5. Agricultural, Natural, and Cultural Resources

Land development patterns are directly linked to the topography, agricultural, natural, and cultural resource base of a community. This resource base presents both opportunities and limitations with respect to the potential impacts and outcomes of development activities. Development should be carefully adjusted to coincide with the ability of the agricultural, natural, and cultural resource base to support the various forms of urban and rural development. If a balance is not maintained, the underlying resource base may deteriorate in quality. Therefore, these features need to be considered when making decisions concerning the future conservation and development of Burnett County. This element of the comprehensive plan provides an inventory and assessment of the agricultural, natural, and cultural resources of Burnett County.

5.1 Land Cover

Land cover is a snapshot of the landscape as seen by satellite imagery and provides a broad overview of the agricultural and natural resources of a region. Land cover is determined by the predominant type of vegetation for rural areas, and the intensity of development in urban areas. Refer to Map 5-1 for land cover in Burnett County. For urban areas, the intensity of development is determined by the amount of impervious surface, or those surfaces that prevent precipitation from soaking into the ground (such as buildings, streets, parking lots, and sidewalks). Areas identified as high intensity development contain more than 50% impervious surface, and areas identified as low intensity development contain less than 50%.

Land cover data are helpful in planning for natural resources and future land use on a community-wide and county-wide scale. While land cover data may not show precise information for a particular location, they do show major patterns. Large, interconnected corridors of open land, forest land, and wetlands may be discerned at this scale. Land cover data also provide historic land use data that can be compared to more recent data to help visualize change over time.

Land cover data in the rural areas of Burnett County show a diverse mix of forests, wetlands, surface water, and open lands. Forested lands are scattered throughout the county, but the largest interconnected forests are found in the northern and western towns. In all, forested land comprises nearly 72% of the county. Large, interconnected, agricultural areas are found primarily in the towns of Wood River, Grantsburg, Anderson, Trade Lake, Daniels, Dewey, Rusk and Roosevelt. In total, agricultural make up about 11% of total land cover. Given the large number of lakes and rivers—surface water comprises about 8% of the land area-- wetlands make up 17% of the total area in the county. Some of the largest interconnected wetland features are found in association with the seven designated wildlife areas scattered throughout the county. Outside of the villages, there is less than 9% low and high density development.

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MAP 5 - 1

LAND COVER (1991-1993)

Burnett County, Wisconsin

State of Wisconsin

Legend

Base Layers

- State Highway
- County Highway
- Town Road
- Rivers
- Lakes
- Village Boundary
- Town Boundary
- County Boundary

Land Cover

- High Intensity
- Low Intensity
- Agriculture
- Grassland
- Forest
- Open Water
- Wetland
- Barren
- Shrubland

Source: Wisconsin DNR and Wisconsin DOT. The land cover data product was derived from LANDSAT Thematic Mapper (TM) satellite imagery acquired from fly-overs in August, 1991; May, July, September, and October, 1992; and May, 1993. TM data are organized by rectangular areas referred to as scenes, each 108 miles on a side. Twelve scenes are required to cover Wisconsin. A scene is comprised of roughly 50 million cells, or pixels, each representing a 30-meter square, or an on-the-ground area of 900 square meters.

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Land cover in the urban areas of Burnett County show diverse development patterns, mainly within the boundaries of cities and villages. Burnett County's cities and villages contain varying proportions of developed and undeveloped lands. All cities and villages contain at least some undeveloped land indicating areas that have been preserved or held to accommodate future development.

5.2 Soils

The use and management of soil has many impacts on the communities within Burnett County. Soil forms the foundation that all other ecosystems depend upon – plant life, wildlife, streams, wetlands, and lakes. Soils may also pose limitations to our use of the land in activities such as agricultural production, forestry, building development, and road construction.

The soil survey from the Burnett County Farmland Preservation Plan of 1982 and the Soil Survey of Burnett County, conducted by the U.S. Department of Agriculture and the Natural Resources Conservation Service in 2006 are the primary sources for the following analysis of the county's soil resources. The USDA study identified over 90 different types of soils in Burnett County, each with distinct profiles. These soil types are grouped into different soil associations that can be used to compare the suitability of large land areas for different land uses. Soil associations are groupings of soils that share a distinctive pattern of soils, relief, and drainage. Since about a quarter of the land in Burnett County is zoned for agriculture, it is important to identify soil types. Within Burnett County about 51,472 acres, or 9% or total land, is considered to have prime agricultural soils. The location of these soils is directly reflected by the land use pattern in Burnett County.

Omega – Vilas – Hiawatha – Cloquet – Pence – Chetek Association:

- 61% of the land in Burnett County
- These soils are moderately deep to deep, excessively drained sandy acid soils over glacial outwash sand and gravel on nearly level plains, with organic soils in depressional areas.

Santiago – Iron River Adolph Association

- 6% of the land in Burnett County
- These soils are moderately deep, silty and loamy, will to poorly drained acidic soils over glacial till on gently to strongly sloping uplands. This area has a well defined drainage pattern and includes small areas of well to poorly drained deep silty soils.

Cushing – Alstad – Brickton – Braham – Blomford – Buffton Association

- 15% of the land in Burnett County
- Moderately deep, well to somewhat poorly drained loamy soils over calcareous, loam glacial till on gently sloping to steep relief. Also includes moderately well to poorly drained deep calcareous clay soils on level relief and shallow to deep, well to somewhat poorly drained loamy sands and sandy loams with calcareous clay substratums.

Antigo – Padus – Chetek – Pence – Rib

- 10% of the land in Burnett County

- Moderately deep, well drained, silty and loamy, acid soils over glacial outwash sand and gravel on nearly level relief, with poorly drained, deep, silty and organic soils in depressional areas.

Organic Soils

- 8% of the land in Burnett County
- Moderately deep to deep, wet, acid to near neutral organic soils and level bogs and depressional areas.

Source: Burnett County Farmland Preservation Plan, 1982.

5.3 Agriculture and Farmland

Agriculture is a key component of the culture, economy, and landscape of Burnett County. Estimates on the amount of farmland in Burnett County range from approximately 9.1% to 12.8% of the total land area.

The most recent Census of Agriculture (2002) reported the top five commodities in Burnett County based on value of sales as follows:

1. Milk and dairy products
2. Grains, oilseeds, dry beans
3. Fruits, tree nuts, and berries
4. Other crops and hay
5. Sheep, goats, and their products.

Farmland Estimates

The difference in estimates for farmland in Burnett County reflects difference methodologies. There are several difference classifications of soils, including prime, prime when drained, farmland of statewide importance, and farmland of local importance. The lower estimate—9.1%--considers prime and prime when drained soils, while the higher figures also includes soils of statewide and local importance. For the purposes of this plan, the 9.1% is a more accurate figure.

Relative to other Wisconsin counties, Burnett County produces significant amounts of various agricultural commodities as shown in Table 5-1.

Table 5-1
Agricultural Production, Burnett County, 2004 - 2007

Commodity	Annual Production (2004)	Annual Production (2007)	% Change 2007 - 2004
Milk	51,200 pounds	54,780 pounds	7.0%
Soybeans	196,000 bushel	118,000 bushels	-39.8%
Corn for Grain	1,060,000 bushel	795,000 bushels	-25.0%
Corn for Silage	42,000 tons	46,000 tons	9.5%
Oats	42,000 bushel	27,000 bushels	-35.7%
Winter Wheat	Non recorded	Non recorded	Non recorded
Forage	76,200 tons	27,100 tons	-64.4%
Alfalfa Hay	22,800 tons	17,000 tons	-25.4%
Sweet Corn	Non recorded	Non recorded	Non recorded
Cattle and Calves	3,000	3,300 head	10.0%

Source: Wisconsin Agriculture Statistics Service (2004 - 2007 data)

Agriculture remains vital in Burnett County despite a few farmland factors that are gradually shrinking. According to the 2002 Census of Agriculture, land in Burnett County farms decreased slightly from 98,464 acres in 1997 to 98,271 acres in 2002. State and national trends are showing an increasing numbers of larger farms, the average size of all farms in Burnett County increased slightly by 2% from 214 acres in 1997 to 218 acres in 2002. The number of farms decreased 2% from 461 farms in 1997 to 451 farms in 2002.

Crop Production

Over the long term, levels of crop production in Burnett County have been relatively stable for the vast majority of commodities (Wisconsin Agriculture Statistics Service). There has been a steady decline in oat production, which is down more than 60% since 1990. In contrast, there has been a steady increase in soybean production. In 1990, Burnett County produced 59,000 bushels of soybeans. By 2007, annual soybean production increased to a reported 118,000 bushels, which is actually a reduction from 191,000 bushels produced in 2006. This is most likely related to the consistently strong pricing of soybeans and less dependency on oats for dairy production.

Dairy

Milk production is a significant component of Burnett County's agriculture industry. According to the *Burnett County Agriculture: Value and Economic Impact* report, milk producers and the dairy industry contributes $79.4 million to the county's economy. Table 5-2 shows a decrease in milk production between 2006 and 2007, but an overall increase of seven percent since 2004.

Table 5-2
Number of Dairy Cows and Milk Production 2004-2007,
Burnett County, Wisconsin

	2004	2005	2006	2007
Number of Cows	3,200	3,500	3,500	3,300
Milk per Cows (pounds)	16,000	16,700	16,600	16,600
Total Milk Produced (pounds)	51,200	58,450	58,100	54,780

Source: Wisconsin 2004 - 2007 Agriculture Statistics reports.

Agriculture Connections

Agriculture not only produces food and fiber, but is also linked to many other components of the economy. Agriculture supports equipment and implement manufacturers, dealers, and repair technicians, the vegetable and meat processing industries, the construction trade, trucking, veterinary services, genetic research, and many others.

Agriculture is connected to Wisconsin's culture and heritage. Barns, cows, fields, and silos paint the scene that so many define as Wisconsin's rural character. Farm families include some of the earliest settlers of many areas and provide a sense of continuity to a community. Public opinion surveys conducted by the American Farmland Trust, the U.S. Department of Agriculture, the American Farm Bureau, Wisconsin counties, and other local units of government show that Wisconsin citizens place a high value on the presence of agriculture and agricultural lands.

Agriculture has many considerations relative to the natural environment, both positive and negative. Farms provide green space, wildlife habitat, enhanced groundwater recharge, and nutrient recycling. Farms can also be sources of soil erosion, polluted runoff, odors, and damage to riparian areas.

Agriculture is connected to other land uses. The interaction between farms and rural residential development has impacted land values, property taxes, and the right to farm. The distance from farm related services, markets for farm commodities, processing industries, and other critical land uses can determine the long term success of an agricultural area. Certain recreational land uses, like hunting and snowmobiling, benefit from the presence of agricultural lands.

Agriculture is linked to transportation issues. Agriculture brings large vehicles to rural roads including farm equipment and heavy trucks. These rural roads are rarely constructed to handle the size and weight of such large vehicles. This often contributes to traffic issues, the posting of weight limits, and increased local expenditures for road maintenance.

Agriculture in Wisconsin

According to a report entitled *Wisconsin and the Agricultural Economy*, farm income reached an all time low in recent years, yet agriculture remains Wisconsin's largest industry sector contributing $16.8 billion in total income each year and 178,528 jobs to the state economy. Wisconsin agriculture contributes a total of 419,556 jobs and $51.5 billion in economic activity when considering all of the sectors that are related to agriculture. These sectors go beyond

agricultural production and include manufacturing, retail trade, service industries, transportation and more all related to agriculture.

Based on cash receipts received for commodities (Table 5-3), milk, field crops and vegetables, and meat animals are the most significant components of Wisconsin's agricultural economy.

Table 5-3
Cash Receipts for Agriculture Commodities
State of Wisconsin, 2006

Commodity	Thousands of Dollars	Percent of Total
Milk	3,075,492	45.3%
Field Crops and Vegetables	1,677,839	24.7%
Meat Animals	1,051,568	15.5%
Fruits and Specialty Crops	173,794	6.8%
Poultry and Eggs	320,174	4.7%
Total	**6,298,867**	**97.0%**

Note: Field crops and vegetables include: wheat, corn, hay, oats, soybeans, beans (dry), potatoes, snap beans, cabbage (fresh), cabbage (processing), carrots (fresh), sweet corn (processing), cucumbers, onions, peas.
Note: Meat animals: cattle and calves, hogs, sheep and lambs.
Note: Fruit and specialty crops include: apples, cherries, cranberries, strawberries, maple products, peppermint, spearmint, greenhouse and nursery, Christmas trees.
Source: Wisconsin Agricultural Statistics Service; does not equal 100% due to rounding.

Farm income varies from year to year and is reported annually by the University of Wisconsin – Madison Department of Agricultural and Applied Economics. In 2008, net farm income was the second highest on record, after 2007; however, this statistic does not reflect the wide price fluctuation in commodities, especially for corn and soybeans. The second half of 2008 saw a sharp downturn in crop prices. At the same time, however, the price of inputs, such as seed and fertilizer, also decreased. Despite the downturn in the overall economy in 2008, the farming sector in Wisconsin had assets totaling over $61 billion and total debts of only $7.3 million. Most of farmland values are tied to their real estate value.

Wisconsin farms are facing other social, economic, and political issues as well. Some of the most significant factors include the trend of aging farmers and the lack of family succession, the trend of scale, or fewer farms and smaller operations to the large tract and production operations, the cost of health insurance coverage, and a growing set of federal, state, and local regulatory programs.

Dairy in Wisconsin

Dairy farming is vital to the total agriculture picture in Wisconsin. Milk sales account for nearly half of Wisconsin farm cash receipts. According to the Wisconsin Agriculture Statistics Service, significant trends in Wisconsin's dairy industry include decreasing numbers of dairy farms, decreasing numbers of cows, increasing milk production, and a shift toward larger farms and

herds. The number of Wisconsin dairy farms has dropped from more than 140,000 in the 1950s to 17,800 in 2002. At the same time, the average herd size grew from 20 cows in the 1950s to 74 in 2003. The net result is a decline in the total number of Wisconsin dairy cows which dropped from over two million in the 1950s to less than 1.4 million in the 1990s.

The state of Wisconsin is now producing more milk with fewer cows. In contrast to the declining numbers of farms and cows, milk production has been on the rise over the long term. Wisconsin's milk production has declined since 2000, most likely due to devastating milk pricing, but since the 1950s, milk production has increased by more than 50%.

The trend toward larger farms and herd sizes has grown out of the need to experience greater economies of scale. Larger dairies are able to produce greater volumes of milk, and are therefore able to tolerate a smaller profit margin. The only growth in dairy farm numbers since 1997 has been in farms with more than 100 cows, with the most significant growth in farms with 200 or more cows. Fifty-four Wisconsin Counties have 500 cow dairies. Twenty-nine Wisconsin Counties have 1,000 cow dairies.

A nation-wide shift in milk production from the Midwest to Western states is continuing to occur. Since the 1970s, Idaho, New Mexico, and Washington have replaced Iowa, Ohio, and Missouri in the top 10 milk producing states. In 1998 the top three milk producing states (California, Idaho, and Washington) were responsible for 24% of U.S. milk production. By 2002, these top producers were responsible for 29%. In contrast, the Midwest's share of milk production declined over the same time period. The Midwestern states in the top 10 for milk production are Wisconsin, Michigan, and Minnesota. These three states were responsible for 24% of U.S. milk production in 1998, and 21% in 2002.

This geographic shift also appears to be influenced by economies of scale, as Western states have a greater share of the nation's large dairy farms. In 2002, operations with 500 or more cows were responsible for 42% of U.S. milk production (U.S. Department of Agriculture). The State of Wisconsin trails both California and Idaho in number of dairy farms with 500 or more cows.

There is a growing risk of losing the Midwest's dairy processing infrastructure with the continued geographic shift in milk production to Western states. On a positive note, Wisconsin continues to lead the nation in the production of most varieties of cheese; however, the State of California now leads in milk and butter production. Wisconsin's strengths in retaining its local and regional processing infrastructure include continued growth in the total amount of milk produced each year, close proximity to Eastern U.S. population centers, a large specialty cheese and cheese spread processing industry, and national recognition for its strong dairy industry.

Local Agricultural Resources

According to a study produced in 2004, *Burnett County Agriculture: Value and Economic Impact*, agriculture in Burnett County is a $97.3 million industry which generates more than 800 local jobs, $27.7 million in local

Local Economic Impact

Burnett County agriculture is a $97.3 million industry which generates more than 800 local jobs, $27.7 million in local income, and pays about $2.2 million in taxes (not including property taxes paid to local schools).

income, and pays about $2.2 million in taxes (not including property taxes paid to local schools). This industry is supported by both the built and natural environments. These natural and man-made features together can be thought of as Burnett County's agricultural resources.

Trends in the Burnett County dairy industry have mirrored state trends. Since 1974, when the U.S. Department of Agriculture began tracking dairy production, the number of dairy cows in Burnett County decreased from 7,000 to 3,300 in 2007. However, annual milk production has declined at a much slower rate—from 67,200 pounds in 1974 to 54,780 pounds in 2007—given technological advances that have made the process more efficient.

Prime Agricultural Soils

Soil is a key component of the natural environment that supports agriculture in Burnett County. The NRCS has identified prime farmland as soil that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and that is available for these uses. It has the combination of soil properties, growing season, and moisture supply needed to produce sustained high yields of crops in an economic manner when treated and managed according to accepted farming methods. In general, prime farmland has an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, an acceptable level of acidity or alkalinity, an acceptable content of salt or sodium, and few or no rocks. Its soils are permeable to water and air. Prime farmland is not excessively eroded or saturated with water for long periods of time, and it either does not flood frequently during the growing season or is protected from flooding. Users of the lists of prime farmland map units should recognize that soil properties are only one of several criteria that are necessary. Other considerations include:

- Land Use
- Frequency of Flooding
- Irrigation
- Water Table
- Wind Erodability

The official list of prime farm soils for Burnett County is maintained by the NRCS State Soil Conservationist. Under the NRCS definition of prime farmland soils, about 9% of Burnett County has either prime, or prime where drained, farm soils. Soils that are prime where drained have all of the characteristics of prime soils, except that they are in need of artificial drainage such as ditching or drain tile. The locations of prime farmland soils are identified on Map 5-2. Table 5-4 below shows prime soils in Burnett County by town.

