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# VILAS COUNTY ALL HAZARDS MITIGATION PLAN



## Vilas County Emergency Management

Prepared by: North Central Wisconsin Regional Planning Commission

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## VILAS COUNTY ALL HAZARDS MITIGATION PLAN

prepared for:

Vilas County Emergency Management

by:

North Central Wisconsin Regional Planning Commission

adopted by Vilas County Board on:

May 28, 2013

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This update was prepared at the request and under the supervision of the Vilas County Law Enforcement & Emergency Management Committee and its Emergency Management Director by the North Central Wisconsin Regional Planning Commission (NCWRPC). For more information, contact:

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**VILAS COUNTY ALL HAZARDS MITIGATION PLAN****Background**

The federal Disaster Mitigation Act of 2000 mandates that mitigation plans be accomplished for all incorporated units of government as well as Native American tribes and updated on a five-year cycle. Although Vilas County collaborated with the Lac du Flambeau Tribe on the development of a joint hazard mitigation plan in 2008, this 2013 plan is considered the County's initial All Hazards Mitigation Plan by FEMA. The first update to this plan will be due in 2018. An approved mitigation plan is required for a jurisdiction to be eligible for certain federal mitigation funding following a disaster. In addition, if a major disaster strikes a jurisdiction without an approved plan, FEMA will require the jurisdiction to complete a plan.

**Plan Preparation Process**

The Vilas County Emergency Management Department received a Planning Grant in 2011 to develop an All Hazards Mitigation Plan through the Pre-Disaster Mitigation (PDM) Program.

The North Central Wisconsin Regional Planning Commission (NCWRPC) finalized a work agreement with Vilas County and began preparation of the All Hazards Mitigation Plan at the request of the County Emergency Management Director in late 2011.

The planning process included regular Task Force committee meetings as well as extensive involvement from the local units of government within Vilas County and the counties surrounding Vilas. A variety of local and regional agencies were involved in the development of the plan at various stages, and extensive opportunity for public participation was provided including public informational meetings and hearings.

**Plan Elements**

In accordance with Federal Emergency Management Agency (FEMA) requirements, the Plan has the following elements:

**Planning Process**

Part I of the Vilas County All Hazards Mitigation Plan (AHMP) describes and documents the process used to develop the plan. This includes how it was prepared and who (committee, organizations, departments, staff, consultants, etc.) was involved in the process. It also describes the local government involvement, the time period in which the plan was prepared, and who to contact to answer questions and make recommendations for future amendments to the plan.

**Planning Area**

Part II of the Vilas County AHMP provides general geographic information on Vilas County including demographic and economic characteristics. The general development patterns of the County are described in terms of current land use and future development trends.

In addition to developing an understanding of the planning area, this chapter represents the beginning stages of assessing vulnerability by inventorying the numbers, types and values of existing buildings, infrastructure and critical facilities within each participating jurisdiction in the planning area. This overall summary of each jurisdiction's vulnerability to hazards describes the potential impact on the community.

Land use and development trends are analyzed to project the number and type of potential future buildings, infrastructure and critical facilities within each jurisdiction so that mitigation options can be considered in future land use decisions.

### **Risk Assessment**

Part III of the County AHMP focuses on an identification of the hazards that can affect Vilas County and an analysis of the hazards identified as most pertinent to the County. These hazards include (in order of priority): Winter Storms/Extreme Cold, Severe Thunderstorms/High Wind/Lightning/Hail, Tornado, Forest/Wild Fires, Epidemic, Hazardous Materials Incidents, Power Outage, Drought/Extreme Heat, and Flood/Dam Failure. The Hazard Analysis consists of background information, history of previous occurrences of hazard events, an analysis of the County's vulnerability to future events, and an estimate of future probability and potential losses from the hazard.

### **Mitigation Strategy**

Part IV of the AHMP contains the recommended mitigation strategy which is comprised of a blend of infrastructure and non-infrastructure projects. For Vilas County's part, the strategy is primarily a non-infrastructure approach focusing on public awareness, training and exercises for county and local officials, and planning. Projects include promotion of NOAA weather radios, weather spotter training, an exercise to assist in planning and preparation for a possible epidemic situation, and working with power companies on communications protocol and on analyzing tree growth patterns to help address the number of power outages in the County.

It is understood that projects may not be carried out as they are scheduled in Part IV due to budget constraints. Actual project implementation is dependent on funding and staff availability. In addition, as a multi-jurisdictional plan there are a number of recommendations specifically for the other units of government that do not entail or require any county participation.

On the local level, these strategies are primarily infrastructure type projects for the City and towns. Examples include the installation of back-up generators, warning sirens and emergency shelters/safe rooms. One high priority recommendation for the City of Eagle River is the relocation of LP storage tanks located in the glide path at the Airport. To address wildfire danger, high risk towns are encouraged to develop Community Wildfire Protection Plans.

### **Plan Update and Maintenance Procedures**

The AHMP concludes with Part V, establishing FEMA required procedures on maintaining and update the plan on a five-year cycle.



**INTRODUCTION**

Part I of the Vilas County All Hazards Mitigation Plan (AHMP) describes and documents the process used to develop the plan. This includes how it was prepared and who (committee, organizations, departments, staff, consultants, etc.) was involved in the process. It also describes the local government involvement, the time period in which the plan was prepared, and who to contact to answer questions and make recommendations for future amendments to the plan.

**DISASTER MITIGATION ACT OF 2000**

The development of the Vilas County All Hazards Mitigation Plan is a response to the passage of the Disaster Mitigation Act of 2000 (DMA2K). On October 30, 2000, DMA2K was signed into law in an attempt to stem the losses from disasters, reduce future public and private expenditures, and to speed up response and recovery from disasters. This Act (Public Law 106-390) amended the Robert T. Stafford Relief and Emergency Assistance Act. The following is a summary of the parts of DMA2K that pertain to local governments and tribal organizations:

- The Act establishes a new requirement for local governments and tribal organizations to prepare an All Hazards Mitigation Plan in order to be eligible for funding from FEMA through the Pre-Disaster Mitigation Assistance Program and Hazard Mitigation Grant Program.
- The Act establishes a requirement that natural hazards such as tornados, floods, wildfires need to be addressed in the risk assessment and vulnerability analysis parts of the All Hazards Mitigation Plan. Manmade hazards such as hazardous waste spills is encouraged but not required to be addressed.
- The Act authorizes up to seven percent of Hazard Mitigation Grant Program funds available to a state after a federal disaster to be used for development of state, local, and tribal organization All Hazards Mitigation Plans.
- The Act establishes November 1, 2004 as the date by which local governments and tribal organizations are to prepare and adopt their respective plans in order to be eligible for the FEMA Hazard Mitigation Grant Program.
- If a plan is not prepared by November 1, 2004, and a major disaster is declared, in order for a local government or tribal organization to be eligible to receive funding through the Hazard Mitigation Grant Program, they must agree to prepare an All Hazards Mitigation Plan within one year.

- In addition, by not having an All Hazard Mitigation Plan, local governments and tribal organizations cannot utilize funding through the Pre-Disaster Mitigation Grant Program.
- All Hazard Mitigation Plans must be updated every five years.

**THE FIVE PARTS OF AN ALL HAZARDS MITIGATION PLAN**

The Vilas County All Hazards Mitigation Plan was categorized into five parts in order to address FEMA’s local mitigation plan requirements. The five parts are as followed:

- Part I: Planning Process
- Part II: Planning Area
- Part III: Risk Assessment
- Part IV: Mitigation Strategy
- Part V: Plan Maintenance Process and Adoption

**DEVELOPMENT OF THE ALL HAZARDS MITIGATION PLAN**

The Vilas County Emergency Management Department received a Planning Grant in 2011 to develop an All Hazards Mitigation Plan through the Pre-Disaster Mitigation (PDM) Program.

The North Central Wisconsin Regional Planning Commission (NCWRPC) finalized a work agreement with Vilas County and began preparation of the All Hazards Mitigation Plan at the request of the County Emergency Management Director in late 2011.

The planning process included regular Task Force committee meetings as well as extensive involvement from the local units of government within Vilas County and the counties surrounding Vilas. A variety of local and regional agencies were involved in the development of the plan at various stages, and extensive opportunity for public participation was provided including public informational meetings and hearings.

The remainder of this chapter expands on and provides more detail on key aspects of the plan development process.

**ALL HAZARDS MITIGATION PLANNING TASKFORCE**

The Vilas County All Hazard Mitigation Plan was prepared under the authorization of the Vilas County Law Enforcement & Emergency Management Committee:

- Mark Rogacki, Chair
- Al Bauman
- Jim Behling
- Sig Hjenvick
- Chris Mayer

This Committee of the County Board delegated oversight of the planning process to a Core Planning Team which consists of cross section of government, agency and interest group representatives from across the County. Periodic meetings were held with the NCWRPC staff and the County Emergency Management Director (Jim Galloway) to provide guidance and input on the types of hazards to be considered, appropriate mitigation strategies / priorities, and to review draft reports. Planning Team members and their representation are as follows:

- Gina Egan, Vilas County / Health Department
- Terry Allen, Lac du Flambeau Tribe
- Joe Laux, City of Eagle River
- John Hanson, Towns
- Bob Egan, Resident at large

### **LOCAL GOVERNMENT INVOLVEMENT**

There were a number of opportunities for the local units of government to become involved in the planning process.

In February of 2012 a hazard mitigation issues survey was sent to each town chairperson and clerk requesting which hazards are a concern, input on past and future mitigation measures, and to document other information that could be incorporated into the All Hazards Mitigation Plan. Responses were received from 11 of 14 towns. A significant amount of information was gleaned from these questionnaires and incorporated into the planning document. In addition, John Hanson, Chair of the Town of Manitowish Waters, represented the towns collectively on the County's Planning Team.

The City of Eagle River had representation on the County's Planning Team through City Administrator Joe Laux. The City was formally introduced to the planning process at a separate meeting on April 30, 2012. The participants at this meeting provided information on hazards that have significance to the area, discussed critical facilities and provided mitigation strategy ideas for the plan. The following City officials participated in this planning meeting:

- Joe Laux, City Administrator
- Pat Weber, Fire Chief and Manager - Eagle River Light and Water Utility

Discussion from this meeting indicated that the City is most concerned about high wind and power outage during the winter or times of excessive heat. Two things are of particular concern to City officials: 1) the location of a large LP gas storage facility on the airport property and in proximity to a school, motel and other developments and 2) the potential need for sheltering of residents during an extended power outage with appropriate warming or cooling.

The Lac du Flambeau Tribe was represented on the County's Planning Team by Terry Allen, Tribal Council Member.

**NEIGHBORING COMMUNITY INVOLVEMENT**

One of the requirements of the update process was to include neighboring communities. In previous plans, the NCWRPC experienced low attendance in response to invitations to county emergency management staff from surrounding counties. As a result, NCWRPC staff corresponded via email during the update process in May of 2012 with the group of EM staff from Oneida, Forest, Iron, Price, and Gogebic (MI) counties.

Ken Kortenhof from Oneida County noted that Oneida County was also planning to acquire new aerial photography with LIDAR, and this was an opportunity for the two counties to partner.

**LOCAL AND REGIONAL AGENCY INVOLVEMENT**

Another requirement of the update process was to involve local and regional agencies that have a role in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and non-profit interests. To meet this objective, the NCWRPC invited a diverse group of stakeholders to discuss potential hazard mitigation strategies.

The meeting was held on June 26, 2012 at the Community Center in Arbor Vitae. Agencies and organizations invited included the following:

- Joe Fortman, Commission On Aging
- Nancy Miller, UW-Extension
- Gina Egan, Vilas County Health
- Pat Weber, Fire Chief's Association
- Kathryn Gardner, Vilas County Social Services
- Dawn Schmidt, County Zoning Administrator
- Jamie Remme, WI Dept. of Natural Resources
- Robert Hom, Airport Manager
- Cindy Burzinski, Vilas County Tourism
- Leah VanZile, Wisconsin Public Service
- Laura Haney, American Red Cross
- Laura Magstadt, Eagle River Memorial Hospital

Discussions with those in attendance revolved around sheltering needs across the County, particularly with warming and cooling capacity. Power outages and the principle problem of trees down on the lines was also discussed at length. One suggestion was to set up a system where county and local personnel operating in the field could communicate back to utilities where trees were encroaching on power lines. One scientific approach was to use the vast forestry resources and knowledge base within the County to local tree growth

expectations to plan trimming activities to enhance the efforts already being taken.

