

# Natural Resources

It is the abundance and quality of natural resources that draw people to live and recreate in Presque Isle County. That same abundance of woodlands, wetlands, water and wildlife drew pioneers here over 100 years ago and native American's here thousands of years ago. Today, public lands form a foundation of green space within the County. The public lands are connected by the green infrastructure of forests, wetlands, and open space on private lands. An important role of local land use planning is to provide for community development while protecting the critical and vital web of ecological resources within a community. Since resources extend far beyond the County borders, we also have a responsibility to communities outside the County.

## Climate

The climate is a factor, which contributes to Presque Isle County's appeal as a place to live and spend leisure time. The County's climatic conditions are best described as long cold winters and moderate warm summers. The year round climate is heavily influenced by Lake Huron, particularly in coastal communities like Rogers City. Lake Huron acts like a large hot water bottle in the fall, warming the nearby land area and prolonging the growing season. In the spring and early summer, Lake Huron has the opposite effect of cooling the adjacent land area. Further inland, the lake moderating effect diminishes. Local topography can influence temperatures and associated frost conditions. For example, low areas and depressions will often experience earlier frosts than surrounding uplands. **Table 2-1** contains weather statistics recorded at weather reporting station in Onaway. As mentioned above the weather conditions do vary across the County, depending upon topography and proximity to Lake Huron.

The frost-free season is typically June 1st to September 12th, which provides for an average 104-day growing season. The mean annual temperature for Presque Isle County is 43.9° F. In the winter the average temperature is 20.1° F, with the average minimum daily temperature of 11.7° F. The lowest temperature on record is minus 35° F. In the summer the average daily temperature is 78.8° F. The highest recorded summer temperature is 107° F. The average annual precipitation, including snowfall, is 31 inches; nearly 19 inches of the precipitation occurs as rainfall during the growing season of April through September. The average annual snowfall is 98 inches.

**Table 2.1**  
**Average Annual Weather Statistics, Presque Isle County**

January average minimum temperature	9.7° F
January average maximum temperature	26.7° F
July average minimum temperature	55.0° F
July average maximum temperature	81.1° F
Average daily temperature for the year	43.9° F
Average annual precipitation	30.98 inches
Average annual snowfall	98 inches
Source: Weather Reporting Station at Onaway, Michigan	

## Geology

The geology of Presque Isle County, as well as the entire northern Lower Peninsula, can be described in terms of the surface geology and bedrock geology. The rolling hills, river valleys, swamps and lakes were created by the retreating continental glacier some 12,000 years ago. Beneath this mantel of the glacial deposits lays a foundation of layered sedimentary bedrock. This section will describe the glacial landforms or quaternary geology and the underlying bedrock geology.

Starting some 2 million years ago, during the Pleistocene era, continental glaciers formed in the Hudson Bay area. Several times, over this two million year period, the massive sheets of ice built up and inched their way south across what is today Michigan. The massive ice sheets, more than one mile thick, advanced in a southerly direction, bulldozing their way across the landscape. The glacier pushed material in front of it, incorporated rocks and soil into the debris laden ice; and scraped, ground and broke apart the sedimentary bedrock of the Michigan Basin.

Each advance and retreat of the continental glaciers took tens of thousands of years. This reoccurring process shaped and reshaped the land, obliterating and then creating hills, valleys, rivers and lakes, swamps and marshes. The last glacial period, called the Wisconsin era, created the landscape we know today. The glacier left behind boulders, rocks, cobble, sand, gravel, silt, clay and loam. In some areas the material was deposited in unsorted masses called till plains, ground moraines and end moraines. Water flowing from the melting glaciers also sorted materials, creating outwash channels, sand deltas, kames and eskers. Fine materials, captured in the fast moving glacial meltwater, settled to the bottom of expansive glacial lakes creating lacustrine clay and silt plains.

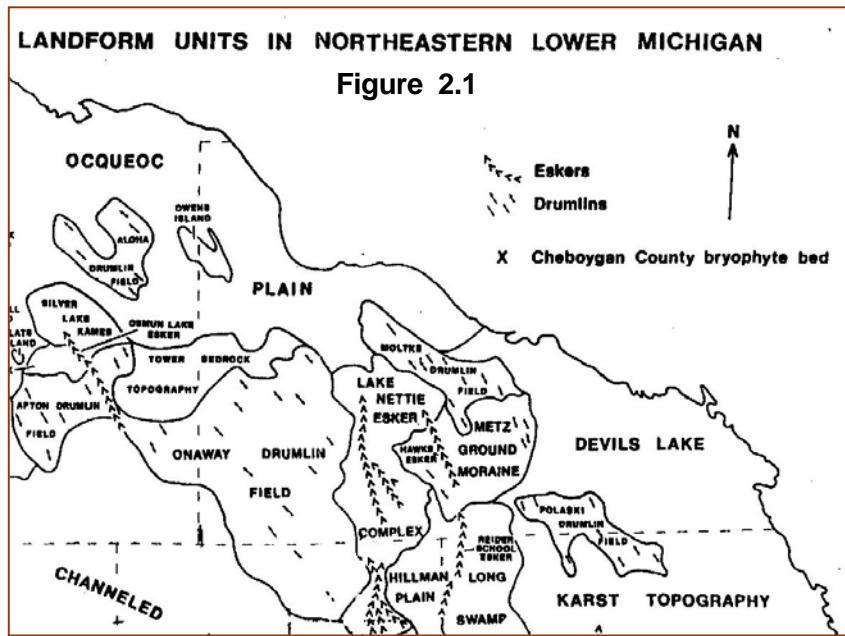
Within the central and southwestern portions of the County, medium textured glacial till deposits (non-sorted loam and silt loam with variable amounts of cobbles and boulders) created landforms called ground moraines and till plains. The Onaway Drumlin field and Moltke Drumlin Field are located in these areas. The drumlin fields are ground moraine areas that consist of scattered elliptically shaped streamlined hills, sculptured from thin glacial drift. The drumlins trend southeastward direction and record the movement of the glacier. Overriding ice molded these streamlined hills, up to a mile long. **Figure 2.1** is a map prepared by W.A. Burgess, titled "Landform Units in Northeastern Lower Michigan."

At the front of the massive retreating glaciers, large streams originated from the melting ice. The debris-laden water carved through moraines creating wide drainage ways and outwash channels, sometimes filling in low areas and creating wide outwash plains. There are two major glacial outwash areas in Presque Isle County. The largest is located in the lakes region in the south central part of the county and a smaller area is located in the southwest corner. The outwash plain is dominated by water sorted sand and gravel deposits. These glacial landforms extend south into Montmorency County and are part of a much larger complex of glacial outwash plains and channels. Many lakes, streams, creeks and wetlands are found in these ancient glacial drainage channels. Located within the outwash areas are the Lake Nettie and Hawks esker complexes. Eskers are narrow, winding ridges of glacial outwash (sand and gravel) deposited by a stream flowing in a tunnel beneath the glacier. The eskers are situated in a wide glacial outwash channel.

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As the continental glaciers melted, huge blocks of ice became separated from the retreating ice front. The ice blocks became embedded in the glacial debris deposited by the retreating glacier. The embedded ice blocks eventually melted and left depressions (kettle holes) which are today's inland lakes and associated wetlands. Most of the natural lakes in Presque Isle were formed in this manner. Two large water bodies, Grand and Long Lakes, have glacial origins different than the numerous kettle lakes. Acting like large bulldozers, the glaciers broke apart the level sedimentary bedrock and scoured out the long linear lake basins we know today. The linear orientation of these lakes is similar to the drumlins found near Onaway and Moltke and is roughly parallel to the Lake Huron shoreline.

As the continental glaciers melted and retreated from the landscape, deep basins carved out of the bedrock filled with water. These emerging lake basins were the beginnings of our Great Lakes. During different periods, the pro and post glacial Great Lakes were both much higher and lower than the lake levels we have grown accustomed to in recent times. Geologists have identified and named the different postglacial Great Lake stages. Glacial Great Lake Warren formed at the front of the melting Huron glacial lobe around 12,000 years before present and was the most extensive, flooding large portions of parts Alpena and Presque Isle Counties.