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MAP 5 - 2
PRIME AGRICULTURAL SOILS
Burnett County, Wisconsin

Legend

Base Layers
- State Highway
- County Highway
- Town Road
- Rivers
- Lakes
- Village Boundary
- Town Boundary
- County Boundary

Soil Classification
Prime Agricultural
- All areas are prime farmland
- Farmland of statewide importance
- Prime farmland if drained

Source: Wisconsin DNR, USDA NRCS Soil Survey and Burnett Co.

Summary of farmland soil classifications taken from the USDA can be found at http://soils.usda.gov/technical/handbook/contents/part622.html#03

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Table 5-4
Prime Soils, Burnett County, 2003

Town Name	All areas are prime farmland	Farmland of statewide importance	Not prime farmland	Prime farmland if drained	Grand Total
Anderson	696	642	38,947	581	40,874
Blaine	1,857	664	41,536	930	45,076
Daniels	2,247	1,172	16,565	2,904	22,891
Dewey	5,367	2,533	12,668	2,992	23,563
Grantsburg	1,495	463	20,248	2,768	24,974
Jackson	0	95	22,178	0	22,273
La Follette	126	376	24,212	238	24,955
Lincoln	419	385	20,996	714	22,515
Meenon	16	1,204	21,138	0	22,358
Oakland	0	817	20,228	0	21,045
Roosevelt	2,947	4,982	12,334	2,310	22,589
Rusk	1,066	188	20,588	390	22,241
Sand Lake	294	1,411	21,442	0	23,147
Scott	41	257	21,524	51	21,877
Siren	642	934	21,952	202	23,735
Swiss	534	0	37,883	357	38,783
Trade Lake	4,234	3,358	12,714	2,407	22,721
Union	43	129	23,967	141	24,284
Webb Lake	0	0	23,147	0	23,170
West Marshland	336	24	45,559	748	46,669
Wood River	3,395	796	10,661	7,959	22,811
Grand Total	**25,756**	**20,432**	**490,487**	**25,691**	**562,551**

Note: Village totals are included in Town totals.
Source: Natural Resource Conservation Service, Soil View, 2003

Working Lands Initiative

The Working Lands Initiative is a program designed to manage Wisconsin farmland through a coordinated and managed approach to land use, taxation, and development regulation. The Wisconsin Working Lands Initiative is included as part of the 2009 – 2011 state budget signed into law by Governor Doyle on June 29, 2009. The Wisconsin Working Lands Initiative can be found primarily in Chapter 91 of Wisconsin State Statutes.

Working Lands Contact Information

Visit the Department of Agriculture, Trade and Consumer Protection at: http://workinglands.wi.gov or DATCPWorkingLands@wisconsin.gov

Three main components in the budget include updates to the state's current Farmland Preservation Program, the ability for farmers and local governments to establish voluntary Agricultural Enterprise Areas, and a state grant program to help with the purchase of

Agricultural Conservation Easements. The goal of the Working Lands Initiative is to achieve preservation of areas significant for current and future agricultural uses through successful implementation of these components.

With the passage of the Wisconsin state budget in 2009, the state created the necessary framework to reorganize what was known for 30 plus years as the Farmland Preservation Program. As Wisconsin's population is growing steadily, there are growing conflicts over land use. Wisconsin farmland is being permanently lost and developed for intensive uses, and the Initiative is designed to save key agricultural resources.

The three primary components include the following:

Expand and Modernize the State's Existing Farmland Preservation Program

- Modernize county farmland preservation plans to meet current challenges
- Provide planning grants to reimburse counties for farmland preservation planning
- Establish new minimum zoning standards to increase local flexibility and reduce land use conflicts; local governments may apply more stringent standards
- Increase income tax credits for program participants
- Improve consistency between local plans and ordinances
- Simplify the certification process and streamline state oversight
- Ensure compliance with state soil and water conservation standards
- Collect a flat per acre conversion fee when land under farmland preservation zoning is re-zoned for other uses

Establish Agricultural Enterprise Areas

- Maintain large areas of contiguous land primarily in agricultural use and reduce land use conflicts
- Encourage farmers and local governments to invest in agriculture
- Provide an opportunity to enter into farmland preservation agreements to claim income tax credits
- Encourage compliance with state soil and water conservation standards

Develop a Purchase of Agricultural Conservation Easement (PACE) Grant Program

- Protect farmland through voluntary programs to purchase agricultural conservation easements
- Provide up to $12 million in state grant funds in the form of matching grants to local governments and non-profit conservation organizations to purchase agricultural conservation easements from willing sellers
- Stretch state dollars by requiring grants to be matched by other funds such as federal grants, local contributions and/or private donations
- Establish a council to advise the state on pending grants and proposed easement purchases
- Consider the value of the proposed easement for preservation of agricultural productivity, conservation of agricultural resources, ability to protect or enhance waters of the state, and proximity to other protected land
- Ensure consistency of state-funded easement purchases with local plans and ordinances

5.4 Forests

Forest land is one of the most prominent land cover features found in Burnett County (refer to map 5-1. Forests are important to the county's resource base, culture, and economy. Forests provide wildlife habitat, recreational opportunities, timber and pulpwood, educational opportunities, and contribute to the county's rural atmosphere. Forestry is part of the second largest economic sector in Wisconsin and employs over 100,000 state-wide. The health and management of forest lands have many implications for the future of Burnett County.

Wisconsin Forests

Forests have been vital to the quality of life in Wisconsin, providing opportunities for sportsmen, tourists, and recreationists. Forests are also essential to the protection of ground and surface water resources. According to the draft *Wisconsin Statewide Forest Plan* (WDNR, 2004), Wisconsin's forests cover 16 million acres, or 46% of the state's land area. While the public sector and the forest industry own significant forest acreage, most of the state's forest land (57%), is owned by private, non-industrial landowners. Thirty percent of the state's forests are owned by the public sector, with federal holdings accounting for 10%, state holdings 5%, and county governments, municipalities, and school districts totaling 15%. Accounting for the balance of the forest resource, Wisconsin's Native American tribes own 2% of the state's forests, corporations own 4%, and the forest industry owns 7%.

Burnett County Forest

According to the 1998 Land Use Plan, Burnett County is the 28th largest county in Wisconsin and is home to the ninth largest county forest in the state. Table 5-5 displays the Burnett County Forest lands by township.

Table 5-5
Burnett County Forest by Town

	Acres	% of Burnett County Forest
Anderson	14,234	13.4%
Blaine	28,277	26.6%
Jackson	2,755	2.6%
Lincoln	3,585	3.4%
Roosevelt	3,861	3.6%
Rusk	5,819	5.5%
Sand Lake	5,720	5.4%
Swiss	18,852	17.7%
Union	9,912	9.3%
Webb Lake	9,429	8.9%
West Marshland	3,985	3.7%
Total	106,429	100.0%

Source: Burnett County Forest Comprehensive Land Use Plan, 2006-2020

Historic Conditions

Prior to European settlement in the mid-1800s, Burnett County was almost completely forested. A large portion of these forests still exist when compared with other more heavily developed areas of Wisconsin. Early settlement patterns were tied closely to forest resources, as villages and towns formed around sawmills. Logging, damming and sawing companies developed together in this region. Moreover, Burnett County's vast system of waterways served as an important mode of transportation for the logging industry.

Unfortunately, the tremendous demand for lumber coupled with poor forest management practices, contributed to the over harvesting of forests and degradation of the land. Land was often left depleted and tax delinquent; the Wisconsin County Forest Program originated with the taking of such tax delinquent land. In 1931, Burnett County joined this program with 29,800 acres of land. These land descriptions were formally entered into the Forest Crop Program on March 19, 1932 forming the Burnett County Forest. The first Burnett County Forestry Ordinance was passed in 1934. As of June 30, 2003 there were 106,429.39 acres in Burnett County enrolled in the County Forest Program in accordance with Table 5-5.

Early phases of development of the County Forest consisted largely of road construction, fire protection, and investment in the planting of open areas. Much of the early planting was done by hand using labor from the nearby Riverside CCC Camp. The first timber sale on the Burnett County Forest was sold on May 16, 1938 to the WPA; 71.32 cords of jack pine was sold for $1.00 per cord with the wood being used for building houses at the Danbury Indian Village.

Native forest types did vary in the county according to the WDNR map, *Original Vegetative Cover of Wisconsin* (1976), however, the majority of Burnett County was covered by mixed confer – deciduous forests. More specifically, the landscape is a gently rolling outwash plain comprised of the jack pine and barrens mixed with oak forest. The southwestern and

southeastern portions of the county, primarily in the Towns of Trade Lake, Anderson, and Wood River, was covered with massing of deciduous forest that included sugar maples, basswoods, and red, white, and black oaks. The county's historic vegetative cover historically included linear patches of lowland hardwoods. The lowland hardwoods are primarily found in wetland areas and include willows, soft maples, box elders, ash, and elm trees.

Current Conditions

As shown in table 5-6, Burnett County currently has over 229,000 acres of forested land, and 79% are publicly owned. State-wide, the vast majority (80%) of forest products come from privately owned forests. If privately owned forest lands are important to planning for the future on a state-wide scale, then they are even more important in Burnett County.

The Burnett County Forest land covers 106,429 acres. Burnett County also has two state wildlife forested areas: Crex Meadows is 27,467 acres and Fish Lake is 13,197 acres. Also, 19,343 acres of the Governor Knowles State Forest is located in Burnett County. As detailed in the *2004 Burnett County Land and Water Resources Plan*, federal, state, and county owned conservation and recreational land total 181,520 acres or 35 percent of the land in Burnett County.

Private forest lands are dispersed throughout the county. Enrollment in WDNR forest management programs and the presence of corporately owned forests are highest in this region of the county. In 2008 47,944 acres of private forest lands are enrolled in the Managed Forest Land program, and 1,754 acres in the older Forest Crop Land program. Lands enrolled in these programs are significant to planning for the future, as long term forest management plans have been produced by voluntary participants in cooperation with the WDNR. These management plans must include a timber harvest at some point.

Table 5-6
Public and Private Forest Lands, Burnett County

	Acres	Percent
Total Public Forest Land (1)	**181,520**	**79%**
Federal Forest Land		
State Forest Land		
County Forest Land		
Total Private Forest Land	**47,944**	**21%**
Private Forest Enrolled in MFL (2)	46,191	
Private Forest Enrolled in FCL (3)	1,754	
Other Private Forest Land		
Total Forest Lands (1)	**229,464**	**100%**

Note (1): Includes Federal, State, and County owned land.
Note (2): Managed Forest Land enrollment as of 2008.
Note (3): Forest Crop Land enrollment as of 2008.
Source: DNR MFL and FCL 2008 listings, 2004 Burnett County Land and Water Resource Plan.

The Burnett County Forest is a productive, sustainable resource. In February, 2009, Burnett County allowed a timber sale of 16,000 cords on 11 different forest tracts, totaling over $500,000 in revenue. According to the Burnett County Forester, Burnett County is in a pulp wood market, with a majority of product going for pulp wood, either paper products or bio-mass. The County typically has a few sales each year. Based on a Burnett County Forestry publication summary, Burnett County showed $1.4 million in timber sale revenue collected for 2008 — which was a record year. Based on current conditions, county forest property yielded $17.39 per acre in 2008, which is high as compared to the previous five years. Of the 106,000 acres in county forest, about 85,000 acres, roughly 75 % is proving to be productive forest land. The county goal for revenue associated with forest timber sales is $850,000 per year.

MFL Program Trends

Increasing property values, increasing property taxes, a growing interest in forest management, and many other factors have led to increased interest in the Managed Forest Land (MFL) program throughout the State of Wisconsin. In Burnett County, lands in MFL applications submitted to the WDNR for consideration totaled 9,998 acres in 2004. This represents a 190% increase over 2003 applications. In 2003, applications included 3,452 acres, which was closer to the 5-year average of about 3,800 acres per year since 1999. As property taxes on recreational lands continue to climb, growth in MFL enrollments is expected to continue.

Of the public forest lands in the county, the vast majority are contained in the Burnett County Forest, State Natural Areas (described later in this chapter), Crex Meadows, and the Governor Knowles State Forest. The Burnett County Forest is located in 11 Burnett County towns, with the largest portions found in Anderson, Blaine, and Swiss. The County Forest is composed of a variety of conifers and deciduous trees in all stages of growth resulting from planned reforestation and selective thinning. This area is being converted to showcase the restoration of the natural plant communities, a mini-arboretum, and various forestry management practices. Table 5-7 shows the various tree varieties in Burnett County.

Table 5-7
Tree Varieties in County Forest, Burnett County

Jack Pine	21.4%
Aspen	23.5%
ROW, Rock, Wet, Other	15.0%
Scrub Oak	14.9%
Red Pine	13.7%
Swamp Hardwoods	3.9%
Swamp Conifer	3.5%
N Red Oak	1.8%
Northern Hardwoods	1.2%
Fir-Spruce	0.5%
White Pine	0.4%
White Birch	0.4%

Source: Burnett County Forest Comprehensive Plan

Forest Uses and Economics

Based on 1994 data, forest related industry in northwest Wisconsin (which includes Burnett County) accounted for over $8.8 billion in output, according to *Forests and Regional Development* (Marcoullier & Mace, 2002). These related industries include wood processing, other manufacturing, construction, tourism, wholesale and retail trade, and a myriad of support services. These outputs are driven by both recreational and timber harvest uses of forest lands. Often viewed as being in conflict with one another, both forms of forest use must be balanced and managed in order to ensure continued benefits to the region and to Burnett County.

Potential conflicts within the realm of recreational forest use must also be taken into consideration when managing forest land. Motorized uses such as snowmobiles and ATVs, use for hunting and trapping, and passive uses like hiking and cross-country skiing all take place on forest lands within Burnett County. Adequate separation between potentially conflicting land uses and forest land must be maintained in order to ensure continued viability of forests into the future.

5.5 Topography

The primary land feature in Burnett County is the level to gently rolling outwash plains known as the "pine barrens". The "pine barrens" cover most of the county except for the southern farming areas. Jack pine trees are the most prevalent cover on the "barrens" that also feature scatters of hardwoods on patches of loams and clays. These areas are also marked by potholes and irregular depressions. Central Burnett County is relatively level and has been influenced by glacial Lake Grantsburg.

Elevations range from 760 feet above sea level in the southwest part of the county forest to1,500 feet above sea level in the southeast corner of the county. The county is characterized by gently rolling to hilly topography resulting from glacial moraine deposits that consist of unsorted, unstratified deposits of clay, silt, sand, gravel, and boulders. The upland soils originating form these glacial deposits generally are high quality for supporting agricultural activities.

Steep slopes have a slope of 12% or greater according to the *USDA Soil Survey of Burnett County* (1984). According to this definition, there are approximately 30,000 acres of steep slopes in Burnett County, occupying about 6% of the landscape.

5.6 Geology

The bedrock and glacial geology of Burnett County play a crucial role in planning for future development. Geological features directly influence other natural resources like topography, soils, surface water, and groundwater. Geology is an important consideration for development activities, and areas of concern include structural stability, groundwater interaction, and the provision of non-metallic minerals.

An understanding of Burnett County's geology can be gained by examining glacial features and the underlying bedrock formations. According to the map *Bedrock Geology of Wisconsin*

(Wisconsin Geological and Natural History Survey, 1995), the western edge, central, and eastern portions of Burnett County are underlain by Keweenawan basaltic to rhylotic law flows. Keweenawan sandstone compromises the geology in the northeastern area of the county. At the time of their formation, a major fracture zone split the continent from Lake Superior south through Minnesota and into Kansas. The Keweenawan rocks are the youngest of the Proterozoic rocks. The Proterozoic Era is the younger of the two Precambian Eons. Meaning, a majority of the Burnett County geologic formations are younger than much of the rest of the state.

According to *Bedrock Geology of Wisconsin*, the southern, southwestern, and northern areas of the county are underlain with Cambian sandstone with some dolomite and shale and the remainder is underlain with a metamorphic/igneous bedrock. These formations are generally greater than feet below the surface and generally contain a readily available groundwater aquifer. Many municipal wells and individual wells draw water from these aquifers.

According to *2004 Burnett Land and Water Resources Plan*, most striking feature of the Burnett County landscape is the level to gently rolling outwash plain known as the pine barrens. The pine barrens cover all but the southern farming areas of the county. Most of the northern and western landscape is characterized by pitted outwash plains marked by irregular depressions and potholes. Soils here are composed of stratified acidic sand and gravel soils from 50 to 150 feet over the bedrock. The central portion of the county extending from Grantsburg east through Siren and Webster and to north of Hertel has been influenced by glacial Lake Grantsburg. Landforms here are relatively level and the soils are poorly to moderately drained. They are composed of well sorted, fine textured sands, silts, clays, and lacustrine deposits. The southwest and southeast portions of the county have rolling topography resulting from glacial moraine deposits. Soils here consist of unsorted, unstratified deposits of clay, silt, sand, gravel, and boulders. Upland soils originating from these deposits generally are of good quality for agricultural purposes because they are moderately permeable. These areas form the productive agricultural lands of Burnett County.

5.7 Metallic and Non-Metallic Mineral Resources

Metallic and non-metallic mineral resources are concentrations of naturally occurring solid materials in or on the earth's crust which occur in such a form or amount that economic extraction of a commodity from the concentration is currently or potentially feasible. Metallic mineral resources include such substances as nickel, copper, lead, iron, gold, and zinc. Non-metallic mineral resources include sand, gravel, topsoil, clay, and stone.