### **PUBLIC REVIEW PROCESS AND PLAN ADOPTION**

Opportunities for public comment were provided to review the Plan during the drafting stage and prior to Plan approval. See APPENDIX A for copies of public meeting notices. A copy of draft Plan elements were made available on the Internet during the planning process. Links that open an email submission form to the County Emergency Management Director or NCWRPC Staff were provided for questions or comments. The final Plan document will remain on the Internet until the next draft update is posted for review. The public can continue to submit questions or comments at any time via the email link. (See Contact Information, below, for web addresses.)

County Law Enforcement & Emergency Management Committee meetings are always open to the public (unless entering into legal closed session), and the public can bring questions or comments regarding this Plan Update to any regular meeting. Meeting schedules can be obtained by checking the County website, contacting the County Clerk's Office or the Emergency Management Director (see Contact Information, below).

A public informational meeting on the draft update was held at the Arbor Vitae Community Center on June 26, 2012. Notice was published in the local newspaper. Unfortunately, no members of the public chose to attend this meeting. In addition, no comments were received via U.S. Mail or email as a result of this meeting.

The County Law Enforcement & Emergency Management Committee as well as the Local Emergency Planning Committee (LEPC) will review the Plan prior to forwarding it to County Board for approval. Following these open, public meetings, the Plan will be forwarded to the County Board for final adoption. The adopting resolution will be included in APPENDIX B along with details on any plan changes resulting from Committee and/or County Board action.

Each incorporated municipality was asked to adopt the Plan for its jurisdiction at their own properly posted and open public meeting, see APPENDIX B for the local units' resolutions of adoption.

### **INCORPORATED PLANS, STUDIES, REPORTS AND TECHNICAL DATA**

Many plans, reports, and technical data sources were referenced and incorporated into the Vilas County All Hazards Mitigation Plan. These sources include but are not necessarily limited to the following:

Wisconsin Department of Natural Resources, North Central Wisconsin Regional Planning Commission and Vilas County geographic information system databases provided much of the base data for the mapping and analysis within

the Plan. Statistical reports and data from the US Census and Wisconsin Departments of Administration, Revenue and Workforce Development were used for the demographic background in Part 2 of this Plan. Land use data in Part 2 was obtained from the Vilas County Comprehensive Plan.

Wisconsin Department of Natural Resources Wetlands Inventory and Dams Database were used to identify and map wetlands and dams within the County for Maps 2 and 3 in Part 2 and Table 14 in Part 3. WDNR revised flood zone maps for Vilas County provided the mapping of 100-year floodplain areas, Map 4 in Part 2, for flooding risk assessment, Map 11 in Part 3.

NOAA National Climatic Data Center severe weather event data was used extensively for the risk assessment in Part 3. The wildfire section of the risk assessment was based on the Wisconsin Department of Natural Resources' fire occurrence database and statewide Communities At Risk (CAR) assessment.

Other plans, reports, and documents were reviewed by staff during the planning process including but not limited to the State of Wisconsin Hazard Mitigation Plan; the Hazard Analysis for the State of Wisconsin, the Wisconsin Repetitive Loss Report, the Vilas County Zoning Ordinance, the Vilas County Land and Water Resource Management Plan, and the Vilas County Vilas County Emergency Operations Plan. Although these may not have been directly incorporated, the review provided valuable insight and direction to the planning process.

### **CONTACT INFORMATION**

Questions or comments related to this Plan Update can be directed to the County Emergency Management Director at any time. For more information contact:

James Galloway, Director  
Vilas County Emergency Management  
330 Court Street  
Eagle River, WI 54521

715-479-3690

jagall@co.vilas.wi.us

### **Go to:**

<http://www.co.vilas.wi.us/emergov.html>  
<http://www.ncwrpc.org/vilas/vilashzdplan.html>  
<http://emergencymanagement.wi.gov/mitigation/default.asp>  
<http://www.fema.gov/government/mitigation.shtm>

**INTRODUCTION**

Part II of the Vilas County All-Hazards Mitigation Plan provides general geographical information on Vilas County including demographic and economic characteristics. The general development patterns of the County are described in terms of current land use and future development trends.

In addition to developing an understanding of the planning area, this chapter represents the beginning stages of assessing vulnerability by inventorying the numbers, types and values of existing buildings, infrastructure and critical facilities within each participating jurisdiction in the planning area. This overall summary of each jurisdiction's vulnerability to hazards describes the potential impact on the community.

Land use and development trends are analyzed to project the number and type of potential future buildings, infrastructure and critical facilities within each jurisdiction so that mitigation options can be considered in future land use decisions.

The resulting information is an important element of the planning process, since sound alternative mitigation strategies cannot be formulated and evaluated without an in-depth knowledge of the relevant conditions in the study area.

**GENERAL GEOGRAPHY****LOCATION**

Vilas County is located in north central Wisconsin (See Map 1) and is bounded by Iron and Price Counties on the west, Oneida County on the south, Forest County on the east and the Upper Peninsula of Michigan on the North. Vilas County lies 292 miles north of Milwaukee; 149 miles northeast of Green Bay; 86 miles north of Wausau and 224 miles north of Madison. Major metropolitan areas outside of Wisconsin with transportation linkages to Vilas County are Chicago, 364 miles southeast; Minneapolis-St. Paul, 266 miles southwest; and Duluth, 184 miles northwest.

The largest incorporated area is the City of Eagle River in the southeast corner. There are also a number of unincorporated "villages" within the County including: Arbor Vitae, Boulder Junction, Conover, Lac Du Flambeau, Land O' Lakes, Manitowish Waters, Phelps, Presque Isle, Sayner, Star Lake, St Germain, and Winchester which are distinguishable by their downtown-like business districts. The County is also home to the majority of the Tribal lands of the Lac du Flambeau Band of Lake Superior Chippewa Indians

**CIVIL DIVISIONS**

There are 15 municipalities (14 towns and 1 city) and one Tribal Nation in the Vilas County planning area. The City of Eagle River is the County Seat. These

units of government provide the basic structure of the decision-making framework. The County has a total surface area of 1,018 square miles, of which about 14.9 % is water. The area and proportion of the County within each civil division is presented in Table 1. Lac Du Flambeau Tribal lands cover approximately 172 square miles between Vilas, Oneida and Iron Counties

Municipality	Area in square miles			Area as % of County
	Water area	Land area	Total area	
Arbor Vitae town	8.69	62.57	71.26	7.0%
Boulder Junction town	18.47	81.92	100.39	9.9%
Cloverland town	3.80	31.38	35.19	3.6%
Conover town	7.21	79.97	87.18	8.6%
Lac du Flambeau town	27.40	100.30	127.71	12.5%
Land O'Lakes town	12.23	83.08	95.31	9.4%
Lincoln town	4.60	32.56	37.16	3.7%
Manitowish Waters town	6.08	30.35	36.43	3.6%
Phelps town	13.96	94.86	108.82	10.7%
Plum Lake town	11.13	88.93	100.03	9.8%
Presque Isle town	12.73	61.71	74.44	7.3%
St. Germain town	6.04	34.00	40.04	3.9%
Washington town	6.15	41.40	47.55	4.7%
Winchester town	5.47	48.13	53.60	5.3%
Eagle River city	0.18	2.55	2.73	0.03%
Vilas County	144.14	873.71	1017.84	100%

Source: U.S. Census and NCWRPC

**TOPOGRAPHY**

Vilas County is in the Northern Highlands area of Wisconsin. This area has some of the highest elevations in the state, ranging from about 1,560 feet above sea level along Squaw Creek in the southwest corner of the County to 1,845 feet at Muskellunge Hill. Relief is low.

The County has a diverse landscape ranging from broad, nearly level glacial outwash plains to rough, broken glacial moraines and areas of pitted outwash. The County has three major areas with distinct physical characteristics. An area of drumlins and ground moraines is in the eastern part of the County. Its



topography is characterized by low, smoothly rounded, elongated, and oval ridges that are nearly level to moderately steep and area interspersed with long, narrow drainageways.

The Winger Moraine, a major end moraine that is predominantly undulating to steep, extends across the northwestern part of the County. This end moraine is rough and broken. It is characterized by short, steep slopes and ridges and by numerous wet depressions, most of which have no outlets.

Outside of the moraine areas lies an outwash plain. Much of the outwash is pitted, resulting in a rolling or hilly topography with many enclosed basins and depressions. Large sand flats are in scattered areas on this outwash plain. The communities of Eagle River, Manitowish Waters, Conover, St. Germain and Boulder Junction are on these flats. The sand flats north of Conover, the ones south of Eagle River and the ones between Manitowish Waters and Lac du Flambeau are characterized by low relief. In some areas, these flats are pitted with depressions. Several small end moraines and drumlins also are in scattered areas on the outwash plain.

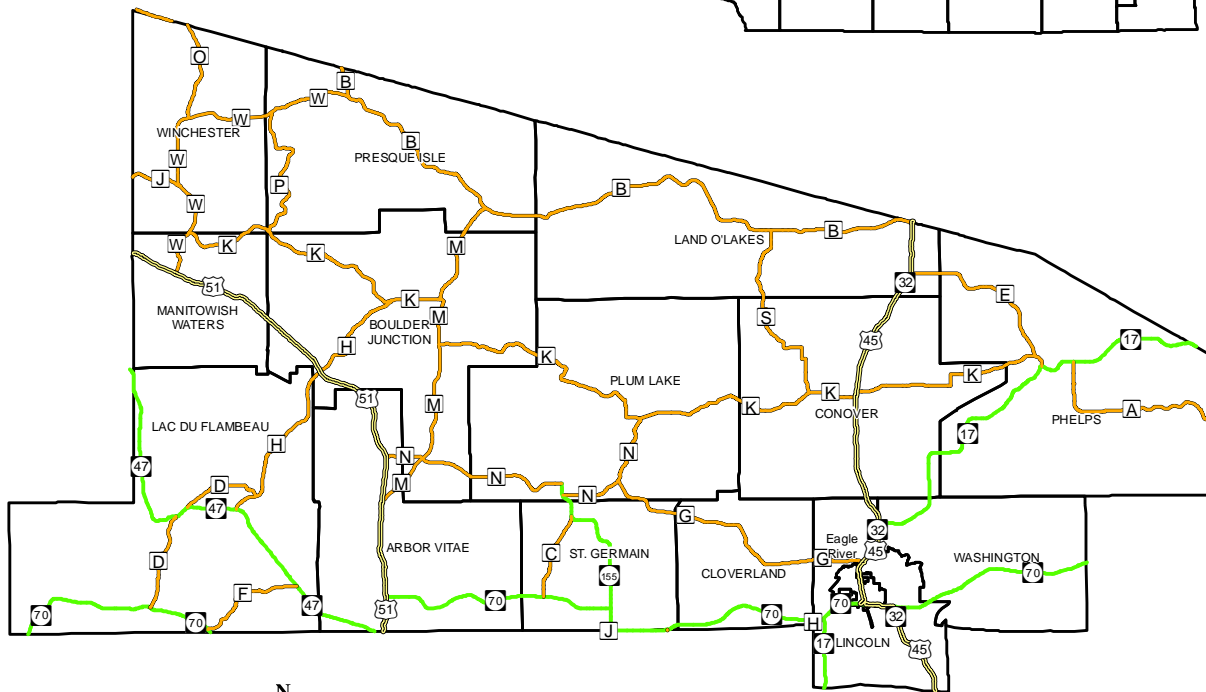
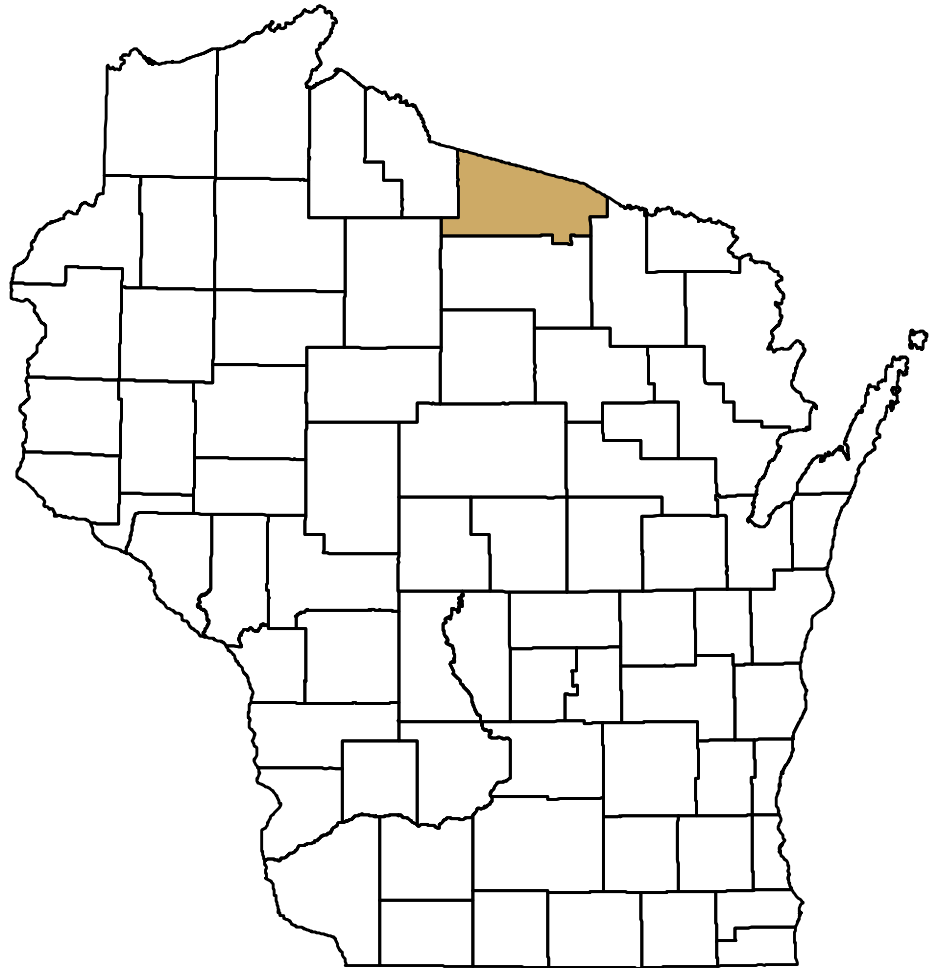
## **CLIMATE**

