine from the Superior lobe of the Wisconsin Age of glaciation. This end moraine consists of unsorted glacial material ranging in size from clay to boulders. Typically, the topography is rugged to rolling or hummocky with deep stream gorges and kettles (pits) which may contain lakes or marshes.

The rest of the County is covered by ground moraine deposited previous to the Wisconsin stage of glaciation. Ground moraine was deposited under glacial ice as a blanket of unsorted rock debris, which ranges widely in size. Early-Wisconsin or pre-Wisconsin Age glaciers deposited the ground moraine, which covers much of St. Croix County. A gently rolling topography, meandering streams and few lakes characterize this ground moraine. The topography here is a gently undulating plain with moderate relief and no definite alignment of undulation.

St. Croix County's rolling topography is clearly depicted in this bare field. Photo by Tammy Wittmer.

Immediately adjacent to the leading edges of the end moraine deposited by the Superior lobe is a pitted outwash plain of stratified layers of sand, gravel, silt, and clay. The outwash plain was deposited by running water from melting glaciers. Kettles developed in the plain from the melting of buried blocks of ice. The St. Croix River Valley, along the western extreme of the County, was a major glacial drainageway as the glaciers melted and receded.

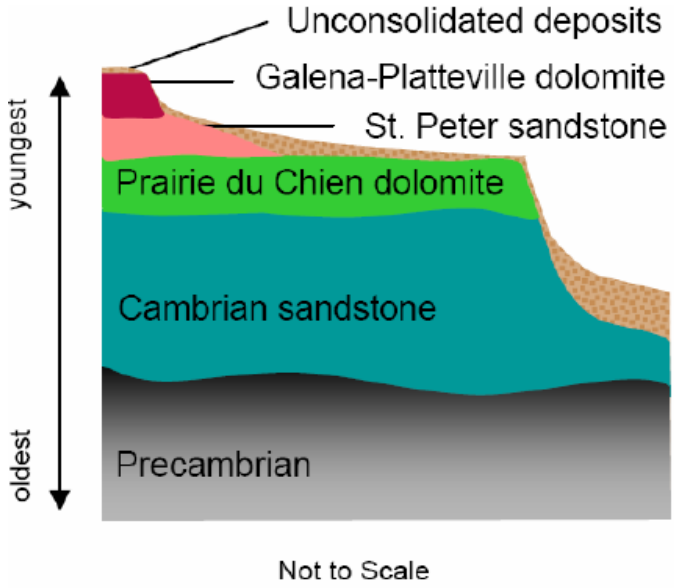
Faults lines underlie St. Croix County's geography. There is no indication of earthquake threat. In some locations, the characteristics of the sedimentary rocks have been altered. Sedimentary rocks are vertically offset by hundreds of feet along two regional faults and by tens of feet along smaller mapped and unmapped faults throughout the county.

The regional Hastings and Cottage Grove faults extend through all of the sedimentary rock and place rocks of different formations adjacent to one another. The internal structure of these faults is not well understood, nor is the effect of the faults on groundwater-flow patterns. Research on other faults outside of the county suggests that faults are generally composed of a thin internal fine-grained core and a surrounding damage zone in which the native rocks are fractured. See Figure 8.3.

Bedrock Geology

Most of the bedrock surface of the County was covered by glaciation. Four different bedrock formations are found below the bedrock surface: Precambrian rocks, Cambrian sandstone, Ordovician rock, and unconsolidated materials. Figure 8.2 displays the bedrock geology of St. Croix County.

Figure 8.2: Bedrock Geology of St. Croix County



source: UW-Extension, Introduction to Groundwater St. Croix County

Precambrian rocks are the bottommost layer of bedrock that can be found throughout St. Croix County and the entire State of Wisconsin. These rocks were formed around 4,000 to 600 million years ago and consist of some very old sedimentary rocks, as well as igneous and metamorphic rock types, primarily granite and basalt. This rock unit or layer is commonly referred to as crystalline bedrock.

Cambrian sandstones are sedimentary rocks that were formed about 600 to 425 million years ago. During this time period eroded sands were deposited in layers on the ocean floor. These layers formed a loosely cemented sandstone rock which is between 300 to 500 feet thick. Predominant formations of the Cambrian include **Mt. Simon, Eau Claire, Galesville, Franconia and Trempealeau**. This formation can be found near surface geology in the northwest portion of the County; however it is usually covered by the deepest deposits of glacial material. See Figure 8.3 for the bedrock geology of the formations.

Ordovician rocks are the youngest rocks and are the uppermost bedrock layers. These sedimentary rocks consist of sandstones, shales, and dolomites. These are further defined as the **Prairie du Chien group, St. Peter Sandstone Formation**, and **Galena-Platteville Formation**. Due to early erosion, the Galena-Platteville Formation is only found where it caps some hills in the southwest portion of the County. The St. Peter Sandstone underlies this formation and is the uppermost bedrock layer in about 1/5 of the County. The primary bedrock layer that covers over half the County is the Prairie du Chien dolomite.

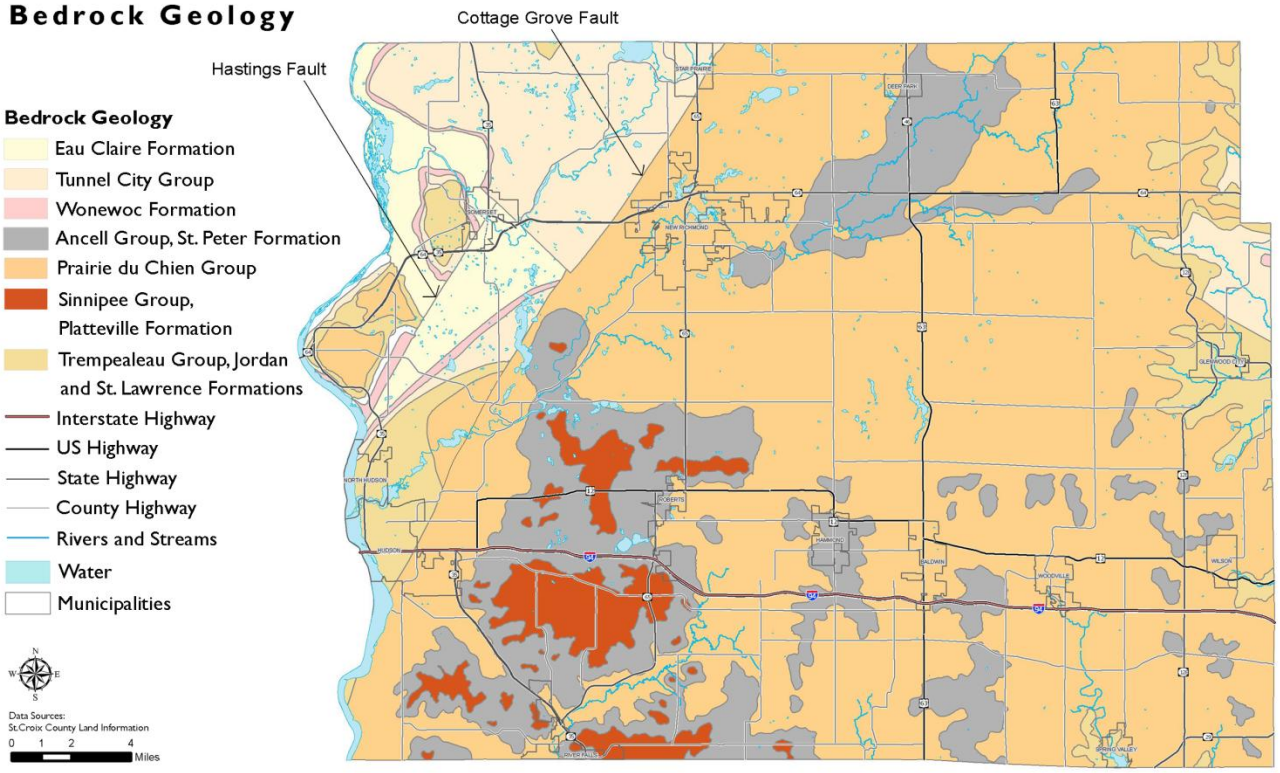
Unconsolidated materials of mainly till and sands deposited by glaciers are found overlying the bedrock throughout almost the entire County. The thickness around Emerald is between 50-100 feet.

The Hydrogeology of the Prairie Du Chien Group

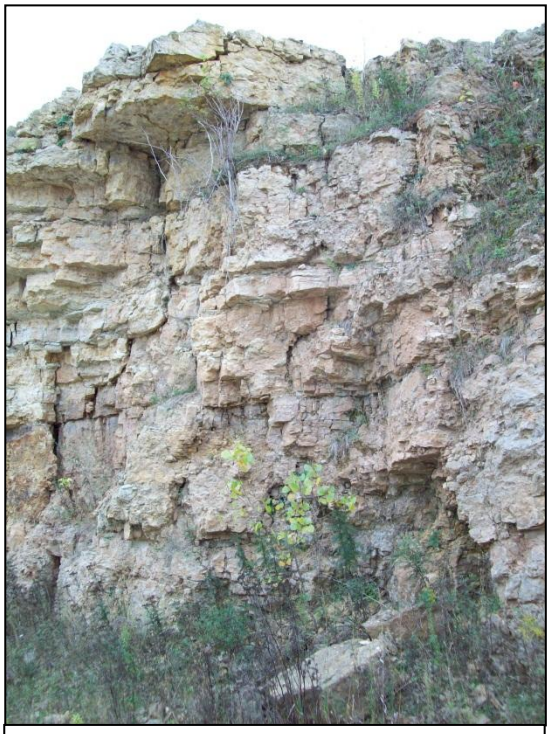
A report on the hydrogeology of the Prairie Du Chien Group was completed in 2007 by Michael Cobb, a graduate student from the University of Wisconsin-Madison. This in-depth study examines and describes the erratic movement of groundwater through St. Croix County's Prairie Du Chien karst geology, and includes a simulation of groundwater flow. The report is available on St. Croix County's Land & Water Conservation website: www.sccwi.us/lwcd.

Figure 8.3

Bedrock Geology



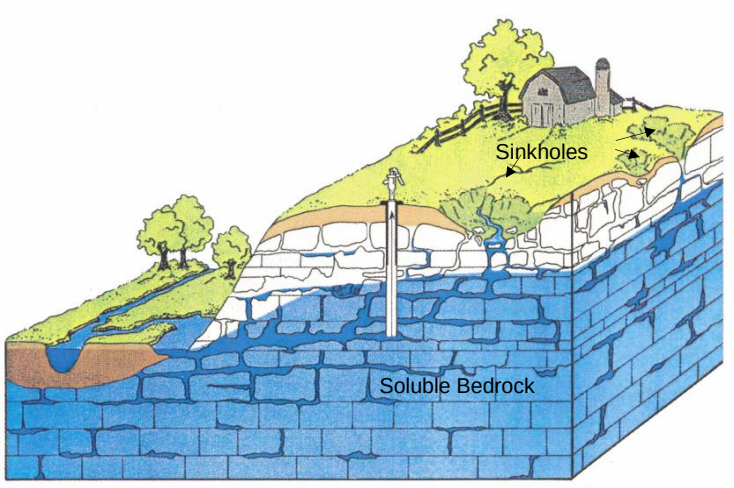
Shallow bedrock is located mostly in the southern half and eastern edge of the County. Figure 8.5 shows shallow depth to bedrock. These conditions pose higher construction costs for basements and also risk groundwater contamination from on-site septic systems because of the lack of a filtering soil layer.



Exposed Prairie du Chien bedrock in St. Croix County. Photo by Tammy Wittmer.

Karst features also referred to as closed depressions are found on the land surface throughout the County and include: sinkholes, exposed or shallow bedrock, springs, disappearing streams and ponds and bedrock outcroppings. These have been formed through two quite different geological processes: karst development and glaciation. Fractures in the Ordovician aged rock units, primarily the Prairie Du Chien Dolomite can increase the potential for Karst Topography.

Figure 8.4 Groundwater Flow



This diagram illustrates groundwater flow through cracks and fractures in the bedrock and the development of several sinkholes.

source: Hallberg Et Al, 1984

Karst development occurs in regions with highly soluble bedrock; St. Croix County is covered by rather thick, soluble carbonate units, primarily known as Prairie du Chien Dolomite. As water travels through the cracks, existing and new fractures develop in the dolomite. The growing fractures form karst features (such as sinkholes) on the land surface and create conduits for polluted surface runoff to enter the groundwater, some of these features can also be seen in Figure 8.4.

This is a sinkhole that is typically found in waterways throughout St. Croix County. Sinkholes can lead to direct contamination of groundwater. Photo by Tammy Wittmer.

Glacial action can also result in topography marked by closed depressions known as kettles or kettleholes. Kettles develop when large blocks of glacier ice are buried within glacial deposits and subsequently melt. Many of the depressions in the western and northwestern portions of the County are kettles that developed in the St. Croix moraine after it was deposited during the Wisconsinian glaciation.

Since closed depressions sometimes offer minimal soil layers between the bottom of the depressions and the bedrock underneath, they are a significant potential source of groundwater contamination. The groundwater section of this document offers more discussion on closed depressions and related groundwater concerns.

MINERAL RESOURCES

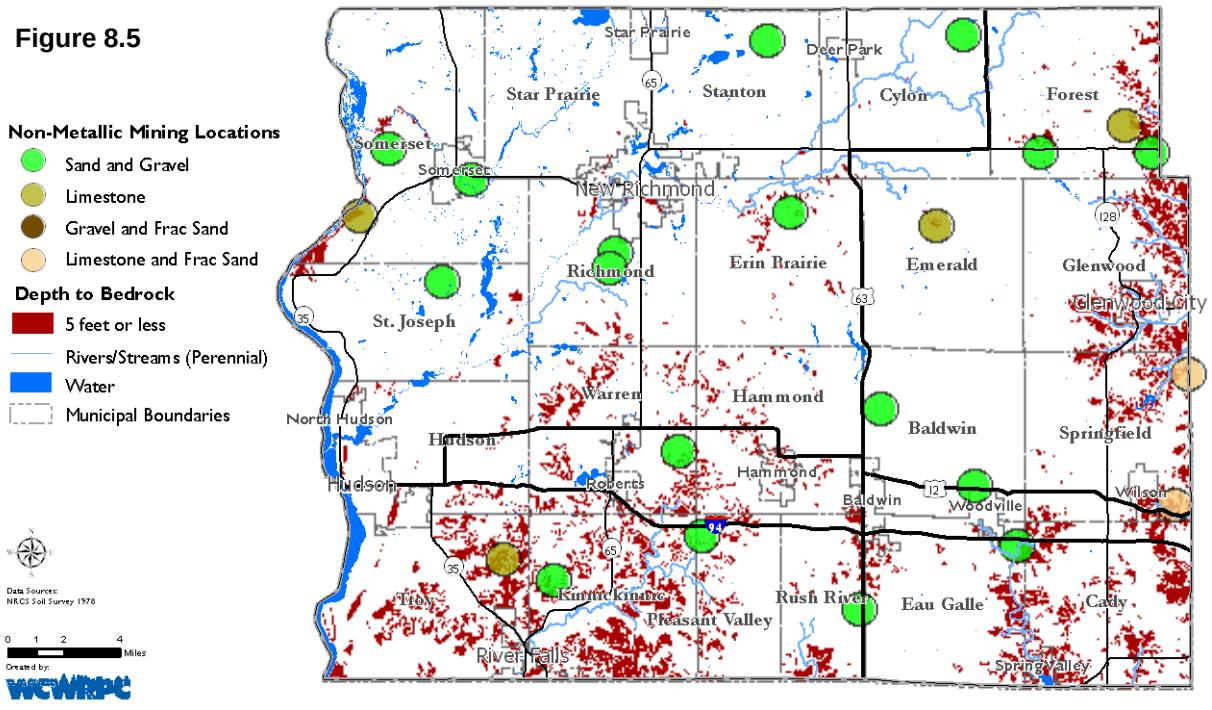
According to the Wisconsin Department of Natural Resources, there are currently no known metallic mineral deposits or occurrences in sufficient tonnage and grade such as iron, taconite or gold in St. Croix County to warrant extraction. Therefore there are no metallic mining operations in the County.