Wisconsin Administrative Code NR 135 requires that all counties adopt and enforce a Non-metallic Mining Reclamation Ordinance that establishes performance standards for the reclamation of active and future non-metallic mining sites, but not abandoned sites. It is intended that NR 135 will contribute to environmental protection, stable, non-eroding sites, productive end land use, the potential to enhance habitat, and increased land values and tax revenues. In response to NR 135, The Burnett County Board of Supervisors enacted the *Burnett County Ordinance for Non-Metallic Mining Reclamation* in May of 2001. The Burnett County Land and Water Conservation Department (LWDC) is authorized to issue citations and collect fines under this ordinance.

MAP 5 - 3
ENVIRONMENTAL AND WATER FEATURES
Burnett County, Wisconsin

Legend

Base Layers

- State Highway
- County Highway
- Town Road
- Rivers
- Lakes
- Village Boundary
- Town Boundary
- County Boundary
- Wetlands
- Watersheds
- Conservation Areas
- Flood Hazard Area

This drawing is neither a legally recorded map nor a survey and is not intended to be used as one. This drawing is a compilation of records, information and data used for reference purposes only.

Source: Map generated using data from the WDNR Endangered Resources and Burnett Co Land Information Office

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According to Burnett County LWDC, there were 15 active non-metallic mining sites in Burnett County in 2007. This included about 82 acres that were identified for active operations on parcels that total more than 847 acres. Active non-metallic mines in Burnett County included sand and gravel extraction operations. There are currently no metallic mines in Burnett County.

In addition to the non-metallic mining reclamation program, both metallic and non-metallic mineral extraction operations are under the jurisdiction of other applicable WDNR regulations as well as county and local zoning regulations.

5.8 Wetlands

Wetlands may be seasonal or permanent and are commonly referred to as swamps, marshes, fens, or bogs. Wetland plants and soils have the capacity to store and filter pollutants ranging from pesticides to animal wastes. Wetlands provide storage of flood waters, preventing damage to developed areas. Wetlands can make lakes, rivers, and streams cleaner and drinking water safer. Wetlands also provide valuable habitat for fish, plants, and animals. Nation-wide, more than one third of endangered species require wetlands during a stage of their life cycle. 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.

Wetlands Defined

According to the United States Environmental Protection Agency, wetlands are areas where water covers the soil, or is present either at or near the surface of the soil all year or for varying periods of time during the year, including during the growing season. Wetlands can be recognized by the presence of 3 features:

1. *Wetland hydrology*, or varying degrees of saturated conditions.
2. *Hydrophytes*, or specially adapted plants that favor the prolonged presence of water.
3. *Hydric soils*, or soils that contain characteristics that confirm the long term presence of wetland hydrology.

The loss of wetlands leads to a loss of the functional values that they provide. For example, as the natural capacity for flood storage is reduced in urban areas, it must often be replaced with storm sewers, detention basins, and other stormwater management structures at a cost to the community. According to a UW-Extension study (*An Introduction to Wetland Resources*, Robinson), Wisconsin has experienced an estimated loss of 50% of its wetlands since European settlement. State-wide, there were approximately 10 million acres of wetlands in 1600, compared to approximately 5 million acres in 2000.

According to the Wisconsin Department of Natural Resources wetlands inventory, there are 96,151 acres of wetlands in Burnett County, covering about 17.1% of the surface area. Refer to Map 5-3, Environmental and Water Features, for the locations of WDNR mapped wetlands (excluding point symbols, or mapped wetlands smaller than five acres). Burnett County contains significant wetlands including not only wetlands of substantial size, but also wetlands with unique habitats and characteristics. The county wetlands types range from emergent/ wet meadows to shrub to deciduous to coniferous forested wetlands. Table 5-10 shows water features in Burnett County.

Due to the significant environmental functions served by wetlands, there is a complex set of local, state, and federal regulations which place limitations on the development and use of wetlands (and shorelands). The WDNR has regulatory authority over filling, dredging, draining, and similar activities in most Wisconsin wetlands. Counties are mandated to establish shoreland-wetland zoning districts for wetlands near lakes, rivers, and streams. In addition, the U.S. Army Corps of Engineers has authority over the placement of fill in wetlands connected to federally navigable waterways, while the USDA incorporates wetland preservation criteria into its crop price support programs. Therefore, prior to placing fill or altering a wetland resource, the appropriate agencies must be contacted to receive authorization.

5.9 Watersheds

A watershed is an area of land from which water drains to a common surface water feature, such as a stream, lake, or wetland. In Wisconsin, watersheds vary in scale from major river systems to small creek drainage areas, and typically range in size from 100 to 300 square miles. River basins can contain several watersheds. There are 32 river basins in Wisconsin which range in size from 500 to over 5,000 square miles. In order to protect and improve the state's water resources, the WDNR prepares water quality management plans for each river basin in the state. These plans identify sources of water quality problems and identify management objectives for the WDNR, local communities, counties, and other agencies.

Burnett County is located entirely within the St. Croix basin. Surface waters in the county generally flow toward the west and south toward the St. Croix River. The St. Croix River basin contains 22 watersheds in the state of Wisconsin, 11 of which include portions that are found in Burnett County. The names and boundaries of Burnett County's watersheds are displayed on Map 5-3. Table 5-8 identifies the names and relative sizes of each watershed in Burnett County.

Table 5-8
Watersheds, Burnett County

Watershed	Square Miles	% of County
Lower Yellow River	131,858.5	23.7%
Wood River	116,563.0	20.9%
Clam River	69,212.1	12.4%
North Fork Clam River	64,964.0	11.7%
Trade River	63,764.4	11.4%
Lower Namekagon River	45,869.8	8.2%
St. Croix, Eau Claire Rivers	26,714.1	4.8%
Upper Tamarack River	21,891.4	3.9%
Shell Lake, Upper Yellow River	15,252.0	2.7%
Wolf Creek	677.1	0.1%
Yellow River	550.1	0.1%
Total	**557,316.5**	**100.0%**

Note: Totals do not match existing county total acreage as some watershed calculations go beyond the existing county boundary.
Source: 2004 Burnett County Land and Water Resources Plan, Appendix D.

5.10 Floodplains

For planning and regulatory purposes, a floodplain is normally defined as those areas, excluding the stream channel, that are subject to inundation by the 100-year recurrence interval flood event. This event has a one-percent chance of occurring in any given year. Because of this chance of flooding, development in the floodplain should be discouraged and the development of park and open space in these areas encouraged. The floodplain includes the floodway and flood fringe. The floodway is the portion of the floodplain that carries flood water or flood flows, while the flood fringe is the portion of the floodplain outside the floodway, which is covered by waters during a flood event. The flood fringe is generally associated with standing water rather than rapidly flowing water.

Wisconsin Statute 87.30 requires counties, cities, and villages to implement floodplain zoning. Burnett County's current floodplain ordinance was adopted in August of 2008.

Trophic Status

The stage of a lake or pond in the process of natural succession, or aging, can be described as the "trophic status." Developed conditions in a watershed can accelerate the natural process of succession, but every lake or pond can be expected to eventually progress through these stages over time.

1. Oligotrophic – The earliest stage of succession, these lakes are infertile, clear, and deep. These lakes have few weeds and only a thin layer of organic material on the lake bed.
2. Mesotrophic – The middle stage of succession, these lakes are beginning to show signs of eutrophication.
3. Eutrophic – A late stage of succession, these lakes are fertile, have stained or tinted water, and are less deep. These lakes have many weeds and a thick layer of organic material on the lake bed.

5.11 Surface Water Features

Its lakes, rivers, and streams are some of the most treasured and widely recognized features of all Burnett County's natural resources. The county's surface waters provide fish and wildlife habitat, tourism and recreation opportunities, scenic beauty, and for many, a sense of peace and quiet and connection to the natural world. Most of the county's rural residences and urbanized areas, are found in close proximity to surface water features as shown by Maps 8-1 and 8-2 (Structure Location and Existing Land Use). Many of the larger lakes are ringed by seasonal homes and cottages. According to the *Burnett County Land and Water Resource Plan*, which was conducted in 2004, at least 5,589 of the nearly 12,600 housings units were located within 150 feet of lakes and rivers. According to the WDNR, there are approximately 42,968 acres of surface water in Burnett County of which 31,258 acres is comprised of lakes. Table 5-10 shows water features in Burnett County. Refer to Maps 5-3 for the locations of Burnett County's surface water features.

Lakes

According to the *2004 Burnett County Land and Water Resource Plan* there over 500 lakes in Burnett County, of which more than 200 are named. The WDNR *Wisconsin Lakes Book* publication lists 263 of the named and unnamed lakes in Burnett County and their characteristics.

The county's lakes are generally small to medium in size, with the major lake regions being located in the northern and central part of the county. Only six of the lakes are greater than 1,000 acres in surface area with the Yellow Lake and Big Sand Lake being the largest. Appendix ANC shows basic information for the lakes that are listed including the area, depth, type of access, type of lake system, and game-fish species present.

Table 5-9
Water Features, Burnett County, 2009

Water Feature	Acreage	Percent of Total
Surface Water	42,968	7.6%
Wetland	96,151	17.1%
Floodplain	101,659	18.1%
Shoreland Zoning	216,704	38.5%
Lands Outside These Zones	105,069	18.7%
Total County Area	**562,551**	100.0%

Source: Burnett County and Foth Infrastructure and Environment, LLC.

Lakes Classification System

In March 1997, Burnett County developed a three-tier classification system for its lake to better balance environmental protection and development pressures and to create a consistent method for dealing with proposals for shoreland development. Lakes are classified into one of three categories. Each category has its own set of restriction on such elements as septic system requirements and lot size. Refer to Chapter 9 Implementation for more information on the Lake Classification System regulations.

Rivers and Streams

In addition to the lakes, Burnett County contains 2 flowages, 10 major rivers, and 145 miles of streams, of which 66 miles are Class 1 trout streams. Also according to the *2004 Burnett County Land and Water Resources Plan* the Class 1 trout streams include:

- Bear Branch, Benson Branch, Brant Branch, Clemens Creek, Dody Branch, Dogtown Creek, East Branch, Ekdahl Branch, Hay Creek, Jones Creek, Kettle Branch, Krantz Creek, Montgomery Creek, Pine Branch, Rand Creek, Sand Creek, Sioux Portage Creek, Spencer Creek, Spring Branch, Spring Creek, and an unnamed tributary to Hay Creek.

Major river systems in Burnett County include the St. Croix National Scenic Riverway, which includes both the St. Croix and Namekagon Rivers.

The following descriptions summarize Burnett County's primary rivers. For additional explanation of "Outstanding and Exceptional Resource Waters" and "Impaired Waters" designations, refer to Section 5.13 (Water Quality).

St. Croix River

The St. Croix River originates at Upper St. Croix Lake near Solon Springs in Douglas County and flows approximately 160 miles to join the Mississippi River at Prescott. The upper 25 miles of the St. Croix River lie solely within Wisconsin. The remaining stretch forms the boundary between Minnesota and Wisconsin. The St. Croix drainage basin lines about 60% in Wisconsin and 40% in Minnesota. In total, the St. Croix drains 7,760 square miles. In Wisconsin, a large portion of the St. Croix River is classified as an Outstanding Resource Water (ORW) for the application of water quality standards under the state's anti-degradation rules. An ORW is defined by the WDNR as a lake or stream which has excellent water quality, high recreational and aesthetic value, and high quality fishing and is free from point source or nonpoint source pollution.

Clam River

The Clam River flows for approximately 55 miles through Burnett and Polk counties. It is designated as an Outstanding Resource Water by the Department of Natural Resources. The shoreland along the river is lightly developed. The Clam River Fish and Wildlife Area is a 2,323 acre property in the southeast portion of Burnett County, with portions of the property in the Towns of Roosevelt, Dewey and Lafollette. The area is a prime wetland with marshes and forestland.

Totagatic River

The Totagatic River is designated by the Wisconsin Department of Natural Resources as an Outstanding Resource Water. It is a tributary of the Namekagon River and part of the watershed of the Mississippi River. It flows approximately 70 miles through Bayfield, Sawyer, Washburn, Douglas and Burnett Counties and passes through several lakes. The Totagatic River Wildlife Area is a 272 acre property located in Sawyer County. The shoreline is generally wild for much of the river's length. A substantial portion of the land along the river is in public ownership as state, county or federal land. There are currently no municipal, industrial or commercial wastewater discharges to the river. Efforts are currently underway to have the Totagatic River designated as a state wild river. State wild rivers have special long-term, cohesive protective measures in place to maintain the high quality and wild nature of the river.

Namekagon River

The Namekagon River is designated as a federal wild and scenic river. Accordingly, it is protected by the National Parks Service, which aims to keep the river in a natural and free-flowing condition. It flows approximately 100 miles through Bayfield, Sawyer and Burnett Counties. The Namekagon Barrens Wildlife Area is a 5,050 acre property located in the northeastern corner of Burnett County. The area contains abundant prairie and forestland, as well as the Beaver and Clemens Creek streams. Additionally, numerous sharp-tailed grouse habitat and population projects have been conducted in the wildlife area.

5.12 Groundwater

Groundwater flow is generally to the west and south similar to surface runoff flow. Groundwater is the source of nearly all drinking water in Burnett County and supplies agricultural and industrial processes as well.

A groundwater quality study pointed out that the overall quality of the resource was very good and that no health risks were present. Groundwater is a limited resource, and both its quality and quantity are important factors. These factors are primarily influenced by local geology and local land use. Even though historically, the groundwater is of a high quality, a combination of shallow groundwater and sandy soils make Burnett County vulnerable to contamination. According to the *Burnett County Land and Water Resource report*, over 75% of the county groundwater is less than 20 feet below the land surface. In addition, the sandy soils, more specifically labeled the northwest sands, are the primary ecological landscape comprising nearly 75% of the land in Burnett County. The sandy soils of this region allow for rapid recharge of groundwater aquifers, as precipitation quickly soaks through the soil. However, this combination of factors also means that the groundwater resource is very susceptible to contamination. Refer to map 5-4, Groundwater Contamination Susceptibility.

Groundwater Terms

Precipitation percolates through the soil and bedrock where it eventually reaches a saturated zone known as an aquifer. It is from these aquifers that wells draw their water.

The process of precipitation moving through the soil and bedrock and into an aquifer is known as groundwater recharge. 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. Certain human uses of the land can carry harmful substances to a groundwater aquifer leading to groundwater contamination. There are many potential sources of contamination including yard and agricultural fertilizers, road salt, failing septic systems, leaking underground storage tanks, and vehicle emissions.

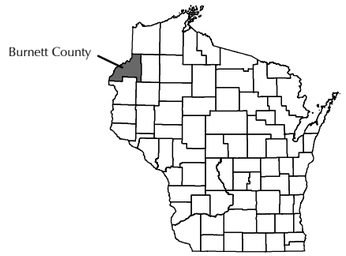
Groundwater contamination can result from the percolation of water containing pollutants from sources such as improperly placed or maintained landfill sites, private septic systems, excessive use of fertilizers, and seepage from mining operations.

Groundwater can also be contaminated by chemical and organic runoff from urban, industrial and agricultural sites that are near locations where the water table is near the surface.

A Wisconsin Geological and Natural History Survey map, *Groundwater Contamination Susceptibility in Wisconsin (1989)*, affirms that the majority of Burnett County has a high risk for groundwater contamination in Burnett County.

A WDNR report, *The State of the St. Croix Basis (2002*, rated the watersheds in Burnett County for susceptibility to contamination based on land cover and sampling results. None of the Burnett County watersheds received an overall ranking above the "medium" threshold, with the majority of the scoring falling in the "low" priority level.

MAP 5 - 4
GROUNDWATER CONTAMINATION SUSCEPTIBILITY
Burnett County, Wisconsin



Legend

Base Layers
- State Highway
- County Highway
- Town Road
- Rivers
- Lakes
- Village Boundary
- Town Boundary
- County Boundary

Groundwater Contamination Model
- Less Susceptible
- More Susceptible
- Buildings

This drawing is neither a legally recorded map nor a survey and is not intended to be used as one. This drawing is a compilation of records, information and data used for reference purposes only.

Source: Wisconsin DNR and Burnett Co Land Information Office

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The Priority Watershed program provides a source of groundwater data on the watersheds in an effort to prioritize financial assistance to local governments to address land management activities contributing to urban and rural runoff. Since, the watersheds in Burnett County are not ranked in "high" priority; there are currently no active WDNR Priority Watershed projects in Burnett County.

5.13 Water Quality

Surface water and groundwater quality in Burnett County are influenced both by natural and developed conditions. Development factors that influence water quality include point and non-point sources of water pollution, the amount of impervious surface in a watershed, the potential pollution sources related to a particular land use, and the degree to which mitigation measures have been used.

Natural factors that influence water quality include soils, geology, topography, climate, vegetation types, and the water cycle. This section addresses several key indicators of water quality for Burnett County. Included in this inventory are state and federal listings for poor (Impaired Waters) and very high (Outstanding and Exceptional Resource Waters) surface water quality, along with a discussion of both point and non-point sources of water pollution that impact both surface and groundwater.

Water Quality Terms

Pollution that comes from a discharge pipe is known as point source pollution. Municipal waste water treatment plants and industries must obtain permits in order to discharge treated or processed water to a surface water body.

As precipitation and snow melt run across the surface of the land, this water can pick up sediment and other pollutants from the ground. This polluted runoff is known as non-point source pollution. Construction site erosion, municipal stormwater runoff, and uncontrolled agricultural runoff are the three primary sources of non-point source pollution.

Hard surfaces that prevent precipitation from soaking into the ground, like buildings and pavement, are known as impervious surfaces. Impervious surfaces prevent groundwater recharge, increase the speed of runoff, and increase the temperature of runoff.

Measures taken to offset the negative impacts of point source or non-point source pollution are known as mitigation. For example, preserving the natural vegetation along a shoreline can mitigate the impacts of impervious surfaces near a body of water.

Impaired Waters

Section 303(d) of the federal Clean Water Act requires each state to periodically submit to the US Environmental Protection Agency (EPA) for approval, a list of impaired waters. Impaired waters are those that are not meeting the state's water quality standards found in Wisconsin Administrative Code Chapter NR 102. The Department of Natural Resources last submitted an updated list to EPA in 2008.