Winters in Vilas County are very cold. Summers are short and fairly warm. A short freeze-free period in summer limits cropping to forage and small grain crops and to adapted vegetables. Precipitation is fairly well distributed throughout the year. It is highest in summer. Snow covers the ground during much of the period from late fall through early spring.

In winter, the average temperature is 13 degrees, and the average daily minimum temperature is 3 degrees. In summer, the average temperature is 64 degrees, and the average daily high is 75 degrees. Total annual precipitation is about 34 inches, of which about 25 inches, or more than 70%, usually falls in April through September. Thunderstorms occur on about 34 days each year.

The average seasonal snowfall is about 85 inches. On the average, 87 days of the year have at least 1 inch of snow on the ground, but the number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 60%. Humidity is higher at night, and the average at dawn is about 80%. The sun shines 60% of the time possible in summer and 80% in winter. The prevailing wind is from the west-northwest. Average windspeed is highest in spring at 13 miles per hour.



Source: WIDNR, NCWRPC  
 This map 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. NCWRPC is not responsible for any inaccuracies herein contained.



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**DEMOGRAPHIC AND ECONOMIC PROFILE****POPULATION AND HOUSEHOLDS**

The 2010 US Census for Vilas County shows a population of 21,430 people for the County. This represents a nearly 2% increase over the 2000 Census reported population of 21,033 people. Since 1990, the population of Vilas County has increased by 21% or by 3,723 people. Vilas has outpaced most of its neighbors but not the overall state average (refer to Table 2). If the growth rate continues at the current level, there will be approximately 21,837 people in Vilas County in 2020, and 22,252 people in 2030.

<b>County</b>	<b>2000</b>	<b>2010</b>	<b># Change</b>	<b>% Change</b>
Vilas	21,033	21,430	397	1.9
Forest	10,024	9,304	-720	-7.2
Iron	6,861	5,916	-945	-13.8
Oneida	36,776	35,998	-778	-2.1
Price	15,822	14,159	-1663	-10.5
Wisconsin	5,363,675	5,686,986	323,311	6.0

*Source: U.S. Census, WisDOA and NCWRPC*

Within Vilas itself, the overall population growth was provided by half of the towns in the County (refer to Table 3). The other half of the towns and the City of Eagle River show a loss of population like the neighboring counties. Wisconsin Applied Population Lab reports indicate that this decline in population is part of a larger pattern of rural population loss across the Midwest. In Wisconsin, the northern counties were the most affected and two of Vilas' neighbors, Iron and Price, in the top three. One big factor was the experiencing more deaths than births in these areas. In addition, young people are tending to move out of more rural areas for multiple reasons including: job opportunities, educational opportunities, the excitement of city-life, and desire for diversity and cultural amenities.

Between 2000 and 2010, the most significant growth occurred in the Town of Presque Isle with a 20.5% increase. The Town of Lac du Flambeau was second with a 14.5% increase equating to an additional 437 people. Also notable was Cloverland with a 12% increase. Significant losses were experienced by the Town of Winchester down 15.6%, Manitowish Waters down 12.4% and Phelps down 11.1%. The City of Eagle River also exhibited a decline of about 3%.

Population concentrations and trends are important when prioritizing hazard mitigation strategies. Eagle River is the most densely populated and developed area in the County. Other areas of population concentrations include the Towns

of Lincoln, St. Germain and Arbor Vitae. Map 2 shows areas of residential population concentrations in the County. Overall population density of the County is 25 persons-per-square-mile and ranges from a high of 548 in the City of Eagle River to a low of 5.5 in the Town of Plum Lake.

MINOR CIVIL DIVISION	2000	2000	2010	2010	% '00-'10	% '00-'10
	Population	Households	Population	Households	Population	Households
Arbor Vitae Town	3,153	1,373	3,316	1,501	5.2%	9.3%
Boulder Junction Town	958	445	933	441	-2.6%	-0.9%
Cloverland Town	919	416	1,029	470	12.0%	13.0%
Conover Town	1,137	483	1,235	574	8.6%	18.8%
Lac du Flambeau Town	3,004	1,093	3,441	1,269	14.5%	16.1%
Land O'Lakes Town	882	412	861	433	-2.4%	5.1%
Lincoln Town	2,579	1,111	2,423	1,102	-6.0%	-0.8%
Manitowish Waters Town	646	301	566	285	-12.4%	-5.3%
Phelps Town	1,350	560	1,200	544	-11.1%	-2.9%
Plum Lake Town	486	221	491	235	1.0%	6.3%
Presque Isle Town	513	241	618	298	20.5%	23.7%
St. Germain Town	1,932	887	2,085	953	7.9%	7.4%
Washington Town	1,577	683	1,451	679	-8.0%	-0.6%
Winchester Town	454	214	383	190	-15.6%	-11.2%
Eagle River City	1,443	626	1,398	684	-3.1%	9.3%
<b>County Total</b>	<b>21,033</b>	<b>9,066</b>	<b>21,430</b>	<b>9,658</b>	<b>1.9%</b>	<b>6.5%</b>

Source: U.S. Census, WisDOA and NCWRPC

According to the Wisconsin Department of Workforce Development the average age of residents in Vilas County is 46.8, placing it in the top five oldest populations in the State. By 2020 it is anticipated that the average age of County residents will be 49.2 and 51.0 by 2030. This puts the County's average age well above the expected state average of 39.6 years in 2020 and 41.0 in 2030.

### SEASONAL POPULATION

In addition to the regular full-time resident population, Vilas County is known as a popular tourist destination. This is reflected in the make-up of its housing stock where 57% of all housing units have been identified as seasonal/recreational. The impact of this seasonal population cannot be overlooked when planning for hazards. Table 4 shows estimated seasonal residents by municipality. Determining when and for how long these seasonal residents will be in the County is problematic, but the numbers give some indication of what weekend or other peak period population levels might be.

Table 4: Estimated Seasonal Population in Vilas County

	2007 Estimates	Accommodations		Campgrounds**			Second (Seasonal)+			Total	% Year- Round Pop.	% Seasonal Pop.
		Rooms	X 2.2 Persons	Sites	X 3.5 Persons	Homes	X 4 Persons	Day Visitors				
Arbor Vitae	3,345	411	904	796	2,786	1,039	4,156	800	<b>11,991</b>	28%	72%	
Boulder Junction	1,019	497	1,093	300	1,050	977	3,908	500	<b>7,570</b>	14%	86%	
Cloverland	1,030		0		0	569	2,276	---	<b>3,306</b>	32%	68%	
Conover	1,256	197	433	101	354	1,028	4,112	400	<b>6,555</b>	20%	80%	
C. Eagle River	1,512	1,114	2,451	341	1,194	50	200	1,000	<b>6,356</b>	24%	76%	
Lac du Flambeau	3,250	377	829	121	424	1,974	7,896	500	<b>12,899</b>	26%	74%	
Land O' Lakes	951	278	612	91	319	940	3,760	500	<b>6,141</b>	16%	84%	
Lincoln	2,765		0		0	742	2,968	---	<b>5,733</b>	49%	51%	
Manitowish Waters	698	285	627		0	836	3,344	400	<b>5,069</b>	14%	86%	
Phelps	1,475	227	499		0	1,091	4,364	400	<b>6,738</b>	22%	78%	
Plum Lake	537	156	343	60	210	592	2,368	400	<b>3,858</b>	14%	86%	
Presque Isle	610	148	326	24	84	1,106	4,424	300	<b>5,744</b>	11%	89%	
St. Germain	2,026	984	2,165	162	567	1,218	4,872	500	<b>10,130</b>	20%	80%	
Washington	1,566				0	1,096	4,384	---	<b>5,950</b>	27%	73%	
Winchester	505	54	119	35	123	618	2,472	300	<b>3,518</b>	15%	85%	
Fed/State/Co. Campgrounds				1,082	3,787				<b>3,787</b>		100%	
<b>Vilas Co. Total</b>	<b>22,545</b>	<b>4,728</b>	<b>10,402</b>	<b>3,113</b>	<b>10,896</b>	<b>13,876</b>	<b>55,504</b>	<b>6,000</b>	<b>105,346</b>	<b>22%</b>	<b>78%</b>	

\* Accommodations, Campgrounds, and Day Visitors for Cloverland, Lincoln, and Washington are included in the Eagle River figures.

\*\* Does not include Residential Campground Units.

+ Seasonal homes includes seasonal, recreational, or occasional use housing units from the U.S. Census Bureau, Census 2000.

Source: Vilas County Comprehensive Plan

Another component of the seasonal population includes short-term accommodations such as campgrounds or hotel-style lodging. The scope of this plan did not provide for a detailed inventory of accommodations; however the County Comprehensive Plan did identify 4,728 rooms (ie hotel/motel rental type accommodations) and 3,113 campground sites available around the County. The plan also estimated peak seasonal populations associated with these at 10,402 persons for rooms and 10,896 for campgrounds as well as another 6,000 day-visitors.

### **EMPLOYMENT**

The leisure & hospitality sector has the highest number of employees in Vilas County at about 1,957 or 23.4% of total employment in 2008. Within the leisure & hospitality sector are two prominent sub-sectors: food service & drinking places and food & beverage stores. With the extent of lakes and recreation land, Vilas County is a popular tourist destination, creating more demand for restaurants, bars and hotels. Although food service is the second highest industry sub-sector, none of these employers appear on the list of top employers in the County (refer to Table 5) as jobs in food service and drinking places tend to be seasonal with many part-time positions. The food & beverage stores subsector is represented by Trigs and Pick'n Save.