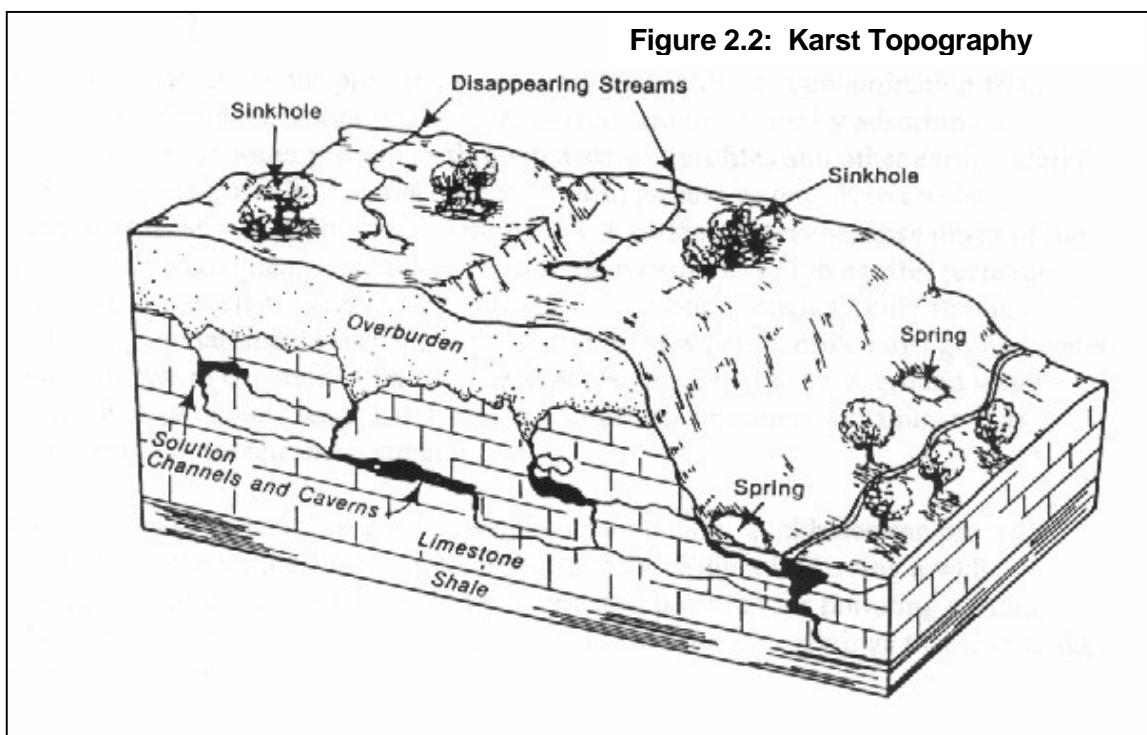
A two to eleven-mile wide lake plain formed from lacustrine sand and gravel deposits runs along the entire coastal area of the County. This relatively level glacial landform was created by the receding postglacial Great Lakes. Some areas are sandy plains covered by pine and aspen forests while other areas consist of poorly drained swamps covered with cedar forests. Black, Grand and Long Lakes are located in the lacustrine deposits. In the eastern part of the County the mantle of glacial deposits are very thin and as a result the limestone bedrock is close to the surface and outcrops are frequent.

The foundation of the lower peninsula, beneath the thin mantel of glacial deposits, consists of layers of sedimentary bedrock that were created during the upper and lower Devonian ages of the Paleozoic Era. The bedrock was formed in ancient seas, which covered the area some 345 to 405 million years ago. Shallow marine seas deposited layers of silt, clay, sediments, marine

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animals, plants, coral, and other calcareous materials. These deposits formed shale, limestone, and dolomite bedrock. The youngest bedrock, Antrim Shale, is found in the southwest corner of the County. Traversing the County in a northerly direction, formations include the Traverse Group, Bell Shale, Dundee Limestone and the Detroit River Group. Limestone and dolomite, extracted from Michigan Limestone and Stoneport quarries, are fine grained, finely crystalline, very pure and high quality.

One important feature of the regional bedrock is the occurrence of sinkholes and underground streams. As groundwater flows through cracks and fissures in the bedrock, the limestone gradually dissolves and the openings are widened. Over a long period of time underground caverns form and the ceilings become thinner. The ceiling collapses when it becomes too thin to support the weight above, thus forming a sinkhole. "Karst" is the scientific term used to describe a type of topography this is formed in dissolved limestone, dolomite or gypsum and is characterized by sinkholes, caves and underground drainage systems. Karst is also a term used to describe a very distinct terrain as well as the process by which it formed. **Figure 2.2** illustrates karst features.



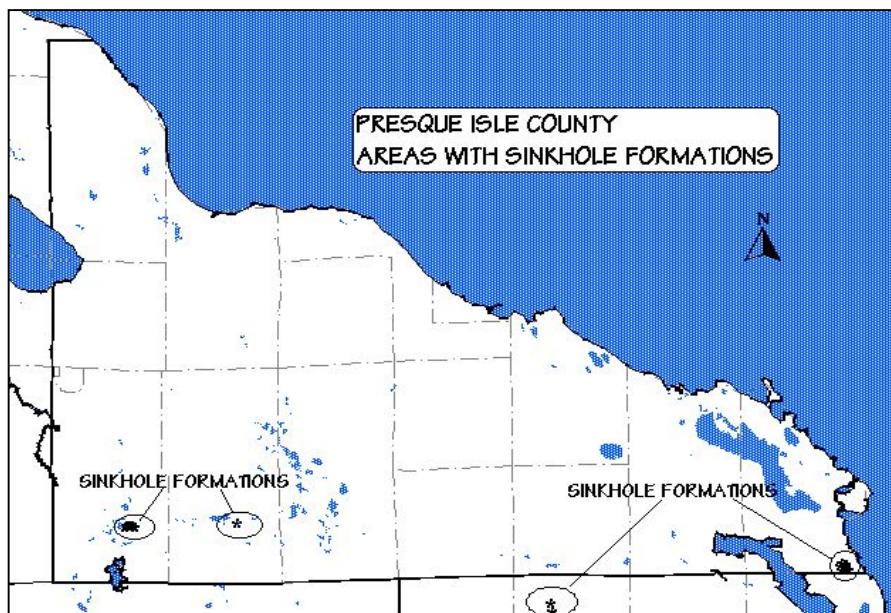
Karst features are present in several northern Michigan counties, but are most prevalent and have the greatest number of exposed features in Presque Isle and Alpena Counties. As **Figure 2.3** shows, groupings of sinkholes are found on the Rockport property in Presque Isle Township and in the Shupac Lake area in Allis Township. In addition to providing an interesting geographic feature, sinkholes also can host unusual plant communities. The relatively moist terrain with bedrock at or near the surface and the partially subterranean shaded location provide an environment, which sustains vegetation not found in the surrounding surface areas.

Sinkhole areas are often especially vulnerable to pollution. Over the years sinkholes have been used as dump areas. The accumulation of refuse is especially dangerous, because of the direct

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connection to the groundwater, which usually exists in a sinkhole. One particular sinkhole clean-out project recently netted eight automobiles, three snowmobiles, a 250-gallon fuel oil tank, and several tons of other metal materials, along with a large amount of household trash. Local action to protect and preserve sinkholes is recommended both on account of their scenic value and as a groundwater quality protection measure.

**Figure 2.3: Locations of Sinkholes**



## Soils

When planning for types and intensity of future land uses, soil types and slopes are two important factors that determine the carrying capacity of land. Soils most suitable for development purposes are well drained and are not subject to a high water table. Adequate drainage is important to minimizing stormwater impacts and the efficient operation of septic drain fields. Adequate depth to the water table is necessary to prevent groundwater contamination from septic systems or other non-point source runoff. The construction of roads, buildings and septic systems on steeply sloped areas or areas with organic and hydric soils require special design considerations. In addition, costs for developing these sensitive areas are greater than in less constrained parts of the landscape. If developed improperly, the impacts to natural resources can be far reaching.

The Natural Resource Conservation Service completed a detailed soil survey of Presque Isle County. A digital or computerized version of the soil survey maps was acquired from the Michigan Center for Geographic Information's web site. Using information contained within the published soil survey book, a series of maps will be presented that depict hydric soils, slopes 18 percent and greater, and areas where the bedrock is close to the surface. While soil constraints discussed in this section can be used as general guides for the planning process, it should not be used for development of specific sites. Detailed, on-site investigations should be conducted prior to development.

## Hydric Soils

**Figure 2.4** (see page 2-14) is a color thematic map that classifies hydric soils. Lower density and less intensive development should be directed to these areas with severe building constraints. Hydric soils are saturated, flooded or ponded during part of the growing season and are classified as poorly drained and very poorly drained. Hydric soils have poor potential for building site development and sanitary facilities. Wetness and frequent ponding are severe problems that are difficult and costly to overcome. Sites with high water tables may be classified as wetlands and a wetlands permit would be required to develop these areas. Some 137,535 acres (approximately 33 percent of the land area in the County) were mapped as hydric soils. An additional 82,216 acres of soils with hydric inclusions were mapped. These are upland soils with small areas of hydric soils that weren't mapped. The hydric soils are generally located adjacent to streams and creeks. This connectivity of riparian wetlands and surface water features can be seen throughout the landscape.

## Depth to Bedrock

The soil survey of Presque Isle County identifies soils where the karst bedrock is near the surface. Areas with these shallow soils have severe constraints to development. Of particular concern is that bedrock aquifers are highly vulnerable to surface contamination from septic systems. Effluent from drain fields is treated as it percolates down through the soil. If there is a lack of filtration from the drain field to the bedrock, the effluent is not treated properly by the soil, and it will contaminate the bedrock aquifers with pathogens. The Northeast Michigan Karst Protection Plan described in the sections on groundwater will further explain the issues. **Figure 2.5** (see page 2-15) show areas with shallow soils over limestone bedrock.