Nonmetallic Mining

Supplies of sand and gravel are available for nonmetallic mining throughout St. Croix County. St. Croix County has 24 operating non-metallic mining sites permitted under Chapter NR 135 of the Wisconsin Administrative Code, which includes three sites operated by the St. Croix County Highway Department. The other mine sites are privately operated, primarily for road aggregate, concrete mix and construction fill. Chapter NR 135 covers annual permitting by local governments and the reclamation of non-metallic mine sites. Of the 23 active mines, 14 also have a special exception permit from the County, as required by the County's non-metallic mining ordinance. Locations of past and present mining operations and depth to bedrock are shown in Figure 8.5. Where the bedrock is at or near the surface of the ground are areas that are more suited for quarrying stone or bedrock operations that extract high quality sand and stone. It is helpful to identify the locations of these deposits so potential extraction sites can be considered before development occurs. Development almost always precludes extraction, while these lands can often be reclaimed for development after extraction is complete.

Mining Locations/Depth to Bedrock

Figure 8.5



source: NRCS Soil Survey 1978

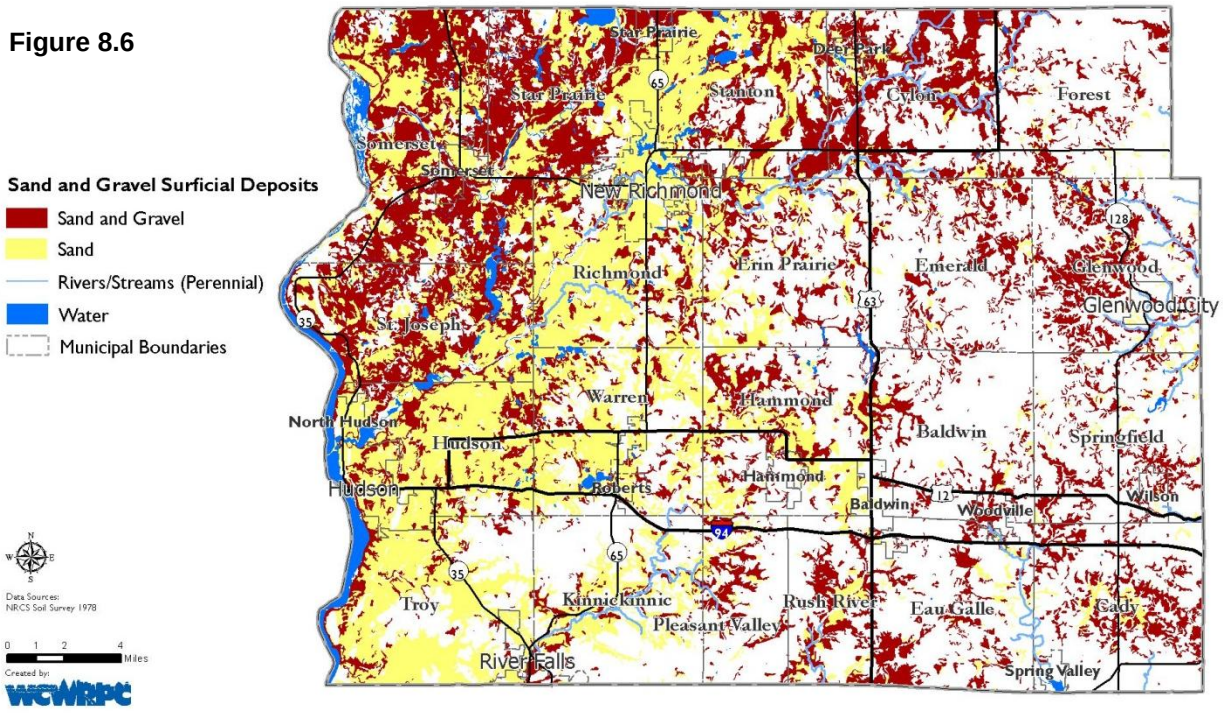
Sand & Gravel Deposits

The northwestern third of the County has the densest concentration of potential sand and gravel deposits as shown in Figure 8.6. These surficial soils found amongst glacial outwash are the most likely sources for sand and gravel as the melting waters of the glacier were most active in sorting and depositing sand and gravel used for localized road fill in this area.

St. Croix County's sand and gravel deposits have a relatively higher potential for extraction based on the National Resources Conservation Service's latest *Soil Survey of St. Croix County, Wisconsin*. Other local conditions, such as access/egress, existing development, current land uses, ownership, and public sentiment may preclude extraction at some of these locations. As communities begin to develop local land use goals, these maps should be considered to reduce potential land use conflicts. Such mineral resources are important raw material inputs to help achieve the County's land use plan goal for continuing to provide safe, efficient, and adequate community facilities. Wise use and conservation of the existing mineral resources of the County was a common theme that surfaced in St. Croix County's local level plans.

Sand and Gravel Surficial Deposits

Figure 8.6



source: NRCS Soil Survey 1978

SOILS

Soil properties are an important factor in how land is used. Soils determine how productive farmland is, and the type and amount of development that can be reasonably supported based on the various soil characteristics. In fact, the best use of the land is often dictated by the types of soils there are in an area. Subsequently, identifying and reviewing soil suitability interpretations, for specific urban and rural land uses, are essential for physical development planning and determining the most suitable land use.

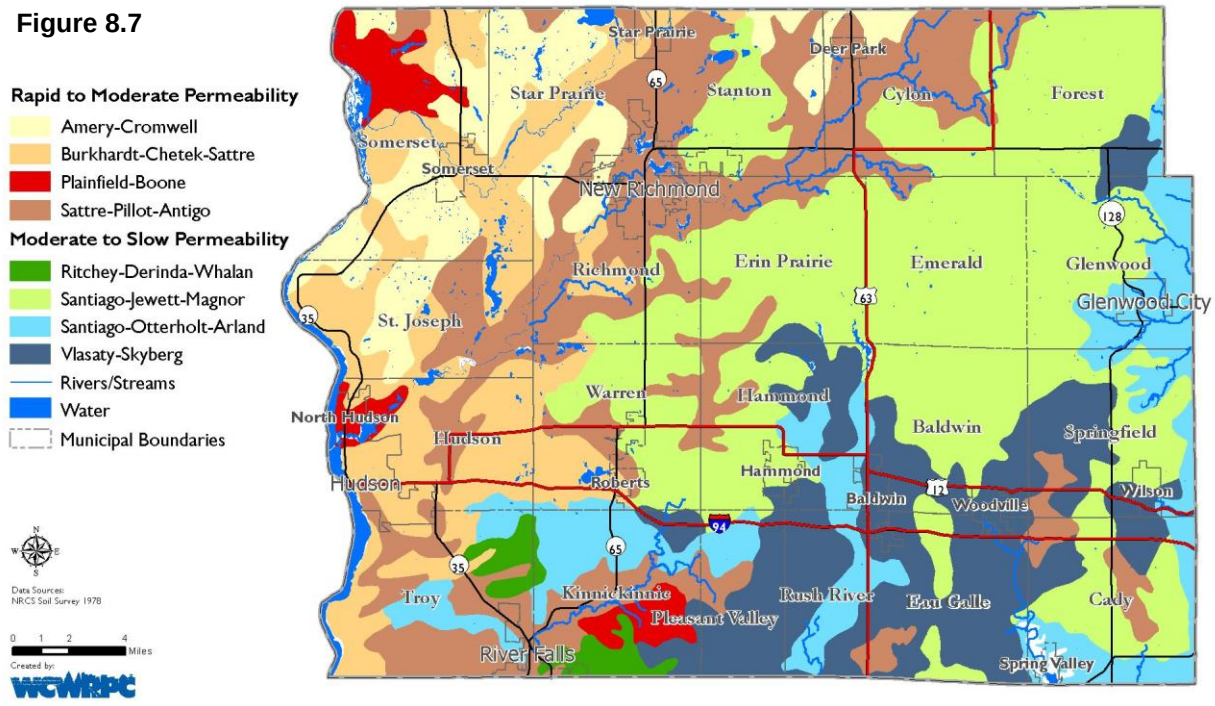
St. Croix County has a wide variety of soils ranging from heavy, poorly drained to light and droughty. Excessively drained and well-drained soils are generally found in the western half of the County. Moderately drained and somewhat poorly drained soils predominate in the eastern half. However, both extreme soil conditions are found throughout much of the County. With a wide variety of soil types and complex slopes the installation of some best management practices is often difficult. An example is where poorly drained soils are found on slopes five percent or more, where there may be erosion and drainage problems.

Soil Associations

The generalized soil associations in St. Croix County are shown in Figure 8.7. Each association contains several major and minor soils in a pattern that varies throughout the association. The soils within an association differ in many properties such as drainage, wetness, slope, and depth to bedrock. These characteristics affect the suitability of the land for agriculture and for development. For these reasons, the generalized information provided in this report is intended to be used for

General Soils

Figure 8.7



source: NRCS Soil Survey 1978

general policy and planning purposes, and not to provide information for site-specific applications. The County has a detailed digital soil survey available for planning or management purposes with information on the physical, chemical and biological properties of the soils, and provided soil property interpretations for agricultural, engineering, planning and resource conservation activities.

For more information on the soil survey, check the following websites: http://soildatamart.nrcs.usda.gov/; or Planning and Zoning at www.sccwi.us/pz; or Land & Water Conservation at www.sccwi.us/lwcd.

Hydric Soils

Wetlands consist of hydric soils. Hydric soils generally have a seasonal depth to water table of one foot or less and are capable of supporting wetland vegetation. Poorly drained soils have a seasonal depth to water table of three feet and are concentrated on the eastern part of the County where many of the soils have high clay content, often causing a perched water table condition. Shallow water table conditions risk groundwater contamination from on-site septic systems and could cause wetness problems for dwellings with basements.

Soil Suitability Interpretations

Soil properties have a strong influence on the manner in which land is used, since they affect the costs and feasibility of building site development and the location of private waste treatment systems. Soils are also an invaluable resource for agricultural and landscaping purposes.

St. Croix County LESA System

St. Croix County has developed a customized LESA system to meet the local soil conditions and site assessment concerns in the county used to rank agricultural lands based on their agricultural value and as a component in the identifying the County's Farmland Preservations Areas. Additional information is available in the Agriculture and Farmland Preservation Section of this plan.

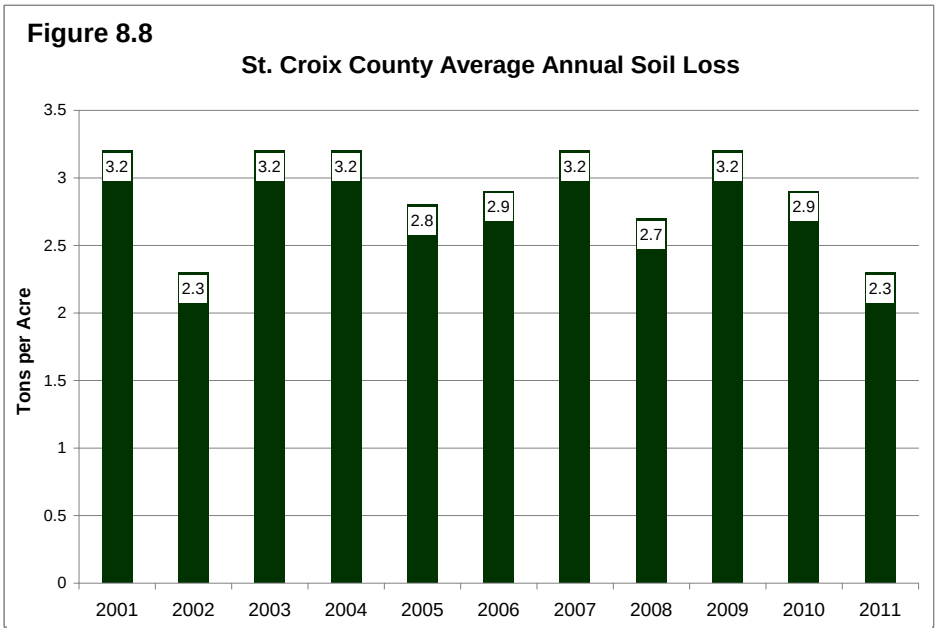
The United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), in establishing a uniform, national identification of productive farmlands, created a **soil classification system** that categorizes soils by their relative agricultural productivity. There are two categories of highly productive soils, national prime farmland and farmland of statewide significance. National prime farmland is well suited for the production of food, feed, forage, fiber and oilseed crops, and has the soil qualities, available moisture and growing season required to produce economically sustained high yields of crops when properly managed. Farmland of statewide significance are those lands, in addition to national prime farmland, which are of statewide importance for the production of food, feed, forage, fiber, and oilseed crops. Soils that fall into classes I, II, and III of the Natural Resources Conservation Service's capability unit classification system are considered prime agricultural lands.

In 1981, NRCS developed a new system for evaluating agricultural lands, "**Land Evaluation and Site Assessment**," (LESA) which uses more detailed considerations of soil capability and potential yields, and provides for the assessment of factors beyond soil productivity in the determination of agricultural potential. The LESA system is a point-based approach that is generally used for rating the relative value of agricultural land resources. This system is now widely used throughout the United States.

Transect Survey of Cropland

A transect survey of cropland cover and practices is conducted annually by the St. Croix County Land and Water Conservation Department, according to standard methods. This inventory began in 1999 and provides information about erosion rates from cropland and assists in targeting areas for conservation practices. The 2011 transect survey estimates a countywide average soil loss of 2.3 tons per acre per year. The tolerable soil loss rate, commonly referred to as "T," is defined as the maximum average annual rate of soil erosion for each soil type that will permit a high level of crop productivity to be sustained economically and indefinitely (ATCP 50.01(16)). Average annual soil loss for St. Croix County is presented in Figure 8.8.

Figure 8.8



source: St. Croix County Land & Water Conservation Department

WATER RESOURCES

Groundwater

Groundwater is a limited resource, and it is the source of residential drinking water in St. Croix County. Eleven municipalities in St. Croix County provide drinking water to 41,513 residents. Given that the 2010 county population was 84,345, this means that approximately 42,832 county residents get their drinking water from private wells. Understanding how groundwater is used in the County and how it can become contaminated is important to understanding the relationship between land use and groundwater quality.

Groundwater Sources

The first step in this process is to understand the source of groundwater. Water enters the groundwater flow system as recharge to the water table. As rain and snow fall to the ground, some runs off into the lakes, rivers, and streams; some evaporates; and some is used by plants. The rest trickles down through the soil and subsoil material. This water eventually reaches a saturated zone that comprises groundwater. These saturated zones, called aquifers, are geologic formations that can store and transmit water.

St. Croix County has five aquifers. At the surface is the *sand and gravel aquifer,* which is made up of unconsolidated glacial and alluvial materials that overlies the bedrock. This aquifer is less than 50 feet thick and occurs in about one-fourth of the county, either at the land surface or buried under less permeable drift. The sand and gravel aquifer can yield sufficient water for private residential water supplies.

The *upper bedrock aquifer* underlies the sand and gravel aquifer and is continuous over the county. It is made up of sandstone and dolomite and includes, from youngest to oldest, the Sinnipee and Ancell groups, where present, and the Prairie du Chien, Trempealeau and Tunnel City groups.

- The Ancell and Sinnipee Groups have been extensively eroded and can be found in the upland ridges of the County.
- The Prairie du Chien Group consists of fine-to medium grained sandstone and sandy dolomite. It ranges in thickness from 50 feet near Glenwood City and increasing in thickness as you move west in the county where it is over 200 feet thick. The Prairie du Chien is susceptible to fracturing and weathering, which can produce solution cavities and conduits and is often referred to as a karst aquifer.
- The Trempealeau Group consists of the St. Lawrence Formation, which is a dolomitic siltstone; and the Jordon Formation, clean fine-to coarse-grained quartzose sandstone. This group is about 100 feet thick.
- The last unit that is classified within the upper bedrock aquifer is the Tunnel City Group. It is around 150 feet thick and is composed of layers of shale and poorly sorted coarse-grained sandstone.
- The Prairie du Chien dolomite and the Trempealeau and Tunnel City sandstones are the major water yielding rocks in this aquifer. The Prairie du Chien dolomite is the uppermost, saturated bedrock in much of the county and is used extensively for private residential water supplies.