Trade, Transportation & Utilities includes such operations as gasoline stations, wholesale food suppliers and novelty shops that also often depend on seasonal tourism is the second leading sector in Vilas County with 1,579 or 19.1% of total employment

Public Administration includes the executive, legislative and general government industry sub-sector provides about 1,316 jobs or 15.9% of total employment in Vilas County. It is not unusual for government to be a high sector of employment in small rural counties, but in Vilas all employment with the Lac du Flambeau Nation is included. This includes not only tribal administration, but also gaming operation, retail stores, and other businesses owned and operated by the Tribe, making them the top employer in the County. Vilas County government itself is the third largest employer in the County.

Education & health is a major employment sector in the County with about 1,204 positions or 14.5% of total employment. The Education sub-sector is well represented on the top employers list with Northland Pines Schools at number two as well as Lac du Flambeau public school, Woodruff-Arbor Vitae School and Conserve School Corporation. As a result of the demand for health services generated by the County's aging population, health services are also a large source of employment with two major facilities among the top employers in the County: Howard Young Medical Group and Aspirus Lillian Kerr Healthcare.

<b>Company</b>	<b>Product or Service</b>	<b>Size</b>	<b>Location</b>
Lac du Flambeau Band of Lake Superior	Tribal governments	500-999	Various locations
Northland Pines Schools	Elementary & secondary schools	250-499	Various locations
County of Vilas	Executive & legislative offices, combined	100-249	Various locations
Trig's Food & Drug Store	Supermarkets & other grocery stores	100-249	Eagle River
Lac du Flambeau Public School	Elementary & secondary schools	100-249	Lac du Flambeau
Howard Young Medical Group	General medical & surgical hospitals	100-249	Various locations
Aspirus Lillian Kerr Healthcare	Nursing care facilities	50-99	Phelps
JT #1 Woodruff Arbor Vitae School	Elementary & Secondary schools	50-99	Arbor Vitae
Pick'n Save	Supermarkets & other grocery stores	50-99	Eagle River
Conserve School Corporation	Elementary & secondary schools	50-99	Land O' Lakes town

Source: WisDWD

Identifying locations of large employment is important when prioritizing hazard mitigation strategies. Analyzing employment sectors within the County confirms Eagle River and Lac du Flambeau as the primary employment and service hubs in the County, however, many of the unincorporated "places" like Arbor Vitae and Phelps are also significant employment centers.

In addition to the seasonal swells in employment, the number of people working in a given locality fluctuates on a daily basis. The county is a net exporter of labor. In other words, the County has fewer local jobs than residents who work. Over 23 % of the County's workforce enters from other counties while about 28.7 % of working residents travel to work outside the county. It is difficult to predict the long-term effect of the recent downturn in the economy on the local employment picture.

**LAND USE/LAND COVER AND DEVELOPMENT PATTERNS**

Land use is an important determinant in the potential impact a particular hazard may have, and in action which may be taken to mitigate the hazard impacts. An understanding of the amount, type, and spatial distribution of urban and rural

land uses within the County is an important consideration in the development of a sound hazard mitigation plan.

The Vilas County Comprehensive Plan has categorized land use in Vilas County into classifications. Aerial photos were used to digitize a land use Geographic Information System (GIS) coverage. Map 2 shows the land use and development concentrations in Vilas County. Table 6 shows the acreage and percent of each classification.

### **AGRICULTURE**

Very little productive agricultural land exists within Vilas County in terms of traditional agriculture and production of cash crops. In fact, such uses comprise less than 1% of the county's total land uses. The Town of Washington has the largest area of tillable land in the county. Sandy soils and a limited growing season make cash cropping very difficult. However, cranberry operations in the Town of Manitowish Waters have been a very strong agricultural component in terms of production and for generating tourism.

### **COMMERCIAL (BUSINESS)**

Commercial uses are found throughout the county. In all less than 1% of the county's land is in this use. Commercial uses include hotels, motels, and resorts which are located throughout the county, particularly along lakeshores. It also includes commercial developments located along highways, such as gas/service stations, gift shops, restaurants, etc. Other commercial uses include those uses which provide goods and services required by both year-round and seasonal populations such as grocery stores, medical facilities, banks, etc.

There are several small communities with concentrations of development, including a mix of residential and commercial, with the largest being the City of Eagle River. There is concentrated commercial in the form of local downtown areas in several towns such as Boulder Junction, Manitowish Waters, St. Germain, Phelps, Presque Isle, Sayner, and Land O' Lakes to name a few. The downtown areas play a large role in Vilas County's community character and northwoods aesthetic. Most of the local business activity is located along the road system, scattered throughout the county. Higher concentrations of commercial uses exist along the state and federal highways, including STH 70, USH 45, and STH 51. Much of the local business activity is home-based, and consists of local trade, service, and retail.

### **GOVERNMENT/PUBLIC/INSTITUTIONAL**

Such uses are comprised of lands used for public schools, cemeteries, airfields, active and closed landfill sites, transfer stations/recycling sites, public facility and service buildings (i.e., municipal buildings, community centers), and provision of community utilities and services such as power, gas, and telephone.



<b>General Category</b>	<b>Acres</b>	<b>Percent</b>
Agriculture	4,415	0.68%
Commercial	3,331	0.51%
Industrial (includes quarries)	1,844	0.28%
Governmental/Public/Institutional	1,144	0.18%
Open Lands	1,636	0.25%
Outdoor Recreation	1,846	0.28%
Residential	37,063	5.69%
Transportation	6,447	0.99%
Woodlands	496,175	76.23%
Water	97,015	14.90%
<b>Total Acres</b>	<b>650,916</b>	<b>100.0%</b>

Source: Vilas County Comprehensive Plan, 2009

**INDUSTRIAL**

Industrial uses in Vilas County are very low and comprise less than 1% of the county’s total existing land use. The majority (70%) of industrial uses in the county consist of active and abandoned gravel pits. Because of the desire for municipal water, sewer, fire protection, cheap land and other services, most industrial uses are typically located in incorporated municipalities, which is why the highest concentration of industrial use occurs in the City of Eagle River. Although historically industrial uses have been segregated from residential areas, certain industrial facilities may be compatible with these areas if there is an adequate buffer and protection. Because protection of the natural environment, including water, air, and forest resources is so important in Vilas County, heavy polluting industries will likely not be a part of the area’s industrial growth. The City of Eagle River does have the county’s only industrial parks.

**OPEN LANDS**

Open lands are areas that have no development and are clear of large concentrations of trees, such as open wetlands or fallow farm fields. Less than 1% percent of land is in this use.

**OUTDOOR RECREATION**

Vilas County has many areas that are dedicated for public parks and outdoor recreation. With an array of recreational resources provided from local, county, state, and federal sources, the effects of a growing population and accompanying service demands will place greater demands on the recreational facilities. Less than 1% of the county is used for parks and recreation, but that does not include the vast resources of land and outdoor recreation found in the Nicolet and

Chequamegon National Forests, the Northern Highland-American Legion State Forest, and the Vilas County Forest.

**RESIDENTIAL USES**

Residential development has consumed less than 6% of the total land in Vilas County. Residential uses are split into four categories: single family, single family with business, two-family residential, and multi-family residential. Residential development patterns can be generally characterized into four categories. These include: 1) high and low density lakeshore residential, 2) community and neighborhood concentrations, 3) remote subdivisions, and 4) rural, large-parcel forestry/residential. A majority of residential development occurs along or in close proximity to the lakeshore areas. Lakeshore development has occurred on the majority of the county's lakes which are 50 acres or greater. As the larger lakes become developed, the trend will shift the development pressure to the numerous smaller-sized lakes (less than 50 acres). Much of the lakeshore development consists of second homes and seasonal conversions to permanent housing. Scattered low-density development is occurring in many areas of Vilas County, radiating outward from the lakeshore areas. This demand is impacting land prices which have more than doubled in the past five years, and is also creating a larger market (demand) for forested land as available lakeshore property is becoming scarce and expensive.

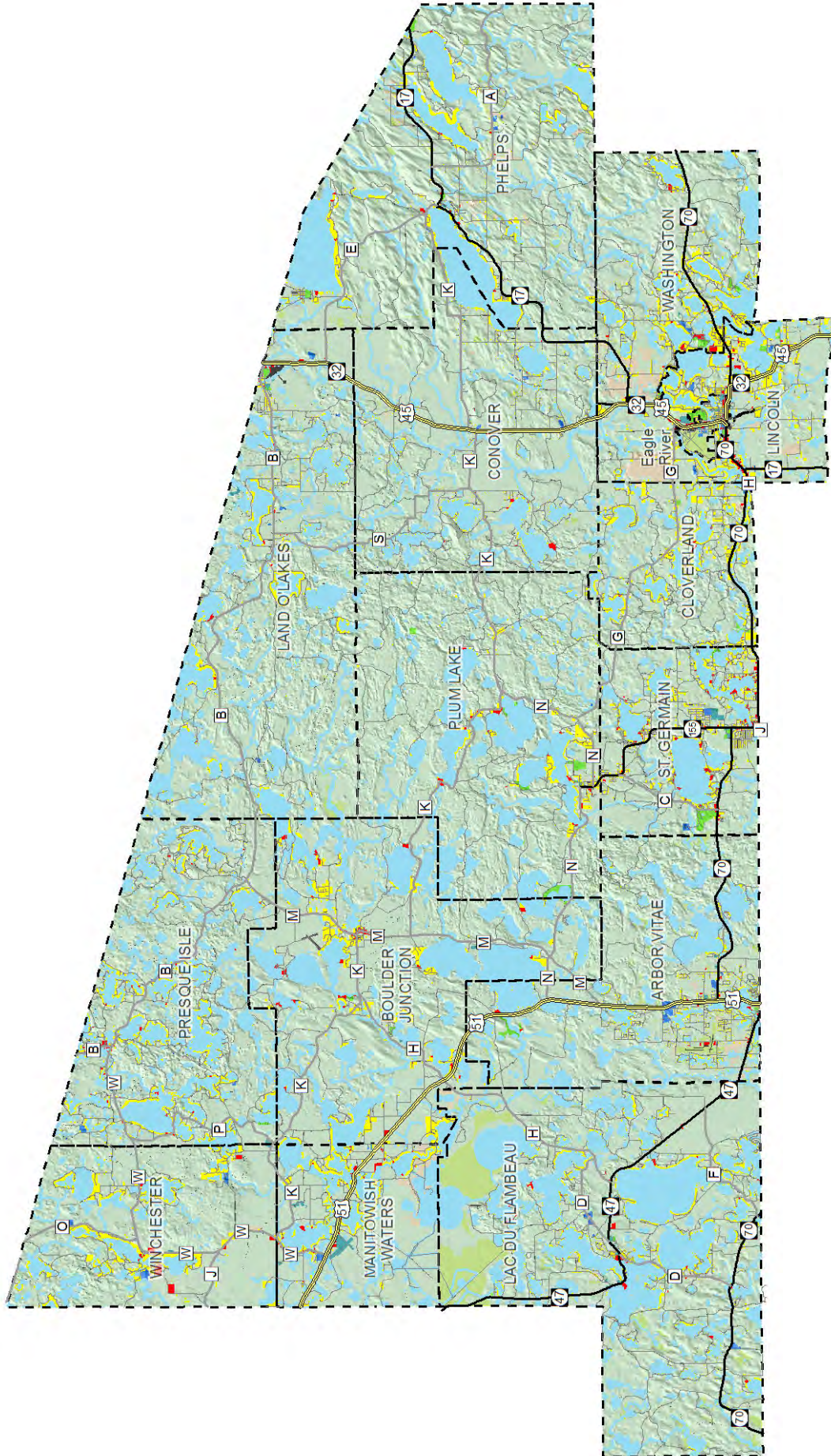
**WOODLANDS**

Over three-fourths of the county is comprised of forest land. The majority of this land in forest use is owned and managed by public entities including the U.S. Forest Service, Wisconsin Department of Natural Resources, and the Vilas County Forestry Department. Much of this land is heavily used for recreation and for commercial timber production.