## Prime Farmland

Farming is important to the local economy and is part of the lifestyle of many long-term residents of the County. The presence of farmland is also an integral part of the rural landscape. While the amount of land being farmed has been decreasing each decade, generally the land is converting to a less intensive use of open lands and so far has not been converted to subdivisions or commercial uses. **Figure 2.6** (see page 2-16) shows the prime farmland soils in the County.

## Groundwater

All of the drinking water in Presque Isle County, whether municipal or individual private wells, is derived from groundwater in subsurface aquifers. *Groundwater* is water beneath the earth's surface, which fills openings (*pore spaces*) in sand or gravel, or in fractures of rock. It begins as rain or snow and passes through the soil and bedrock. An *Aquifer* is an underground layer of rock, sand, or gravel containing enough groundwater to supply a well.

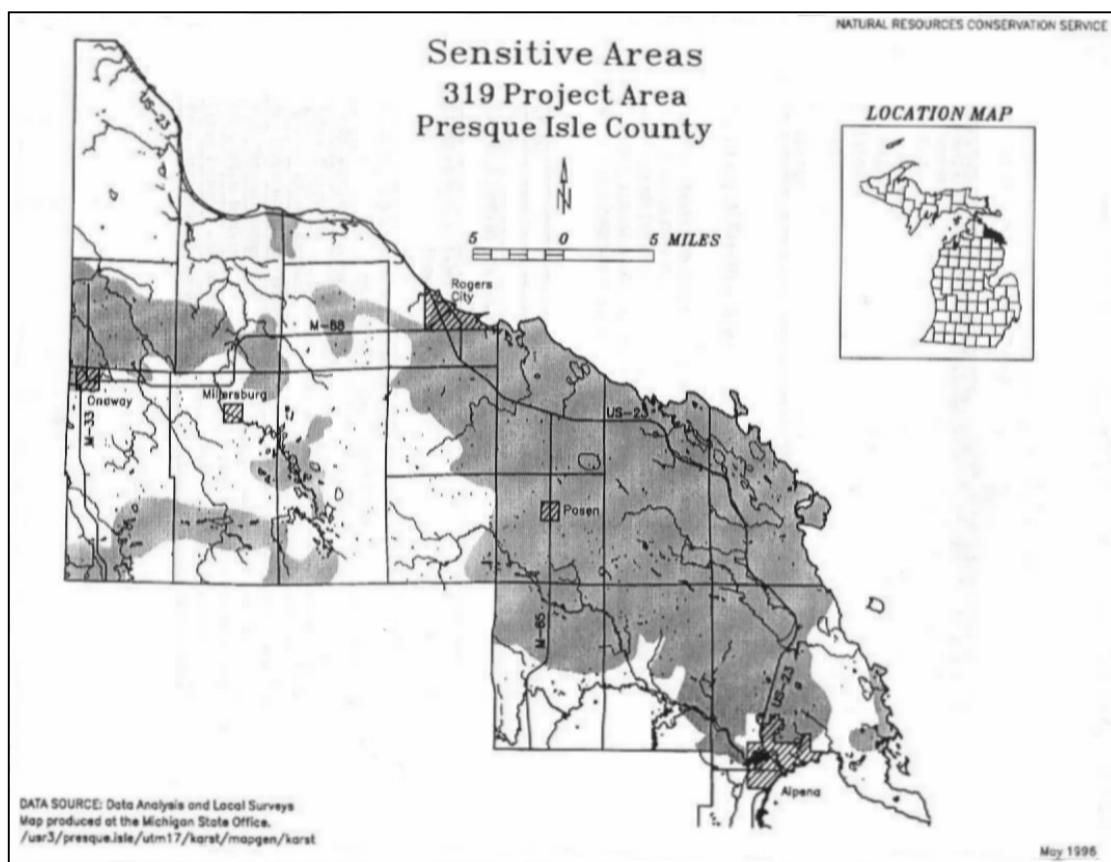
Groundwater is generally available in adequate quantities throughout Presque Isle County. Water wells are developed in glacial deposits and the underlying bedrock. Since the bedrock is close to the surface in many areas, most water wells are developed in limestone bedrock. Overall, Presque Isle County has good water quality. In general the County's groundwater is quite hard, containing high concentrations of calcium and magnesium. Concentrations range from an average of 250-

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700 mg/l. Nitrate concentrations in the range of less than 2 mg/l are common. In localized areas the levels can be much higher and are attributed to septic systems, fertilizers, manure and septage spreading. Fluoride is fairly common in wells in Presque Isle County with levels averaging around 1 ppm. Some of the highest levels in the State have occurred in the County. Low levels are beneficial in preventing tooth decay, however, high levels may cause mottling of teeth.

Given the karst geology and sandy soils that are prevalent throughout the County, groundwater in Presque Isle County is a resource at risk. The Presque Isle Soil Conservation District, in cooperation with a number of agencies, has developed the Northeast Michigan Karst Aquifer Protection Plan. The primary objective of the plan is to protect the area's drinking water by correcting the sources of pollution. A secondary objective is to increase awareness of the connection between different land use pollutants and drinking water in karst areas.

The Karst Aquifer Protection Plan covers Presque Isle County and parts of Alpena County. **Figure 2.7** shows karst sensitive areas within the County. According to the plan, "much of the project area is characterized by karst. Karst is defined as a type of topography that is formed over limestone, dolomite, or gypsum by dissolving or solution; and is characterized by sinkholes, caves and underground drainage through fractures in bedrock. Karst waters are just as susceptible to contamination as surface waters because much of the water moves through open channelways, resulting in extremely high aquifer recharge rates. Consequently, the shallow aquifers of the project area are extremely vulnerable to contamination from surface and subsurface sources."



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According to the study, "District Health Department #4 has documented 490 cases where domestic water supplies have been adversely affected due to direct migration of pathogens (432), nitrates (54), hydrocarbons (2), sediment (2) from surface sources into aquifers through improper wells and karst features. In addition, although the cost of testing creates a lack of data, professional judgment is that pesticides, heavy metals and salts also have the potential to contaminate area aquifers. Prioritized pollutants are as follows: pathogens, nitrates, sediment, pesticides, hydrocarbons, salts, and heavy metals." The study further states, "There are four known sources of pollutants. These are agriculture including barnyards, feedlots, pastures, and croplands; residential including septic systems and abandoned wells; illicit dumps; and road corridors.