Burnett County has five water bodies that were included on the latest list of impaired waters. The pollutant for each water body is mercury that has been found in fish tissue. Following is the list of Burnett County water bodies found on the impaired list.

- Dunham Lake

- Johnson Lake
- Mud Hen Lake
- Round Lake (T37n R18w S27)
- Sand Lake (T40n R15w S25)

Although these waters appeared on the impaired list, each of the water bodies is classified as a low priority. In addition, Yellow Lake was removed from the list of impaired waters in 2006. The pollutant formerly impairing Yellow Lake was also mercury.

Exceptional and Outstanding Resource Waters

Wisconsin has classified many of the state's highest quality waters as Outstanding Resource Waters (ORWs) or Exceptional Resource Waters (ERWs). These surface waters are recognized for being relatively unchanged by human activities and for providing valuable fisheries, unique environmental features or settings, and outstanding recreational opportunities. Chapter NR 102 of the Wisconsin Administrative Code lists the ORWs and ERWs. The WDNR conducted a statewide evaluation effort in the early 1990s to determine which waters qualified for ORW and ERW classification. The following Burnett County waters are classified as ORW or ERW.

- St. Croix River, ORW
- Namekagon River, ORW
- North Fork Clam River, ORW
- South Fork Clam River, ORW
- Indian Creek ORW
- Krantz Creek, ORW
- Spencer Creek, ORW
- Spring Brook, ORW
- Big McKenzie Lake, ORW
- Big Sand Lake, ORW
- Sand Lake (T40N R15W S25), ORW
- Bear Brook, ERW
- Benson Brook, ERW
- Brant Brook, ERW
- Clemens Creek, ERW
- Dody Brook, ERW
- East Brook, ERW
- Ekdall Brook, ERW
- Hay Creek, ERW
- Jones Creek, ERW
- Kettle Brook, ERW
- Montgomery Creek, ERW
- Moore Farm Creek, ERW
- Nelson Creek, ERW
- Perkins Creek, ERW
- Pine Brook, ERW
- Rand Creek, ERW
- Sand Creek, ERW
- Spring Brook (Spring Cr & Spg), ERW
- Unnamed Tributary to Hay Creek at S13 and S14 T42N R15W, ERW
- Dogtown Creek, ERW

Point Source Discharges

Many industrial processes depend upon the ability to dispose of water they have used by discharging it to a surface water body – typically a river or stream. The WDNR establishes regulations and monitors compliance of all such discharges. Permits are obtained through the Wisconsin Pollutant Discharge Elimination System program (WPDES). The capacity of these waterways to receive processed water without becoming ecologically impaired is also monitored.

WPDES permits for point source discharges are commonly required of municipalities, sanitary districts, industries, and large livestock operations. According to the WDNR, current municipal WPDES permit holders in Burnett County include:

- Village of Grantsburg
- Village of Siren
- Village of Weber

According to the WDNR, current industrial WPDES permit holders in Burnett County include:

- Burnett Dairy Cooperative
- St. Croix Manufacturing
- St. Croix Tribal Fisheries

Non-Point Sources of Pollution

According to the WDNR, urban and rural non-point pollution is the leading cause of water quality problems in Wisconsin, degrading or threatening an estimated 40% of the streams, 90% of the inland lakes, many of the Great Lakes harbors and coastal waters, many wetland areas, and substantial groundwater resources in Wisconsin. When water from rainfall or melting snow flows across the landscape, it washes soil particles, bacteria, pesticides, fertilizer, pet waste, oil and other toxic materials into our lakes, streams, and groundwater. This is called "non-point source pollution" or "polluted runoff." Non-point source pollution comes from a diverse number of activities in our daily lives including fertilizing lawns and farm fields, driving and maintaining our cars, constructing buildings and roads, plowing our fields for crops, and maintaining our roads in the winter. Polluted runoff contributes to habitat destruction, fish kills, reduction in drinking water quality, stream siltation, and a decline in recreational use of lakes.

<u>Animal Waste Facilities</u>
One of the most significant potential groundwater contamination sources is animal waste. Both storage and spreading of animal waste can contaminate groundwater if not done properly. Animal waste contains chlorides, nitrogen, and phosphorus, among other pollutants.

Animal waste storage facilities currently in use in Burnett County range from manure pits dug 50 years ago to newly engineered and installed storage structures. The State of Wisconsin regulates livestock operations with 1,000 animal units or more and those livestock operations with less than 1,000 animal units that have discharges that significantly affect water quality. Through Wisconsin Administrative Code Chapter NR 243 (Animal Feeding Operations), some of the worst sites in the state have been addressed, but significant animal waste problems remain. The WDNR has codified statewide performance standards that apply to agricultural operations of various types and sizes. These performance standards include:

- Manure management prohibitions.
- Nutrient management.
- Manure storage.
- Soil loss from riparian fields.

Implementation of the standards and prohibitions will occur primarily through the counties, although the WDNR will be the main implementation authority for state permitted facilities.

All livestock and poultry operations in Wisconsin, regardless of size, must comply with the four common-sense manure management prohibitions. These prohibitions are required by Wisconsin Administrative Code Chapter NR 151 (Runoff Management). The purpose of these prohibitions is to protect water quality from adverse impacts related to manure discharges by encouraging practices that should become common-sense for every producer.

1. No overflow of manure storage facilities.

2. No unconfined manure piles in water quality management areas (within 300 ft. of a stream, 1,000 ft. of a lake, or areas where the groundwater is susceptible to contamination).

3. No direct runoff from a feedlot or stored manure into waters of the state.

4. No unlimited livestock access to waters of the state where high concentrations of animals prevent the maintenance of adequate sod cover or self-sustaining vegetation.

Wellhead Protection

The goal of wellhead protection is to prevent potential contaminants from reaching the wells that supply municipal water systems. This is accomplished by monitoring and controlling potential pollution sources within the land area that recharges those wells.

Wellhead protection planning is administered by the WDNR as required by the U.S. Environmental Protection Agency (EPA) and the 1986 amendments to the Federal Safe Drinking Water Act. Wellhead planning is encouraged for all communities, but is required when any new municipal well is proposed.

The general process of community-level wellhead protection planning includes:

1. Forming a planning committee.
2. Delineating the wellhead protection area.
3. Inventorying potential groundwater contamination sources.
4. Managing the wellhead protection area.

Burnett County communities that have completed wellhead protection plans as of July 8, 2008 include the Villages of Grantsburg, Siren, and Webster.

5.14 Air Quality

In order to evaluate the quality of the air and to protect the public health, a series of National Ambient Air Quality Standards (NAAQS) have been developed by the U.S. Environmental Protection Agency (EPA) as established in section 109 of the Clean Air Act. According to the Wisconsin Air Quality Report, as prepared by the Wisconsin Department of Natural Resources (WDNR), the air pollutants affecting Wisconsin include sulfur dioxide, suspended particulate

matter, carbon monoxide, ozone, oxides of nitrogen, lead, sulfates, and nitrates. Burnett County is considered an attainment area, which is an area that meets the NAAQS defined in the Federal Clean Air Act.

While compliance with NAAQS is not likely to become a concern in Burnett County, there are localized air quality issues that commonly face rural areas. Outdoor burning can lead to air quality problems in a particular neighborhood if garbage or other materials that release toxic substances are burned, or if burning occurs in a densely populated area. Issues might arise from open burning, the improper use of burning barrels, or the improper use of outdoor wood burners (furnaces). Concerns with airborne particulates, or dust, may also be a concern where residential land use is in close proximity to extraction operations or agricultural operations.

5.15 Environmental Corridors and Sensitive Areas

Environmental corridors have not been officially designated in Burnett County for regulatory or planning purposes. There are many places in Burnett County of special environmental value containing unique and sensitive habitats or other natural features. Such places have been designated by the WDNR as State Natural Areas, Land Legacy Places, and State Natural Resources Areas.

State Natural Areas

State Natural Areas (SNAs) protect outstanding examples of Wisconsin's native landscape - often the last refuge for rare plants and animals. Natural Areas are valuable for research and educational use, the preservation of genetic and biological diversity, and for providing benchmarks for determining the impact of use on managed lands. As such, they are not intended for intensive recreation. State Natural Areas differ from other WDNR properties because they allow for a broad range of vegetation and recreation management. Specific vegetation and recreation management practices can be determined through WDNR property master planning. The management objectives of State Natural Resources Areas may be implemented through partnerships with local governments, conservation organizations, and others along with traditional WDNR management options including land acquisition and easements. State Natural Areas are designated by the Wisconsin Department of Natural Resources under Chapter 23.28, Wisconsin Statues. Refer to map 5-3, Environmental and Water Features, for wildlife area locations.

There are 12 State Natural Areas in Burnett County. The descriptions provided by the WDNR are included below.

- **Crex Sand Prairie**, State Natural Area No. 32, is located in the Crex Meadows Wildlife Area. Crex Sand Prairie occupies part of an extensive sand plain that was once glacial Lake Grantsburg and contains a sand prairie representative of the presettlement vegetation once found in northwestern Wisconsin. Upland soils of the Omega series are sandy with very little organic matter. The natural area is a gently rolling, treeless prairie that in the early 1940's was a jack pine-oak forest that had grown up from the barrens during the period of fire suppression. After management activities of tree removal and prescribed burning, the native prairie has recovered and prairie plants have regained

dominance. Spring burns maintain this treeless aspect although oak grubs are very common. Grasses such as big and little blue-stem, June grass, and needle grass grow there along with lead-plant, wormwood, sky-blue aster, wild lupine, spiderwort, and prairie larkspur. Breeding birds include large populations of common yellowthroat and clay-colored sparrow. In addition, a sharp-tailed grouse dancing grounds is found within the natural area. Crex Sand Prairie is owned by the DNR and was designated a State Natural Area in 1958.

Crex Sand Prairie can be accessed from Grantsburg going north on County F 7 miles, then east on North Refuge Road two miles to the north boundary of the natural area. An overlook located 0.25 mile south on West Refuge Road, which bisects the area, is an excellent place to view the site. The site is closed to the public from September 1-December 31. No hunting or trapping allowed.

- **St. Croix Ash Swamp**, State Natural Area No. 148, is located in Governor Knowles State Forest and along the St. Croix National Scenic Riverway. St. Croix Ash Swamp features a range of forest types from mesic uplands adjacent to the St. Croix River through extensive low swamp to droughty uplands on the sandy plain above the river valley. The hardwood swamp is composed of basswood, black ash, American elm, yellow birch, white oak, and red maple with scattered white cedar, balsam fir, and white pine. On the forest floor are small pockets of standing water between the mossy hummocks. The flat sandy uplands are wooded with young oaks. The river valley contains very steep sides that rise nearly 100 feet above the swamp. Small spring fed streams and seepages have eroded small pockets and tributary valleys providing diverse microhabitats. The primary soils are Omega sand, Cathro muck, Rifle mucky peat, and Emmett loamy sand. Common nesting birds include winter wren, scarlet tanager, veery, ovenbird, red eyed vireo, and cerulean warbler, the latter here at its northern most range limit. St. Croix Ash Swamp is owned by the DNR and was designated a State Natural Area in 1979.

- **Brant Brook Pines**, State Natural Area No. 149, is located in the Governor Knowles State Forest and along the St. Croix National Scenic Riverway. Brant Brook Pines is an old-growth stand of large red pines along the St. Croix River estimated to have originated in the mid 1880's. The northern dry-mesic forest is dominated by red pine with white and jack pines, Hill's oak, basswood, large-toothed aspen, and white birch. A narrow swale of black ash nearly divides the area. On the elevated river terrace above the pines is a dense forest of small oaks while a more mature swamp hardwood forest of oak, black ash, and red maple occurs on the low terrace below the pines. The herbaceous layer contains numerous fern species including bracken, spinulose wood, and ostrich along with common early summer species such as wild geranium and columbine. Brant Brook, a steep gradient, sandy-bottomed stream deeply incised into the river terrace flows through the site. Fed by numerous seeps, the narrow cold water stream supports native brook trout. Two uncommon birds, black and white warbler (Mniotilta varia) and yellow-throated vireo (Vireo flavifrons), inhabit the forest. Brant Brook Pines is owned by the National Park Service and the DNR. It was originally designated a State Natural Area in 1979 and expanded in 2002 to include the St. Croix National Scenic Riverway.

- **Ekdall Wetlands**, State Natural Area No. 150, is located in Governor Knowles State Forest. Ekdall Wetlands lies in a low terrace, 0.25 to 0.75 mile wide, where the St. Croix River has meandered away from the steep escarpment. The site contains northern wet forest and alder thicket plus a southern wet-mesic forest, here at its northern range limit in Wisconsin. Flat uplands above the escarpment are about 80 feet above the swamp and consist of barrens openings and dense stands of young oaks and jack pine. The escarpment slope also exhibits a continuum from xeric oaks at the summit to more mesic species midslope to swamp species at the wet base. Numerous seeps near the base contribute water to an open swamp of white cedar, tamarack, black spruce, black ash, and alder with scattered balsam fir and yellow birch. Typical understory species are sphagnum moss, Labrador-tea, pitcher plant, cat-tail, and sedges. Closer to the river are shrub-dominated thickets and small marshy pockets. The soils include wet alluvial land near the river, Cathro muck in the swamp, and sandy soils on the terrace escarpment. Deer use in the area is heavy. Other disturbance includes a ground fire that burned 75 percent of the understory in 1980 and some windthrow in 1977. Ekdall Wetlands is owned by the DNR and was designated a State Natural Area in 1979.

- **Norway Point Bottomlands**, State Natural Area No. 151, is located in the Governor Knowles State Forest. Norway Point Bottomlands lies along a bend in the St. Croix River and encompasses five major lowland plant communities including a southern wet-mesic forest at its northern range limit in Wisconsin. An interpretive trail loops through the swamp. Also present are a northern wet-mesic forest, shrub carr, northern sedge meadow, and a 0.3-mile reach of Iron Creek. Closest to the river is a bottomland hardwood forest with silver maple, American elm, white ash, and black ash. Between the floodplain and uplands are swamp hardwoods dominated by black ash with yellow birch and elm. Along the base of the river terrace escarpment are similar hardwoods and white cedar with numerous springs and seeps that feed into Iron Creek. Willow, alder, dogwood, and Spirea dominate the surrounding shrub thickets. The adjacent sedge meadow was historically used for mowing prior to state ownership. Iron Creek is a minnow stream with turbid, acid, and infertile waters. The wetlands provide nesting habitat for waterfowl and the area is home to high beaver and deer populations. Common breeding birds include eastern bluebird, eastern wood pewee, veery, red-eyed vireo, ovenbird, mourning warbler, black and white warbler, and pileated woodpecker. Norway Point is owned by the DNR and was designated a State Natural Area in 1979.

- **Kohler – Peet Barrens and Cedar Swamp**, State Natural Area No. 152, is located within the Governor Knowles State Forest. Kohler-Peet Barrens is a nearly flat expanse of sandy, open barrens situated within the vast glacial outwash deposits of northwestern Wisconsin and adjacent to the steep-walled St. Croix River Valley. Historically, this region supported Pine Barrens vegetation, which burned repeatedly. Today, Hill's oak grubs, jack pine, quaking aspen, and pin cherry are the common trees and many of the oaks have multiple trunks and bushy sprouts, the result of prescribed burning used to maintain the open barrens. The barrens flora is diverse with many species of prairies, barrens, and bracken grassland communities. Four plant species with Great Plains distribution - blue giant hyssop (*Agastache foeniculum*), autumn onion (*Allium stellatum*), Carolina larkspur (*Delphinium carolinianum*) and hairy four-o'clock (*Mirabilis hirsuta*) - are found here at their northeastern range limit. Common shrub species include beaked

and American hazelnut, New Jersey tea, and prairie red-root. A swamp forest of white cedar with black ash and a sphagnum moss understory is also present and grades into black spruce and tamarack. A wooded river terrace escarpment contains oaks at its dry summit which grades into yellow birch, red maple, and black ash near its base where many springs and seeps emanate. Many rare and uncommon animals of open habitats are found here including the federally endangered Karner blue butterfly (*Lycaeides melissa samuelis*), sharp-tailed grouse (*Tympanuchus phasianellus*), eastern bluebird, vesper sparrow, and field sparrow. Kohler-Peet Barrens and Cedar Swamp is owned by the DNR and was designated a State Natural Area in 1979

- **Big Island**, State Natural Area No. 384, is located in the St. Croix National Scenic Riverway. The area is best seen by boat. Big Island contains maturing examples of northern dry and dry-mesic forest, and northern wet forest along with forest seeps and a very diverse reach of the St. Croix River containing numerous aquatic invertebrates. The island rises about 100' above the river and is forested with second growth aspen and paper birch with old-growth white pine and basswood occurring on north-facing slopes. Shrubs include nannyberry, American fly honeysuckle, eastern leatherwood, and northern bush-honeysuckle. The ground layer is rich in plant species diversity and contains club-mosses, blueberries, maidenhair fern, wild sarsaparilla, blue cohosh, yellow-blue-bead lily, partridgeberry, and numerous spring ephemerals. The northwest and eastern tip of the island are lower and wetter with species such as white spruce, marsh bluegrass, northern blue flag iris, and wool-grass. Numerous seeps and north-south aspects add to the site variability creating numerous microhabitats for flora and fauna. Big Island is owned by the National Park Service and was designated a State Natural Area in 2002.