These areas are not only used by local residents, but also attract people from around the nation, and thus protection of these areas is important to maintaining the county's viable tourist economy. Protection of environmentally sensitive areas, such as riparian and forested habitats and floodway areas, whether on public or private land, is important for the same reason.

**SURFACE WATER**

Vilas County contains approximately 97,015 acres of surface water, including lakes, streams, and islands, which comprise approximately 14.9% of the county's total area. There are approximately 1,320 lakes in Vilas County, including 563 named lakes and 757 unnamed lakes, more than any other county in the state. There are approximately 263 lakes of 50+ acres. The largest is Trout Lake at 3,816 acres. It is also the deepest lake in the County with a maximum depth of 115 feet. There are 3,383 miles of shoreline in Vilas County. A total of 17,179 structures were identified as being located along these shorelines, resulting in an average of approximately 19.71 structures per private mile of shoreline.



- Minor Civil Divisions
- US Highways
- State Highways
- County Highways
- Local Roads
- Agriculture
- Commercial
- Governmental
- Industrial
- Open Lands
- Outdoor Recreation
- Residential
- Transportation
- Water
- Woodlands

Sources: WI DNR, 2009 Aerial Photo Interpretation, NCRWPC  
 This map 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. NCRWPC is not responsible for any inaccuracies herein contained.

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In addition to the significant number of lakes in the county there are also numerous rivers and streams, totally approximately 402 miles. The major river system which travels through Vilas County is the Wisconsin River, which originates at Lac Vieux Desert in the Town of Phelps. Because Vilas County has some of the highest elevations in the state, it is the source of other major river systems such as the Flambeau which with the Wisconsin drain to the Mississippi as well as the Brule and Menominee which flow to Lake Michigan and the Presque Isle discharging to Lake Superior.

The majority of Vilas County lies within two watersheds: the Upper Chippewa River Basin in the west/northwest and the Upper Wisconsin River Basin in the central, southern, and eastern areas. In addition, a small portion in the east is included in the Upper Green Bay Basin. Overall, 13 watersheds are included within the county either completely or partially.

Floodplains and wetlands are important subsidiary components to the surface water system as described below.

### **Floodplain**

The primary value of floodplains is their role in natural flood control. Flood plains represent areas where excess water can be accommodated whether through drainage by streams or through storage by wetlands and other natural detention/retention areas. Specific areas that will be inundated will depend upon the amount of water, the distance and speed that water travels, and the topography of the area. If uninterrupted by development, the areas shown on Map 4 as floodplains should be able to handle the severest (regional) flood, i.e. those that have a probability of occurring once every one hundred years.

There is a value in preserving and protecting these natural flood control areas from encroachment. First, by preventing development in the floodplain, the cost of building dikes, levies, or other man-made flood control devices will be saved. Second, for each structure that is constructed in a flood-prone area, that flood-prone area expands, potentially subjecting other structures originally built outside the delineated flood hazard area to the risk of flooding. Each new structure (or modification to existing) placed in the flood plain puts more life and property in danger.

Counties, cities, and villages are required to adopt reasonable and effective floodplain zoning ordinances. The requirement is found in section 87.30 of the Wisconsin Statutes and Chapter NR 116 of the Wisconsin Administrative Code. Floodplain zoning is designed to protect individuals, private property, and public investments from flood damage.

Floodplain maps for Vilas County were produced by FEMA in the 1970's using the information and technology available at that time. These maps identify areas where flooding may occur. These areas are identified by FEMA as SFHAs

(Special Flood Hazard Areas). Regulations prohibit development in the floodway, the most dangerous flood area. In other flood areas, the flood fringe, development that is built above flood levels and other wise flood-protected is allowed if it is accordance with local ordinances. For regulatory purposes, the floodplain is generally defined as land where there is a one percent chance of flooding in any year (also known as the 100 year floodplain).

A visual inspection of the areas depicted on those original FEMA maps indicates that not all of the areas are actually within the floodplain. Many of these areas are developed higher lands. Dissatisfaction with these maps is in part why the County has not yet joined the National Flood Insurance Program (NFIP). In 2010, as part of FEMA's effort to modernize the floodplain maps, the Wisconsin DNR began updating the Vilas County maps, resolving some of the discrepancies. The revised maps are scheduled to become effective on June 5, 2012. The County and City of Eagle River should reconsider entry into the NFIP based on these new maps. Note that federal lending regulations require flood insurance whether or not a community participates in the NFIP. NFIP participation reduces the cost of the insurance.

Although the new maps correct many problems from the original SFHAs and are available in modern electronic formats, they do not meet standards for DFIRM (Digital-FIRM) mapping. Vilas County is not yet scheduled for DFIRM development which requires advanced data collection and detailed studies.

For purposes of this plan, the NCWRPC downloaded the revised floodplain mapping from the County's land records database. Although unofficial, these digital files indicate there are 6,251 acres of floodplain in Vilas County, or about one percent of the area of the County. NCWRPC analysis indicates that the revised floodplain area is 1,950 acres less than the original floodplain which was about 8,201 acres.

Map 4 shows the approximate area of the revised floodplains in Vilas County. Floodplains in Vilas are generally small and floods occur only during periods of exceptionally heavy rainfall or in conjunction with snowmelt. Currently, there are no repetitive loss structures, those with multiple flood insurance claims, in Vilas County.

### **Wetlands**

Wetlands perform many indispensable roles in the function of the hydrologic cycle and local ecological systems. In terms of hazard mitigation, they act as water storage devices in times of high water. Like sponges, wetlands absorb excess water and release it back into the watershed slowly, preventing flooding and minimizing flood damage. As more impermeable surfaces are developed, this excess capacity for water runoff storage becomes increasingly important.

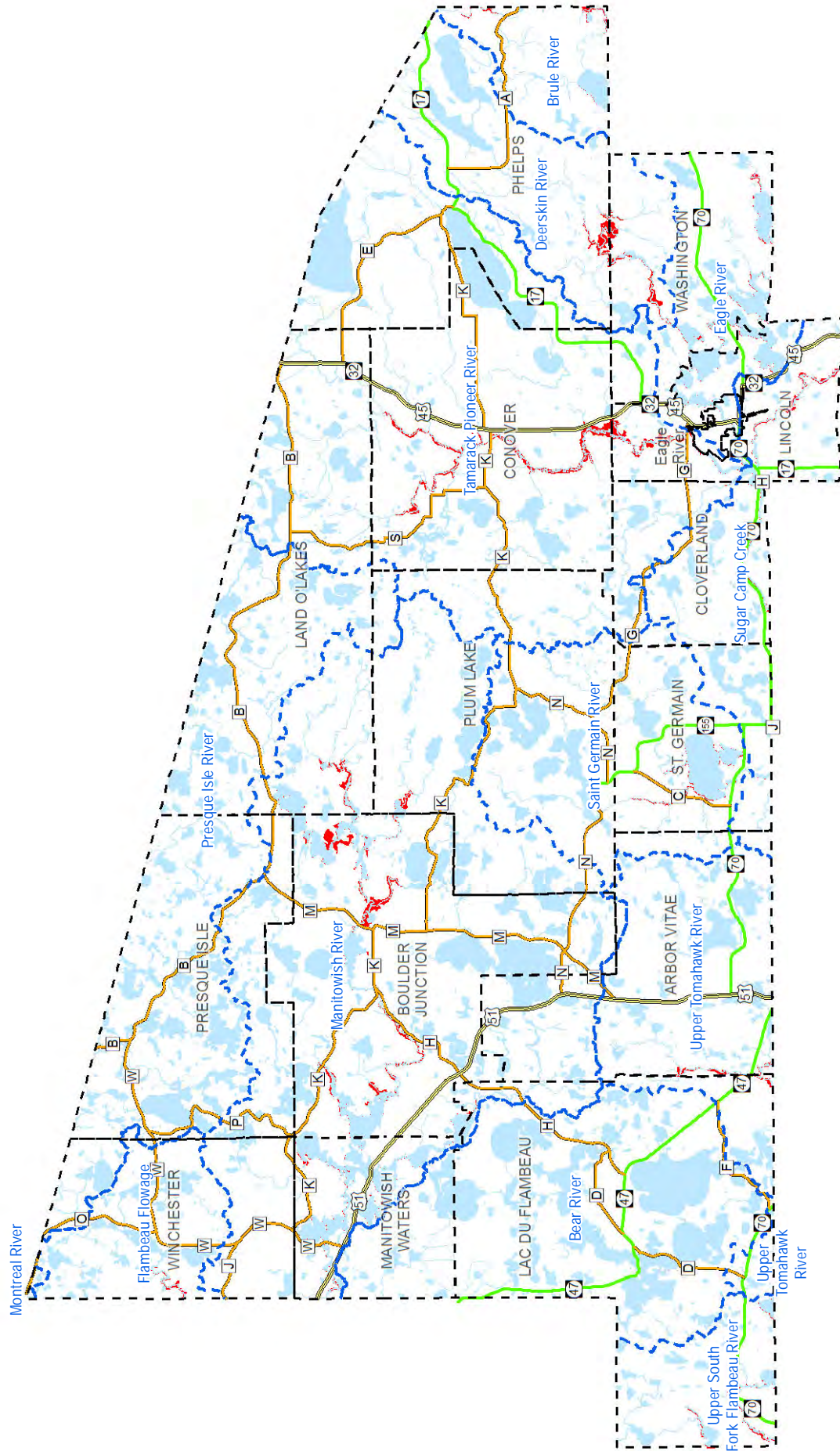
The DNR has identified the location of wetlands on their WISCLAND database. According to this, Vilas County has about 110,632 acres, or 17 percent of its total area. Map 2 shows these wetland areas in Vilas County. These wetlands include a wide variety of wetland types ranging from emergent/wet meadow to scrub/shrub, to deciduous and coniferous forested wetlands. One of the largest wetland areas in the County, at about 18 square miles, is Powell Marsh, a designated waterfowl refuge.

Eradication of wetlands can occur through the use of fill material. This can destroy the hydrological function of the site and open the area to improper development. The Wisconsin Department of Natural Resources (DNR) has promulgated minimum standards for managing wetlands.

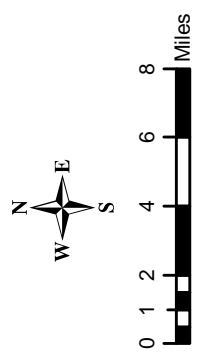


*Firefly Lake. (WDNR)*






- Minor Civil Divisions
- Watershed Boundaries
- US Highways
- State Highways
- County Highways
- Flood Way
- Water



Source: WI DNR, FEMA, NCRWPC  
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**FUTURE GROWTH AND DEVELOPMENT IN VILAS COUNTY**

Vilas County's population has increased 1.9% over the last decade (2000 to 2010) for a net gain of 397 residents. While the County continues to grow, the rate of growth has declined from the very high rates observed during the 1990's.

From a net growth perspective, residential migration into Vilas County has been solely responsible for all of its population growth because natural growth has been negative (more deaths than births). This growth pattern is reflective of an aging population and the trend in seasonal-to-permanent housing markets.

Based on the county existing land use map (Map 2), a large percentage of existing shoreline is developed on lakes 50 acres and above. The focus will move to smaller lakes and stream areas, then to the off-water parcels. In recent years, the demand for private forest land has increased dramatically. The reason for this can be primarily attributed to the decreasing available supply of waterfront property. As the amount of available waterfront property in the county declines, the demand for forest land has been increasing.

According to the current Vilas County Comprehensive Plan, development patterns can be generally characterized into four categories. These include: 1) high and low density lakeshore residential, 2) community and neighborhood concentrations, 3) remote subdivisions, and 4) rural, large-parcel forestry/residential. A majority of residential development occurs along or in close proximity to the lakeshore areas. Lakeshore development has occurred on the majority of the county's lakes which are 50 acres or greater. As the larger lakes become developed, the trend will shift the development pressure to the numerous smaller-sized lakes (less than 50 acres). Much of the lakeshore development consists of second homes and seasonal conversions to permanent housing. Scattered low-density development is occurring in many areas of Vilas County, radiating outward from the lakeshore areas. This demand is creating a larger market (demand) for forested land as available lakeshore property is developed.