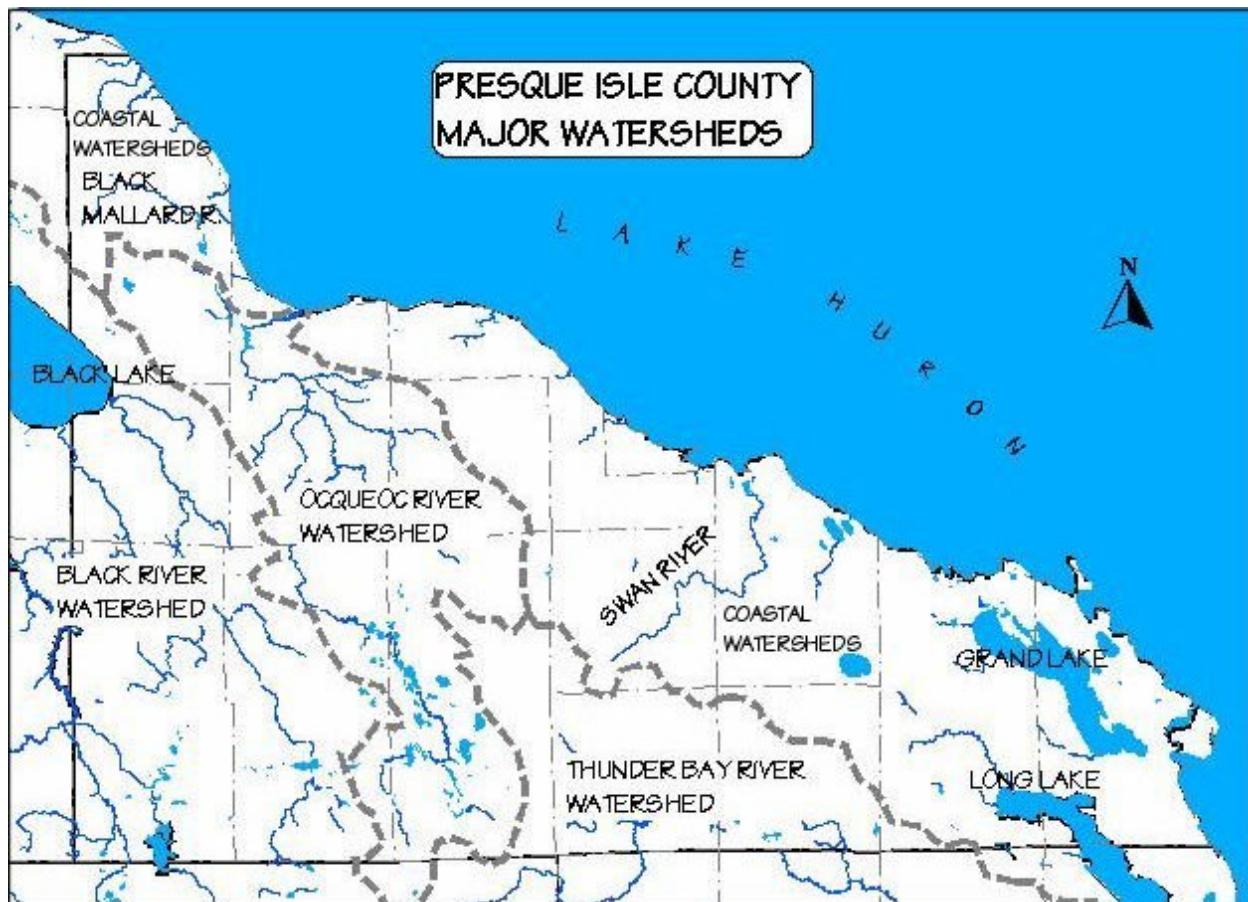
### **Surface Water**

In addition to numerous lakes, streams and swamps, a great number of small ponds, kettle holes and marshes occupy portions of Presque Isle County. These smaller bodies of water are characterized by moderate seasonal water level fluctuations and various stages of vegetation encroachment. Many of the lakes and smaller bodies of water are interconnected by streams.

According to the USDA Soil Survey, Presque Isle County has 89 inland lakes, 13 of which are 100 acres or larger. Black Lake, Grand Lake and Long Lake are all over 2000 acres in size. Other larger lakes include Lake Agusta, Lake Esau, Big Trout Lake, Lake Nettie and Tomahawk Creek Flooding, each with surface areas of 250 acres or more. The soil survey shows 16,376 acres of surface water in the County.

There are three major watersheds in the County, which are all part of the Lake Huron drainage basin. The Black River/Black Lake watershed in the western portion includes the Upper Black River, Canada Creek, Tomahawk Creek, Stony Creek and Rainy River. This surface water eventually empties into Lake Huron at the City of Cheboygan. The Ocqueoc River watershed drains the west central parts of the County, and includes the chain of lakes area (Lake Nettie, Lake Emma and Lake May). The Thunder Bay River Watershed extends into the south central part of the County. The North Branch of the Thunder Bay eventually empties into Lake Huron at the City of Alpena. There are numerous smaller coastal watersheds such as the Black Mallard River, Trout River, Swan River, Little Trout River, Grand Lake and Long Lake Watersheds. (See **Figure 2.8**).

Of course, the largest surface water resource is Lake Huron, with entire northeast boundary of the County (long side of the triangle) running parallel to the shoreline. The Great Lakes are the largest system of fresh, surface water on Earth, containing roughly 18 percent of the world supply. Only the polar ice caps contain more fresh water. Lake Huron is the second largest of the five Great Lakes in surface area (23,000 square miles). However, due to its many islands and inlets, it has the greatest length of shoreline at 3,827 miles, over 1,000 miles more than Lake Superior, which is the largest in surface area.



## Fish and Wildlife Resources

The predominance of forested land and surface water makes Presque Isle County the home to many species of fish and wildlife. With over 300 miles of fishing streams and creeks, 89 inland lakes and Lake Huron, the County has an abundance and variety of fish habitat. Brook, rainbow, and brown trout are established singly or in combination in streams. Lakes offer warm water fisheries such as walleye, northern pike, largemouth bass, smallmouth bass and panfish. Lake Huron is an excellent salmon and lake trout fishery. The annual Salmon Tournament in Rogers City is a testament to the high quality fishery.

Deer, rabbit, grouse and woodcock are abundant in the County. Bear, coyote, bobcat, elk and turkey have small to moderate populations that are growing. Wildlife is a resource that brings in hunters and tourists. October and November bring thousands of hunters to the County for small game hunting, bear and bow season (deer), peaking sharply in mid-November with the opening day of deer (rifle) season. Michigan's elk herd was formerly centered in western Otsego County, but increased development in that county caused the center of the herd's range to move east into the southwest of Presque Isle County. This is an area of large tracts of state and private club lands, few roads and little permanent population.

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Unfortunately, large deer populations, combined with indiscriminate feeding practices, were contributing factors to the spread of Bovine Tuberculosis (TB) in Presque Isle County and across northern Michigan. TB is a serious disease caused by bacteria attacking the respiratory system. There are three main types of TB - human, avian, and bovine. Human TB is rarely transmitted to non-humans, and avian TB is typically restricted to birds. Bovine TB - also known as 'cattle TB' is the most infectious of the three, and is capable of infecting most mammals.

Although the State of Michigan attained Bovine TB accredited-free state status in 1979, it is now thought that during earlier periods of high TB reactor rates there was spillover of Bovine TB from infected cows into Michigan's white-tailed deer population, a result of shared pastures. In 1994, a TB infected deer was killed by a hunter in Alpena County. Since then, over 87,000 deer have been tested with 397 testing positive or being suspected of having the disease.<sup>1</sup> In 2001 Presque Isle County had one deer test positive for TB.<sup>1</sup> Although primarily found in hoofed animals, and not considered a health risk to humans, humans can and have contracted Bovine TB. The disease has been found in coyotes, raccoons, black bear, bobcat, red fox and opossum.

The effort to eradicate the disease has led to an aggressive TB testing campaign and the creation of a surveillance zone and Deer Management Unit (DMU) 452. Hunters in the surveillance area are asked to submit deer heads for testing. In DMU 452 testing is mandatory. Presque Isle County (DMU 071) is in the infected area, but is not a part of DMU 452. Efforts to eradicate the disease have led to changes in deer feeding rules, deer harvest increases, extension of the number of hunting days, and the banning of new deer or elk farms. As the eradication effort continues, more changes in hunting and feeding rules can be expected.

## **Threatened and Endangered Species**

Presque Isle County is also home to a number of plants and animals that are threatened, endangered or are of special concern as identified in Michigan Natural Features Inventory (MNFI) database which is maintained by the Michigan Department of Natural Resources, Wildlife Division, Natural Heritage Program. The following list presents the endangered or threatened plant and animal species of Presque Isle County, which are protected under the Natural Resources and Environmental Protection Act of the State of Michigan (Part 365 of Public Act 451 of 1994, as amended). This list also includes plant and animal species of special concern. While not afforded legal protection under the act, many of these species are of concern because of declining or relict populations in the State. Should these species continue to decline, they would be recommended for threatened or endangered status. Protection of special concern species before they reach dangerously low population levels, would prevent the need to list them in the future by maintaining adequate numbers of self-sustaining populations. The MNFI database does not list the piping plover, and none have been noted in Presque Isle County. However, Hoeft State Park and Thompson Harbor State Park have been identified as critical habitat for the endangered bird.

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<sup>1</sup> Source: State of Michigan Tuberculosis Eradication Project Report

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**Table 2.2**  
**Presque Isle County Threatened and Endangered Species**

Scientific Name	Common Name	Type	Federal Status*	State Status**
<i>Adlumia fungosa</i>	Climbing fumitory	Vascular Plant		SC
Alvar	Alkaline scrub/grassland	Community		
<i>Appalachia arcana</i>	Secretive locust	Invertebrate		SC
<i>Armoracia lacustris</i>	Lake cress	Vascular Plant		T
<i>Astragalus neglectus</i>	Cooper's milk-vetch	Vascular Plant		SC
<i>Buteo lineatus</i>	Red-shouldered hawk	Bird		T
<i>Cacalia plantaginea</i>	Prairie indian-plantain	Vascular Plant		SC
<i>Calypso bulbosa</i>	Calypso or fairy-slipper	Vascular Plant		T
<i>Carex concinna</i>	Beauty sedge	Vascular Plant		SC
<i>Carex richardsonii</i>	Richardson's sedge	Vascular Plant		SC
<i>Carex scirpoidea</i>	Bulrush sedge	Vascular Plant		T
<i>Cirsium hillii</i>	Hill's thistle	Vascular Plant		SC
<i>Cirsium pitcheri</i>	Pitcher's thistle	Vascular Plant	LT	T
	Cobble beach	Community		
<i>Cypripedium arietinum</i>	Ram's head lady's-slipper	Vascular Plant		SC
<i>Dendroica discolor</i>	Prairie warbler	Bird		E
Devonian earth history	Geographical feature	Geologic		
<i>Drosera anglica</i>	English sundew	Vascular Plant		SC
Drumlin	Geographical feature	Geologic		
<i>Eleocharis engelmannii</i>	Engelmann's spike-rush	Vascular Plant		SC
<i>Emydoidea blandingii</i>	Blanding's turtle	Reptile		SC
Esker	Geographical feature	Geologic		
<i>Gavia immer</i>	Common loon	Bird		T
Great blue heron rookery	Great blue heron rookery	Other Element		
Great lakes marsh		Community		
<i>Haliaeetus leucocephalus</i>	Bald eagle	Bird	(PS:LT, PDL)	T
<i>Incisalia henrici</i>	Henry's elfin	Invertebrate		SC
Intermittent wetland	Infertile pond/marsh great lakes	Community		
<i>Iris lacustris</i>	Dwarf lake iris	Vascular Plant	LT	T
<i>Juncus militaris</i>	Bayonet rush	Vascular Plant		T
Karst	Geographical feature	Geologic		

Source: Michigan Natural Feature Inventory, Michigan Department of Natural Resources, Wildlife Division

\*LE = Listed endangered, LT = Listed threatened, PDL = Proposed delist, PS = Partial status (federally listed in only part of its range), C = Species being considered for federal status.