- **St. Croix Seeps,** State Natural Area No. 387, is located in the St. Croix National Scenic Riverway. St. Croix Seeps contains a four-mile stretch of river and is one of the most diverse places along the St. Croix National Scenic Riverway for rare species. Here the terrace is very near the river and numerous seeps and spring runs emanate from the lower slopes of the steep, west facing bluff. This area supports a high quality black ash seepage swamp with yellow birch and red maple. Dominant ground layer species include skunk cabbage, broom-like sedge, jewelweed, ostrich fern, eastern willow-herb, fowl manna grass, marsh bluegrass, and swamp aster. The southwest flank of the river bluff is forested with red pine and old-growth red oak and white pine. Below is a large flowing seepage run with a shady overstory of old-growth sugar maple and eastern hop-hornbeam. Understory species include American golden saxifrage, lady fern, and Pennsylvania sedge. These small, specialized habitats support large populations of very rare plant species such as the state threatened bog bluegrass (*Poa paludigena*) and drooping sedge (*Carex prasina*). Other common trees within the area include basswood, green ash, bitternut hickory, and hackberry. Associate herbaceous species are Virginia water-leaf, cut-leaved coneflower, rosy sedge, wild geranium, black snakeroot, and Jack-in-the-pulpit. This area of the St. Croix is also important habitat for numerous rare dragonfly and fish species including river redhorse (*Moxostoma carinatum*), gilt darter (*Percina evides*), and lake sturgeon (*Acipenser fluvescens*). St. Croix Seeps is owned by the National Park Service and was designated a State Natural Area in 2002.

- **Blomberg Lake**, State Natural Area No. 392, is located in the Amsterdam Sloughs Wildlife Area. Located within a sandy glacial plain, Blomberg Lake is a 68-acre bog lake surrounded by a northern wet forest. The shallow lake (4' maximum depth) supports only a few aquatic plants including white and yellow water-lily, and large-leaved pondweed. The surrounding wet forest is dominated by tamarack with very few black spruce. The understory varies locally from Labrador-tea to three-seeded sedge to alder. Further from the margin of the lake are many wetland grasses and sedges in the herbaceous layer such as blue-joint grass, drooping wood-reed, bristly sedge, American woolly-fruit sedge, yellow blue-bead-lily, sweet gale, marsh skullcap, and American starflower. Migratory waterfowl often use the lake and surrounding wetlands. Blomberg Lake is owned by the DNR and was designated a State Natural Area in 2003.

- **Fish Lake Meadow**, State Natural Area No. 393, is located within the Fish Lake Wildlife Area. Fish Lake Meadow is a vast northern sedge meadow bordering Fish Lake dominated by wire-leaved sedges and rushes. Dominant species are American woolly-fruit sedge, cord-root sedge, mud sedge, beaked sedge, few-seeded sedge, cotton-grass, and Juncus. Other plants include blue-joint grass, round-leaved sundew, narrow-leaved sundew, marsh cinquefoil, bog St. John's-wort, and steeplebush. Islands of leather-leaf and sphagnum moss are scattered throughout the site. Larger islands support shrubs such as speckled alder, white meadowsweet, black chokeberry, bog birch, and willows. A few trees are also present, mainly paper birch, red maple, and tamarack. The meadow is very wet, often with 4-12" of standing water. Bird life is diverse and includes a number of rare or uncommon species such as sharp-tailed sparrow (*Ammodramus nelsoni*), Le Conte's sparrow (*Ammodramus leconteii*), yellow rail (*Coturnicops noveboracensis*), Wilson's phalarope (*Phalaropus tricolor*), American bittern (*Botaurus lentiginosus*), black tern (*Chlidonias niger*), northern harrier (*Circus cyaneus*), and sedge wren. The 200-acre Fish Lake occupies the northwest portion of the site. Fish Lake Meadow is owned by the DNR and was designated a State Natural Area in 2003.

- **Fish Lake Pines**, State Natural Area No. 394, is located within Fish Lake State Wildlife Area. Located on pitted glacial outwash, Fish Lake Pines contains a small remnant northern dry-mesic forest, once a more common community type in northwest Wisconsin. On a low, sandy peninsula is a mature forest of white pine and red pine with Hill's oak surrounded by wetlands. Associated trees include white oak, red maple, big-tooth aspen, red oak, and Jack pine. Reproduction is mostly by white pine with red maple saplings common throughout. Although the surrounding wetlands may have protected the forest from most wildfires, scattered stumps and fire scars through the forest suggest that this stand originated by fire about 100 years ago. The moderate shrub layer consists of American hazelnut, beaked hazelnut, Rubus, and common winterberry. The herbaceous layer includes bracken fern, interrupted fern, wild sarsaparilla, blueberries, rough-leaved rice grass, three-leaved gold-thread, leather-leaved grape fern, and Canada mayflower. Resident birds are pileated woodpecker, scarlet tanager, ovenbird, veery, and golden-winged, pine, Canada, and Nashville warblers. Fish Lake Pines is owned by the DNR and was designated a State Natural Area in 2003.

- **Reed Lake Meadow**, State Natural Area No. 395, is located within Crex Meadows Wildlife Area. Situated within the gently rolling terrain of glacial outwash sands is Reed Lake Meadow -- a landscape mosaic of extensive wetlands, barrens, and brush prairie and savanna with scattered small lakes. A huge, open wetland south and west of Reed Lake is dominated by few-seeded sedge while to the east, leather-leaf and bog birch are dominant. A small stand of black spruce and tamarack is present on the eastern edge of the wetland. Sphagnum moss is present but not dominant in this "wire-grass" meadow. Numerous rare wetland birds are found here including yellow rail (*Coturnicops noveboracesis*), Le Conte's sparrow (*Ammodramus lecontii*), sharp-tailed sparrow (*Ammodramus nelsonii*), and short-eared owl (*Asio flammeus*). The natural area also supports distinct phases of barrens community including brush prairie, oak savanna, and oak woodland that vary in canopy cover and shrub density. The brush prairie contains Hill's oak grubs over a sand prairie understory while the oak savanna contains shrub patches of New Jersey tea, American hazelnut, and prairie willow. Herbaceous plants include little blue-stem, June grass, prairie goldenrod, rough blazing-star, western sunflower, and wild lupine. The woodland consists of Hill's oak with thickets of Pennsylvania sedge and hazelnut in the understory. Other herbaceous plants present include lyre-leaved rock cress, prairie phlox, Carolina puccoon, bird's-foot violet, and showy goldenrod. Of interest is the presence of the federally-endangered Karner blue butterfly (*Lycaeides melissa samuelis*), whose caterpillar feeds only on wild lupine leaves. Management activities such as controlled burning help keep the site open and free from woody vegetation --the necessary conditions for maintaining the lupine population. Reed Lake Meadow is owned by the DNR and was designated a State Natural Area in 2003.

Land Legacy Places

At the request of the Natural Resources Board, the Department of Natural Resources undertook a study to identify places that would be critical in meeting Wisconsin's conservation and recreation needs over the next 50 years. The study did not address how or when these "Legacy Places" should be protected or who should be responsible for implementing protection measures. The outcome of the three-year effort was a *Land Legacy Report* that catalogs the results of the study. These locations are not specific sites, but general areas without specific boundaries.

The following Land Legacy Places were identified by the report as being located or partially located in Burnett County.

- **Clam River:** The Clam River is a lightly developed, 55 mile long river, originating in Polk County and flowing northwesterly through Burnett County before entering the St. Croix River. The river corridor is heavily forested with bottomland hardwoods along part of its course. Adjacent uplands along the upper half of the river consist of mixed farmland, forest, and bedrock glade, while the lower half winds through sand country characterized by dry jack pine-hill's oak forests and remnant barrens.

  The river's headwaters and tributaries are high quality trout water known especially for their excellent brown trout fishing. Downstream the river contains spawning areas for lake sturgeon, walleye, smallmouth bass, buffalo and carp. Several lakes and

impoundments along the mid to lower stretches contain wild rice stands and provide excellent lake fishing and waterfowl hunting. The area has high recreation potential and currently receives considerable fishing pressure in the upper reaches and is a popular canoeing river in the lower reaches. The State currently manages three projects in the headwaters area (Sand Creek and Clam River Fisheries Areas and McKenzie Creek Wildlife Area). Most of the Clam River is located within a 1½ hour drive of the Twin Cities.

The *Land Legacy Report* rates the Clam River as being of significant recreational potential that will require substantial protective measures to be put into place.

- **Crex Meadows:** Since its inception in 1946, Crex Meadows State Wildlife Area has evolved into one of the premier wildlife viewing sites in the Midwest. It is one of the largest and most heavily used wildlife areas in Wisconsin with more than 100,000 people visiting each year. Its popularity is due to its large size, unobstructed vistas, wide range of habitats, diversity and abundance of wildlife, and abundant opportunities to view wildlife.

  Wetlands, primarily sedge marshes, comprise approximately half of the area. Extensive diking of these sedge marshes has resulted in the creation of 6,000 acres of deep-water marsh. Upland vegetation includes 7,000 acres of restored brush-prairie and 6,000 acres of oak, jack pine, and aspen forests. These different habitat types are interspersed over the flat to gently rolling terrain. More than 200 species of birds as well as numerous mammals, reptiles, and amphibians can be seen on the property.

  The *Land Legacy Report* rates the Crex Meadows as being of significant recreational potential and conservation significance. Only limited levels of additional protection are anticipated, as substantial protective measures have already been initiated.

- **Danbury to Sterling Corridor:** The Danbury to Sterling corridor is located on sandy glacial outwash. Historically, the area was a fire dependent, open mosaic of prairie, brush land, and savanna, with occasional stands of coniferous, deciduous, or mixed forest. Currently, many lands are being managed predominantly for jack pine pulpwood. The resulting mosaic of cut-over, standing timber and young forests provides excellent habitat for white-tailed deer, wild turkey and ruffed grouse.

  Danbury, Crex Meadows, Amsterdam Sloughs, and Fish Lake State Wildlife Areas, as well as Burnett and Polk County Forests, are within this corridor and provide a variety of exceptional wildlife habitats and recreation opportunities. Waterfowl and shorebirds, in particular, are attracted to the large, high quality wetlands. The St. Croix National Scenic Riverway and Governor Knowles State Forest lie on the west edge of the area. Providing ecological links between these public properties would enable them to meet the needs of species that require very large amounts of habitat. In particular, sharptailed grouse are believed to need thousands, if not tens of thousands, of acres of habitat to support a population that can remain viable over a long period of time. This corridor has the opportunity to support such a large population (Crex Meadows already harbors the largest

population east of the Mississippi River). The Danbury to Sterling Corridor is also a prime area for recovery of the federally-Endangered Karner blue butterfly.

The *Land Legacy Report* rates the Danbury to Sterling Corridor as a large ecological feature with high conservation significance. Only a moderate amount of additional protection is anticipated since substantial protection has been initiated.

- **Namekagon - Brule Barrens:** Running from the west central Bayfield County to northwest Polk County, this swat of land represents one of the best places to combine large scale pine barrens restoration with active forestry practices. Namekagon Barrens and Douglas County State Wildlife Areas, large public properties where significant barrens habitat has been restored, are located here. Unfortunately, it appears these properties are too small and isolated to maintain viable populations of several of the species that characterize this landscape. Of particular management concern are sharp-tailed grouse, Connecticut warbler and upland sandpiper. If existing public properties were expanded or linked with a protected mosaic of farm fields, forest, barrens, and grassland habitat, this corridor could enable critical movement of species as well as more effective land management strategies.

  A considerable portion of the area is owned by industrial forest companies and managed primarily for red pine. Much of the rest of the area is currently a mix of woodlands consisting of jack pine, red pine and oak, grassland, small lakes, wetland, and farmland. Nearly all of the lakes in the area that are not within either public or industrial forest ownership are heavily developed. Although some plantation-type forestry in the area would not conflict with maintaining functioning pine barrens habitat, extensive single species-even aged forests can dramatically reduce plant and animal diversity for the entire region. Commercial forestry has played, and can continue to play, an important role as one part of an over-all management regime to perpetuate a functioning barrens ecosystem.

  In addition to the ecological benefits of connecting existing public properties, many recreation opportunities exist in this area that would benefit from linking public lands. Of particular interest may be sharp-tailed grouse hunting, bird watching trails, and watchable wildlife auto trails.

  The *Land Legacy Report* rates the Danbury to Sterling Corridor as a large ecological feature with high conservation significance. Only a moderate amount of additional protection is anticipated since a moderate amount of protection already exists.

- **Namekagon River:** The Namekagon River is part of the National Park Service's St. Croix National Scenic Riverway. It begins as a narrow, cool trout stream flowing through the marshes, mixed hardwoods and pine forests that lie within a broad valley sculpted by the glaciers. The lower reaches of the river pass through many high, sandy banks and sharp turns. Four flowages occur over its 98-mile length. The river is very popular for canoeing and fishing. The Namekagon forms an important ecological link between the St. Croix/Mississippi River system and the Chequamegon National Forest and surrounding County Forests.

The *Land Legacy Report* rates the Namekagon River as a feature with high conservation significance and recreational potential. Only a limited amount of additional protection is anticipated since a substantial protection already exists for the Namekagon River.

- **St. Croix River:** Flowing out of the spring-fed Upper St. Croix Lake, the river begins as a shallow, narrow, relatively fast waterway. Here in its upper reaches, the river flows through stands of cedar, spruce, and tamarack in the Douglas County Forest. The area harbors a variety of nesting birds and rare plants. Near the Namekagon Barrens, the St. Croix is joined by the Namekagon River and enters the Northwest Lowlands ecological landscape. The river continues to the southwest and forms the boundary of this ecological landscape. As such, the rivers that flow off the Northwest Sands to the west—including the Totagatic, Yellow, and Clam—play critical roles in the St. Croix River's water quality and quantity.

  The St. Croix valley forms an important ecological connection between the Mississippi River and the Great Lakes, via the Brule River State Forest. In this upper stretch, the St. Croix receives light recreational pressure, mostly fishing and canoeing.

  The *Land Legacy Report* rates the St. Croix River as a feature with high conservation significance and recreational potential. However, limited additional protection is anticipated since a significant amount of protection already exists for the St. Croix River.

- **Upper Yellow River:** Upstream of Yellow Lake, the Yellow River winds its way through one of the largest forested swamps in the Northwest Sands ecological landscape. Many bogs, groves of red pine, and nutrient-poor fens occur here. The river corridor supports a wide diversity of bird species and is important habitat for many Neotropical migrant birds. With its riffles, rapids and steep terrace walls, the river is a popular paddling destination.

  The *Land Legacy Report* rates the Upper Yellow River as a relatively small ecological feature with moderate conservation significance and recreational potential. A moderate amount of protection remains to be initiated.

- **Chase Creek:** This creek flows through very high quality wetlands and eventually drains into the St. Croix River. The creek supports a diverse aquatic ecosystem and, along with the Upper Tamarack system, provides a link between the extensive Douglas County Forest and Minnesota's St. Croix State Forest. The area is one of the most isolated and wild parts of the state and provides a truly remote experience for visitors.

  The *Land Legacy Report* states that Chase Creek is a medium sized ecological feature with a high amount of conservation significance, but a low level of recreational potential because of isolated and remote location. A moderate amount of protection remains to be initiated.

- **Trade River Wetlands:** This wetland complex of marsh, sedge meadow, and shrub swamp is located in the Trade River watershed of the St. Croix Basin and straddles the Polk/Burnett County boundary. Historically, these wetlands were located at the convergence of several natural communities: mesic prairie, oak savanna, barrens, and southern mesic hardwoods. The surrounding land is rolling and soils are silt loams. The Trade River is a somewhat degraded coldwater river that flows to the St. Croix.

  The *Land Legacy Report* states that Trade River is a small ecological feature with a medium amount of conservation significance and a low level of recreational potential. A moderate amount of protection remains to be initiated.

5.16 Rare, Threatened, and Endangered Species and Communities

Wisconsin's Natural Heritage Inventory (NHI), established in 1985 by the Wisconsin Legislature, is maintained by the Wisconsin Department of Natural Resources' (WDNR) Bureau of Endangered Resources. The NHI program is responsible for maintaining data on the locations and status of rare species, natural communities, and natural features in Wisconsin. The Wisconsin NHI program is part of an international network of inventory programs that collect, process, and manage data on the occurrences of natural biological diversity using standard methodology. Refer to Map 5-5, Natural Heritage Inventory Features.

Wisconsin's Natural Heritage Inventory program's three objectives are to: collect information on occurrences of rare plants and animals, high-quality natural communities, and significant natural features in Wisconsin; standardize this information, enter it into an electronic database, and mark locations on base maps for the state; and use this information to further the protection and management of rare species, natural communities, and natural features.

According to NHI mapping for Burnett County, the following rare species and natural communities are found in the county. The dates following the occurrence name notes the most recent year the occurrence was recorded in the county.

Table 5-10 display the rare aquatic and terrestrial plant species found in Burnett County.

Table 5-10
Rare Aquatic and Terrestrial Plant Species, Burnett County

Aquatic Occurrences		
Common Name	**Species Name**	**Date**
Swamp-pink	*Arethusa bulbosa*	1975
Bog Bluegrass	*Poa paludigena*	1993
Fairy Slipper	*Calypso bulbosa*	1931
Adder's-tongue	*Ophioglossum pusillum*	1966
Drooping Sedge	*Carex prasina*	1993
Slender Bulrush	*Scirpus heterochaetus*	1929
Prickly Hornwort	*Ceratophyllum echinatum*	1955
Torrey's Bulrush, , 1945	*Scirpus torreyi*	1945
Assiniboine Sedge	*Carex assiniboinensis*	1993
Marsh Willow-herb	*Epilobium palustre*	2004
Leafy White Orchis	*Platanthera dilatata*	1930
Robbins' Spikerush	*Eleocharis robbinsii*	1945
White Adder's-mouth	*Malaxis monophyllos var. brachypoda*	1930
Showy Lady's-slipper	*Cypripedium reginae*	1930
Sparse-flowered Sedge	*Carex tenuiflora*	2007
Common Bog Arrow-grass	*Triglochin maritima*	1911
Farwell's Water-milfoil	*Myriophyllum farwellii*	1971
Northeastern Bladderwort	*Utricularia resupinata*	1929
Northern Yellow Lady's-slipper	*Cypripedium parviflorum var. makasin*	1975

Terrestrial Occurrences		
Common Name	**Species Name**	**Date**
Sand Violet	*Viola fimbriatula*	1981
Hooker Orchis,	*Platanthera hookeri*	1927
Dwarf Milkweed	*Asclepias ovalifolia*	2007
Richardson Sedge	*Carex richardsonii*	1995
Pale Green Orchid	*Platanthera flava var. herbiola*	1930
Dotted Blazing Star	*Liatris punctata var. nebraskana*	1989
Brittle Prickly-pear	*Opuntia fragilis*	1977
Silky Prairie-clover	*Dalea villosa*	1957
Large Roundleaf Orchid	*Platanthera orbiculata*	1930

Source: Wisconsin Department of Natural Resources, 2008.