Three major trends are identified in the Comprehensive Plan relative to development in the County:

- ✓ Conversion of seasonal to permanent residences will increase as the baby-boomer generation migrates northward for its retirement location.
- ✓ Waterfront development pressure and cost of shoreline property will increase as fewer lakefront properties are available.
- ✓ Large, privately-owned parcels adjacent to lakes will likely face heavy development pressure for subdivision.

The Comprehensive Plan projects overall residential land demand based on the addition of 1,209 units for year round residents, and an additional 677 units for seasonal uses. This accounts for seasonal housing making up about 56 percent of the housing stock. Combined about 1,886 new housing units (2010–2030) or about 94 per year per year will be added to the housing stock. Assuming a county wide average of about 2 acres of land needed per unit, 188 acres per year on average is expected to be needed to accommodate anticipated population growth by the year 2030.

Commercial and industrial development is subject to market forces and difficult to predict, however, the Comprehensive Plan projects future development of about 660 acres for commercial uses and about 360 acres for industrial uses over the next 20 years.

Therefore, between 2010 and 2030 based on data presented in the County Comprehensive Plan, it is anticipated that approximately 1,195 acres will be needed every five-years to support residential, commercial and industrial development demands in Vilas County. Over the twenty-year period about 4,780 acres will be needed to meet overall development demands. However, the backlog of parcels currently available will buffer the amount of "new" acreage taken for development.

New infrastructure or public facilities will be somewhat minimal as budget constraints will curtail local government ability to develop new facilities and result in a tendency to make do with existing infrastructure and delay expansion plans.

The City of Eagle River is planning sewer and water facility expansion and upgrades. The City will also be developing a new public works shop facility in the next 5 to 10 years. The Eagle River Airport is planning a new runway and associated taxi-way. The Manitowish Waters Airport is planning to rebuild and extend a runway. The Vilas County Commission on Aging will be moving into a new facility in 2012. In addition, Vilas County will need to address courthouse spaces needs within the next 20 years.

The County's population is generally older with a median age of nearly 47 years, versus statewide median age of 38 years. Over the next few decades, the residential base will become even older, aging more quickly than the state as a whole. In fact, the number of persons 60 and older will likely increase to more than 50 percent of the population by 2030. This will have implications affecting the demand for emergency services.

**PUBLIC FACILITIES AND SERVICES****TRANSPORTATION**

The transportation system of Vilas County provides the basis for movement of goods and people into, out of, through, and within the County. An efficient transportation system is essential to the sound social and economic development of the County and the Region. The analysis of transportation routes should be considered in the possible event of a disaster (See Map 5).

The principal highways serving Vilas County are (north-south) US Highways 45 & 51 and State Highway 17 and (east-west) State Highways 47 and 70 State Highways 32, 47 and 155 also serve the County. These highways link the County with neighboring communities and are vital to the County's tourism and recreation-based economy.

Networks of county trunk highways collect traffic from rural land uses. These county highways serve an important role in linking the area's recreation and timber resources to the County's major highways and population centers. Local roads provide access to local development and forest areas, as well as the County's lake areas.

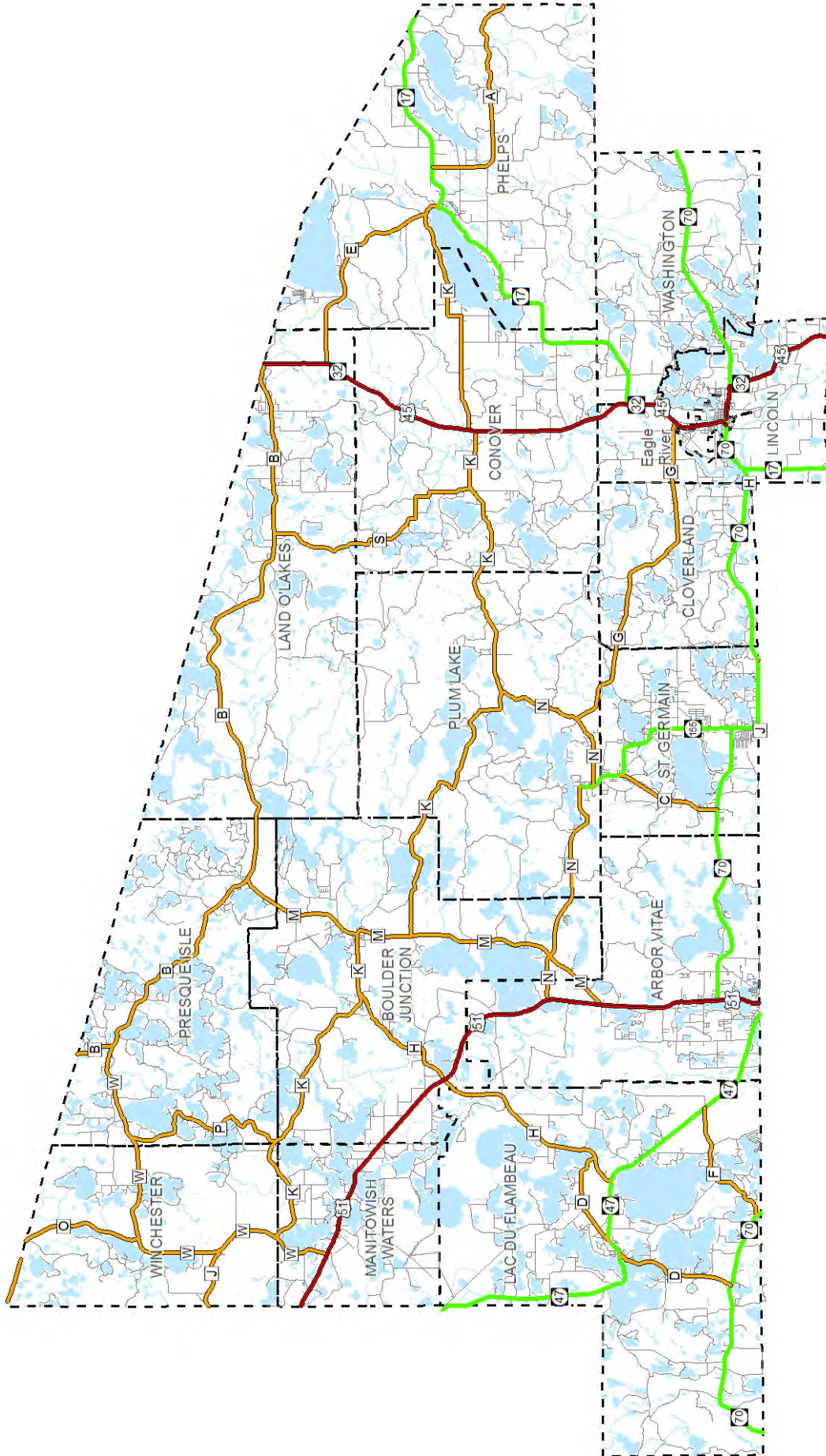
Vilas County Social Services coordinates transit services for the elderly and disabled in the County with the area tribal nations and neighboring counties. A volunteer driver network is also available.

The County does not have any rail lines within its boundaries; however, access to rail service through the Canadian National Railroad is available in Rhinelander to the south of Vilas County. The rail line runs east-west through the southern and central part of Oneida County with access in Rhinelander at the downtown rail yard, the mill and the airport industrial park.

Commercial air service is available at the Rhinelander-Vilas County Airport located approximately two miles west of the City of Rhinelander. In addition, there are a number of smaller airports serving corporate and tourism/recreation uses. These include Eagle River Union Airport, Lakeland/Noble F. Lee Memorial Airport in Arbor Vitae, Land O' Lakes Airport, Manitowish Waters Airport and Boulder Junction Airport. There are also a number of privately owned air strips in the County.

**UTILITIES**

Utility systems are important in hazard mitigation planning because of the dependency on water, wastewater treatment, gas service, electricity, and communications. Because of this reliance and vulnerability to hazards, utility systems must be identified for this Plan.



- Minor Civil Divisions
- US Highways
- State Highways
- County Highways
- Local Roads
- Airport



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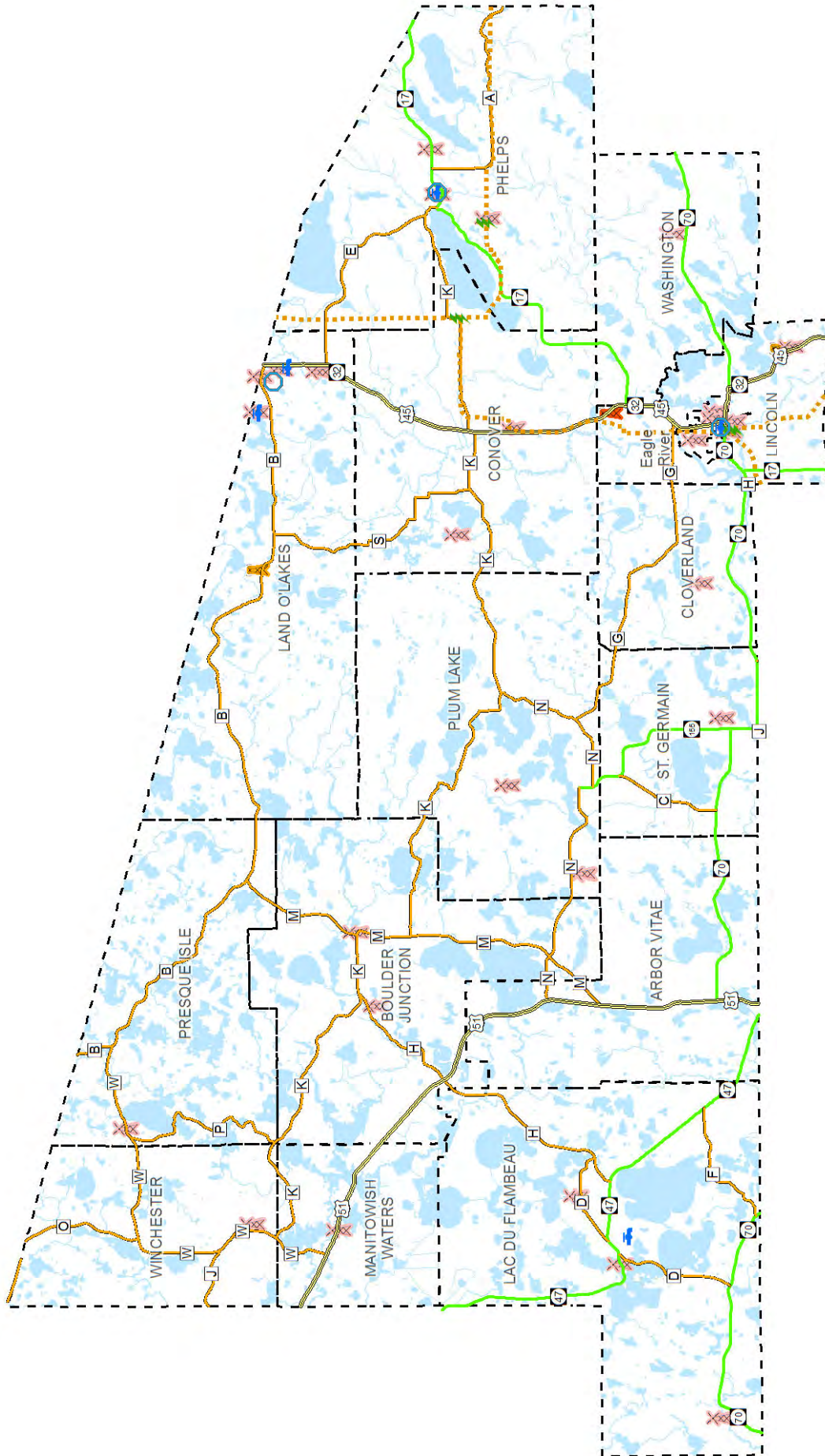
The protection of the public water supply facilities from potential contamination from hazards such as flooding is a consideration for hazard mitigation planning. Vilas County has four municipalities that manage water and waste water services through a public system. The City of Eagle River has a municipal water and sewer system that serves commercial, residential and industrial customers. Land O Lakes municipal water and sewer system services approximately 50% of the residents in Land O Lakes. The Phelps Sanitary District #1 serves 90% of the community of Phelps. The Lac du Flambeau Tribal public sewer system serves approximately 75% of the households in Lac du Flambeau including Tribal facilities.