The ***Wonewoc aquifer*** consists of the Wonewoc formation which underlies the shaly base of the upper aquifer and forms a thin aquifer of about 75 feet. The Wonewoc is a clean, well-sorted medium-to coarse-grained quartzose sandstone.

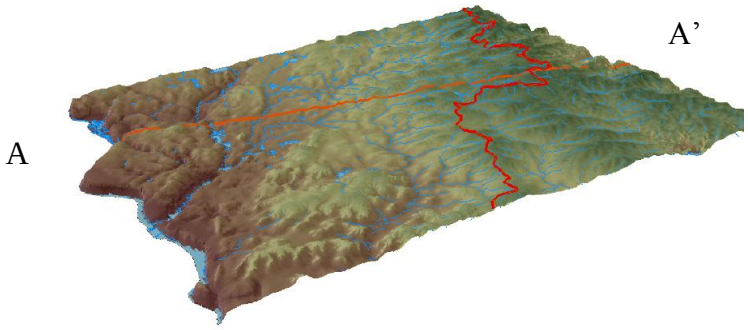
The ***Eau Claire aquifer*** consists of the Eau Claire Formation which underlies the Wonewoc aquifer and consists of lateral layers of very-fine to fine grained sandstone and several shaly facies which defines this aquifer as a confining unit. The total thickness of this unit is about 100 feet.

The ***Mount Simon aquifer*** is the lowest found in St. Croix County, it consists of the Mount Simon Formation. This formation overlies the Precambrian crystalline basement rock, which is assumed to be impermeable and forms the lower boundary of the groundwater-flow system. The Mount Simon consists of medium-to-coarse-grained sandstone with some shale and is about 250 feet thick.

Groundwater Recharge

According to *An Introduction to Groundwater in St. Croix County,* May 2006, between one and ten inches of precipitation infiltrates and recharges the groundwater aquifers each year. Groundwater recharge maintains the quantity of water in an aquifer. The natural process of recharge can be altered by land use and development. Impervious surfaces, or surfaces that prevent precipitation from soaking into the ground like buildings and pavement, affect the rate of recharge and quantity of available groundwater. In St. Croix County, some recharging water moves downward to the sand and gravel or upper bedrock aquifer, travels a short horizontal distance and discharges to a stream or wetland. Figure 8.9 represents the land and water surface of St. Croix County, the red line shows the groundwater divide and the orange line represents the cross-section from A-A' and further describes the water table, local and regional flow paths as shown in Figure 8.10.

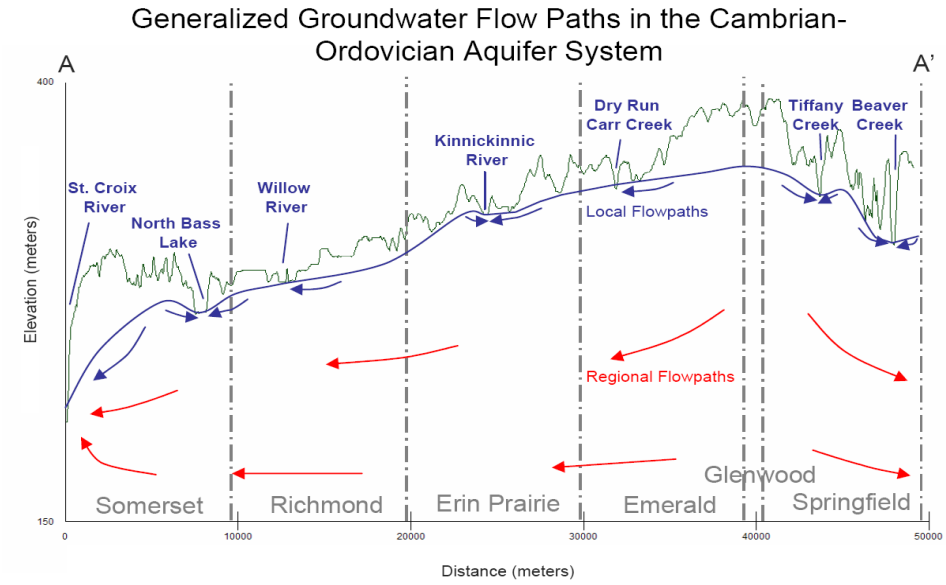
Figure 8.9 Land & Water Surface – St. Croix County



source: An Introduction to Groundwater in St. Croix County, May 2006

The altitude of the water table ranges from more than 1,100 feet in several places in the eastern quarter of the county to just over 675 feet along the St. Croix River.

Figure 8.10



source: An Introduction to Groundwater in St. Croix County, May 2006

Groundwater traveling in the blue flow paths represents groundwater that has only been in the system for a few years to decades. Most of the groundwater withdrawn by private wells is collected from these local groundwater systems. Shallow flow in the county is dominated by the karstic Prairie du Chien aquifer. Given the variability found in this aquifer, karst conduits can influence rapid water movement in some cases ranging from 3 feet per day to 3000 feet per day. Regional flow paths (red) are much longer and slower and groundwater has been in the system for hundreds of years. A study, *Simulation of Groundwater Flow System for St. Croix, Pierce and Polk Counties,* was completed in 2009 by the United States Geological Service (USGS). Results indicate that about

82 percent of groundwater is from recharge within St. Croix County, 15 percent from surface-water sources and 4 percent is inflow across county boundaries.

The concept of water moving from the land's surface into groundwater is the starting point for thinking about the relationship between land use and groundwater quality. Nearly anything that is dumped, spilled, or spread on the ground can seep down to groundwater. This groundwater is then used by residents for drinking, farming, and other activities. Groundwater can also return to the surface as springs or as discharge to lakes, river, and streams.

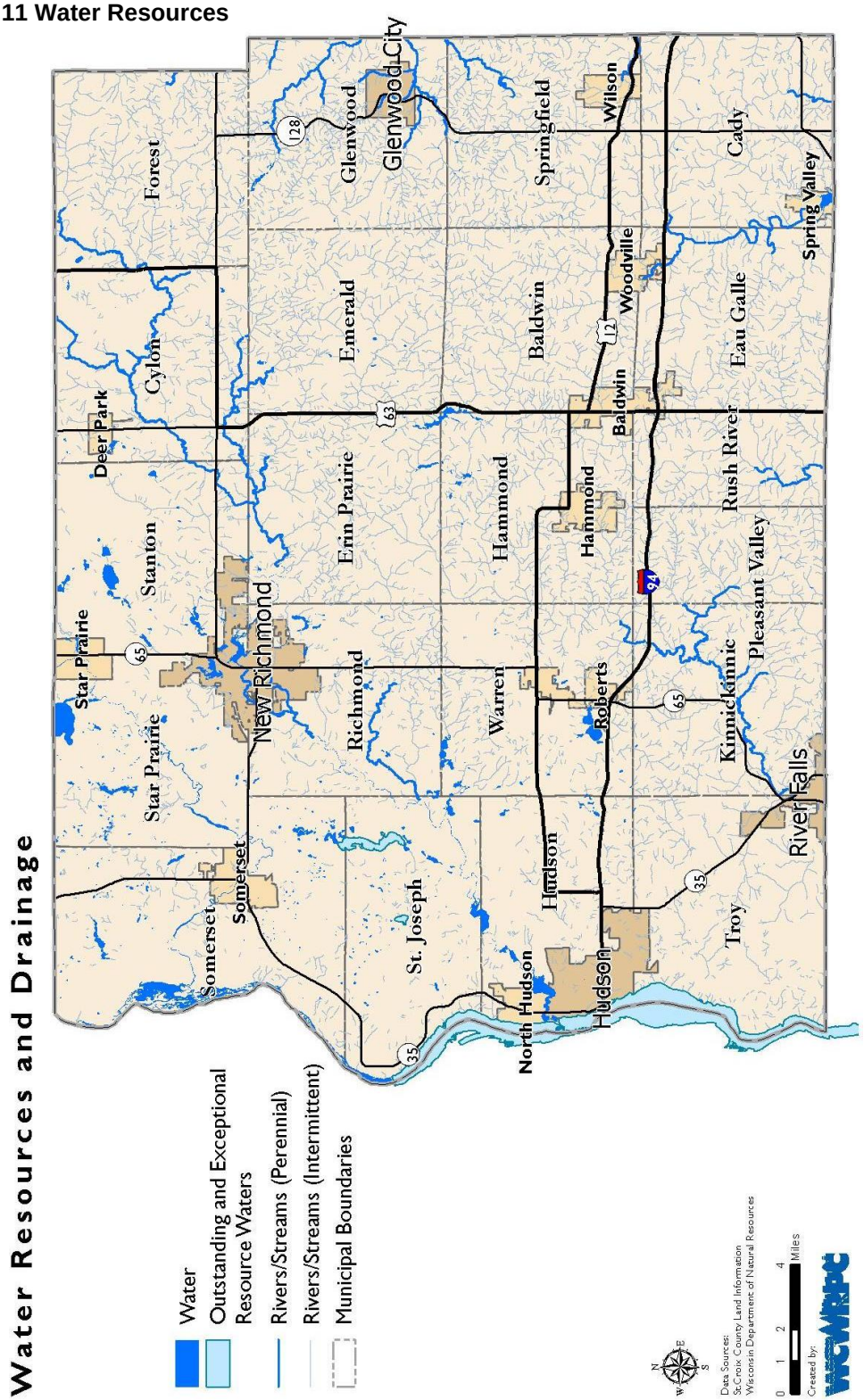
Surface Waters

Lakes, ponds, rivers, streams, intermittent waterways, and natural drainageways make up the 18,934 acres of surface waters in St. Croix County. These resources are all water bodies, standing still or flowing, navigable and intermittent, and include natural drainageways that collect and channel overland rainwater or snowmelt runoff. Natural drainageways are characterized by intermittent streams, threads, rills, gullies, and dry-runs that periodically contribute water to first-order streams. There are also many artificial drainageways where the natural drainageways have been altered by human activity. All of these features have the ability to transport sediment and pollutants and are affected by their watersheds.

- St. Croix County has a total in-land surface water area of 9,598 acres or 15 square miles and approximately 290 miles of shoreland as shown in Figure 8.11.
  - 33 lakes and two spring ponds, the largest of which are:
    - 416-acre Bass Lake in the towns of Somerset and St. Joseph
    - A portion of the 1,107-acre Cedar Lake in the Town of Star Prairie
    - 129 acre Squaw Lake in the Town of Star Prairie
    - 107 acre Pine Lake in the towns of Baldwin and Erin Prairie
  - Seven river systems and numerous creeks or other tributaries, the primary ones are:
    - Apple River
    - Eau Galle River
    - Kinnickinnic River
    - Rush River
    - St. Croix River
    - Tiffany Creek
    - Willow River
  - Seven flowages ranging from 35 to 270 acres:
    - 270-acre Lake Mallalieu in the City of Hudson and Village of North Hudson
    - 172-acre Little Falls Lake in the towns of Hudson and St. Joseph
    - 142-acre New Richmond Flowage on the Willow River in the City of New Richmond
    - A portion of the 150-acre Eau Galle Lake/Lake George in the Town of Cady and Village of Spring Valley.
    - 84-acre Glen Lake in the Town of Springfield
    - 68-acre Riverdale Flowage on the Apple River in the Town of Star Prairie
    - 35.5-acre Apple Falls Flowage in the Town of Somerset
- The St. Croix River and its lake, Lake St. Croix, is the largest surface water in St. Croix County, the county's only surface with a shared border. Approximately half of the 9,336-acre lake is located on the Wisconsin side of the state border with Minnesota. The St. Croix River is also notable since it has been designated by Congress as the Lower St. Croix National Scenic Riverway. With this designation, the National Park Service and Wisconsin

Department of Natural Resources work with local jurisdictions to manage and protect this waterway.

Figure 8.11 Water Resources

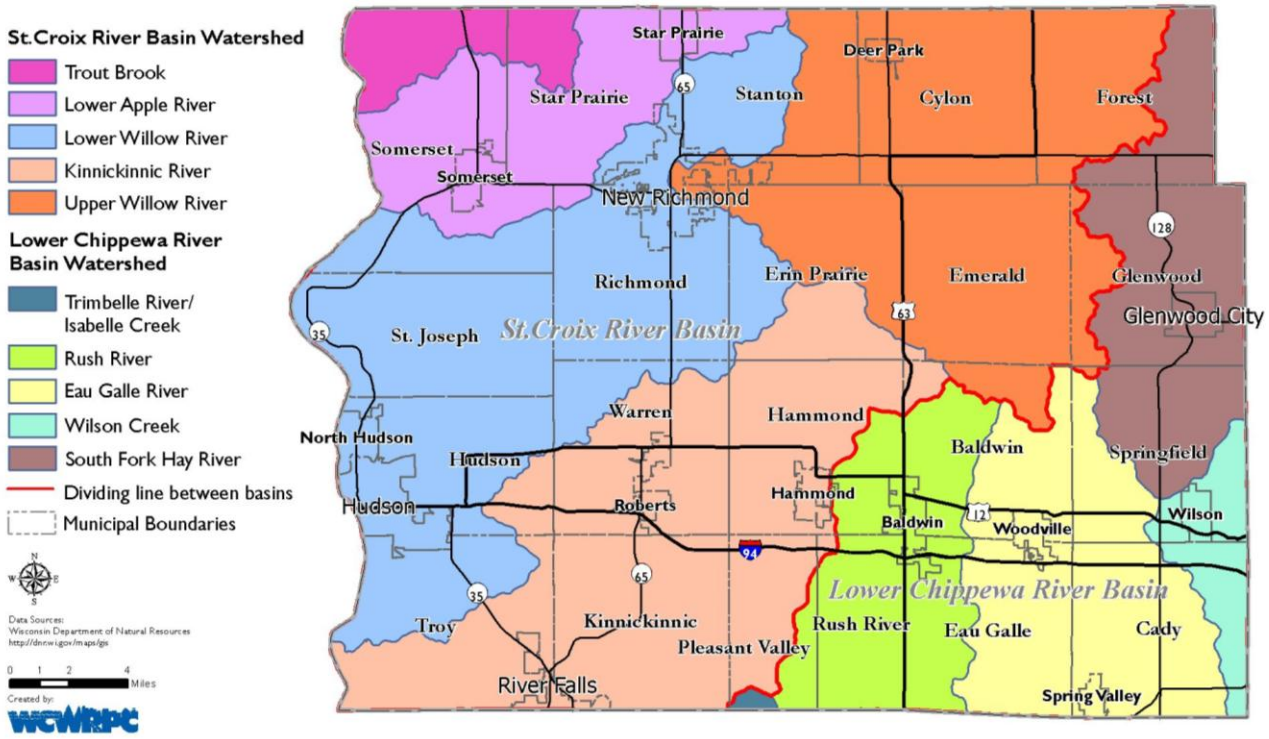


Source: Wisconsin Department of Natural Resources

Watersheds

A watershed is an area of land that drains or "sheds" its water to a lake, river, stream, or wetland. Some watersheds encompass several hundred square miles, while others may be small, covering only a few square miles and drain into a lake. This is important to understand since the effects of natural and human activities in one area can have a direct impact on other areas. The surface waters of St. Croix County fall within two major drainage systems - the St. Croix River Basin and the Lower Chippewa River Basin which can be seen in Figure 8.12. Surface waters in the western two-thirds of the County, including the Apple, Kinnickinnic, and Willow Rivers, fall within the St. Croix River Basin. The eastern third of the County, including the Hay and Eau Galle Rivers, are part of the Lower Chippewa River Basin. The exception is the Rush River in the south-central part of the County which flows directly into the Mississippi River.