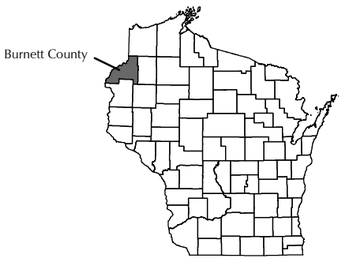
Table 5-11 displays rare aquatic and terrestrial animal species found in Burnett County

Table 5-11
Rare Aquatic and Terrestrial Animal Species, Burnett County

Aquatic Occurrences			Terrestrial Occurrences		
Common Name	**Species Name**	**Date**	**Common Name**	**Species Name**	**Date**
Elktoe	*Alasmidonta marginata*	1997	Bullsnake	*Pituophis catenifer*	1983
Osprey	*Pandion haliaetus*	2005	Gray Wolf	*Canis lupus*	2007
Mink Frog	*Rana septentrionalis*	2006	Phlox Moth	*Schinia indiana*	1994
Bald Eagle	*Haliaeetus leucocephalus*	2007	Karner Blue	*Lycaeides melissa samuelis*	2004
Black Tern	*Chlidonias niger*	1993	Pygmy Shrew	*Sorex hoyi*	1983
Blue Sucker	*Cycleptus elongatus*	1979	Henry's Elfin	*Callophrys henrici*	1989
Gilt Darter	*Percina evides*	1983	A Tiger Beetle	*Cicindela patruela patruela*	1999
Lake Darner	*Aeshna eremita*	2002	Chryxus Arctic	*Oeneis chryxus*	1996
Weed Shiner	*Notropis texanus*		Cobweb Skipper	*Hesperia metea*	1996
Wood Turtle	*Clemmys insculpta*	1992	Dusted Skipper	*Atrytonopsis hianna*	1999
Yellow Rail,	*Coturnicops noveboracensis*	2005	Long-eared Owl	*Asio otus*	2003
Least Darter	*Etheostoma microperca*	1987	Lakota Crescent	*Phyciodes batesii lakota*	1990
Redside Dace	*Clinostomus elongatus*		Northern Goshawk	*Accipiter gentilis*	1990
Round Pigtoe	*Pleurobema sintoxia*	1997	Upland Sandpiper	*Bartramia longicauda*	1993
Elfin Skimmer	*Nannothemis bella*	1991	Leonard's Skipper	*Hesperia leonardus*	1989
Lake Sturgeon	*Acipenser fulvescens*	1991	Mottled Dusky Wing	*Erynnis martialis*	1996
Pugnose Shiner	*Notropis anogenus*	1983	Connecticut Warbler	*Oporornis agilis*	2006
River Redhorse	*Moxostoma carinatum*	1979	Sharp-tailed Grouse	*Tympanuchus phasianellus*	1993
Spectacle Case	*Cumberlandia monodonta*	1988	An Issid Planthopper	*Fitchiella robertsoni*	2006
Trumpeter Swan	*Cygnus buccinator*	1999	Gorgone Checker Spot	*Chlosyne gorgone*	1988
Pygmy Snaketail	*Ophiogomphus howei*	1999	Greater Prairie-chicken	*Tympanuchus cupido*	1979
American Bittern	*Botaurus lentiginosus*	2007	Whitney's Underwing Moth	*Catocala whitneyi*	1999
Banded Killifish	*Fundulus diaphanus*	1983	Franklin's Ground Squirrel	*Spermophilus franklinii*	1983
Common Goldeneye	*Bucephala clangula*	2006			
Greater Redhorse	*Moxostoma valenciennesi*	1993			
Purple Wartyback	*Cyclonaias tuberculata*	1997			
Red-necked Grebe	*Podiceps grisegena*	2003			
Blanding's Turtle	*Emydoidea blandingii*	2005			
Salamander Mussel	*Simpsonaias ambigua*	1988			
Le Conte's Sparrow	*Ammodramus leconteii*	2003			
Liatris Borer Moth	*Papaipema beeriana*	1997			
Wilson's Phalarope	*Phalaropus tricolor*	2002			
Red-shouldered Hawk	*Buteo lineatus*	2007			
A Flat-headed Mayfly	*Pseudiron centralis*	1992			
A Flat-headed Mayfly	*Macdunnoa persimplex*	1991			
Saint Croix Snaketail	*Ophiogomphus susbehcha*	2000			
Extra-striped Snaketail	*Ophiogomphus anomalus*	1994			
A Primitive Minnow Mayfly	*Parameletus chelifer*	1992			
Black-crowned Night-heron	*Nycticorax nycticorax*	1956			
Nelson's Sharp-tailed Sparrow	*Ammodramus nelsoni*	2004			
Sylvan Hygrotus Diving Beetle	*Hygrotus sylvanus*	1991			
American Sand Burrowing Mayfly	*Dolania americana*	1989			

Source: Wisconsin Department of Natural Resources, 2008.

MAP 5 - 5
NATIONAL HERITAGE INVENTORY FEATURES
Burnett County, Wisconsin



Legend

Base Layers
- State Highway
- County Highway
- Town Road
- Rivers
- Lakes
- Village Boundary
- Town Boundary
- County Boundary

National Heritage Inventory Habitat
- Aquatic
- Terrestrial
- Both

This drawing is neither a legally recorded map nor a survey and is not intended to be used as one. This drawing is a compilation of records, information and data used for reference purposes only.

Source: Map generated using data from the WDNR Endangered Resources and Burnett Co Land Information Office

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The following rare, natural communities, as designated by the WDNR, are found in Burnett County. The date following the occurrence name is the most recent year the feature was recorded in the county.

Aquatic Natural Communities

- Open Bog, 1982
- Spring Pond, 1980
- Alder Thicket, 1981
- Forested Seep, 2007
- Hardwood Swamp, 2007
- Lake--Hard Bog, 1981
- Lake--Soft Bog, 1979
- Floodplain Forest, 1981
- Northern Wet Forest, 1981
- Northern Sedge Meadow, 1993
- Stream--Fast, Soft, Cold, 1979
- Stream--Fast, Soft, Warm, 1985
- Lake--Shallow, Hard, Seepage, 1979
- Lake--Shallow, Soft, Seepage1982
- Lake--Shallow, Hard, Drainage, 1980
- Springs and Spring Runs, Hard, 1982
- Springs and Spring Runs, Soft, 2006

Terrestrial Natural Communities

- Oak Barrens, 1993
- Pine Barrens, 1990
- Sand Barrens, 1977
- Northern Dry Forest, 2007
- Southern Mesic Forest, 2007
- Northern Dry-mesic Forest, 2007

5.17 Wildlife Habitat

Wildlife habitat is any natural community with adequate food, water, and cover to sustain a species of wildlife. The Burnett County landscape provides habitat for a variety of birds, mammals, amphibians, reptiles, aquatic and terrestrial invertebrates, and fish. Wildlife habitat is connected to many other natural resources including forests, wetlands, open space, and surface water, so healthy wildlife populations are good indicators of the overall health of the environment.

Wildlife Population Dilemma

While healthy wildlife populations can be good indicators of the overall health of the environment, unchecked wildlife populations can create serious problems. For example, white-tailed deer, black bears, Canadian geese, and wild turkeys have sometimes damaged commercial seedlings and crops. Burnett County, along with Polk and Washburn Counties, participates in the Tri-County Wildlife Damage Program. The program provides financial and abatement assistance for commercial agricultural operations whose crops have been damaged by wildlife.

Burnett County contains several major habitat types. The county contains three different ecological landscapes as defined by the WDNR. The following ecological landscapes are found in Burnett County.

- **Northwest Sands**: The Northwest Sands cover approximately 74% of the county. The Northwest Sands Ecological Landscape is a large glacial outwash system consisting of two major landforms: flat plains or terraces along glacial meltwater channels, and pitted outwash plains containing kettle lakes. The soils are deep sands, low in organic material and nutrients. Historic vegetation was dominantly jack pines and scrub oak forest and barrens. White and red pine forests were also a sizable component. Numerous barrens occurred in the southwest half of the Ecological Landscape, and a few large barrens within the northeast half. Most of the trees in the barrens were jack pine, but oak savannas also occurred in the south central part of the Ecological Landscape.

  Current vegetation is a mix of forest, agriculture, and grassland with some wetlands in the river valleys. Pine, aspen-birch and oak equally dominate the forested area of the Ecological Landscape. The maple-basswood, spruce-fir, and lowland hardwood forest type groups occupy small percentages of the Ecological Landscape. Within the open lands, there is a relatively large proportion of grassland and shrubland, a small but locally significant amount of emergent/wet meadow and open water, and very little row-crop agriculture.

- **Forest Transition**: Covering portions of southern Burnett County (about 13% of the total lands area), in pre-settlement times, this landscape was almost entirely covered with mesic to wet-mesic forests of hemlock and sugar maple, with some yellow birch, red pine, and white pine. There were pockets of conifer swamps, often near the headwaters of streams, containing white cedar, black spruce, and tamarack. The Forest Transition supports both northern forests and agricultural uses. Currently, over 60% of this Ecological Landscape is non-forested. Forested areas consist primarily of northern hardwoods and aspen, with smaller amounts of oak and lowland hardwoods.

- **Northwest Lowlands**: The Northwest Lowlands cover slightly more than 13% of the land area in Burnett County and are found primarily in the northwestern corner of the county and periodically along the Mississippi River boundary. The major landforms are ground and end moraines, with drumlins present in the southwestern portion. Topography is gently undulating. The historic upland vegetation of this landscape was almost entirely forest, composed mostly of paper birch, fir, sugar maple, aspen, and white spruce, with some white and red pine on the drier ridges. The lowlands supported extensive wet forests of black spruce and tamarack, and some white cedar and black ash swamps. The present-day forests remain extensive and relatively unbroken. Forests consist mainly of aspen, paper birch, sugar maple, basswood, spruce, and fir. Minor amounts of white and red pine and red oak are also present.

Wildlife species present in Burnett County are directly related to the community types and ecological landscapes that provide habitat. Burnett County's extensive woodlands and wetlands provide habitats for populations of deer, black bears, wolves, as well as smaller land animals, including rabbits, squirrels, and raccoons. Avarian wildlife is especially plentiful in Burnett

County. The wildlife areas in Burnett County, especially Crex Meadows, are a popular destination for bird-watchers across the country. Bird species include the sharptail grouse, the sandhill crane, the trumpeter swans, the golden-winged warbler, ospreys, the Northern harrier hawks, and the indigo bunting.

Land use can have substantial impacts on wildlife populations and habitats. The development pattern of the land directly impacts the fragmentation, total area, and types of natural communities and habitats available to wildlife in a given location. For example, when a large forest is fragmented into smaller woodlots by rural development over time, this fragmentation may cause certain wildlife species to thrive, and others to move on. Those species that require "edge" habitats, like raccoons and white-tailed deer, benefit from forest fragmentation, while species that require "interior" habitats, like wolves and migratory songbirds, suffer from forest fragmentation. Loss of habitat is the primary reason for species to become listed as "threatened," "endangered," or "of special concern."

5.18 Historical and Cultural Resources

Historical, architectural, and archeological resources establish important links to a community's heritage. They provide well-known educational and aesthetic benefits and harder to quantify benefits such as an improved quality of life, a sense of community pride, and an important feeling of social and cultural continuity between the past, present, and future. As interest in cultural resources continues to grow in Wisconsin, communities may also experience economic benefits by preserving historical, architectural, and archeological resources. "Heritage tourism" is centered on cultural resources and is a growing component of the tourism industry.

Historic Places

The National Register of Historic Places recognizes properties of local, state, and national significance. Properties are listed in the National Register because of their association with significant persons or events, because they contain important information about our history or prehistory, or because of their architectural or engineering significance. The National Register also lists important groupings of properties as historic districts. In addition, the National Park Service highlights properties that have significance to the nation as a whole by conferring them the status of National Historic Landmark. There are currently no properties designated as National Historic Landmarks in Burnett County.

The Wisconsin State Register of Historic Places parallels the National Register. However, it is designed to enable state-level historic preservation, protection, and benefits. Most of the properties in Wisconsin listed in the National Register are also listed in the State Register. According to the Wisconsin Historical Society (WHS) there are six sites located in Burnett County that are listed on both the National and State Register. There are three additional sites that only appear on the National Register. The following registered historic places are found in Burnett County.

- Altern Site, Town of Rusk*
- Burnett County Abstract Company, Village of Grantsburg
- Daniels Town Hall, Town of Daniels

- Ebert Mound Group, Town of Union*
- Fickle Site, Town of Siren*
- Jacobson House and Mill Site, Town of Wood River
- Northwest and XY Company Trading Post Sites, Town of Union*
- Sandrock Cliffs, Town of Grantsburg*
- Yellow River Swamp Site 47 – Bt – 36, Town of Meenon*

*These sites are only found on the National Register

The Wisconsin Architecture & History Inventory (AHI), provided by the WHS, lists historical and architectural information on properties in Wisconsin. The AHI contains data on buildings, structures, and objects that illustrate Wisconsin's unique history. The majority of properties listed are privately owned. Listed properties convey no special status, rights, or benefits. There are currently 262 entries in the AHI for Burnett County, but limited data exist for the vast majority of these sites. Many of these sites may no longer exist, or have possibly been altered to the extent that their historic or architectural significance has been lost. Refer to map 5-6, Historical and Cultural Resources, for selected historic sites and roads.

MAP 5 - 6
HISTORICAL AND CULTURAL RESOURCES
Burnett County, Wisconsin

State of Wisconsin

Legend

Base Layers
- State Highway
- County Highway
- Town Road
- Rivers
- Lakes
- Village Boundary
- Town Boundary
- County Boundary

Historic Sites
- Log Camps
- Stop Places
- Historic Bridges
- Ferry Crossing
- Burnett Co Firsts
- Historical Roads
- Archaeological Site Inventory
- Bibliography of Archaeological Reports

This drawing is neither a legally recorded map nor a survey and is not intended to be used as one. This drawing is a compilation of records, information and data used for reference purposes only.

Source: Wisconsin DOT and Burnett Co Land Information Office. Historical data shown is a depiction of information taken from various sources of diverse quality.

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January 5, 2010 Drawn by: DAT Checked by: JDW

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Table 5-12
AHI Sites per Community, Burnett County

Community	No. of AHI Sites
T. Anderson	13
T. Blaine	9
T. Daniels	10
T. Dewey	8
T. Grantsburg	33
T. Jackson	4
T. La Follette	9
T. Lincoln	9
T. Meenon	6
T. Oakland	8
T. Roosevelt	3
T. Rusk	5
T. Sand Lake	4
T. Scott	10
T. Siren	2
T. Swiss	3
T. Trade Lake	27
T. Union	1
T. Webb Lake	8
T. West Marshland	11
T. Wood River	16
V. Grantsburg	50
V. Siren	3
V. Webster	10
Burnett County	**262**

Source: Wisconsin Archeological and Historic Resources Database, Wisconsin Historical Society.

Archeological Sites

The Wisconsin Archeological Site Index (ASI) is maintained by the Office of the State Archeologist. Similar to the AHI, these sites have no special status, rights, or benefits. However, should a state or federally sponsored project potentially impact these sites, a complete archeological survey would need to be conducted before the project could proceed. It should also be noted that all burial sites are granted protection from disturbance by both public and private actions by Chapter 157, Wisconsin Statutes. The SHS estimates that less than one percent of archeological sites state-wide have been inventoried.

There are 406 archeological sites in Burnett County cataloged in the ASI. Selected ASI sites are shown on map 5-6, Historical and Cultural Resources. These maps display the approximate locations of known prehistoric sites including: cabins, homesteads, farmsteads, campsites, villages, trading posts, fur posts, workshops, and sawmills. These maps also display the approximate locations of known burial sites cataloged in the ASI including cemeteries, burial

plots, and burial mounds. Other ASI sites not shown are the maps include: isolated finds, cache/pit/hearth, garden beds/corn hills, lithic scatter, and sites of an undefined type.

Museums and Monuments

Museums and monuments are important community features with the specific purpose of preserving the history and culture of a community for future generations. The approximate locations of Burnett County's museums and monuments are described below.

Burnett County Historical Society Museum
The Burnett County Historical Society Museum has an inventory of records that relate to the history of the county and the surrounding area both before and after the county boundaries were formed. The history library is located at the Forts Folle Avoine Historical Park on County Road U and is open every Wednesday and Thursday from 10 a.m. to 4 p.m.

Grantsburg Area Historical Society
Located in the Village of Grantsburg, three buildings located on the property make up the society's complex. The society's exhibits are housed in an 1800's Norwegian Methodist Church. The property contains the original Burnett County jail, utilized from 1870 – 1920 and the Stenborg Home that was donated to the society by the descendants of Alex Stenborg, and early Grantsburg blacksmith. The complex is open to the public Sundays from 1:00 p.m. – 4:00 p.m., the first weekend in June through Labor Day.

Forts Folle Avoine Historical Park
This 80 acre wooded preserve located along the Yellow River is a living historical site where reconstructed fur trade posts occupy the actual site where they were originally operated form 1802 to 1805, alongside an authentic Woodland Indian Village. This site is on the National Register of Historic Places and is operated by the Burnett County Historical Society.

Cultural Resources Protection Laws

There are laws, both federal and state, that protect cultural resources from the effects of projects that have federal, state, or local government involvement. Which law applies will depend upon which level of government is primarily involved in funding, permitting, or licensing the project. The primary historic preservation laws are listed in Table 5-13.