\*\* E = Endangered, T = Threatened, SC = Special concern.

**Table 2.2 Continued**

Scientific Name	Common Name	Type	Federal Status*	State Status**
<i>Lanius ludovicianus migrans</i>	Migrant loggerhead shrike	Bird		E
<i>Mesodon sayanus</i>	Spike-lip crater	Invertebrate		SC
Northern fen	Alkaline shrub/herb fen	Community		
<i>Notropis anogenus</i>	Pugnose shiner	Fish		SC
<i>Pandion haliaetus</i>	Osprey	Bird		T
<i>Pinguicula vulgaris</i>	Butterwort	Vascular Plant		SC
Pitted outwash	Geographical feature	Geologic		
<i>Potamogeton hillii</i>	Hill's pondweed	Vascular Plant		T
<i>Prosapia ignipictus</i>	Red-legged spittlebug	Invertebrate		SC
<i>Pterospora andromedea</i>	Pine-drops	Vascular Plant		T
<i>Pyrgus wyandot</i>	Grizzled skipper	Invertebrate		SC
Rich conifer swamp		Community		
<i>Sistrurus catenatus catenatus</i>	Eastern massasauga	Reptile	C	SC
<i>Solidago houghtonii</i>	Houghton's goldenrod	Vascular Plant	LT	T
<i>Somatochlora hineana</i>	Hine's emerald	Invertebrate	LE	E
<i>Sterna hirundo</i>	Common tern	Bird		T
<i>Tanacetum huronense</i>	Lake Huron tansy	Vascular Plant		T
<i>Trimerotropis huroniana</i>	Lake Huron locust	Invertebrate		T
Wooded dune and swale complex		Community		

Source: Michigan Natural Feature Inventory, Michigan Department of Natural Resources, Wildlife Division  
 \*LE = Listed endangered, LT = Listed threatened, PDL = Proposed delist, PS = Partial status (federally listed in only part of its range), C = Species being considered for federal status.  
 \*\* E = Endangered, T = Threatened, SC = Special concern.

## Wetlands and Woodlands

Wetlands are often referred to as marshes, swamps or bogs. The US Army Corps of Engineers defines wetlands as, "Wetlands are those areas inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions." Residents of Michigan are becoming more aware of the value of wetlands. Beyond their aesthetic value, wetlands improve water quality of lakes and streams by filtering polluting nutrients, organic chemicals and toxic heavy metals. Wetlands are closely related to high groundwater tables and serve to discharge or recharge aquifers. Additionally, wetlands support wildlife, and wetland vegetation protects shorelines from erosion.

There are several sources that depict the presence of wetlands in Presque Isle County. These include the MIRIS Land Cover Inventory (**Figure 2.9**) National Wetlands Inventory (**Figure 2.10**) and Presque Isle County Soil Survey (**Figure 2.4**). Each source was developed independently, with different criteria and therefore depicts the location and types of wetlands somewhat differently. The MIRIS Land Cover Inventory found forested wetlands to be the dominant wetland type in Presque Isle County. Wetland forest species include lowland conifers such as northern white cedar, black spruce and eastern tamarack and lowland hardwoods such as black ash, elm, balsam poplar, aspen and red maple. For reference purposes, wetland areas are mapped on the existing

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land use map. Lowland brush (tag alder, dogwood, and willow) was the second most prevalent wetlands type.

National Wetlands Inventory (NWI) maps were compiled by the US Fish and Wildlife Service using color infrared aerial photography and ancillary data. This inventory classified more areas as wetlands than did the MIRIS land cover inventory. Still the NWI project found forested wetlands to be the most prevalent wetland type. As shown in the section on soils, the Presque Isle County Soil Survey maps hydric soils and soils with hydric inclusions. These soils typically support wetland vegetation.

### **A COMPARISON OF SURVEYS**

#### **Michigan Resource Information System (MIRIS)**

Forested Wetlands	87,071 acres
Shrub-Scrub Wetlands	10,335 acres
Emergent-Aquatic Wetlands	1,828 acres

#### **National Wetlands Inventory Maps (NWI)**

Forested Wetlands	124,462 acres
Shrub-Scrub Wetlands	14,790 acres
Emergent-Aquatic Wetlands	9,879 acres

#### **Presque Isle County Soil Survey**

Hydric Soils	137,535 acres
Soils with Hydric Inclusions	82,152 acres

An exercise that would further define the probability of wetlands at a given location would be to overlay the three maps generated from the above sources. If a site is classified as a wetland on all three maps, the likelihood of wetlands being present is very high. It is important to note all of these sources are appropriate for general planning purposes. Any development should have a site specific field survey to determine the presence and location of wetlands that may be impacted.

In addition to the scenic characteristics of woodlands, forested areas provide habitat for wildlife, protect the soil from erosion and acts as a buffer from noise on heavily traveled highways. State forestland encompasses approximately 24 percent of the total land area in the County. In addition, privately owned forestlands can be found throughout the County. Forested areas are mapped on the existing land use map in Chapter 5.

By far the most dominant forest type is aspen/birch. The next most prevalent forest types are lowland conifers (cedar, tamarack and spruce) and lowland hardwoods (black ash, slippery elm, balsam poplar, aspen and red maple). Other forest types include pine (red, jack and white), oak (red and white) and northern hardwoods (sugar maple, American beech and basswood). **Figure 2.11** depicts the forest types and acreage according to the MIRIS Existing Land Cover/Use Data.

### **Pre-settlement Vegetation**

The Michigan Department of Natural Resources has compiled pre-settlement vegetation maps of counties in Michigan. The maps were generated from information contained in the first government land survey notes in the 1800's along with information such as current vegetation, land forms and

## **Presque Isle County Green Infrastructure**

soils. A review of the pre-settlement vegetation map (**Figure 2.12**) of Presque Isle County shows extensive areas were covered with beech-sugar maple-hemlock forests and lowland forests types of mixed conifer swamps, cedar swamps, and mixed conifer swamps. To a lesser extent white pine-red pine forests and jack pine-red pine forests were present. Two major events have resulted in major conversions and loss of these pre-settlement forest types. Logging and subsequent wildfires 100 years ago resulted in the shifting of forests from pines and mixed forest swamps to aspen-birch forests. In addition, early settlers sought out “better soils” to establish their farmsteads. Since northern hardwood forests (sugar maple-beech) were the dominate forest type on soils most suitable for agricultural purposes, such as sandy loam, land clearing for farming resulted in a significant reduction in the amount of acres covered by this forest type.