Watershed **Figure 8.12**



source: Wisconsin Department of Natural Resources

Similar to surrounding counties, the source of nearly all potable water is groundwater. However, surface water can be a major source of groundwater recharge, and in the case of St. Croix County, a factor in maintaining the County's natural and recreational values. Consequently, there is also significant concern for understanding the impacts of development on the surface water resources in the County.

Water Quality by Watershed

In general, the water quality in the Lower Chippewa River Basin and St. Croix River Basin is a concern. The major concern is from added nutrients and sediment from run-off, primarily from agricultural land and but also from urban areas. The two basins include the following watersheds: Trout Brook; Lower Apple River; Lower Willow River; Kinnickinnic River; Upper Willow River; Trimbelle River and Isabelle Creek; Rush River; and Eau Galle River. Surface and ground water quality can be affected by a wide variety of point and non-point sources, including agricultural run-

off, stormwater from parking lots and roads, soil erosion, and spills of hazardous materials. The risk of water contamination increases as development occurs.

Impaired Waters

St. Croix County's plentiful surface waters are generally healthy. However, according to the Wisconsin Department of Natural Resources, eleven water bodies in St. Croix County are on the impaired waters list due to water quality concerns, see Figure 8.13.

FIGURE 8.13 - IMPAIRED WATERS – ST. CROIX COUNTY

IMPAIRED WATER	POLLUTANT
Cedar Lake	Phosphorus
Glen Lake	Mercury
Lake George (Spring Valley Reservoir)	Phosphorus
Lake Mallalieu	Phosphorus
Lake St. Croix	Phosphorous
Squaw Lake	Phosphorus
East Twin Lake	Phosphorus
West Twin Lake	Phosphorus
Eau Galle River	Phosphorus and Sediment/Total Suspended Solids
St. Croix River (entire length in St. Croix County)	Polychlorobiphenyls (PCBs)
Willow River	Biological Oxygen Demand and Phosphorus

source: Wisconsin Department of Natural Resources 2008

Several water bodies are at risk from high levels of phosphorus. Many are suffering from the results of soil erosion in the form of sedimentation. The native soils of the area contain a high level of phosphorous. This creates a situation of reduced habitat and high weed growth levels in the lakes and streams. The County Land & Water Conservation Department is actively working to minimize soil erosion through best management practices to reduce such impacts and conserve soil. As noted, the St. Croix River is impaired by polychlorobiphenyls. This body of water has fish consumption advisory.

Outstanding & Exceptional Resource Waters

Through its Wisconsin's Outstanding and Exceptional Resource Waters Program, the Wisconsin Department of Natural Resources is working to maintain the water quality in Wisconsin's cleanest waters. These waters have been classified into outstanding and exceptional 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 outstanding waters, but that may be impacted by point source pollution or have the potential for future discharge from a small sewer community. St. Croix County has four waters categorized as outstanding resources, and six exceptional resource waters identified, see Figure 8.14.

FIGURE 8.14 - OUTSTANDING & EXCEPTIONAL WATERS – ST. CROIX COUNTY

OUTSTANDING WATERS
Bass Lake – All
Kinnickinnic River – Upstream above STH 35
Perch Lake – All
St. Croix River - Between the northern boundary of the Hudson city limits and the Polk County border
EXCEPTIONAL WATERS
Apple River – From NSP plant below CTH "I" to its Mouth
Cady Creek – 0.4 mile in S34 SESE (T28N R15W)
Parker Creek – Lower. 0.4 mile
Race Branch, Willow River – All
St. Croix River - From northern boundary of Hudson city limits to the Pierce County border
Willow River - From end of Class II portion into the delta in Lake Mallalieu

source: Wisconsin Department of Natural Resources 2006.

AIR QUALITY

Air quality in St. Croix County is very good. Understanding how air quality is impacted in the County and how it can become contaminated is important. Wisconsin's air quality varies in different areas of the state. Location relative to prevailing weather, physical geography and human development patterns all contribute to an area's air quality circumstances.

In 2010, the Air Monitoring Section in the Air Management Bureau of the Wisconsin Department of Natural Resources analyzed the air for carbon monoxide, lead, nitrogen oxides, ozone, PM2.5 (i.e., particulate matter with a diameter of 2.5 µm or less), PM10 (i.e., particulate matter with a diameter of 10 µm or less), PM course (i.e., particulate matter with a diameter between 2.5 and 10 µm), sulfur dioxide and a variety of toxic air pollutants. The WDNR Somerset site tested for ozone for five years from 2006 to 2010 and found that the ozone levels never exceeded the 2008 National Ambient Air Quality Standard. In 2010, this station never detected ozone exceeding 85 percent of the standard.

NATURAL RESOURCES – SENSITIVE LANDS

In addition to the more distinct physical land features, there are other environmentally sensitive and valued land resources that should be considered for the potential impacts of growth and development activities. These areas, referred to as sensitive lands, should be identified and evaluated for their significance as a valued resource in the County. In addition, growth and development policies and management techniques will need to be established to affect the desired impacts on these resources.

The following are the Sensitive Lands that are briefly reviewed and discussed in this section:

- Shorelands
- Floodplains
- Wetlands
- Steep Slopes
- Forests & Woodlands
- Grasslands & Prairie
- Wildlife, Wildlife Habitat & Open Space
- Parks & Recreational Resources

SHORELANDS

Shorelands provide valuable habitat for both aquatic and terrestrial animals and vegetation, and also act as buffers and thus serve to protect water quality. Shorelands are also considered prime residential building areas because of their scenic beauty. Recognizing this conflict, and to maintain the environmental, recreational, and economical quality of our water resources, the State of Wisconsin requires counties to adopt and enforce a shoreland ordinance.

As required by the State, shorelands are defined as:

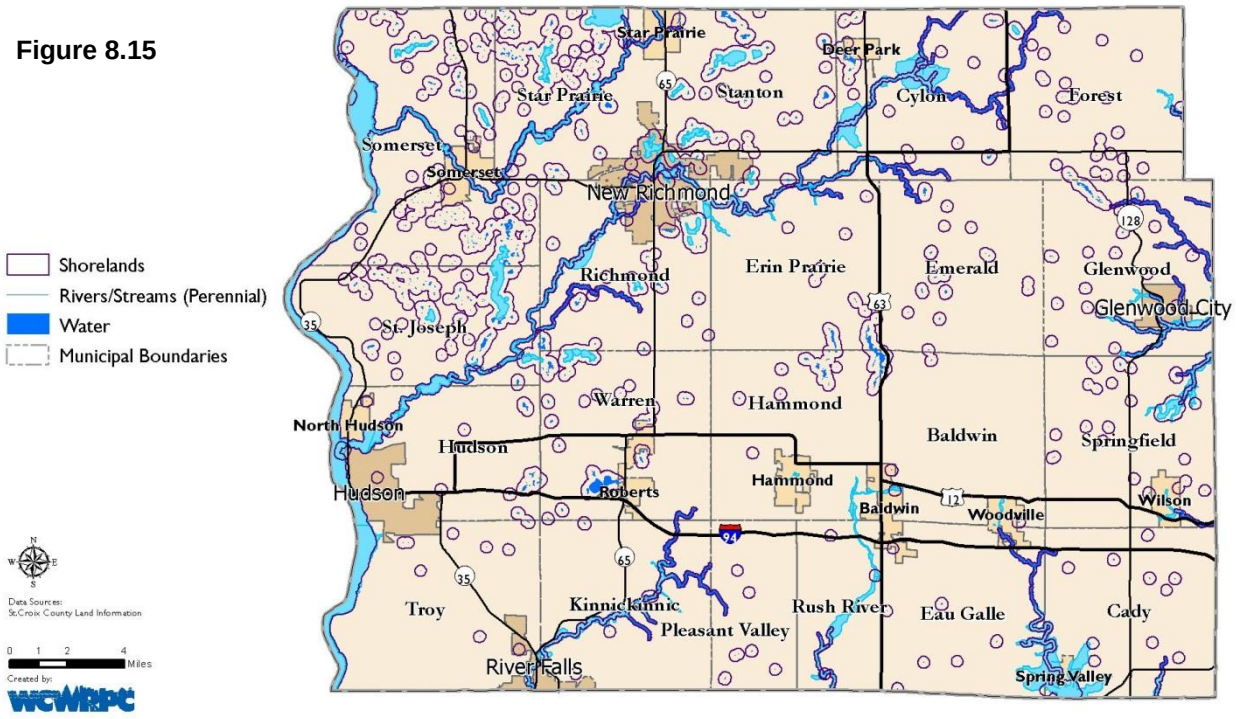
- all land within 1,000 feet of the ordinary high water mark of a lake, pond, or flowage; or
- all land within 300 feet of the ordinary high water mark of a river or stream or to the landward side of the floodplain, whichever is greater.

St. Croix County has approximately 290 miles of shorelands on it lakes, rivers, streams, etc.

Each county must meet or exceed the minimum state standards for shoreland protection. The identified shoreland areas, Figure 8.15, are based on the standards as defined in the St. Croix County Shoreland Zoning Ordinance.

Shorelands

Figure 8.15



source: St. Croix County Land Information

FLOODPLAINS

One sensitive land feature that most residents are aware of is the floodplain, which is the flood-prone land adjacent to water bodies. Topography is an important factor in determining flood risks and vulnerabilities. Most surface waters of the County drain to the south and west, toward the St. Croix and Mississippi River, with the exception of the eastern areas surrounding Glenwood City and Wilson, which drain towards Dunn County to the east. Approximately 85 percent of the County is classified as uplands, which may be less prone to the vulnerabilities associated with large flooding events, but where stormwater or flash flooding may be a more common problem. Stormwater erosion and flash flooding can be a significant concern for those areas with moderate to steep topography and in particular where development interrupts natural drainage systems.

Spring flooding in backyards and basements is related to development that alters the landscape or does not account for drainage patterns. Photo by Tammy Wittmer.

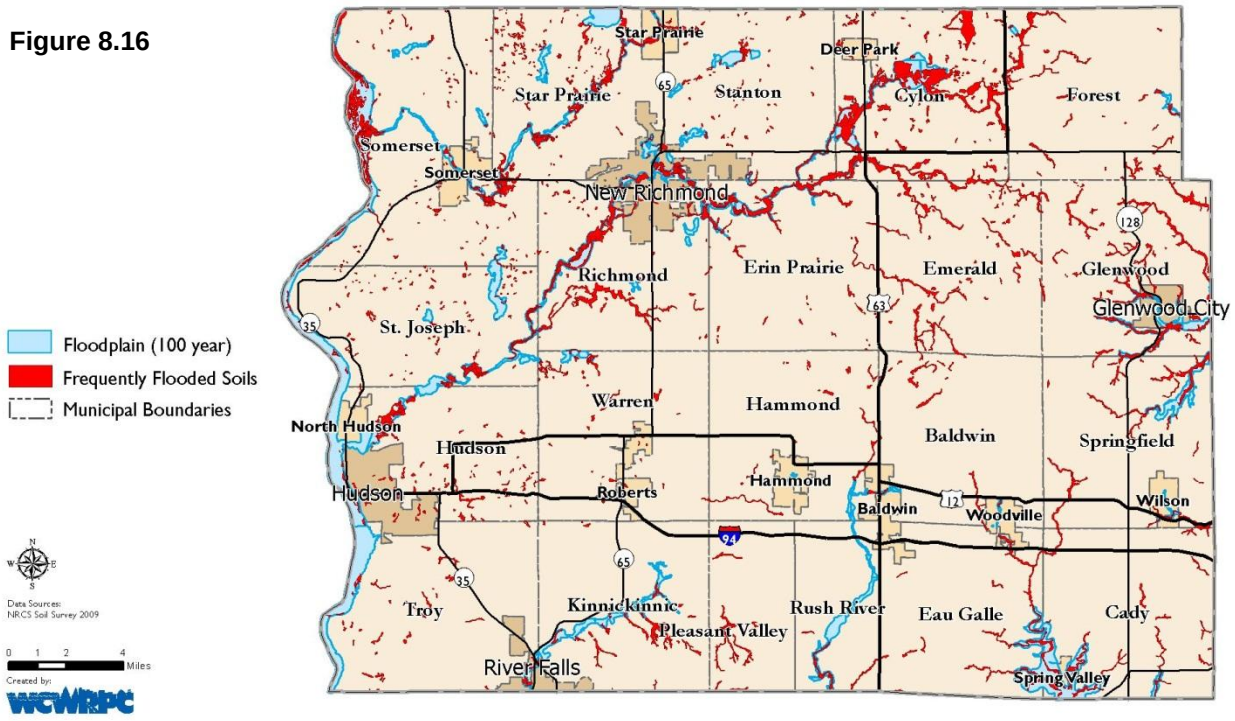
Floodplains can be desirable development areas due to the proximity to lakes, rivers, and streams, but pose problems by possibly putting residents and property at risk. Altering the floodplain landscape by filling or building levees or structures can exacerbate flooding conditions. The filling of wetlands in floodprone areas has been proven to increase the likelihood of flooding. These alterations divert water away from where it once traveled or was stored during spring runoff or storm events, which can increase the area of the floodplain. The accumulation of development in floodplains can cause more severe flooding in other areas within the floodplain. Development in floodplains can also affect the environmental quality of the waterway.

To better protect the residents throughout the state, and to minimize the loss of property, the State of Wisconsin, under Wisconsin Statute 87.30(1), requires counties, cities, and villages to adopt and enforce floodplain zoning. In addition, Wisconsin Administrative Code NR116, Floodplain Management Program, has been promulgated for the protection of property and public investments from the effects of flooding.

Development within the floodplain is usually assessed through the use of the Flood Insurance Rate Maps (FIRM) developed by the Federal Emergency Management Agency (FEMA). The floodplains have been identified for St. Croix County based on the FEMA flood insurance maps, as seen in Figure 8.16. It is important to remember that this map is no substitute for site-specific analysis as natural and human changes in the landscape, and the age and accuracy of the flood insurance maps, has limited their reliability for identifying and designating floodplains in some cases.

Floodplain (100-year) and Frequently Flooded Soils

Figure 8.16



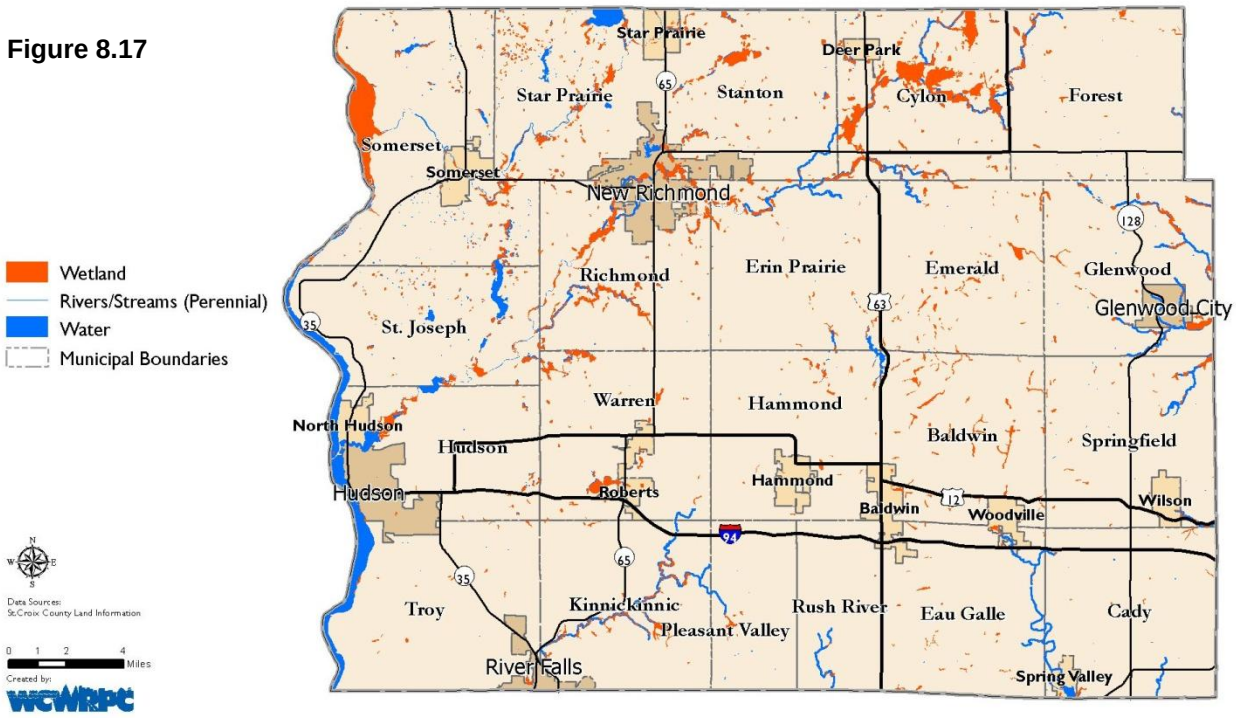
source: NRCS Soil Survey 2009

WETLANDS

Figure 8.17 shows the wetland areas within St. Croix County's watersheds. These areas can affect water levels of rivers and creeks flowing through St. Croix County. Wetlands are defined by the State Statute as "an area where water is at, near, or above the land surface long enough to be capable of supporting aquatic or hydrophytic (water-loving) vegetation and which has soils indicative of wet conditions." Wetlands may be seasonal or permanent and are commonly referred to as swamps, marshes, or bogs. Wetland plants and soils have the capacity to store and filter pollutants, replenish groundwater supplies, store floodwaters, and maintain stream flows.