Table 5-13
Cultural Resources Protection Laws

Type of Project	Applicable Law
Public Projects (Federal)	Section 106, National Historic Preservation Act
Public Projects (State)	Section 44.40, Wisconsin Statutes
Public Projects (Municipal)	Section 66.1111, Wisconsin Statutes
Public Projects (School District)	Section 120.12(21), Wisconsin Statutes
Any Potential Disturbance of Burial Sites	Section 157.70, Wisconsin Statutes

Section 106 of the National Historic Preservation Act of 1966 (as amended) requires that every federal agency sponsoring, authorizing, permitting, licensing, or funding an undertaking, whether directly or indirectly, take into account effects the project may have on historic properties. Undertakings may include the reconstruction of a public highway using federal funds, filling in or reestablishment of a wetland, or selling or adding on to a post office building.

All projects under the jurisdiction of a state agency that do not have any federal involvement are subject to Wisconsin's state historic preservation laws. The primary state agency provision is Wisconsin Statute § 44.40. Examples of agency projects covered by this law are financial grants from the Wisconsin Department of Natural Resources, new building construction on a University of Wisconsin campus, and power plant and transmission line utility permits from the Public Service Commission. Each state agency with project jurisdiction is required to check the Wisconsin Historical Society's inventories to see if there are recorded properties within the project area, and determine whether the project may affect any such property. If an historic property may be affected, then the agency must submit the project proposal to the Society for its review and comments.

Under Wisconsin Statute § 66.1111, all municipalities in Wisconsin must consider whether their actions may affect historic properties listed in the State or National Register of Historic Places. Projects subject to review under this law include construction of a new facility that results in the abandonment of a National Register-listed building, or development of a publicly owned park that may affect a listed archeological site. If such a project is being considered, the local unit of government is required to submit a proposal to the Wisconsin Historical Society at the earliest stages of planning to seek the Society's determination of whether the project may adversely affect the listed property. If there may be an adverse effect, then the Society may require negotiation with the local unit of government to explore alternatives and other project options that may avoid, minimize, or mitigate the possible adverse effect.

Under Wisconsin Statute § 120.12(21), at the earliest stages of planning, school districts are required to determine whether their long-range planning for facilities development or proposed demolitions of historic properties may affect properties that are listed in the State or National Registers of Historic Places. If these actions may affect listed properties, then the school district is required to submit a project proposal to the Society for its determination of whether the project may adversely affect a listed property. If there may be an adverse effect, then the Society may require negotiation with the school district to explore alternatives that avoid, minimize, or mitigate the adverse effect.

Wisconsin's burial law, Wisconsin Statute 157.70, prohibits unauthorized intentional disturbances of burial sites, from platted cemeteries to Native American mounds, to abandoned family burials. Once a Native American mound group or any marked or unmarked burial area is formally cataloged as a burial site under Section 157.70, that area is exempt from property taxes. This makes the property tax treatment of all human burial sites equal to the property tax treatment given to operating cemeteries.

5.19 Community Design

Community design as a cultural resource helps explain the origins and history of how a given community looks, feels, and functions in the present day. Components of the origin of community design include historic settlement patterns, resource use (like mining, farming, and forestry) in rural areas, the industries and businesses that influenced urban areas, transportation features and traffic flow patterns, natural features like rivers, lakes, and wetlands, and the heritage and values of the people who lived in a community in the past and who live there today. These factors might be expressed through street layout, building architecture, landscaping, preservation of natural features, development density, and other components of development design. The design of a community as seen today might also be influenced by community decisions including the use of zoning and subdivision controls, the establishment of parks and other community facilities, the use of historic preservation, and in some cases, the use of land use planning.

Citizens of Burnett County tend to describe the present design of their communities as being tied to "rural character", "Northwoods character", or "small town atmosphere." Generally, Burnett County's towns identify with the concept of rural and "Northwoods" character, while the villages and cities tend to identify more with the concept of small town atmosphere. With a focus on the positive aspects of community design, Burnett County further defines rural and "Northwoods" character to include scenic beauty, lakes and rivers, large contiguous forests, a variety of landscapes, curved roads accommodating natural features, attractive design of buildings and landscaping, undeveloped lands, farms, small businesses, and quiet enjoyment of these surroundings. Burnett County further defines small town atmosphere to include attractive community entrances, vital downtowns, community culture and events, and the aspects of rural character which surround its small cities and villages.

5.20 Agricultural, Natural, and Cultural Resources Trends and Outlook

The following agricultural, natural, and cultural resource trends are likely to be experienced in Burnett County over the next 20 to 25 years. The following statements are based on recent trends that are expected to continue well into the future, the opinions of Burnett County and municipal staff that deal with these resources, and the opinions of other Burnett County citizens who are leaders in these areas.

Agriculture Trends

- Increased pressure to convert farmland to other uses resulting in a continued loss of farmland
- The size of the average farm will continue to show moderate increases
- The number of dairy farms will continue to decline
- Dairy herd sizes will continue to increase
- Expect an increase in the number of large "commercial" type farms, especially dairy
- Increased interest in cash cropping
- Increased interest in specialty farming
- Increased interest in "agri-tourism".
- Dairy herd production will continue to increase

- There will be an increasing number of large dairies that are required to obtain WPDES permits
- Continuing phased-in enforcement of state non-point source pollution control regulations (Chapters NR 151 and ATCP 50, Wisconsin Administrative Code) as they apply to agriculture
- Increased interest in "value-added" businesses to complement small dairy and general farming operations
- State tax credits available to farm operations will begin to focus on large contiguous productive agricultural areas (Working Lands Initiative – Enterprise Zones) rather than distributed to scattered individual operations.

Natural Resources Trends

Groundwater

- Growing demand to supply adequate water for human consumption, agriculture, and industry
- Continued interest in Wisconsin's groundwater by bottled water suppliers
- Continuing need to site new municipal wells
- Growing need for municipal wellhead protection planning
- Increasing pressure on quality by various land uses
- Continuing need for improved groundwater quality and quantity data

Surface Water

- Continuing pressure to develop shoreland areas
- Increasing use of publicly accessible waters by growing numbers of recreationists
- Increasing threat of invasion of exotic species
- Increasing enforcement of non-point pollution control regulations for municipal runoff management, construction site erosion control, and agricultural runoff

Wetlands

- Continued pressure to alter or eliminate wetlands for mining, commercial development, highway construction, etc.
- Increasing emphasis on the use of mitigation to allow the alteration or elimination of low quality wetlands
- Growing understanding of the functional values of wetlands
- Continued loss of wetland acres, but at a slower pace

Wildlife Habitat

- Continued state-level priority to protect and acquire unique natural habitats
- Growing interest in land trusts and conservation easements for the preservation of unique natural areas
- Recovering levels of hunting interest back to pre-CWD levels, in contrast with a nation-wide trend toward declining participation in hunting
- Increasing conflict between rural development and the ability to hunt

Forests and Woodlands

- The price of forest land sold for recreational purposes will continue to increase
- Shift in tax burden from agriculture to forest lands
- Growing interest in forest management programs that provide tax relief
- Demand for timber production and recreational forest uses will increase while the amount of forest land able to support these activities will decline

Non-metallic Mining

- Continuing demand for non-metallic minerals for state, county, and local road improvement projects
- The price of non-metallic minerals will increase with the increasing difficulty of obtaining permit approvals
- Increasing difficulty in siting new non-metallic mines due to development in rural areas
- Changing laws regarding notification of non-metallic mines and land use planning/zoning changes

Cultural Resources Trends

- The recognized value of historic and cultural resources will grow, demanding more attention to their preservation
- Limited data on historic and cultural resources will emphasize the need for more thorough local inventories
- The community design features that express rural character and small town atmosphere will be increasingly challenged in areas that experience significant growth
- Growing interest in "heritage tourism" including organized and self-guided tours to visit sites of historical and cultural significance

5.21 Agricultural, Natural, and Cultural Resources Plans and Programs Currently in Use

Burnett County and its communities have a legacy of planning and implementation related to agricultural, natural and cultural resources. This section describes plans and programs that are currently in place in Burnett County.

Federal Programs

National Scenic Riverway Program

The St. Croix National Scenic Riverway includes the Namekagon and St. Croix Rivers was established in 1968 (the State of the St. Croix page 13)

USDA Farmland Protection Program

The purpose of the USDA Farmland Protection Program is to maintain prime farmland in agricultural uses through agricultural conservation easements. This program provides funding for state, tribal, or local governments to purchase development rights on prime agricultural land. Eligible lands must be part of a pending easement offer from a local, state, or tribal program, have a conservation plan, and meet other criteria on size and location to support long-term

agricultural production. Public access is not required. Contact: USDA Natural Resources Conservation Service.

State Programs

Managed Forest Law (MFL)
The purpose of the MFL program is to promote good forest management through property tax incentives. Forest management practices on enrolled lands are required by a WDNR approved forest management plan. Eligible properties will contain a minimum of 10 contiguous acres, of which at least 80% must be capable of producing merchantable timber. Contracts for enrolled properties are for the duration of 25 or 50 years and are transferable to a new owner for small fee. Enrolled properties may be open or closed to public access. Open lands must allow hunting, fishing, hiking, cross-country skiing, and sight-seeing. Up to 160 acres may be closed to public access by the landowner.

Forest Crop Law (FCL)
The management objectives of the FCL program are essentially the same as MFL, but the older FCL program is being phased out by the WDNR. Lands eligible for FCL had to be no smaller than 40 acres and were required to allow public access. In 2008, Burnett County property owners had approximately 3,300 acres enrolled in FCL, and no new enrollments in the program are being accepted. Those lands currently enrolled are nearing the completion of their management commitments.

Wisconsin Department of Natural Resources Fish, Wildlife and Habitat Management Plan
The purpose of this statewide plan is to provide guidelines for management and planning regarding Wisconsin's ecosystems. More specifically, the plan establishes conservation goals and management practices related to: sport fish, aquatic education, boating access, wild birds and mammals, game and non-game species, hunter education and shooting range construction.

The State of the St. Croix Basin
The State of the St. Croix Basin is a resource management plan published by the Wisconsin Department of Natural Resources in 2002. The plan guides development in the St. Croix Basin, including Burnett County.

Wisconsin Farmland Preservation Program
The purpose of the Farmland Preservation program is to help preserve farmland through local planning and zoning, promote soil and water conservation, and provide tax relief to participating farmers. Farmers qualify if their land is zoned or if they sign an agreement to use their land exclusively for agricultural purposes.

Wisconsin Forest Landowner Grant Program
This state program assists private landowners in protecting and enhancing their forested lands, prairies, and waters. Cost sharing and technical assistance is provided to implement conservation practices identified in the landowners Forest Stewardship Plan.

Non-Point Pollution Abatement Program (Priority Watersheds)

Funds are available to improve water quality by limiting or ending sources of non-point source (run-off) water pollution by providing financial and technical assistance to landowners, land operators, municipalities, and other governmental units. Governmental units located within designated priority watersheds, or whose jurisdiction include priority lakes, are eligible to apply. Eligible projects are watersheds and lakes where: 1) the water quality improvement or protection will be great in relation to funds expended; 2) the installation of best management practices is feasible to abate water pollution caused by non-point source pollution; and 3) the local governmental units and agencies involved are willing to carry out program responsibilities. Efforts are focused statewide in critical watersheds and lakes where non-point source related water quality problems are most severe and control is most feasible. Rural landowners or land operators, whose properties lie within selected priority watersheds or include a priority lake, can contact their county land conservation department to receive an explanation of the program and to sign for cost sharing of best management practices. Non-rural landowners and land operators can contact their municipal government offices. A watershed or lake project normally has a 10 to 12 year time frame: two years for planning and eight to ten years to implement best management practices.

Self-Help Volunteer Lake Monitors

Since 1986, Self-Help Volunteer Lake Monitors have played an integral part in the Wisconsin lakescape by collecting vital information on water quality. Citizens who live on their lakes and know their lakes better than anyone else have volunteered on behalf of their lakes and their communities in a partnership with the Department of Natural Resources. This concept was so successful that Self-Help Citizen Lake Monitoring was expanded to include volunteer opportunities for chemistry, dissolved oxygen monitoring, and aquatic plant surveys. Since its beginning, over 3,200 volunteers have participated in the program, monitoring over 1,000 different lakes.

Lake Management Planning Grants

Lake planning grants provide funding for the lake management planning process. Small scale lake planning grants of up to $3,000 are available for use in obtaining and disseminating basic lake information, conducting education projects, and developing management goals. These grants are ideal for lake groups just beginning the planning process or for activities that supplement an existing plan. Large scale lake planning grants up to $10,000 per project are available for bigger projects. The intent of the large-scale program is to conduct technical studies to help develop elements of, or complete, comprehensive management plans. Depending on the condition and needs of the lake (which the planning process will help determine), the plan will specify activities, for example, related to minimizing the impact of future development, managing user conflicts, improving fishing, or improving water quality.

Lake Protection Grants

Lake protection grants provide funding for implementing the recommendations of a management plan. As one progresses from planning to implementation, the costs and the time involved increase. Because implementation is more expensive, protection grants are available for up to $200,000 per project. Grants for regulation or ordinance development projects are limited to $50,000.

Sensitive Area Designations

The definition of a Sensitive Area, as stated in Chapter NR 107.05(3) (i)(1.), is an area of aquatic vegetation identified by the WDNR as offering critical or unique fish and wildlife habitat, including seasonal or lifestage requirements, or offering water quality or erosion control benefits to the body of water.

County Programs

Burnett County Forest Comprehensive Land Use Plan

This comprehensive plan for county forest land outlines plans to preserve the forest for future recreation, education and economic uses. It applies to all county forest lands and aims to encourage solid forest management practices while minimizing the likelihood of over harvesting the land. The plan is to be administered between 2006 and 2020.

Burnett County Historical Society

The Burnett County Historical Society is located near Danbury and is dedicated to the preservation and study of the county's history. The Society also maintains a Research Library, which maintains archives and records of significance to the county; this library is open to the public.

Burnett County Aquatic Invasive Species Education and Prevention Program

The purpose of this program is to ensure the control of aquatic invasive species in Burnett County. Of particular emphasis is Eurasian water milfoil, which has been a threat to the county's water during recent years. The Burnett County Land and Water Conservation Department is working with the National Park Service and the Wisconsin Department of Natural Resources to implement this program.

Burnett County Land Information System

The Burnett County Land Information System is an automated county land records system that maintains and provides property and parcel information, reports and statistics, and geographic data. It is guided in part by the Wisconsin Land Information Program.

Shoreline Incentive Program

The Shoreline Incentive Program offers Burnett County lakeside property owners technical assistance and tax breaks for maintaining and restoring waterside vegetative buffers. Landowners receive a one-time payment of $250 and an annual $50 property tax break for agreeing to maintain a minimum 35-foot vegetative buffer next to the water's edge. Participants are required to sign a deed covenant that guarantees the zone will continue to be protected with each new owner of the property, and are asked to install a small sign indicating their participation.

Tri-County Wildlife Damage Program

This program serves Burnett, Polk and Washburn counties by providing assistance to people in the agricultural business. The program provides abatement assistance and financial compensation for crops that are damaged by wildlife, such as deer, geese, turkey and bears. It aims to mitigate the conflict between agricultural and wildlife land uses. Program participants must meet a number of requirements to be eligible for this program.

Big Wood Lake Priority Watershed Project

This project is part of the Wisconsin Non-Point Source Water Pollution Abatement Program, administered by the Wisconsin Department of Natural Resources. Technical assistance and funding for conservation practices in the watershed are provided through this project.

The Farmland Preservation Plan

The *Farmland Preservation Plan* was developed in 1982 to allow Burnett County landowners to participate in the state program. The plan is used for guidance and eligibility for the Farmland Preservation Program. Landowners under contract receive property tax incentives for preserving agricultural lands against unplanned development. Burnett County has eleven farmland preservation zoned towns, six of which have land in Exclusive Agricultural Zoning, according to the *Burnett County Land and Water Resource Plan*.

Local Programs

Forts Folle Avoine Historical Park

Located on 80 acres along the Yellow River near Danbury, this park recreates the fur trading experience that was so important to the development of the county. Today, two reconstructed fur trade posts occupy the sites they actually did in the early 1800s. This park is listed on the National Register of Historic Places.

Grantsburg Area Historical Society

The Grantsburg Area Historical Society operates museums in three historic buildings in Grantsburg. One of the buildings is a former Norwegian Methodist church from the 1800's. The Historical Society also operates the former Burnett County jail, originally utilized between 1870 and 1920. Finally, the Stenborg Home (also known as Emma's House) was built in the 1800's as a home for a blacksmith. The museums are open to the public to provide people with information about early Grantsburg. Special exhibits are also featured on occasion. Additionally, the historical society provides genealogical resources for community members.