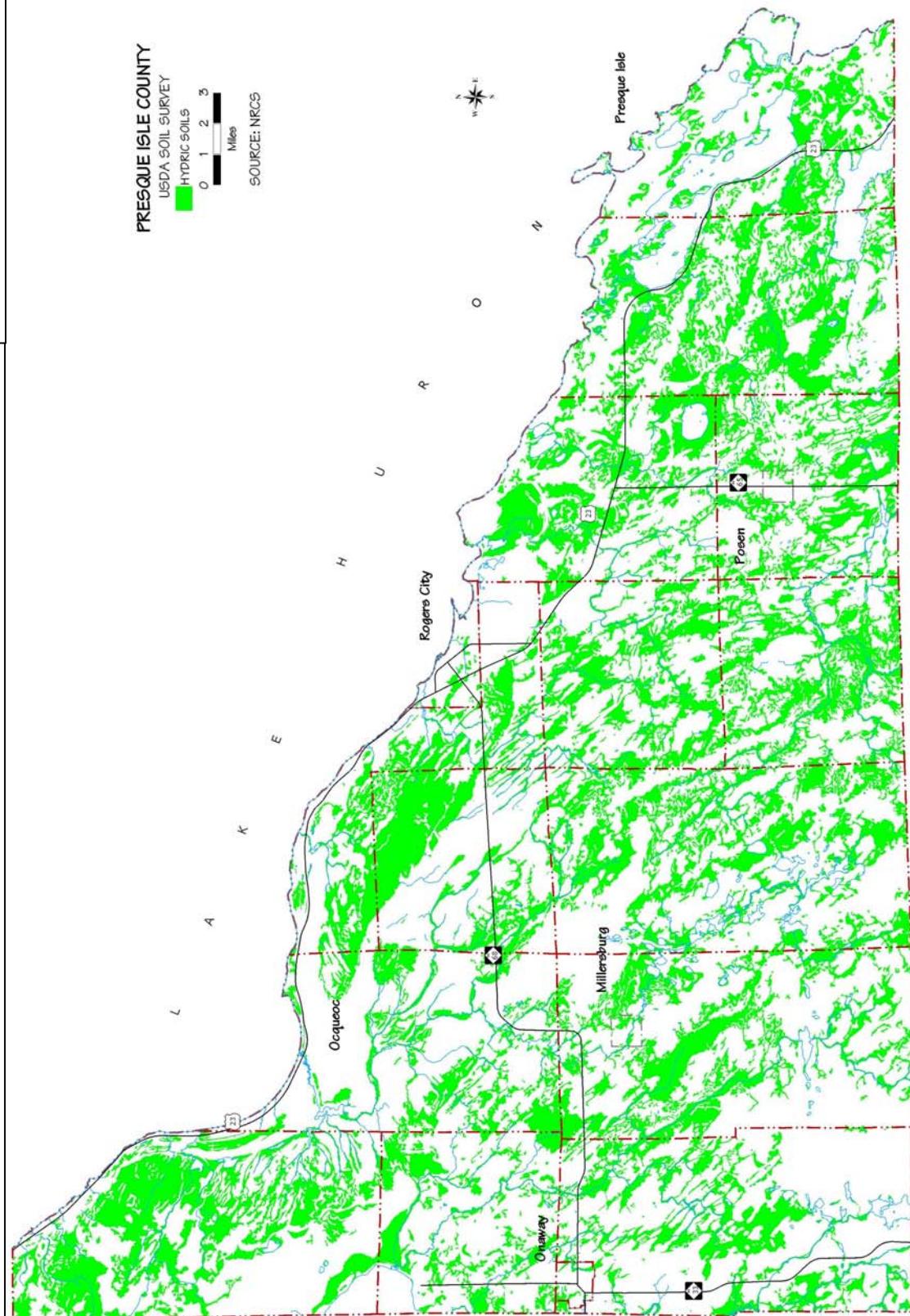
### **Public Forestlands**

Publicly owned lands form the hubs for protected lands in the County. By far, the largest public landowner is the State of Michigan. **Figure 2.13** shows publicly owned land in Presque Isle County. As can be seen on the map, Allis, Bearinger, Bismarck, Krakow, North Allis, and Ocqueoc Townships have considerable amounts of public lands.

## Presque Isle County Green Infrastructure

**FIGURE 2.4: HYDRIC SOILS MAP**

PRESQUE ISLE COUNTY  
USDA SOIL SURVEY  
HYDRIC SOILS  
0 1 2 3 Miles  
SOURCE: NRCS



## Presque Isle County Green Infrastructure

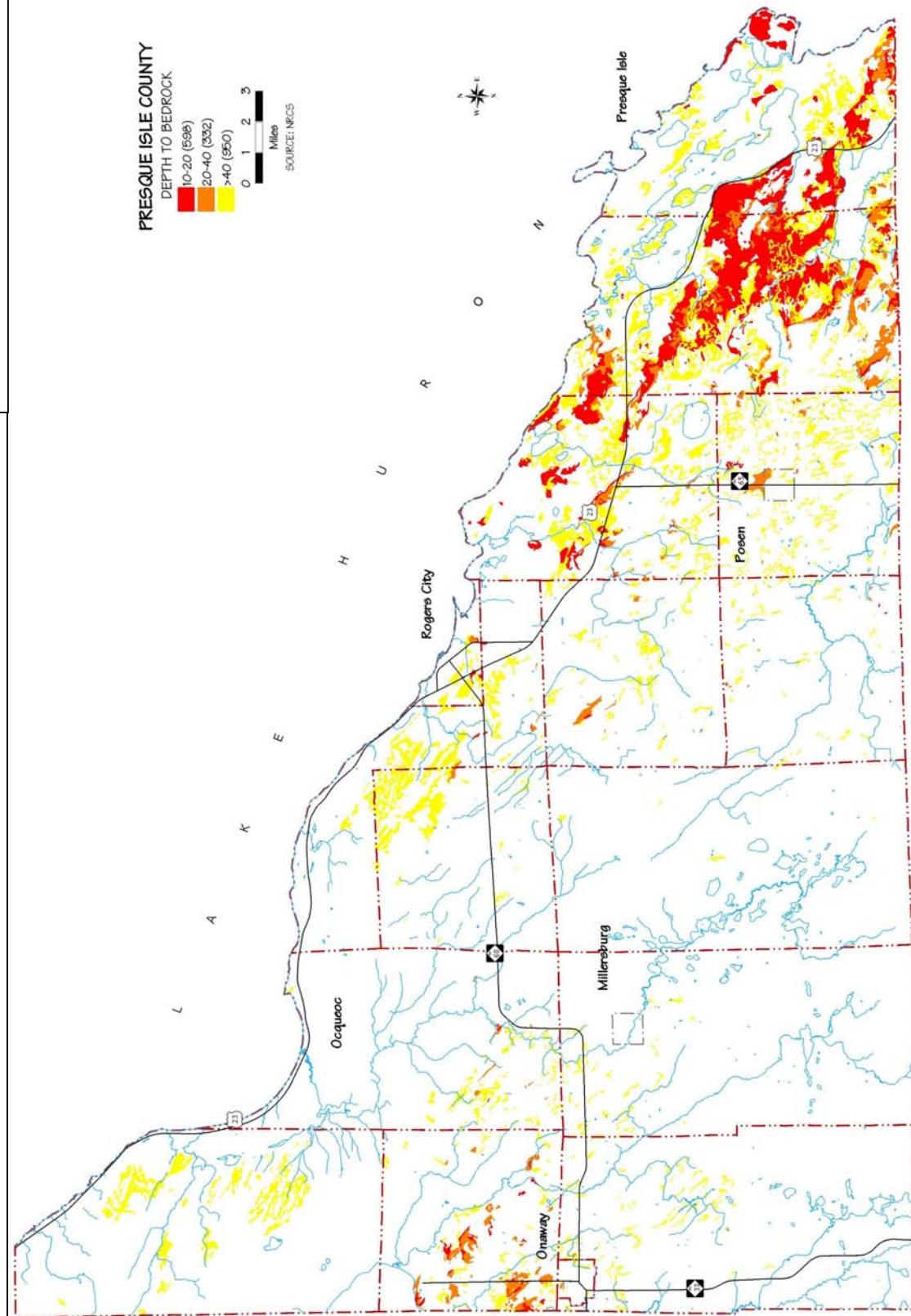
**FIGURE 2.5: DEPTH TO BEDROCK MAP**

PRESQUE ISLE COUNTY  
DEPTH TO BEDROCK

10-20 (658)  
20-40 (392)  
>40 (950)