Wetlands

Figure 8.17



source: Wisconsin Department of Natural Resources

Wetlands can make lakes, rivers and streams cleaner, drinking water safer and also provide valuable habitat for both aquatic and terrestrial animals and vegetation. In addition, some wetlands can also provide the replenishment of groundwater supplies. Groundwater discharge is common from wetlands and can be important in maintaining stream flows, especially during dry months. Groundwater discharged through wetlands can contribute to high quality water in lakes and streams. Draining and filling wetlands or development near wetlands can remove these natural functions and values.

All construction projects involving wetlands should be reviewed according to local, state and federal regulations before they begin. Particular attention must be given to wetlands within shorelands to ensure protection. The St. Croix County shoreland zoning ordinance restricts development of wetlands five acres and greater within the shoreland zone. The federal government and the Wisconsin Department of Natural Resources (WDNR) restrict development in wetlands through Section 404 of the Clean Water Act and NR 103, respectively. All wetlands meeting the state definition are subject to WDNR regulation. Federal regulation may apply in addition to or instead of state regulations.

STEEP SLOPES

It is generally more desirable, both environmentally and economically, to avoid steep slopes and disrupting natural drainageways with construction and land development. Steep slopes represent possible increased grading costs. There is a higher risk for soil erosion and runoff pollution with development on steep slopes, and flooding and wet basements can occur with drainageway disruptions.

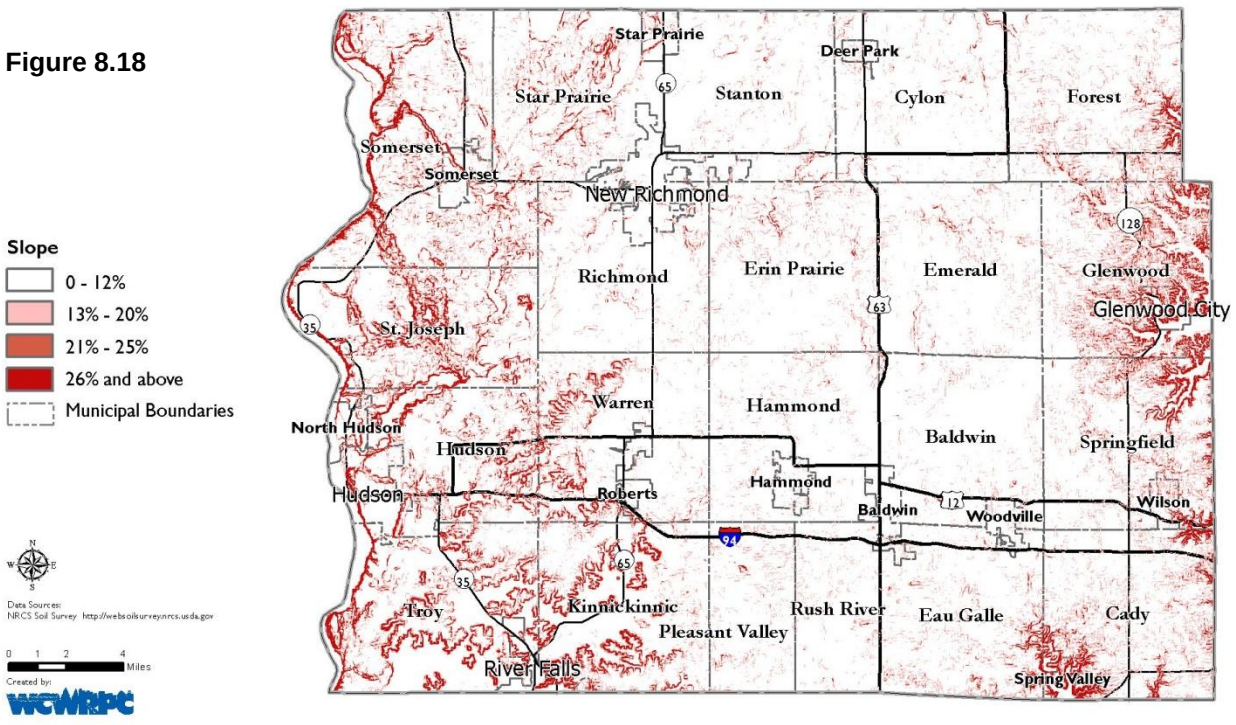
Steep slopes are any area where the gradient of the land is 13 percent or greater (each percent of slope is measured as one unit in elevation for every 100 horizontal units). Areas having steep slopes can be categorized into three levels, 13 percent to 20 percent slope, 21 percent to 24 percent, and 25 percent and greater.

Development on slopes of 13 percent to 20 percent should consider direct runoff into lakes, rivers, or streams, follow state approved construction site erosion control standards, and institute best management practices to control on-site runoff and pollution. Land with slopes of 21 percent or greater represent a definite limiting environmental condition. Development on these slopes results in high construction costs and severe erosion with resultant negative impacts to surface and ground waters. Development on slopes of 21 percent or greater is highly discouraged.

Based on the Soil Survey for St. Croix County, there are 78,100 acres that potentially have a slope of 13 percent or greater representing 9.8 percent of the total land base. Of this, 12,700 acres (1.9 percent) have slopes of 21 percent or greater and 0.3 percent have a slope of 25 percent or greater. The majority of these steep slopes are located in the western and eastern portions of the county. These relief changes can be seen on Figure 8.18. Additional localized and site-specific variations in topography and slope may exist. Glacial activity created some scenic topography, but may also be very sensitive to development activities.

Slopes

Figure 8.18



source: Wisconsin Department of Natural Resources

FORESTS & WOODLANDS

Forests and woodlands are an important feature of St. Croix County. In fact, its forests are the second most extensive land use and land cover after agriculture. The largest concentrations of woodlands occur on the peripheries of the County. Most significant, the densest patches of forests are located on the western and eastern edges of the County. There are also some forests on the northern border of the County.

- Assessed forest acreage increased by roughly 14,839 acres, or more than 23 square miles, between 1990 and 2010, as shown in Figure 8.19. This was a 41 percent increase.
- Between 1990 and 2010 the towns of Eau Galle (442 percent), Glenwood (163 percent), and Springfield (154 percent) saw the largest percentage increases in assessed forested acreage.
- In 2010, the towns of Forest (4,847), Springfield (4,662), Cady (4,341), Eau Galle (3,808), Somerset (3,425), and Emerald (3,357) had the greatest amount of assessed forested acreage, respectively.
- At the same time, Hudson (372), Hammond (556), Pleasant Valley (618), and Rush River (774) had the least amount of assessed forested acreage.
- The greatest percentage decreases occurred in the towns of Hudson (-46 percent) and Somerset (-33 percent).

In St. Croix County, woodlands are an important part of the environment, aesthetics, and economy. Woodlands provide:

- habitat for a variety of plants and animals;
- the basic resource for many wood-based industries, including the expanding bio-energy sector;
- resources for the agricultural community;
- an environment for recreational activities; and
- for the scenic beauty of the landscape and the rural character of the county.

Woodlands managed according to approved forest management practices can support varying and sometimes complementary objectives, such as timber production and wildlife habitat. On the other hand, strict preservation of woodlands would be unusual and reserved for the most rare and unique stands in the County.

Unmanaged development and the fragmentation of woodlands in residential lots can diminish or eliminate a woodlands capacity to provide wood products, habitat for plants and animals, and aesthetic quality. St. Croix County has experienced a loss of some woodland acres, in part due to the subdividing of woodlands into residential lots. Because woodlands are considered a valued resource for these reasons, significant woodlands are often protected from conversion to other uses or properly managed in order to retain their desirable characteristics. For example, residential development in woodland areas could use conservation design techniques in order to allow for development and preserve the environmental and aesthetic value.

The WI DNR manages three forestry tax law programs that provide tax incentives to encourage managing private forestlands for forest crop production while recognizing a variety of other objectives. St. Croix County has 15,238 acres enrolled in Managed Forest Law programs with 753 acres in Forest Crop Law as of February 2011.

FIGURE 8.19 - ASSESSED FOREST & AG FOREST -- 1990 - 2010 – ST. CROIX COUNTY								
	TOTAL PARCELS				TOTAL ACRES			
Town	1990	2010*	# Change	1990 -2010 % Change	1990	2010*	# Change	1990 -2010 % Change
Baldwin	109	180	71	65%	882	1,747	865	98%
Cady	215	371	156	73%	3,649	4,341	692	19%
Cylon	264	233	-31	-12%	3,753	3,141	-612	-16%
Eau Galle**	54	383	329	609%	702	3,808	3,106	442%
Emerald	126	269	143	113%	1,757	3,357	1,600	91%
Erin Prairie	75	110	35	47%	993	1,465	472	48%
Forest	127	301	174	137%	2,434	4,847	2,413	99%
Glenwood	116	340	224	193%	1,273	3,351	2,078	163%
Hammond	33	134	101	306%	319	556	237	74%
Hudson	54	38	-16	-30%	694	372	-322	-46%
Kinnickinnic	241	273	32	13%	2,332	2,869	537	23%
Pleasant Valley	109	88	-21	-19%	543	618	75	14%
Richmond	98		-98	-100%	928	767	-161	-17%
Rush River	46	89	43	93%	449	744	295	66%
Saint Joseph	192	79	-113	-59%	2,340	2,185	-155	-7%
Somerset	374	187	-187	-50%	5,116	3,425	-1,691	-33%
Springfield	99	279	180	182%	1,839	4,662	2,823	154%
Stanton	176	299	123	70%	1,395	1,455	60	4%
Star Prairie	110	143	33	30%	1,594	3,076	1,482	93%
Troy	189	246	57	30%	2,209	2,776	567	26%
Warren	95	256	161	169%	965	1,443	478	50%
TOTALS	**2,902**	**121**	**-2781**	**-96%**	**36,166**	**51,005**	**14,839**	**41%**

source: Wisconsin Department of Revenue
** Between 2003 and 2007, the Department of Revenue changed the classification system and included the category "AG Forest". This alteration has in most cases influenced the comparison of 2007 data and the data from the previous three years.*
*** 1990 data was not available, so 1996 data was used.*

GRASSLANDS & PRAIRIE

Many parts of St. Croix County were originally covered by prairie, most of which does not remain today. Existing grassland areas are spread throughout the County. The northwestern part of the county has larger patches of grassland which are intermingled with forests and woodlands.

Prairie is the term used to describe the grassland type that predominated Wisconsin prior to Euro-American settlement. Prairies are dominated by grasses and sedges, lack trees and tall shrubs, and are home to a rich variety of plants and animals. Within the prairie designation there are variations due to soils and climate. Prairies continue to be a threatened plant community in Wisconsin. The reduction of prairie in the state means that an estimated 20 percent of the original grassland plants are considered rare in the state.

Consequently, many species of plants and animals associated with Wisconsin prairies are endangered, threatened or of special concern, and two are known to no longer exist in the State. Many grassland birds face similar circumstances as indicated by a growing list of special concern species and declining numbers of birds once considered common in the state, such as several species of sparrows and the meadowlark. Although the majority of prairie mammals have been able to adapt to the loss of prairie habitat, some are no longer present in the state, some are of special concern and others will have trouble adapting to the continued agricultural and land use changes. Prairie-associated reptiles and amphibians have been affected as well. About half have adapted to the loss of prairie, but there are three reptiles on the State's endangered species list: one is listed as threatened and two are of special concern. Little is known about the invertebrates

of Wisconsin's native prairies. It is likely that many grassland insects are extinct, no longer found in the state, or have not yet been discovered.

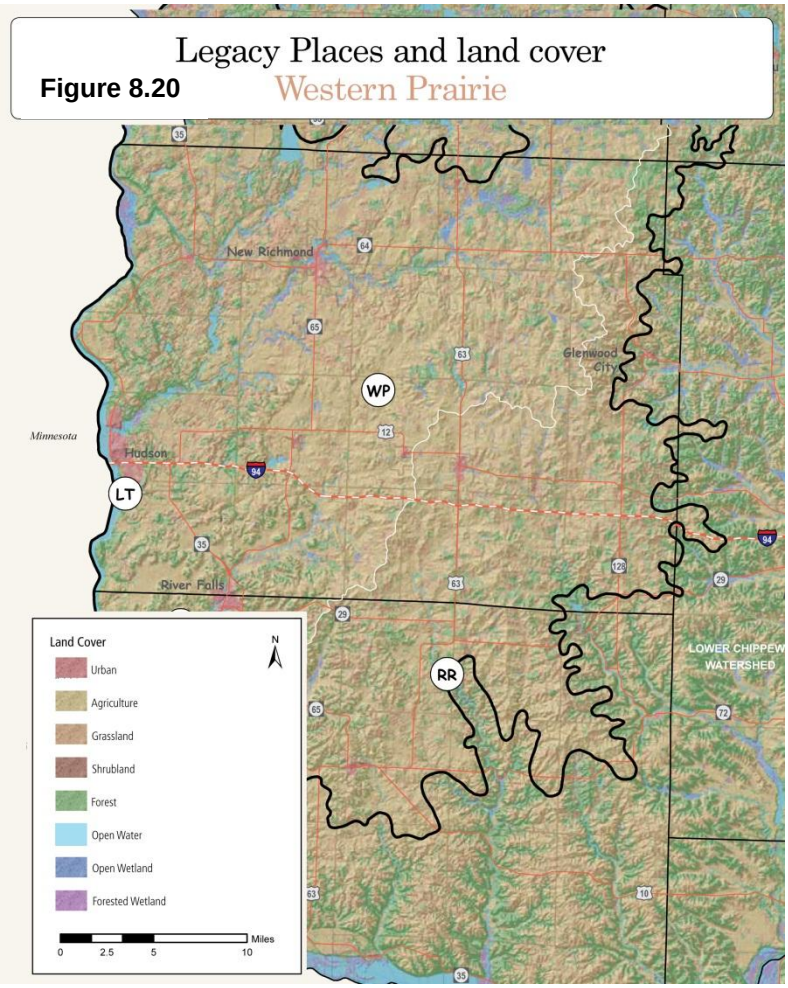


Figure 8.20

source: Wisconsin Department of Natural Resources

There are few high quality prairie remnants remaining; only about 13,000 acres (0.5 percent) of the State's original 3.1 million acres remain. Research shows it will take more than the preservation of these remnants to recover or retain the biodiversity this ecosystem can offer. Degraded areas that were once prairie can often be restored with moderate effort to yield a habitat suitable for most of the associated plant and animal species. Even certain managed agricultural and livestock practices can accommodate the maintenance of the open habitats needed by many grassland species. Grasslands can be restored and maintained through preserving a certain amount of open space for this type of cover as development occurs. Hence, development can occur in such a way that it can maintain sufficient grasslands for its habitat value while preserving the rural character of the landscape.