Appendix ANC

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Table A-ANC-1

Lake Descriptions, Burnett County, 2005

Lake	Area	Maximum Depth	Mean Depth	Public Access	Lake map	Lake Type	Muskie	Northern Pike	Walleye	LM bass	SM bass	Panfish	Trout	Catfish	Sturgeon	Exotic Species
Ann Lake	27	6	6	NW	X	SE										
Austin Lake	86	48	23		X	DG		P	P	P	P	C				
Baker Lake*T38N R16W S36	22	9				SE										
Baker Lake T39N R14W S18	27	6		T		SE										
Baker Lake T39N R15W S02	20	4		W		SE										
Banach Lake (Kiezer)	16	40	12	BR	X	SE							A			
Barrens Springs No. 1	3	6				SP		C				P	P			
Barrens Springs No. 2	1	1		NW		SP							P			
Bartash Lake	22	21				SE		P		P		C				
Bashaw Lake	171	16	7	BR	X	DG		C		P		P				
Bass Lake T37N R18W S17	43	45				SE		P		P		P				
Bass Lake T38N R15W S09	110	18	5		X	SE		P		P		P				
Bass Lake T38N R15W S25	39	34				SE				P						
Bass Lake T39N R14W S24	31	27		W		SE				P		P				
Bass Lake T39N R16W S23	226	24	11		X	SE		P		P	P	P				
Bass Lake T40N R15W S23	42	8				SE				P		C				
Bass Lake T40N R17W S13	236	6	4		X	SE		P		P		C				
Bass Lake T41N R14W S03	30	35		W		SE		P		P		C				
Bass Lake T41N R16W S13	67	21	8		X	SE				C		C				
Behr Lake	38	15				SE		P		P		P				
Benoit Lake	297	41	17	BR	X	SE	P	C	P	C	P	P				
Berg Lake	42	45				SE				P	C		P			
Big Bear Lake	189	17	7		X	SE		P		P		P				
Big Doctor Lake	212	9	6	BR	X	SE		C		C		P				
Big McKenzie Lake	1,185	71	19	BR	X	DG	A	A	A	C	P	C				P
Big Sand Lake	1,400	55	9	BR	X	SE		A	P	A	P	P				
Birch Island Lake	838	13	6	BR	X	SE		C		A		C				
Black Lake	11	6				SE										
Blomberg Lake (Bloomberg)	68	4				SE										
Bluff Lake	51	23				SE		P		P		P				
Bogey Lake	24	20				SE		C		P		P				
Boner Lake	89	15	9	BR	X	SE		P		P		A				
Bradley Lake	6	15		W		SE				P		P				
Bricher Lake	27	25				SE		P		P						

Lake	Area	Maximum Depth	Mean Depth	Public Access	Lake map	Lake Type	Muskie	Northern Pike	Walleye	LM bass	SM bass	Panfish	Trout	Catfish	Sturgeon	Exotic Species
Briggs Lake	55	13	4	BR	X	DG		A		P		C				
Buck Lake T37N R14W S14	18	31				SE										
Buck Lake T39N R15W S26	67	6	4		X	SE		P		P		P				
Buffalo Lake	69	4				SE		P				P				
Burlingame Lake	57	19	10	BR	X	DG		A		A		A				
Cadotte Lake	127	21	10	NW	X	SE		P		P	A	P				
Chase Lake	6	30				SE										
Clam Lake, Lower	337	14	7	BR	X	DG		A	P	C	P	C		P		P
Clam Lake, Upper	1,207	11	5	BR	X	DG		A	P	C	P	C		P		P
Clam River Flowage	359	29	11	BR	X	DG		A	P	C	P	C		C		P
Clear Lake	115	55	24	R	X	SE		P	P	A		P				
Clubhouse Lake	25	26				SE				P		C				
Conners Lake	113	16	7	BR	X	SE		A		C		C				
Corwick Lake	6	25				SE				C		P				
Cranberry Lake																
Cranberry Lake T38N R15W S05	79	23				SE		P		C		P				
Cranberry Lake T40N R14W S04	14	2				SE										
Cranberry Lake T41N R16W S35	82	26	6	NW		DG		C	P	C		P				
Crescent Lake Crooked Lake	36	11		R		SE		C		C		P				
Crooked Lake T38N R16W S08	180	10	6	BR,P	X	SE		C		A		A				
T40N R15W S07	254	13	6	BR	X	SE		P		P		P				
Crystal Lake	32	5		NW		SE						P				
Culbertson Lake	28	34		T		DG		A		C		A				
Culbertson Springs	8	9		BR		SP		P					P			
Dahlberg Lake T40N R15W S30																
Danbury Flowage	256	10		BR		DG	C	C	C	C	P	C		P	P	
Deep Lake	34	58				SE				P		P				
Deer Lake	157	23	14	W	X	SE		P		P		P				
Des Moines Lake (Sucker)	229	37	23	BR	X	SE	P	P	P	C		P				
Devils Lake	1,001	24	14	BF	X	SE		C	A	C		P				
Doctor Lake	64	7	5	R		SE		P				A				
Dogtown Springs	6	8		NW		SP							C			
Dubois Lake	71	25	8			SE		C		P		C				
Dunham Lake	243	63	35	BR	X	DG		C	C	A		P				
Durand Lake	29	6				SE										
Eagle Lake T40N R14W S26	22	3				SE										
Eagle Lake T41N R15W S34	71	15	9	NW	X	DG		P		C		P				

Lake	Area	Maximum Depth	Mean Depth	Public Access	Lake map	Lake Type	Muskie	Northern Pike	Walleye	LM bass	SM bass	Panfish	Trout	Catfish	Sturgeon	Exotic Species	
Echo Lake	24	9		NW		SE				P		P					
Elbow Lake	233	8	4	T	X	SE				C		C					
Falk Lake	82	32	11	BR	X	DG		C	P	A		C					
Fawn Lake	30	14				SE		P		P		C					
Fenton Lake	17	8		T		SE						C					
Fern Lake*	17	7				SE											
Ferry Lake	16	36				SE				P							
Fish Lake T38N R16W S06	94	7	4	BR	X	SE				P		P					
Fish Lake T40N R14W S04	356	29	10	BR	X	SE	P	A	C	A		C					
Freedom Lakes*	106	4	3		X	DG											
Fremstadt Lake	88	22	7		X	SE		C		C		C					
Frog Lake (Prinel, Prinell)	22	2		BR		SE		C		P							
Gabrielson Lake (Gabelson)	38	35				SE		P		P		A					
Gaslyn Lake	164	12	6	BR	X	DG		C		P		P					
Glendenning Lake	20	3				SE											
Godfrey Lake	56	41	8	BR	X	SE		C		P		P					
Goose Lake	68	6	3	BR	X	SE		P				P					
Grass Lake*	56	3				DG											
Green Lake	274	6	4	T	X	SE		P		C		C					
Greenwood Lake	7	6		T		SE											
Gull Lake	182	19	4	T	X	DG		C	P	C		C					
Ham Lake	324	29	9	R	X	SE		C	P	C		C					E
Hanscom Lake	127	7	5	T	X	SE		P		A		P					
Hayden Lake	59	12				SE	P	P		P		P					
Holmes Lake	54	26	13	T	X	SE		P		P		P					
Horseshoe Lake	17	29				SE		P		P		P					
Hunters Lake	63	5				SE											
Indian Lake	17	15				SE		P		P		C					
Isaac Lake	17	22				SE						P					
Island Lake Johnson Lake	23	56				SE		P		P		A					
Johnson Lake T40N R16W S23	397	23	6	T	X	SE		C		C		C					
Johnson Lake T41N R15W S24	28	7		BR		SE				P		P					
Kapes Lake (Miller)	22	3		W		SE											
Keizer Lake	24	4	3	BR	X												
Kent Lake	31	16		NW		SP		P		C		P					
Kreiner Lake	65	2		W		SE											
Lang Lake	85	4				SE		P		C		P					
Lang Lake, North	16	10		BR		DG		C		P		A					
Larson Lake	31	12				SE		P		C		P					
Lily Lake T39N R15W S06	15	44				SE		P		C		C					

Lake	Area	Maximum Depth	Mean Depth	Public Access	Lake map	Lake Type	Muskie	Northern Pike	Walleye	LM bass	SM bass	Panfish	Trout	Catfish	Sturgeon	Exotic Species
Lily Lake T41N R14W S34	187	21	5	BF	X	SE		P		C		P				
Lind Lake	42	19				SE				P		P				
Lindy Lake	56	14				SE		P		P		P				
Lipsett Lake (Lipsie)	393	24	13		X	DG	P	A	C	C		C				
Little Bass Lake																
Little Bass Lake																
T38N R15W S24	10	12				SE		P		C						
Little Bass Lake																
T38N R15W S36	11	30				SE		P		C			P			
Little Bass Lake																
T40N R16W S22	34	12				SE		P		C		P				
Little Bear Lake	128	55	27	BR	X	SE		P		A		P				
Little Deer Lake	14	4		W		SE										
Little Dunham Lake	11	33				SE		P		P		C				
Little Holmes Lake	23	8				DG		P		P		P				
Little Mallard Lake	24	6		W		SE										
Little McGraw Lake	55	12	6	BR	X	SE		C	P	A		C				
Little Round Lake	13	40		BR		SE				P		P	C			
Little Wood Lake	207	23		BR	X	DG		A		C		P				
Little Yellow Lake	348	21	10	NW	X	DG	C	C	C	C	P	C		P	P	
Lone Star Lake (Saunders)	23	40				SE		P		P		C			P	
Long Lake T38N R16W S16	318	13	5	NW		DG		C		C		C				
Long Lake T41N R14W S28	251	41	18	BR	X	SE		P	P	C		C				
Long Lake T41N R16W S33	49	14		W		SE		P		P		P				
Loon Lake T40N R15W S01	228	28	10	BR	X	SE		P		P		P				
Loon Lake T41N R15W S36	89	10		B R		DG		C		C		C				
Lost Lake T39N R14W S02	21	3				SP										
Lost Lake T39N R15W S27	34	2				SE										
Lost Lake T41N R14W S26	248	4		BR		SE		P				P				
Love Lake	253	65	22	NW	X	DG		P	P	C		P				
Lucerne Lake	40	21		W		SE		P				P				
Mallard Lake	113	35	14	W	X	SE		P	P	C		P				
Mallard Slough	25	4				SE										
McElroy Lake	7	16		W		SE						P				
McGraw Lake	135	25	13	BR	X	SE		P		P		A				
McKenzie Lake, Middle*	530	45	20		X	DG	C	C	C	C		C				
Meeker Run Lake	18	1		BR		SE										
Memory Lake	10	6		W		DG		P		P		P				
Minerva Lake	222	26	14	BR		DG		P	P	C	P	C				
Mingo Lake	16	9				SE				P						
Miniature Lake	38	69				SE				P		P				

Lake	Area	Maximum Depth	Mean Depth	Public Access	Lake map	Lake Type	Muskie	Northern Pike	Walleye	LM bass	SM bass	Panfish	Trout	Catfish	Sturgeon	Exotic Species
Minnow Lake	57	50	28		X	SE		P		P		C				
Mollete Lake	25	4		W		SE										
Money Lake	46	3				SE										
Monson Lake T39N R18W S04																
Mud Hen Lake	563	66	14	BR	X	SE		C		A		C				
Mud Lake T40N R16W S26	163	3				SE		P		P		P				
Mud Lake T41N R15W S34	26	7		NW		SE		P		P		P				
Muskrat Lake	9	14				SE						P				
Myre Lake	128	27	8			SE		A		A		A				
Myrick Lake	19	12		W		SE		P		C		P				
Mystery Lake	26	51	19	R	X	SE				A		A				
Nicaboyne Lake (Nicahoyne)	291	34	12	BR	X	SE		C		C		A				
No Mans Lake*	70	23	7	BR	X	SE		C		C		A				
North Lake	33	22	6	T	X	SE		P		P		P				
Oak Lake	227	19	8	R	X	SE		P		A		P				
Our Lake	9	12				SE				P		P				
Owl Lake	127	27	7	W	X	SE		P		P		C				
Peacock Lake	14	13		W		SE						P				
Perch Lake	16	27				SE				P		P				
Peterson Lake	24	11				SE		P		C		A				
Peterson Lake (Big)	94	16	7	T	X	SE		P		P		P				
Phantom Flowage T39N R19W S36	1480					DG										
Phernetton Lake	61	5				SE				P		P				
Pickle Lake	20	20				SE		P		P		P				
Pike Lake	77	15	7			SE		P		P		P				
Pine Lake T37N R18W S22	51	46	20		X	SE		P		P		C				
Pine Lake T40N R15W S25	89	19	5			SE		P		P		P				
Places Lake	13	13				SE										
Point Lake	144	7				SE				P		P				
Pokegama Lake	160	28	4	BR	X	SE		P	P	P		P				
Poquettes Lake (Little Long)	97	23	10	BR	X	SE		C	C	A		P				
Pratt Lake	21	4		W		SE										
Prinel Lake (Frog)	64	12	7	BR	X	SE		P		P		C				
Put Lake	19	3				SE										
Rahn Lake	4	3		T		SE										
Rice Lake T37N R18W S10	83	13				SE		P		P		P				
Rice Lake T37N R18W S25	50	5				SE		P		C		P				
Rice Lake T39N R14W S10	326	10	4	BR	X	DG	P	C	P	C		C				
Richart Lake	17	3		W		SE										

Lake	Area	Maximum Depth	Mean Depth	Public Access	Lake map	Lake Type	Muskie	Northern Pike	Walleye	LM bass	SM bass	Panfish	Trout	Catfish	Sturgeon	Exotic Species	
Robie Lake	31	14		NW		DG		P		P		P					
Rohr Lake	12	5				SE						A					
Rooney Lake	322	30	10	BR	X	SE		C	P	A		C					
Round Lake T37N R18W S27	204	27	15	BR	X	DG		C	C	C	P	C					E
Round Lake T39N R15W S03	27	5		W		SE											
Round Lake T41N R16W S33	56	11		BR		SE		P	P	P		A					
Saginaw Lake	13	19		BR		SE				P		P					
Sand Lake T38N R16W S22	81	42	17	R		SE		P		P		P					
Sand Lake T40N R15W S25	962	73	24	BR	X	SE		A	C	C		P					
Sanks Lake	39	4				SE											
Shallow Lake*																	
T37N R13W S31	92	30		BR		SE		C		C		C					
Shoal Lake	247	5	3			SE		P				P					
Silver Lake T38N R16W S22	64	67	24			SE				P		P					
Silver Lake T38N R18W S36	33	35				SE		P		P		P					
Smith Lake	26	22				SE		P			P	P					
Spencer Lake (Spence)	188	19	10	W	X	SE		A		C		A					
Spirit Lake	593	27	12	BR	X	DG		C		C		C					
Spook Lake	18	40				SE		P		P		P					
Spring Brook Springs	5	11				SP							A				
Spring Lake (Clam R Springs)	9	7				SP		P					C				
Staples Lake	85	42	17	W		SE		P		P		P					
Stone Lake	34	11		W		SE				P		C					
Stulen Lake	20	14				SE		C		P		P					
Sunfish Lake	9	41				SE				P		P					
Swamp Lake T38N R16W S30	39	3				SE											
Swamp Lake T39N R15W S11	21	5		W		SE											
Tabor Lake (Loon)	157	28	13	BR	X	SE		C		P		P					
Tamarack Lake	13	3		W		SE											
Tanda Lake	39	4				SE						P					
Taylor Lake	80	10	6	BR	X	SE		P		P		A					
Temple Lake	18	6		W		SE											
Thatcher Lake	23	41				SE		P		P		C	P				
Thirty-Two Lake	22	17		R		SE		P		P		P					
Tomoe Lake	67	6	4	W	X	SE						P					
Trade Lake, Big (Little Trade)	434	39	15		X	DG	P	C	P	A		C					
Tucker Lake	47	2				SE											
Twenty-Six Lake	230	45	20	BR	X	DG	C	C		C		C					
Twenty-Six Lake Springs	3	8		NW		SP											

Lake	Area	Maximum Depth	Mean Depth	Public Access	Lake map	Lake Type	Muskie	Northern Pike	Walleye	LM bass	SM bass	Panfish	Trout	Catfish	Sturgeon	Exotic Species
Twin Lake, Lower	123	9				SE		P		P		P				
Twin Lake, North	27	26				SE		P		C		P				
Twin Lake, South	19	25				SE		P		C		P				
Twin Lake, Upper	163	18	5	W		SE		A				A				
Unnamed																
T37N R18W S12-13	26	7				SE										
T37N R18W S15-6	24	25				SE										
T38N R15W S7-10	22	5				SE										
T38N R17W S25-16	33	5		R		SE				P		P				
T39N R15W S5-6	23	3				SE										
T39N R16W S13-13	24	3				SE										
T40N R14W S17-13	20	3				SE										
T40N R14W S23-10	22	6				SE										
T40N R14W S23-15	25	11				SE										
T40N R14W S36-15	61	7		NW		DG		P		C		P				
T40N R15W S19-10	23	3				SE										
T40N R15W S25-16	23	6		W		SE										
T40N R16W S13-6	24	7				SE										
T40N R16W S25-14	22	13				SE				P		P				
T41N R14W S36-7	32	4		W		SE										
Viola Lake	285	34	13	BR	X	SE		C	P	C		P				
Ward Lake	18	21				SE				P		P				
Warner Lake	176	75	19	R	X	SE		C		C		A				
Webb Lake (Web)	761	31	14	BR	X	DG		C		C		A				
Wilson Lake	10	13				SE						P				
Wood Lake	521	35	16	BR	X	DG		C		C		A				
Yellow Lake	2,287	31	19	BF	X	DG	A	C	A	P	P	C		P	P	

Source: Wisconsin Department of Natural Resources, Wisconsin Lake Book, 2005. Area is in acres. Depth is in feet.

Public Access is described using the following codes:

- BR, Boat Ramp. Sites with a defined public boat launching facility.
- NW, Navigable Water. Navigable access is provided by the presence of an inlet or outlet stream which furnishes adequate boat access to a lake.
- R, Roadside. These sites do not include any access developments. Public roads with a marked right-of-way extending to the water provide a limited degree of access.
- T, Walk in Trail. These access sites are partially developed, excluding a boat ramp, and are entirely within public lands.

Lake types are described as follows:

- DG, Drainage Lake. These lakes have both an inlet and outlet where the main water source is stream drainage.
- SP, Spring Lake. These lakes have no inlet, but do have an outlet. The primary source of water is groundwater flowing into the bottom of the lake.

- SE, Seepage Lake. These lakes do not have an inlet or an outlet, and only occasionally overflow. The principal source of water is precipitation or runoff, supplemented by groundwater from the immediate drainage area.
- DN, Drained Lake. These lakes have no inlet, but like spring lakes, have a continuously flowing outlet. Drained lakes are not groundwater-fed. Primary source of water is from precipitation and direct drainage from surrounding land.

The description of the presence of fish is coded as follows:

- A, Abundant
- C, Common
- P, Present
- The absence of a symbol means that a fish species is not present.