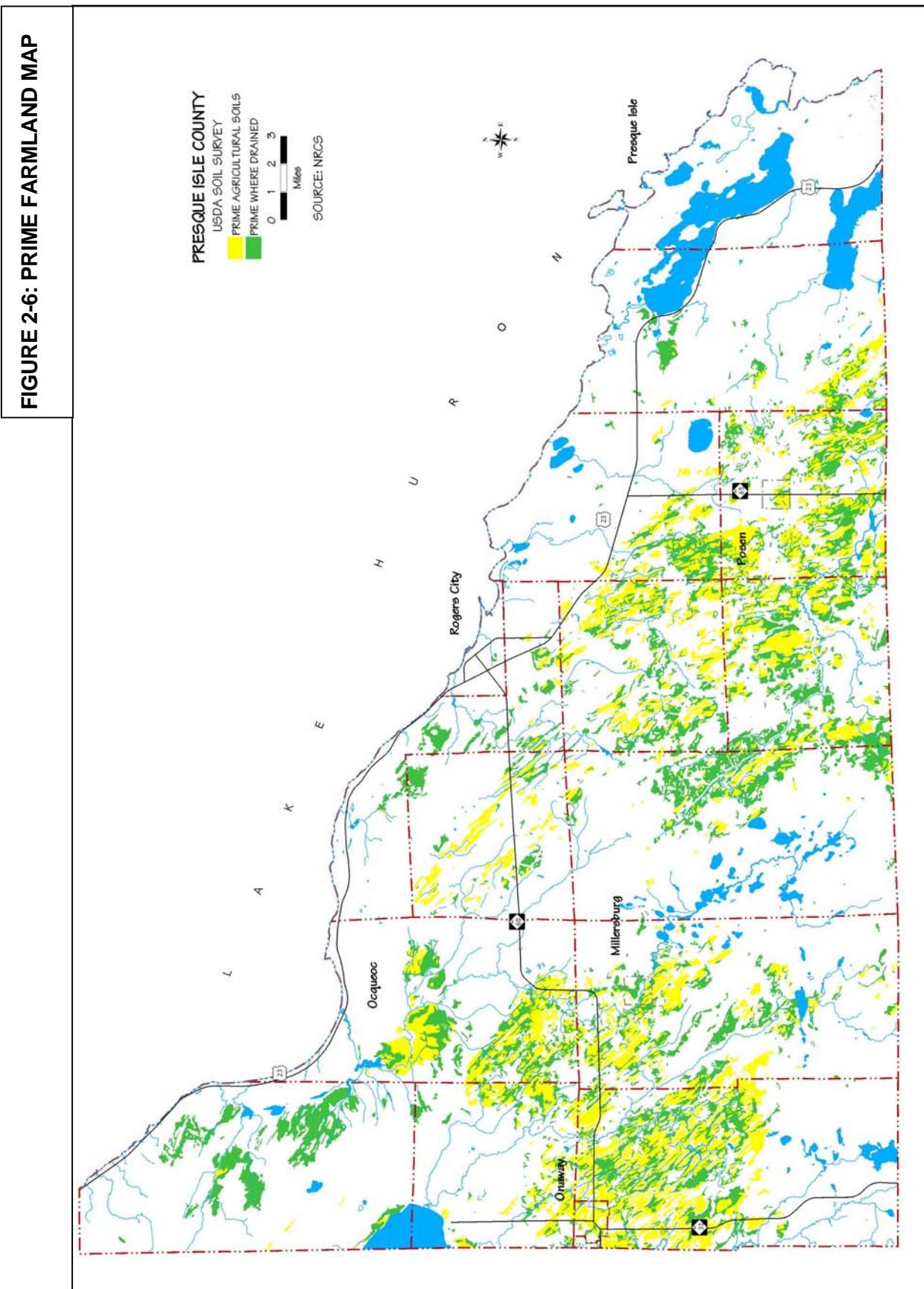
Miles

SOURCE: NRCS



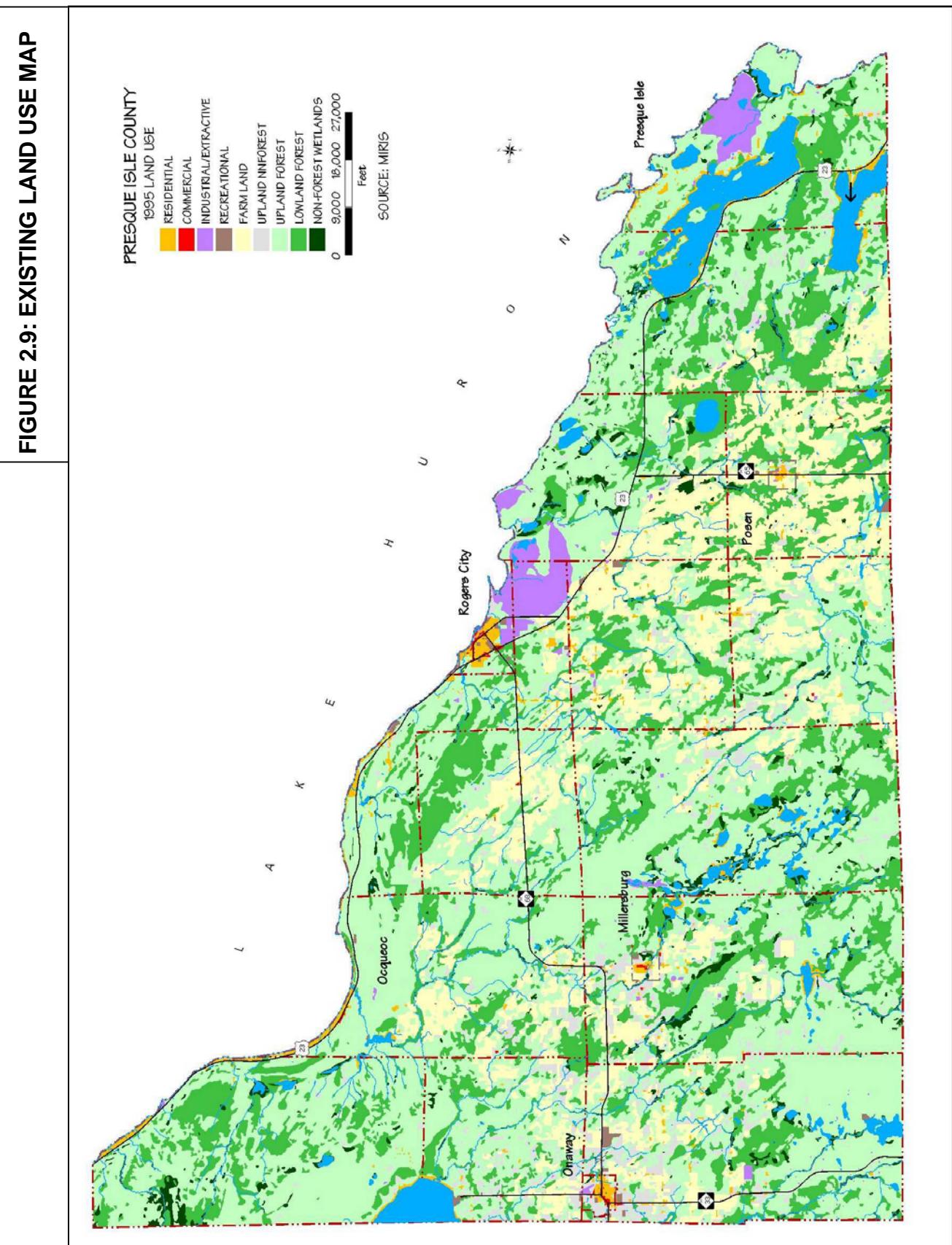
## Presque Isle County Green Infrastructure

**FIGURE 2-6: PRIME FARMLAND MAP**



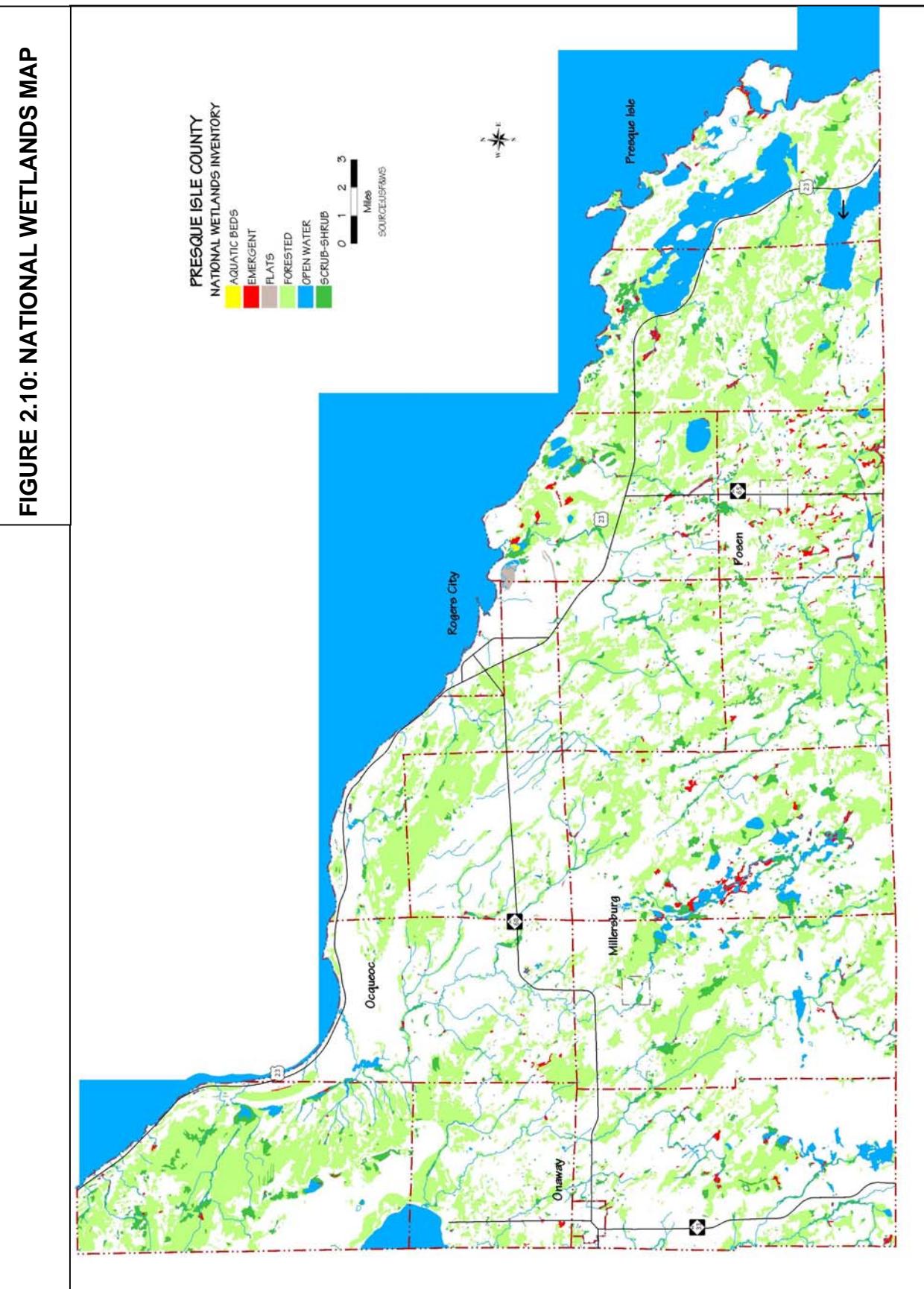
## Presque Isle County Green Infrastructure