To help keep the western prairie legacy alive, the Western Prairie Habitat Restoration Area was established in 1999 to protect and restore 15,000 acres of grassland and wetland habitat in western St. Croix and southwestern Polk counties (see Figure 8.20). The Wisconsin Department of Natural Resources is the sponsor of the program and more information can be found by visiting the following website: http://dnr.wi.gov/org/land/wildlife/wphra/.

Oak Savanna

Oak savanna was originally present in St. Croix County. Wildfire and possibly bison and elk maintained these grasslands with scattered oaks. Only scant remnants of the ecosystem exist today. Oak savanna is the ecosystem that historically was a part of a larger complex bordered by prairies of the west and the forest of the east. Savannas were considered to be in the middle of prairie and forest. They were a mosaic of plant types maintained by wildfire and possibly large ungulates such as bison and elk.

Oak savannas were home to an abundant variety of plants and animals, and were probably optimum habitat for many game species and songbirds. However, oak savanna is presently one of the most threatened plant communities in the world. Less than 500 acres of oak savanna are listed in Wisconsin's Natural Heritage Inventory.

There is no inventory of oak savanna remnants in St. Croix County. However, some of the identified grasslands have the potential for oak savanna restoration by the Department of Natural Resources and other conservation groups.

WILDLIFE, WILDLIFE HABITAT & OPEN SPACE

Scattered throughout St. Croix County are various federal, state, and local wildlife, fishery, natural, and scientific areas, including private conservancy areas. These often encompass one or more of the sensitive land areas discussed previously (e.g., wetlands, forests, shorelands, prairies). These areas are managed as open space to provide important feeding, breeding, nesting, cover, and other habitat values to a wide variety of plant and animal species. Agricultural lands can also provide important open space and wildlife habitat, while maintaining the rural character of the area.

The existing federal, state and local wildlife and fisheries areas, labeled as public conservancy areas, are included on Figure 8.21. These areas are managed to provide important feeding, breeding, nesting, cover and other habitat values to a wide variety of plant and animal species. Additional information about fisheries is available on the Land and Water Conservation Website, www.sccwi.us/lwcd.

Waterfowl Production Areas, (WPA) are also included in Figure 8.21. The WPAs include lands purchased with duck stamp dollars. Their primary purpose is to provide waterfowl production habitat which consist of large tracks of grassland interspersed with numerous wetlands.

Hundreds of wild geese surround a private pond and are attracted to the short grass and easy pond access. Photo by Tammy Wittmer.

Management of WPAs includes ongoing wetland and prairie restoration, water level manipulation, prescribed fire, tree removal, mowing, and sometimes grazing. They are open to the public for hunting, fishing, environmental education and interpretation, and wildlife observation and photography. Motorized vehicles, mountain bikes, horseback riding and dogs off leash (except when hunting) are not allowed in WPAs.

Rare and Endangered Species and Natural Communities

According to the Wisconsin Department of Natural Resources Natural History Inventory, St. Croix County is home to 44 animal species, 25 plant species, and 22 natural communities that can be considered rare or endangered.

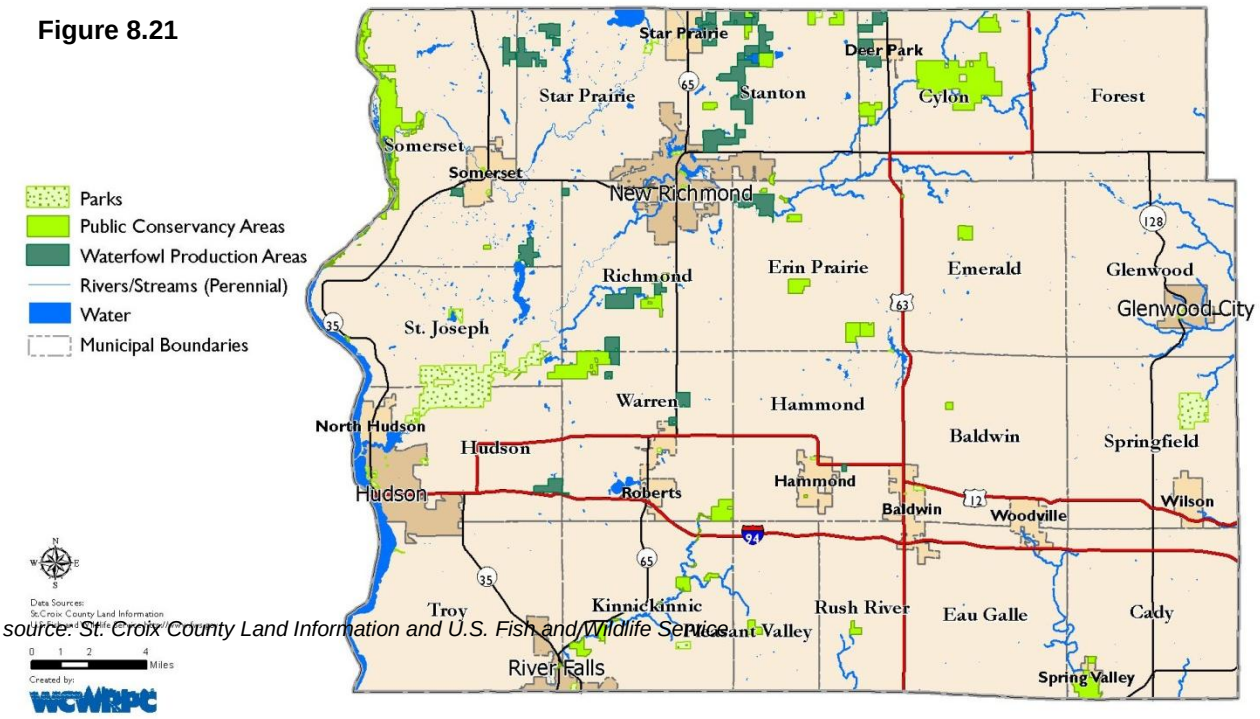
The Natural History Inventory is a statewide inventory of known locations of rare and endangered species and communities. This information is for general planning purposes only, and the lack of known occurrences in an area does not mean that no significant endangered resources are present. Lists of these species and communities are provided by the Wisconsin Department of Natural Resources. The specific locations of some resources may not be mapped due to their sensitive nature and in order to minimize impacts.

Twenty-two St. Croix County species have been categorized as endangered by the Wisconsin Department of Natural Resources, further information is available on the following website: http://dnr.wi.gov/org/land/er/wwap/. Wisconsin's Endangered Species Law (www.dnr.wi.gov/org/land/er/laws, s. 29.604, Wis. Stats.) requires the protection of our state's endangered and threatened species and directs the WDNR to determine whether any activity the WDNR *conducts, funds, or approves* may affect endangered or threatened species. As part of the permit approval process, an Endangered Resources Review (ER Review) is required from the WDNR to make this determination. In addition, regardless of whether a WDNR permit or approval is required or funding is involved, Wisconsin's Endangered Species Law still applies to all projects.

Other sources of information should be considered in the review, including information about the

Conservancy Areas

Figure 8.21



source: St. Croix County Land Information and U.S. Fish and Wildlife Service

project site, wildlife and plant databases, and species experts. Habitat assessments or surveys may be necessary to determine whether state or federally listed species occur within a project area or to confirm whether suitable habitat is present for an identified species or community.

Three species found within St. Croix County have Federal protection status designated by the U.S. Fish and Wildlife Service, additional information can be found on the following website: http://www.fws.gov/midwest/endangered/index.html.

Important examples of the following natural community types have been found in St. Croix County. Although these natural communities are not legally protected, they are critical components of Wisconsin's biodiversity and may provide habitat for rare, threatened, and/or endangered species. Further information can be found in the St. Croix County Land and Water Conservation Plan on the county's website: www.sccwi.us/lwcd.

State Wildlife Areas

The Wisconsin Department of Natural Resources manages the Cylon Wildlife Area, Cylon Marsh Wildlife Area, and the St. Croix County Islands Wildlife Area. A variety of recreational activities may be pursued at the Wildlife Areas including hunting, fishing, trapping, hiking, nature study, bird

watching and berry picking. In addition, the State Department of Natural Resources own 17 additional pieces of land that range from urban wetlands to larger native terrains. They also own the Kinnickinnic River Fishery which includes 2,443 acres of parkland and water resources and the Willow River State Park.

FIGURE 8.22 – STATE PARK AND WILDLIFE AREAS – ST. CROIX COUNTY

FACILITY	SIZE	LOCATION	NOTES
Willow River State Park	2,900 acres	five miles NE of Hudson	campground, boat launch, beach
Cylon Wildlife Area	2,285 acres	one mile E of Deer Park	forested/wetland
Cylon Marsh Wildlife Area	513 acres	four miles N of Deer Park	forested/grass/wetland
St. Croix County Islands W.A	1106 acres	three miles NW of Somerset	grass/wooded/backwaters

Source: Wisconsin Department of Natural Resources

State Natural Areas

State Natural Areas are managed to protect rare plants, animals, or native landscapes. State Natural Areas may be part of a larger State Wildlife Area, though permitted recreational activities may be less intensive. According to the Wisconsin Department of Natural Resources, there are four State Natural Areas in St. Croix County. They are Apple River Canyon; Kinnickinnic Wet Prairie; St. Croix Islands; and Cylon Natural Area.

Apple River Canyon features a deep (100-140 feet), narrow (150 feet) gorge along the Apple River about two miles upstream from its confluence with the St. Croix River. The Apple River is a shallow stream flanked by steep high cliffs on both sides. The canyon lies a few miles south of the limits of Glacial Lake Grantsburg, and presumably the gorge was formed during the period of drainage of the lake. The vegetation is diverse due to the nearly east-west orientation of a segment of the gorge, creating north and south walls with contrasting sunlight, moisture, and temperature conditions. On the upland to the north is an oak forest: on the south-facing upper slope a strip of prairie grasses; on the south-facing cliffs a few lichens and mosses; on the lowest talus slope a floodplain forest; on north-facing talus a northern dry-mesic forest; on northern cliffs, cryptogams; and on the upper slope a narrow prairie. Apple River Canyon is owned by the DNR and was designated a State Natural Area in 1978.

Kinnickinnic Wet Prairie supports many native prairie plants that have persisted despite having been grazed in the past. Most of the surviving species are characteristic wet prairie indicators with the majority being forbs (flowering plants) that survived years of grazing pressure. Wet prairies were once common throughout this Ecological Landscape but none remain today. This site supports the most remnant species, and has the right soils and moisture content making it the best candidate for restoration. Active interseeding of grasses and other species will be needed in order to preserve this site and restore its species composition for future generations to enjoy. Numerous springs and seeps are also present. These provided a barrier to the cattle and may have served to protect the prairie. Sedge meadow and cattail marsh surround the prairie and contain less conservative species but are none-the-less high quality examples of these natural community types. Several seeps and springs flow into Parker Creek, a tributary of the Kinnickinnic River. Kinnickinnic Wet Prairie is owned by the DNR and was designated a State Natural Area in 2008.

St. Croix Islands features a diverse and extensive mosaic of running sloughs, backwater lakes, braided stream channels, stands of emergent aquatic vegetation, old-growth lowland forest, and the delta of the Apple River. Abundant flowing springs on the north and east banks provide exceptional habitat for mussels and darters in the east channels. The stands of emergents are extensive, and, depending on water depth, dominated by arrowhead, river bulrush, softstem bulrush, reed grass, and huge patches of cordgrass. The lowland forest is dominated by silver maple with a few individuals reaching 35 inches in diameter. Canopy associates include green ash, hackberry, black willow, and elm. The understory is variable but is often undeveloped after annual flooding and scouring. Sedges, catchfly grass, smartweed, and sensitive fern are commonly seen. Also present is wet prairie containing cardinal flower, swamp milkweed, Joe-pye weed, jewelweed, water horehound, culver's root, obedience plant, monkey-flower, and great blue lobelia. The extensive nature of this site and diversity of habitats allows for an abundance of wildlife to flourish. Fishes include crystal darter, gilt darter, greater redhorse, common shiner, pumpkinseed, speckled chub, river redhorse, and bass. Birds include great blue heron, bald eagle, marsh wren, belted kingfisher, great egret, and red-shouldered hawk. St. Croix Islands is owned by the DNR and was designated a State Natural Area in 2010.

Wisconsin's Land Legacy Report

The Wisconsin Department of Natural Resources has completed a study that identifies unique places that are critical to meeting Wisconsin's future conservation and recreation needs for the next 50 years. A range of criteria were used in determining these places, including: high quality ecosystems, outstanding scenic beauty, accessibility, recreational opportunities, size of the resource, networks between resources, and water quality protection.

The following locations in St. Croix County were identified as important legacy places:

- Kinnickinnic River;
- Lower St. Croix River;
- Western Prairie Habitat Restoration Area.

For more information about Wisconsin's Land Legacy, visit http://dnr.wi.gov/master_planning/land_legacy/report.html. The report is also available at the Land & Water Conservation Office.

Cylon Natural Area is located on nearly level topography just south of the Willow River. It features woods and sedge meadows with an interesting mix of both northern and southern plant species. This mix of species occurs due to the site's location near Wisconsin's vegetation "tension zone", a band running from northwest Wisconsin to the southeast. It is largely determined by climactic factors. Within this zone, both southern and northern species can be found. The closed canopy forest is composed of large Hill's oak, white oak, and bur oak with basswood, red maple, and white pine. Red maple and American elm are common in the sapling layer. Ironwood dominates the sub-canopy layer and hazelnut and blackberry in the shrub layer. Ground flora includes such species as sweet cicely, tick-trefoil, enchanter's nightshade, black snakeroot, large-flowered trillium, maidenhair fern, wild strawberry, Canada mayflower, and partridgeberry. The sedge meadow is comprised of wire-leaved sedges mixed with broad-leaved white meadowsweet and steeplebush. Birds using the area include wood duck, ruffed grouse, broad-winged hawk, ovenbird, and red-eyed vireo. The Cylon Natural Area is 207 acres within the 2,347 acre Cylon Wildlife Area. It is owned by the DNR and was designated a State Natural Area in 2010.

Parks & Recreation Resources

Visitors and residents of St. Croix County have many opportunities to enjoy the natural resources of the county through parks, trails, and other public lands. A complete inventory of county, state and federally owned recreation facilities is provided in the Utilities & Community Facilities section.

Residents and visitors also have the option to enjoy the natural resources of St. Croix County

through many privately operated campgrounds, resorts, and other ventures, many of these are discussed in the Utilities & Community Facilities section and under tourism in the Economic Development section. Individual cities and villages also maintain their own parks and recreational activities discussed as part of the Utilities & Community Facilities Element.

ENVIRONMENTAL CORRIDORS

Environmental corridors are significant areas of environmental resources characterized by continuous systems of open space, physical features, environmentally sensitive lands and natural or cultural resources which can be adversely impacted by development. These areas are often evident to people in the area and they identify with them as significant natural areas in their surroundings. Independent resources are non-continuous open space, physical features, environmentally sensitive lands, and natural or cultural resources that also can be adversely impacted by development.

The adverse impacts caused by development in these areas can create undue costs on society in the attempt to alleviate those problems. Managing development in these areas either eliminates or reduces the adverse impacts from development. Management cannot overcome the impacts of developing in some of these areas, and in those areas it is prudent to prohibit development. In managing the development in those areas that can accommodate it, the costs associated with the adverse impacts of development can be shifted from society as a whole to those who choose to develop in them. This is accomplished by ensuring development occurs using engineering, site design, construction and management practices which address potential adverse impacts.

Environmental Corridor Criteria

Environmental corridors incorporate the following environmental and historical resources: lakes, ponds, rivers, streams, intermittent waterways and natural drainageways; wetlands; shorelands; floodplains; steep slopes; geologic formations and physiographic features; highly erodible soils; wet, poorly drained organic soils; closed depressions; wellhead protection areas; woodlands; prairie; rare or endangered species and communities; historical and archeological sites; and scenic areas.