The protection of the wastewater facilities is an important consideration for hazard mitigation planning because of its potential to contaminate nearby waterbodies in the event of high water. Also of concern during periods of flooding is the threat of damage to infrastructure and associated facilities.

Excel Energy, Wisconsin Public Service, Wisconsin Electric, and Eagle River Light & Water provide electrical service and natural gas service throughout the county. Eagle River Light and Water services the City of Eagle River and the immediate surrounding area via power purchased through Wisconsin Public Power, Inc. (WPPI). Wisconsin Electric services the northern half of the Town of Washington with electric and all of the Towns of Phelps, Conover, and Land O' Lakes with both electric and natural gas. Wisconsin Electric serves the Towns of Presque Isle, Boulder Junction, Manitowish Waters, and Winchester with gas facilities only. Wisconsin Public Service serves the remainder of the county with both gas and electric service. Gas and other petroleum pipelines are not mapped due to homeland security concerns.

The infrastructure of electric and telephone lines as well as broadband internet should be considered in the events of high wind, ice storms, tornadoes, flooding, and fire.

The primary telephone provider in the County is Frontier Communications. A number of providers offer cell phone services. Nationwide, cellular telephone systems account for about half of all 911 calls. Service coverage is based upon the handset receiving a direct line-of-sight signal from a system provider's antenna on a tower. Limitations for receiving a signal include topography and the thickness & type of building materials. Signals generally cannot travel well in dense forest cover, over tall hills, or through thick or multiple cement walls.



- Waste Water Treatment Plant
- Public Water Supply
- ✕ Communication Tower
- FM / AM / Communication Tower
- FM / Communication Tower
- - - Minor Civil Divisions
- US Highways
- State Highways
- County Highways
- ⚡ Substations
- ⋯ High Voltage Powerline



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**EMERGENCY SERVICES AND FACILITIES**

The type and location of public emergency services are an important consideration in hazard mitigation planning, because of the potential direct involvement of such facilities in certain hazard situations. Fire, EMS/ambulance, and police service areas and station locations are shown on Maps 7 and 8.

Within Vilas County, fire suppression, rescue, and emergency medical services are municipally based. There are twelve fire departments in Vilas County, all of which are staffed with volunteer personnel. All of these fire departments include rescue capabilities; nine of these fire departments provide ambulance service. Ambulance service in the City of Eagle River and the Towns of Cloverland, Lincoln, and Washington is provided by Ministry Health Care based at Eagle River Memorial Hospital. Ambulance service in the Town of Arbor Vitae is provided by Ministry Health Care based at Howard Young Medical Center.



*Eagle River Area FD. (City of Eagle River)*

However, all of these municipalities are also served by municipal first responders. The City of Eagle River and the Towns of Cloverland, Lincoln, and Washington are members of a joint fire commission and are served by the Eagle River Area Fire Department.

All fire and EMS agencies in Vilas County operate under an automatic aid agreement and have also entered mutual aid agreements on a regional basis. These mutual aid agreements include Federal fire suppression agencies, Wisconsin fire suppression agencies, and municipal fire suppression agencies located in adjoining Wisconsin and Michigan counties.

The lead law enforcement agency in Vilas County is the Vilas County Sheriff's Department. Other law enforcement agencies in the County include: the City of Eagle River Police Department, the Boulder Junction Police Department and the Lac du Flambeau Tribal Police.

The Vilas County Sheriff's Department has 33 sworn personnel, 26 civilian correctional staff and civilian telecommunications staff, five civilian law enforcement clerk staff and two part-time staff. The Department's administrative staff includes a chief deputy, an operations captain, a jail administrator, and four lieutenants. The remainder of the department consists of five detective sergeants, 21 full-time deputies, 16 correctional officers, 10 telecommunication officers, and four full-time law enforcement clerks.

The Tribe has its own Police Department that includes 10 full-time officers and is dispatched through the Vilas County Sheriff's Department Communication Center. The Tribal Police respond to calls on reservation lands in Vilas, Oneida

and Iron Counties. In Vilas County this service area covers 71,345 acres. Annually, Vilas County and the Lac du Flambeau Nation enter into an agreement financially supported by grants for shared law enforcement.

The Eagle River Police Department provides police protection to City residents. The department consists of a chief, five full-time officers and two part-time staff. Dispatching is provided for the Department through the Vilas County Sheriff's Department. The Department has a mutual aid agreement with the Sheriff's Department.

The Boulder Junction Police Department provides police protection to Town of Boulder Junction residents. The department consists of one full time officer. The Department has a mutual aid agreement with the Sheriff's Department.

To coordinate all these emergency services, Vilas County has created an Emergency Operations Plan (EOP). This provides a general overview for the County and Municipal emergency response personnel during response to a number of disasters. This document is used to coordinate the County and local units of government during times of response and recovery. It also provides a link between the County and municipal plans.

### **CRITICAL COMMUNITY FACILITIES**

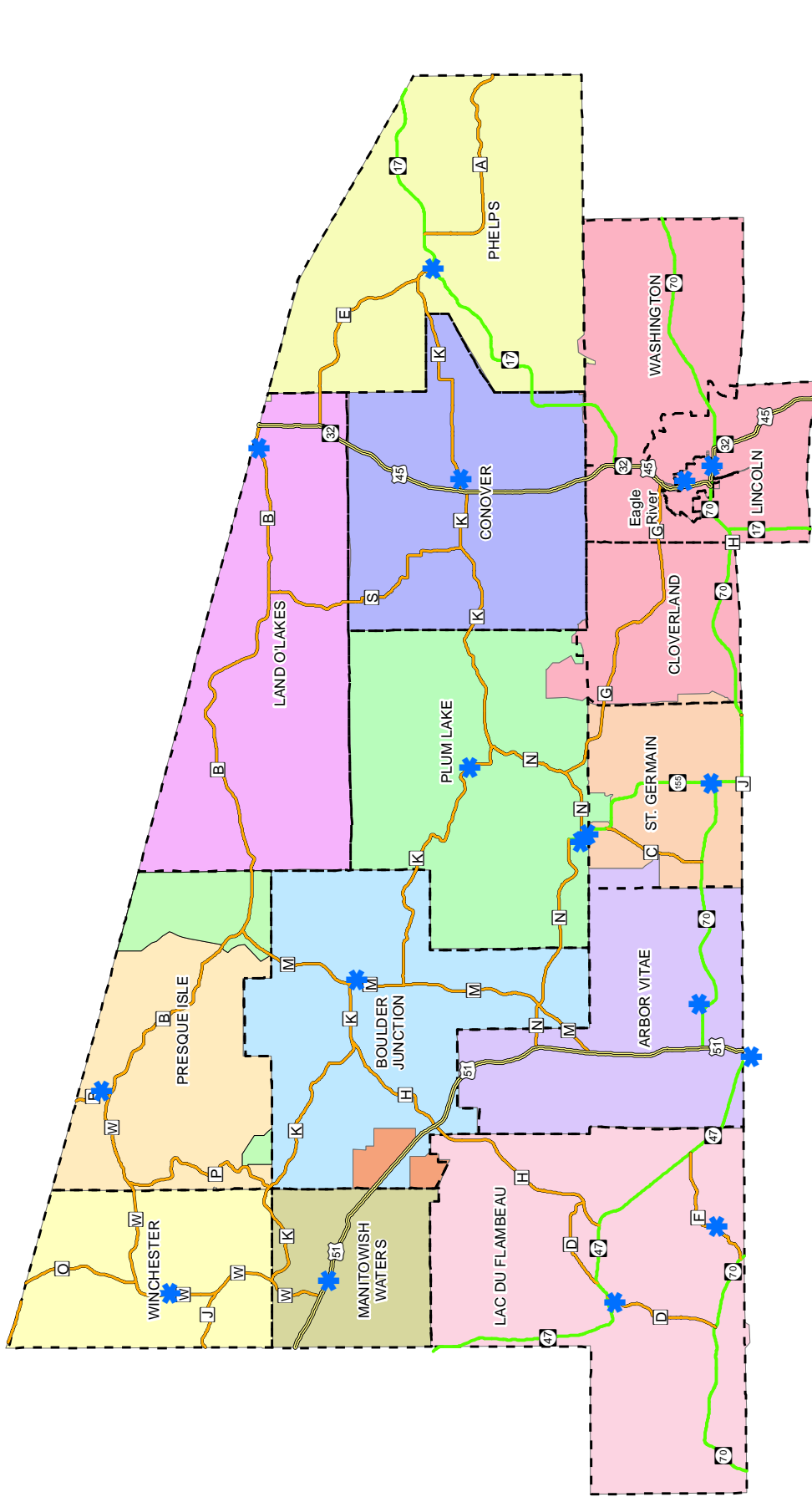
In addition to emergency service facilities, other community facilities are also important in hazard mitigation planning. Government administration buildings serve as the headquarters that link to resources in helping solve potential problems. Hospitals are very important for knowing where injured residents have to be transported and as to how many people each hospital can handle if a hazard would breakout.

Two general medical and surgical hospitals serve Vilas County: Eagle River Memorial Hospital in the City of Eagle River, a 25-bed facility, and Howard Young Medical Center located primarily Oneida County (Arbor Vitae/Woodruff area). Clinics include Marshfield Clinic Eagle River Center, Ministry Medical Group in Eagle River and Aspirus Clinics in Land O' Lakes and Phelps.

Lillian Kerr Healthcare Center is a 64 bed skilled care facility in Phelps offering long-term nursing care, rehabilitation services and senior center in the Vilas County area. Several assisted living locations are available in Vilas County.

Nursing homes are vulnerable, because of the high level of assistance with the residents that live there. The schools are another facility that are important, since hundreds of the county's children are there for much of the year. Map 9 shows the location of selected types of critical community facilities within Vilas County.





- Eagle River FD & Ambulance
  - Lac du Flambeau FD & Ambulance
  - Land O'Lakes FD & Ambulance
  - Manitowish Waters FD & Ambulance
  - Phelps FD & Ambulance
  - Presque Isle FD & Ambulance
  - Plum Lake FD & Ambulance
  - Presque Isle FD & Ambulance
  - St Germain FD & Ambulance
  - Winchester FD & Ambulance
- Minor Civil Divisions
  - US Highways
  - State Highways
  - County Highways
  - Fire & Ambulance Locations; Ambulance Service
- Emergency Service Zones**
- Arbor Vitae FD & Howard Young Ambulance & Arbor Vitae Rescue
  - Boulder Junction & Manitowish Waters FD & Ambulance
  - Boulder Junction FD & Ambulance
  - Conover FD & Ambulance