**FIGURE 2.9: EXISTING LAND USE MAP**



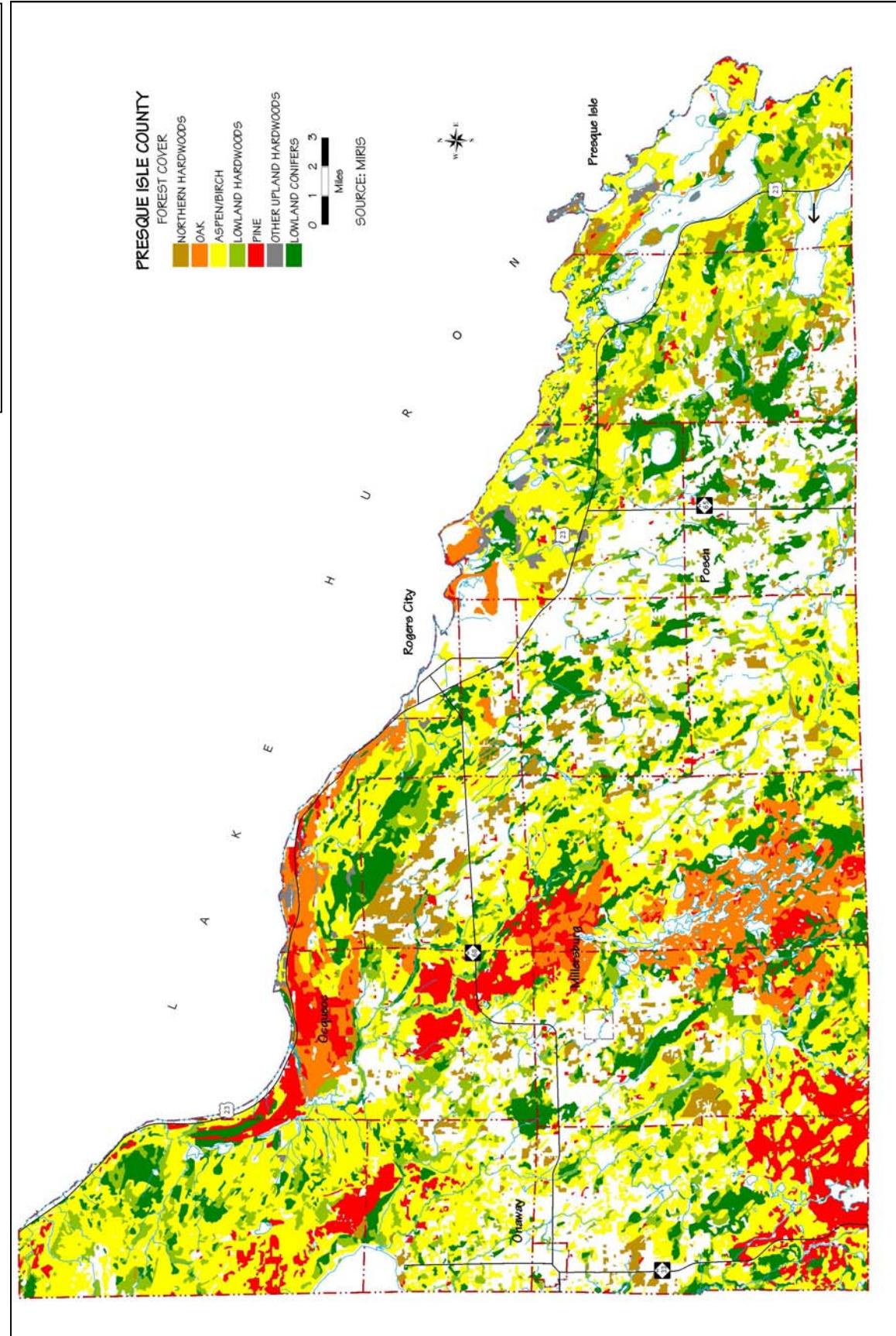
## Presque Isle County Green Infrastructure

**FIGURE 2.10: NATIONAL WETLANDS MAP**



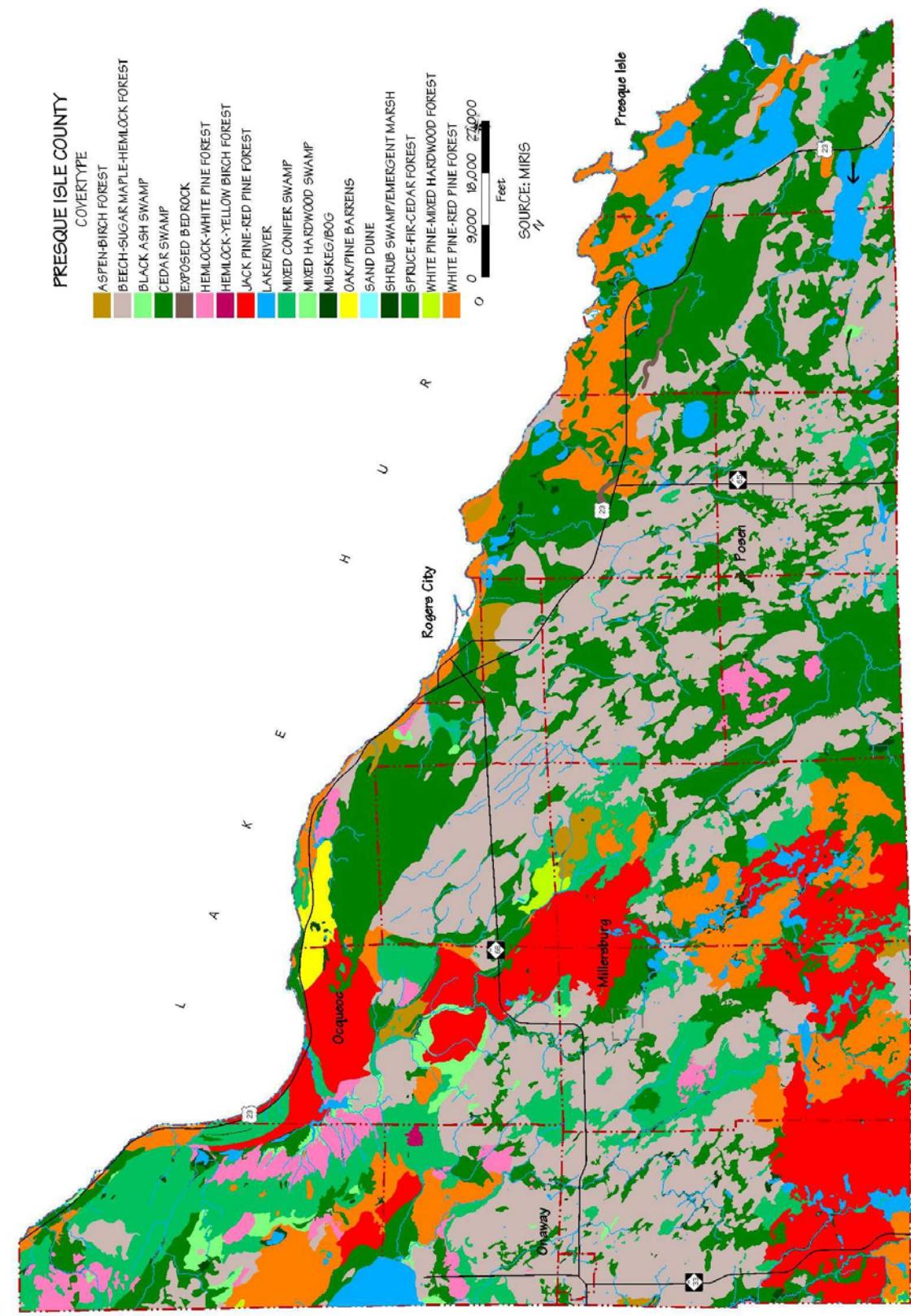
## Presque Isle County Green Infrastructure

**FIGURE 2.11: FORESTLANDS MAP**



## Presque Isle County Green Infrastructure

**FIGURE 2.12: PRE-SETTLEMENT VEGETATION MAP**



## Presque Isle County Green Infrastructure

FIGURE 2.13: STATE OWNERSHIP MAP

### PRESQUE ISLE COUNTY GREEN INFRASTRUCTURE PLAN