The following are the criteria used to designate environmental corridors and resources:

Primary Environmental Corridor

- Linear in nature, often arising from a dominant feature or focal point, such as a waterbody or geologic feature
- At least three environmental resources present
- At least 400 acres in size
- At least two miles long
- At least 200 feet wide

Secondary Environmental Corridor

- At least two environmental resources present
- At least 100 acres in size
- Approximately one mile long or longer
- No minimum width

Independent Environmental Resources

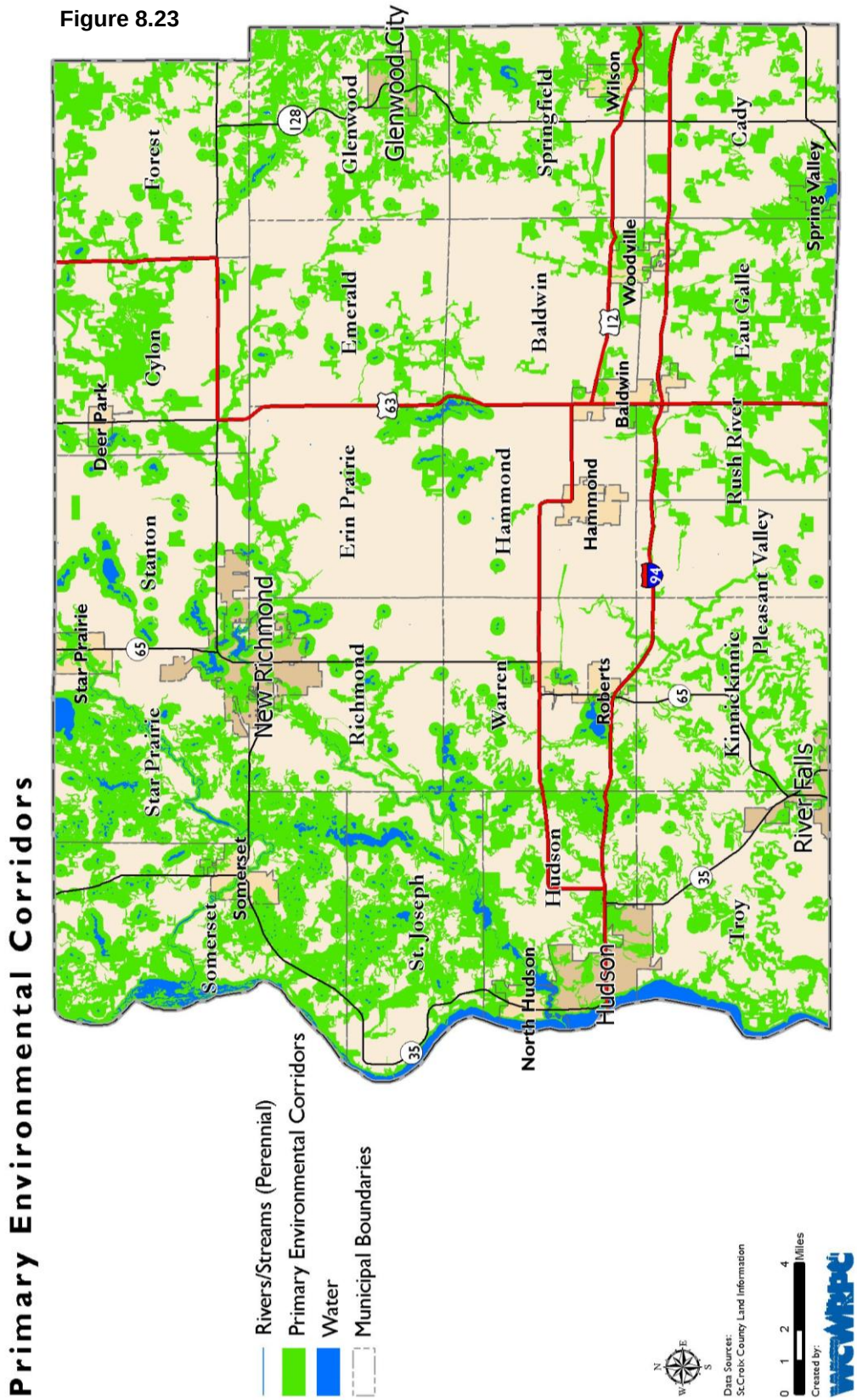
- At least one valued resource present
- No minimum size

- Separated from environmental corridors by intervening land or small, narrow features abutting environmental corridors

Figure 8.23 shows primary environmental corridors. The Primary Environmental Corridors map identifies the areas in the county with the most significant environmental features. County residents are most likely to identify these areas as significant environmental areas.

There are environmental resources throughout the county, not just in primary environmental corridors, which should be considered when determining the impacts of development.

Figure 8.23



source: St. Croix County Land Information.

NATURAL RESOURCES ISSUES & CONCERNS

The quality and accessibility of natural resources can be threatened in many ways. The following subsection describes the most common concerns and ways there are being addressed. The following concerns or issues are discussed in this subsection:

- Radon in Soils
- Groundwater Quality & Contamination
- Drinking Water Testing Program
- Nitrates
- Emerging Contaminants
- Point Source Discharges
- Invasive Species

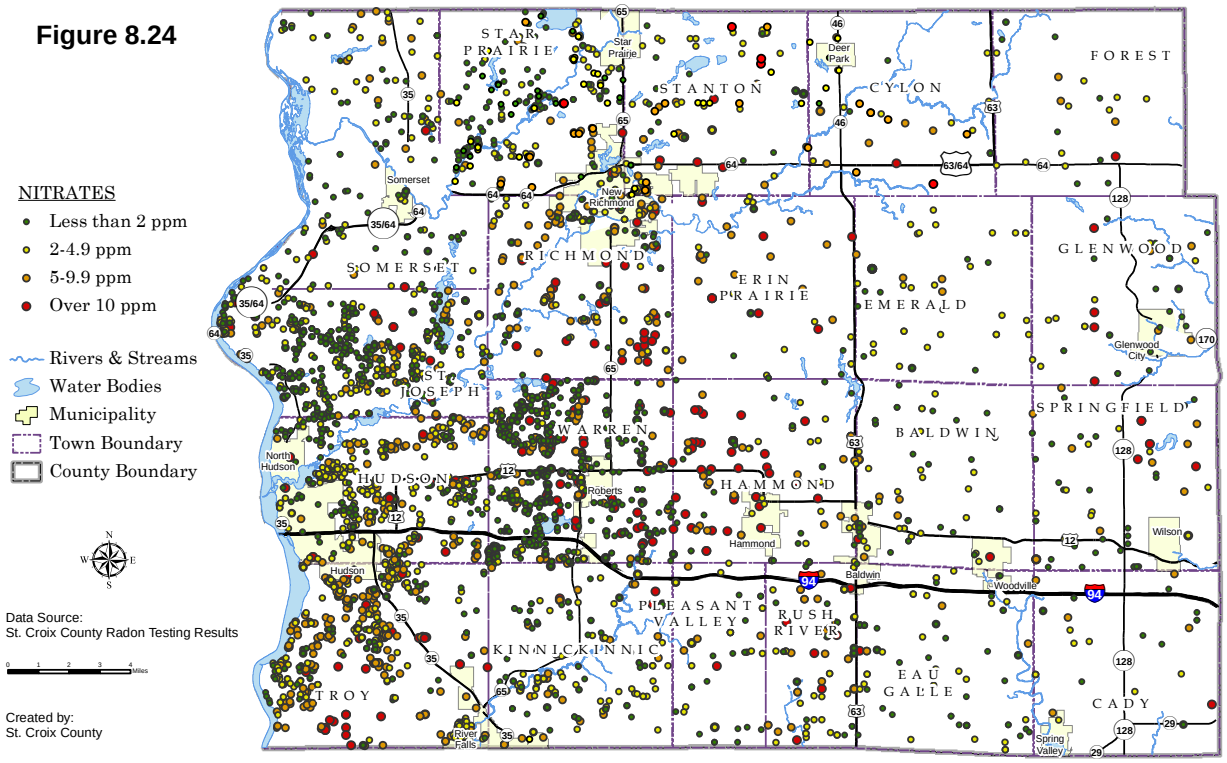
Radon in Soils

Radon is the earth's only naturally produced radioactive gas. It is produced by the decay of uranium and radium found in soil, rock and water. Radon is odorless, colorless, and undetectable by the human senses. In the soil, as these elements decay, radon gas is produced. Radon easily moves in homes through cracks and other openings. Once into the home, radon has less air to mix with, and may build up to dangerous levels.

Radon decay products or the radioactive particles can be inhaled. Once inhaled, the particles stick to your lungs and release radioactive energy. The radioactive energy can cause damage to the lung tissue. Extended exposure to high levels of radon can increase the risk of lung cancer. Radon results have been mapped for St. Croix County, see Figure 8.24.

Radon Test Results Above EPA Action Level

Figure 8.24



source: St. Croix County Radon Test Results.

Radon levels shown are not intended to predict the radon level in a neighboring house. This map shows that elevated radon levels can occur in all areas of St. Croix County. The variability of radon concentrations further suggests that adjacent properties should not assume that if a neighbor's house has low levels that their house would be the same, houses right next to each

other can have completely different radon levels. Any home may have a radon problem whether it is old, new, drafty, well-sealed, has a basement or is built on a slab. The only way to know if your home has a radon problem is to test. Radon test kits that meet EPA guidelines are available at the following county offices: Land and Water Conservation office in Baldwin; Planning and Zoning office in the Government Center in Hudson; or Public Health Department in New Richmond. Additional information on radon, testing, and health impacts is available on the St. Croix County Public Health website or at http://www.dhs.wisconsin.gov/radiation/.

Groundwater Quality & Contamination

Municipal water systems are regulated by the WI Department of Natural Resources, meaning they have to regularly test their water and must notify the public if water exceeds certain drinking water standards. In the case of municipal wells, if water does exceed drinking water standards additional steps must be taken to ensure that the standards are met before the water is distributed to the individual homes in the community. Municipal systems provide reasonable assurance that drinking the water will not result in any acute or chronic health effects.

Another tool used by municipal water systems is the development of wellhead protection plans (WHPP). These plans identify sources of drinking water and protect the quality and quantity of those sources. The communities in St. Croix County with WHPPs are Baldwin, Hammond, Hudson, Roberts, Somerset, Star Prairie, and Woodville.

Private wells that serve individual families are not required to be regularly tested. The majority of the county's nearly 16,000 wells fall under the category of private water supply. It is up to the individual homeowner to determine what tests to perform and how often. If water quality problems are detected, the homeowner is not required to treat the water; it is the individual's responsibility to determine what the risks are and whether those risks are great enough to correct the problem or find an alternative source of water.

An Introduction to Groundwater in St. Croix County

This report completed in May 2006, offers insight into a broader range of water quality measurements, such as nitrates, triazine, arsenic, chloride, hardness, and pH. For additional information and to see the full report, please visit www.sccwi.us/lwcd.

Protecting groundwater may mean modifying or even prohibiting certain activities in areas where contaminants can easily enter the groundwater. This can mean changing the type of septic system required, or limiting the concentration of development in areas that are most susceptible to contamination.

Simulation of Groundwater Flow System for St. Croix, Pierce and Polk Counties

This report, completed in 2009 by the United States Geological Service (USGS), is a groundwater modeling effort that lends additional insight into the characteristics of groundwater in the area and will help guide future studies and mitigation strategies. For additional information and to see the full report, please visit www.sccwi.us/lwcd.

The Wisconsin Department of Natural Resources has developed the Groundwater Contamination Susceptibility Model (GCSM) used to estimate the susceptibility of the groundwater based on particular natural resource characteristics. The natural resource characteristics include bedrock depth, bedrock type, soil characteristics, surficial deposits, and water table depth. The GCSM assigned a value to each of the resource characteristics. A weighting scheme was also developed to indicate the strength of each resource characteristic in estimating groundwater contamination susceptibility. The result of the analysis is a groundwater susceptibility map available for the State of Wisconsin which shows that the majority of St. Croix County has contamination susceptibility numerical

scores above the "moderately susceptible" level. A map showing the Groundwater Contamination Susceptibility results for St. Croix County can be found at http://wi.water.usgs.gov/gwcomp/. The preponderance of closed depressions in the County significantly increases these risks as contaminants at the surface may not be given the opportunity to be adequately filtered by soils, but instead, are passed more directly from the surface to the aquifer.

Figure 8.25 identifies areas of groundwater contamination concern:

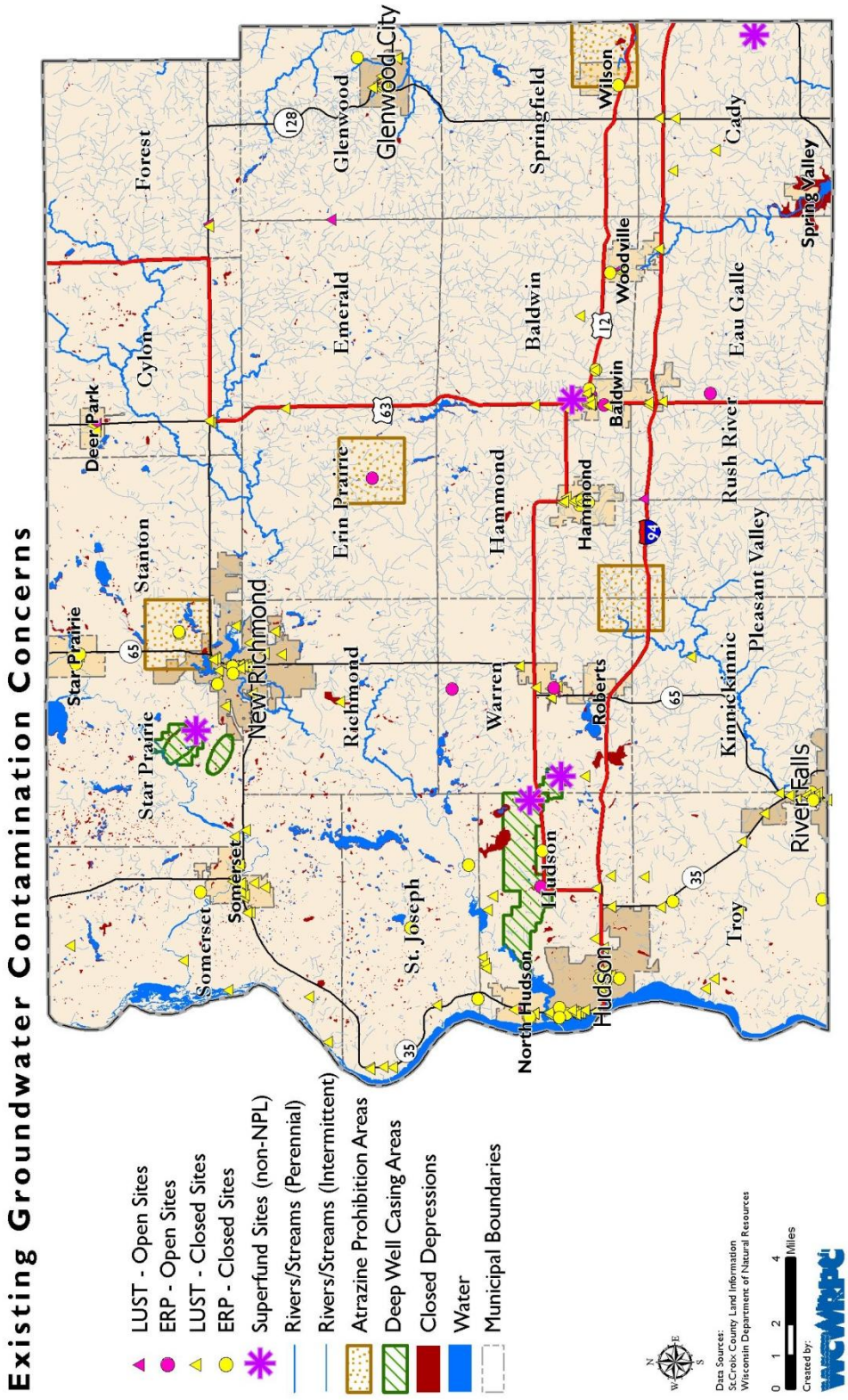
- Two deep well casing areas have been established by Wisconsin DNR in which private well requirements, special testing, and special treatment systems have been implemented due to groundwater contamination. These areas are actually four individual areas, three of which are related to Superfund sites in which Volatile Organic Compounds (VOCs) have caused significant groundwater contamination. Long-term exposure to VOCs can include cancer, liver damage, spasms, and impaired speech, hearing, and vision. Each of these areas has related requirements for private wells, such as increased testing and the installation of whole-house, point-of-entry, activated carbon filter treatment systems. In some cases, landowners have elected to use bottled water; municipal water has been extended to the Town of Star Prairie area. The second deep well casing area is quite large, extending from the Town of Warren west through a large portion of the Town of Hudson.
- Five Superfund sites, as well as the Lee Farm Property which is related to the Rosen Metals site. All superfund sites are no longer on the National Priority List (NPL). Additional information is available in the St. Croix County All Hazards Mitigation Plan and on the WI DNR website, http://dnr.wi.gov/topic/Brownfields/clean.html.
- Four atrazine prohibition areas in which groundwater contamination from atrazine pesticide use has exceeded State enforcement standards.
- Open and closed Leaking Underground Storage Tank (LUST) and Environmental Repair (ERP) sites are potential brownfield remediation sites that are due to past hazardous materials dumping, storage tank leaks, or other such contamination. All of these sites have had some level of contamination to varying degrees, most often limited to the site itself.
- An approximate potential impact area of a second plume of groundwater contamination in the Town of Star Prairie from a second, older landfill. Landfill license #310. It is reported to have operated from approximately 1945 until it closed in 1975. In 1992, an Environmental Conditions Assessment was completed and based on the results of that assessment, one private well was replaced because of VOC contamination and the landfill was capped in 1994 with clay material. Since that time, Operation & Maintenance (O&M) continues at the site with scheduled water sampling from monitoring wells and private wells. This second plume has not been declared a deep-well casing area or other formally identified well advisory area. However, the Wisconsin Department of Natural Resources may require additional actions at this site in the future.
- Known areas of closed depressions.

Not shown on the map are two "special areas of well compensation eligibility" in Emerald that were established by the Wisconsin DNR as of June 2009. Wells located in those areas were found to contain Rhodococcus bacteria; an ecoli-positive bacteria. This type of bacteria is indicative of grazing animal waste contamination, which includes waste from livestock.

- Residential well owners within these designated areas may be eligible, depending on income, for a grant to help pay for the cost of a replacement well and for sealing their existing contaminated well.

- Based on the susceptibility of the groundwater supply for the Town of Emerald, the WDNR recommends that all new or replacement wells within the town be cased to a depth below the Prairie du Chien aquifer.

Figure 8.25



Source: Department of Natural Resources

Drinking Water Testing Program

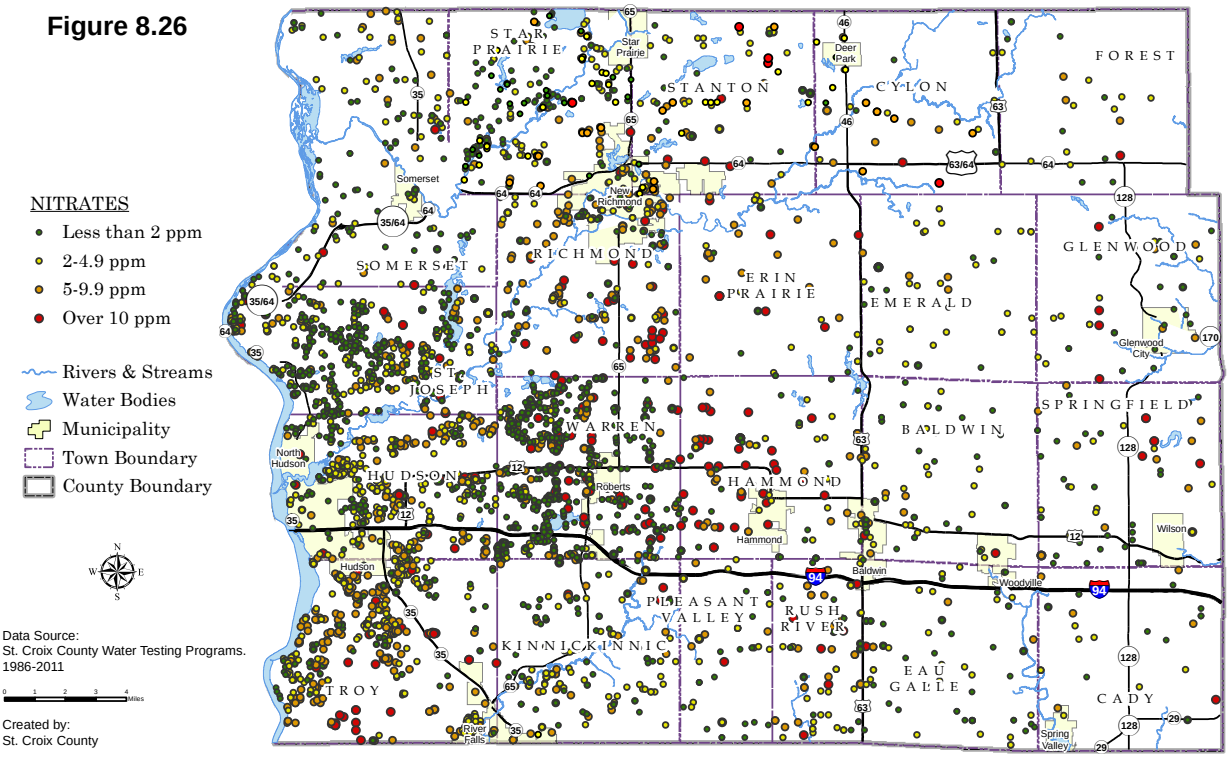
The groundwater/drinking water testing program was developed to provide information and education on the use and quality of drinking water for the rural residents in St. Croix County. This program was a cooperative effort between UW Extension, St. Croix County Public Health Department, St. Croix County Land and Water Conservation Department, UW Stevens Point Environmental Task Force Lab and local towns. The objective is to continue to provide information to rural landowners on the quality of their drinking water and allow comparison between testing periods.

St. Croix County's Drinking Water Testing Program

The St. Croix County's Land and Water Conservation and Public Health departments work with certified laboratories to offer water testing. Water test kits are available for a fee from St. Croix County offices in Hudson, Baldwin and New Richmond. More information about this program can be found at: www.sccwi.us/lwcd.

Nitrates in Groundwater

Figure 8.26



source: St. Croix County Drinking Water Test Results.

- Since 1999, staff has worked with 21 towns and many rural residents to conduct this voluntary drinking water program.
- Landowners choose to pay for up to three different water tests: the homeowner's test, metals test, triazine screening, or a combination of their choice. All costs for water tests are the responsibility of the landowner.
- Nearly 3200 households have participated. This represents only about 20% of the private wells in St. Croix County. Figure 8.26 illustrates countywide nitrate levels found in drinking water test results from 1999-2010.

Nitrates

As water runs over the land surface and soaks downward, it may pick up natural and manmade pollutants from materials that were spread, spilled, buried or piled during the use of the land. Nitrates from fertilizers, animal waste and human waste are examples of pollutants. Nitrate pollution affects much of St. Croix County's groundwater and most of its wells. For wells tested through the County's Drinking Water Program:

- Nitrate levels of less than 2 parts per million are considered naturally occurring; this represents less than 25 percent of wells tested.
- Nitrate levels of 2 to 10 parts per million are considered elevated levels due to human activities, over 65 percent of the wells tested have elevated nitrate levels.
- About 10 percent exceed the safe drinking water standard of 10 parts per million.
- Nitrate levels greater than 10 ppm:
  - are risky for humans especially for young children and pregnant women because they can reduce the amount of oxygen in the blood of infants under six months old.
  - may also be toxic to aquatic wildlife.
  - are risky for livestock if feed is also high in nitrates.

Emerging Contaminants

Developed to promote human health and well-being, certain pharmaceuticals are now attracting attention as a potentially new class of water pollutants. Such drugs as antibiotics, anti-depressants, birth control pills, seizure medication, cancer treatments, pain killers, tranquilizers and cholesterol-lowering compounds and over-the-counter medicines like acetaminophen and ibuprofen have been detected in surface and ground water sources throughout the United States. Along with pharmaceuticals, personal care products also are showing up in water. Generally these chemicals, the active ingredients or preservatives in cosmetics, toiletries, fragrances or sunscreens, have attracted concern because of their persistence and possible adverse environmental impacts.

- People often dispose of unused medicines by flushing them down toilets, and human excreta can contain varied incompletely metabolized medicines. These drugs can pass intact through conventional sewage treatment facilities, into waterways, lakes and even aquifers. Further, discarded pharmaceuticals often end up at dumps and landfills, posing a threat to underlying groundwater.
- Farm animals also are a source of pharmaceuticals entering the environment, through their ingestion of hormones, antibiotics and veterinary medicines. Animal waste containing traces of such pharmaceuticals is spread on land and can then wash off into surface water and even percolate into groundwater.
- A safe option is now available for residents to properly dispose of their unwanted or unneeded medications, the St. Croix County Medication Disposal Program.

St. Croix County's Medication Disposal Program

This program is available at ten police departments and at the County Sheriff's Department and provides an anonymous and free option to drop off old or unneeded prescription drugs and over-the-counter medications in secure-bins. More information about this program can be found at: www.sccwi.us/safemedsdrop.

Point Source Discharges

Private and public sewer systems and wastewater discharges are two potential sources of water pollutants. From 1995 through 2003 the number of new private onsite wastewater treatment systems installed each year almost doubled from around 300 new systems per year to over 600 new systems each year. Since 2003, St. Croix County has seen a significant and consistent decrease in the number of permits issued for new private onsite waste water treatment systems. From the 2003 high of 756 new sanitary system permits issued, to 2010's low of 84 permits issued. At the same time, every new system increases the number and density of private sewage systems in the County. This can lead to nitrates in the groundwater. There are 16 municipal, sanitary district and private wastewater treatment facilities (WWTF) that discharge to either surface or ground water in St. Croix County and four permitted industrial discharges in St. Croix County as seen in Figure 8.27.

FIGURE 8.27 - PERMITTED MUNICIPAL AND INDUSTRIAL WASTEWATER DISCHARGES TO SURFACE AND GROUNDWATER – ST. CROIX COUNTY

WATER BODY	OWNER	TYPE
Baldwin Creek	Baldwin	Municipal WWTF
Willow River	Deer Park	Municipal WWTF
Groundwater/wetland tributary to Tiffany Creek	Glenwood City	Municipal WWTF
Groundwater	Hammond	Municipal WWTF
St. Croix River	Hudson	Municipal WWTF
Willow River	New Richmond	Municipal WWTF
East Twin Lake	Roberts	Municipal WWTF
Apple River	Somerset	Municipal WWTF
Apple River	Star Prairie	Municipal WWTF
Wilson Creek	Wilson	Municipal WWTF
Groundwater	Woodville	Municipal WWTF
Groundwater	Emerald/Glenwood	Sanitary District
Groundwater	Forest	Sanitary District
Groundwater	Richmond	Sanitary District
Groundwater	St. Croix Meadows (Mobile Home Park, Houlton)	Municipal WWT Permit Private
Groundwater (domestic water only)	Travel Centers of America (Twin Cities East, Hudson)	Municipal WWT Permit Private
Groundwater/Lohn Creek	Cady Cheese	Industrial
Groundwater/Cady Creek	Foremost Farms USA COOP	Industrial
Groundwater/Willow River	Lakeside Foods	Industrial
Groundwater	Nor Lake	Industrial

source: Wisconsin Department of Natural Resources

Invasive Species

A threat to some of St. Croix County's natural communities is invasive species of plants and animals. These pests invade lakes, rivers, forests, wetlands, and grasslands. They displace native species, disrupt ecosystems, and affect people's livelihoods and quality of life. They hamper boating, swimming, fishing, hunting, hiking, and other recreation and take an economic toll on commercial, agricultural, forestry, and aqua cultural resources.

Humans have created conditions where plants and animals can aggressively invade and dominate natural areas and waterways in three ways:

- Introducing exotic species that lack natural competitors and predators to keep them in check.
- Disrupting native ecosystems by changing environmental conditions.
- Spreading invasive species through various methods.

According to the UW-Stevens Point Robert W. Freckmann Herbarium, there are 24 noted invasive plant species in St. Croix County. However, most species are vastly under collected; so many more invasive plant species are likely present. In fact, there are over 600 additional invasive plant species recorded in one of St. Croix's adjoining counties. Of specific concern to St. Croix County are: buckthorn, spotted knapweed, leafy spurge, wild parsnip, garlic mustard, Reed Canary Grass, and Eurasian Water-Milfoil. There are almost 50 other invasive species, such as the gypsy moth, zebra mussels, rusty crayfish, and Butternut Canker which have become established in Wisconsin. The Emerald Ash Borer could also pose a threat in the future.

Controlling invasive species can be difficult and expensive. Learning how to prevent the introduction of new invasive species and controlling the spread of those already in St. Croix County will take education. One source of information is the Department of Natural Resources, http://dnr.wi.gov/invasives.

SUMMARY

Numerous programs at the State and County level are available to assist local communities in their planning efforts and in the protection of local natural resources. Protection of such resources needs to be balanced with, and can be complementary to, other community goals as discussed in the other existing conditions sections.

Natural Resources - Physical Features Conditions Summary

- Generally, the topography of St. Croix County is lower in the western edge of the County abutting the St. Croix River and rises in elevation the further east.
- St. Croix County has 23 operating and licensed non-metallic mining sites. There are no known metallic mineral deposits in sufficient tonnage or quality to warrant extraction.
- Sand and gravel resources are available throughout the County, but are more abundant near rivers, and in the northwest portion of the County.
- St. Croix County has a total surface water area of 9,598 acres or 15 square miles and approximately 290 miles of shoreline.
- St. Croix County is located in both the St. Croix River Basin and the Lower Chippewa River Basin.
- In general, the surface water quality in the St. Croix River Basin and the Lower Chippewa River Basin needs improvement due to agricultural runoff and sedimentation. There are four outstanding resource water bodies and six exceptional resource water bodies.

Natural Resources - Sensitive Lands Conditions Summary

- Approximately 9.8 percent of St. Croix County has steep slopes of 13 percent or greater, on which development should be limited or discouraged.
- In 2010, the combined assessed forestland acres in the unincorporated areas (minimal acres existed in incorporated areas) amounted to 51,005 acres or about 12.5 percent of the total County acreage.
- Combined, assessed agricultural and forest acres account for 75 percent of the assessed land in the County.
- Assessed forest and AG forest acreage increased by roughly 14,839 acres, or almost 23 square miles, between 1990 and 2010. This was a 41 percent increase. The greatest percentage decreases occurred in the towns of Hudson (-46 percent) and Somerset (-33 percent).
- St. Croix County is home to 44 animal species, 25 plant species, and 22 natural communities that can be considered rare or endangered.
- St. Croix County has four State Natural Areas managed to protect local plants, animals, and/or ecosystems.
- St. Croix County has three Wisconsin Land Legacy Places identified in the draft State plan: Kinnickinnic River, Lower St. Croix River, and Western Prairie Habitat Restoration Area.

Natural Resources – Environmental Corridors Summary

- St. Croix County has identified environmental corridors and resources with a concentration of significant environmental features that can be adversely impacted by development.

Natural Resources – Issues & Concerns Summary

- Radon is the earth's only naturally produced radioactive gas. St. Croix County homes should be tested to detect unsafe levels of radon.
- Groundwater provides drinking water to St. Croix County residents. Groundwater is susceptible to contamination from metals, triazine, nitrates and other contaminants and must be tested to ensure it is safe for consumption.
- Sensitive habitats can be encroached upon or degraded by invasive species. There are a variety of invasive plants and animals that have been found St. Croix County.