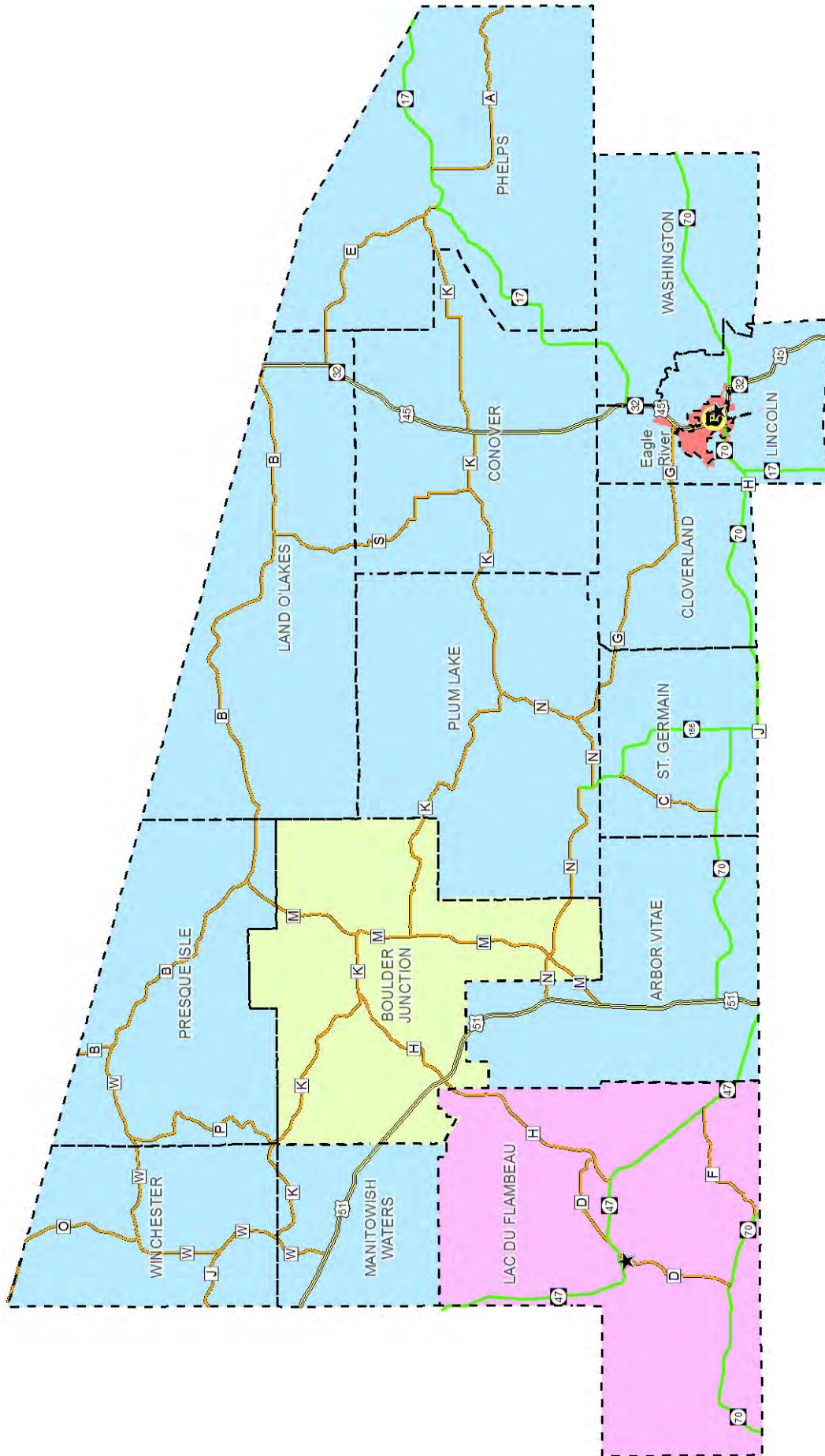


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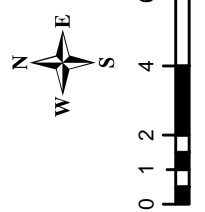
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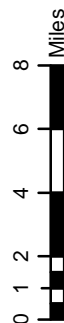
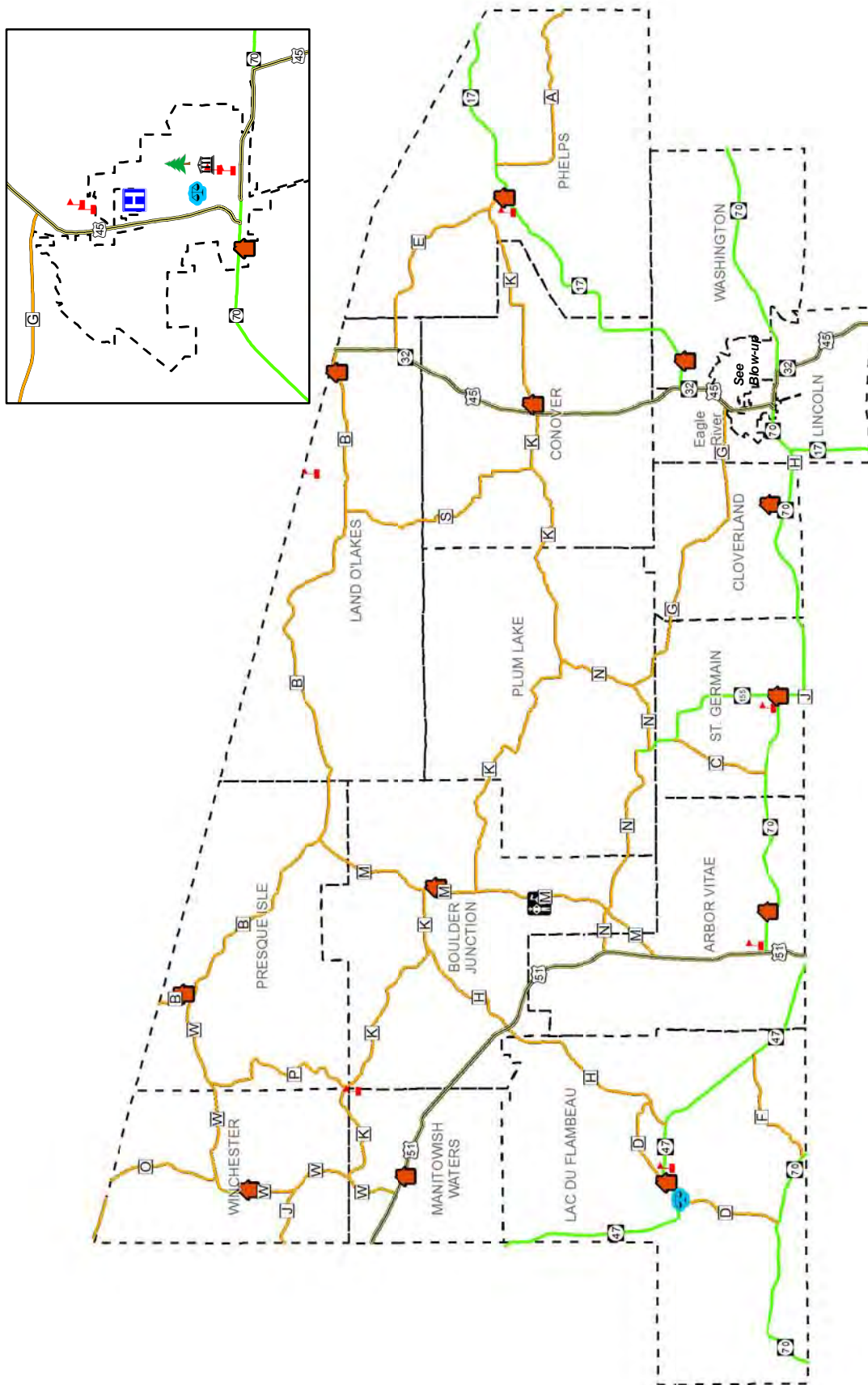
- Minor Civil Divisions
- US Highways
- State Highways
- County Highways
- P Sheriff Department
- Police Department
- Boulder Junction-Vilas County Sheriff's Dept
- Eagle River Police Dept-Vilas Co Sheriff
- Lac du Flambeau Tribal-Vilas County Sheriff's Dept
- Vilas County Sheriff's Dept



Source: WI DNR, NCWRPC, ATC  
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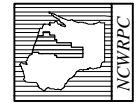
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City of Eagle River



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**INVENTORY & VALUE OF STRUCTURES/PROPERTY IN VILAS COUNTY**

The value of the real estate and personal property in a community reflects the upper end of the potential for property damages in each community. The annual equalized value of each municipality represents the Department of Revenue estimate of market value (Agricultural land is included at Use Value) of all taxable property. Property tax levies of jurisdictions are apportioned to each municipality on the basis of equalized value. Table 7 lists each municipality's total equalized values for real estate, personal property, and all property and the percent each municipality represents of the county total.

<b>Table 7 Equalized Value by Municipality</b>				
<b>Municipality</b>	<b>Real Estate</b>	<b>Personal Property</b>	<b>Total</b>	<b>% Co. Total</b>
Arbor Vitae Town	536,313,100	15,717,500	552,030,600	7.5%
Boulder Junction Town	563,336,100	3,878,400	567,214,500	7.7%
Cloverland Town	241,348,100	35,000	241,383,100	3.3%
Conover Town	411,519,400	1,559,500	413,078,900	5.6%
Lac du Flambeau Town	956,154,600	3,216,200	959,370,800	13.1%
Land O'Lakes Town	479,284,300	5,669,300	484,953,600	6.6%
Lincoln Town	529,940,200	5,628,300	535,568,500	7.3%
Manitowish Waters Town	587,642,100	1,561,600	589,203,700	8.0%
Phelps Town	426,314,500	1,903,700	428,218,200	5.8%
Plum Lake Town	285,280,600	993,100	286,273,700	3.9%
Presque Isle Town	651,843,900	553,400	652,397,300	8.9%
St. Germain Town	631,064,000	5,839,300	636,903,300	8.7%
Washington Town	517,570,200	2,039,400	519,609,600	7.1%
Winchester Town	310,814,300	386,700	311,201,000	4.2%
Eagle River City	155,677,700	11,334,400	167,012,100	2.3%
<b>County Total</b>	<b>7,284,103,100</b>	<b>60,315,800</b>	<b>7,344,418,900</b>	<b>100%</b>

Source: WisDOR, 2011

The valuation of property in a community reflects the potential for property damages across the community. However, only taxable properties are included in this valuation. Tax-exempt government properties are not included. With Vilas County owning many critical facilities that are needed in times of disaster, the potential for damages to these structures could be devastating for the county. In Table 8a, the county owned facilities are listed with the general location they are in and the value of the facilities. Estimates for local government facilities are given in Table 8b - c. Tribal facilities are included in Table 8d.

<b>Name</b>	<b>Value*</b>	<b>Location</b>
Courthouse - Justice Center	\$31,795,357	Eagle River city
Highway Department	\$2,678,609	Eagle River city
Highway Shop - Arbor Vitae	\$2,545,165	Arbor Vitae town
Highway Shop - Boulder Jct	\$1,637,017	Boulder Junction town
Forestry Office / Shop	\$628,482	Eagle River city
Fairgrounds	\$892,558	Eagle River city
Public Health Office	\$90,000	Eagle River city
Oldenburg Sports Complex	\$231,771	Cloverland town
Misc. Parks & Recreation	\$209,621	Various locations
E911 System & Towers	\$3,124,637	Various locations
Misc. Property	\$2,406,532	Various locations
<b>Total</b>	<b>\$46,239,749</b>	<b>Above locations</b>

*\*Includes insured buildings, contents, and property in the open.*

*Source: Statement of Values State of WI Local Government Property Insurance Fund.*

<b>Property</b>	<b>Value*</b>
Street Department	\$721,100
Dog Pound	\$100,000
City Parks & Rec. - various	\$776,250
Golf Course	\$1,053,020
Info Bureau - Depot	\$444,000
City Hall	\$2,100,000
Sewer & Water - various	\$3,097,577
Misc. Buildings	\$492,500
Pine Substation	\$150,000
Library	\$1,528,650
Airport	\$1,779,813
Stop Lights	\$120,000
Sundstein Substation	\$3,500,000
<b>Total</b>	<b>\$15,862,910</b>

*\*includes insured buildings, contents and property in the open.*

*Source: City of Eagle River.*

<b>Table 8c: Value of Town Owned Properties</b>		
<b>Municipality</b>	<b>Property</b>	<b>Value*</b>
Arbor Vitae town	Town Hall / Community Center	\$1,142,377
	Fire Station	\$1,297,058
	Fireman's Park	\$321,657
	Town Garage	\$789,572
	Brandy Park	\$678,232
Boulder Junction town	Town Hall / Community Center	\$1,782,889
	Fire Station	\$615,754
	Museum	\$195,667
	Misc. Recreation	\$120,212
	Maintenance Garage	\$520,240
	Recycling Center	\$102,565
Cloverland town	Town Hall	\$377,700
Conover town	Town Hall / Community Center	\$1,337,616
	Fire Department	\$601,058
	Town Garage	\$230,951
	Town Park	\$246,603
	Chamber Info Center	\$79,849
	Misc. Property	\$47,048
Lac du Flambeau town	Town Hall	\$na
	Fire Department	\$na
	Sewer and Water	\$na
Land O' Lakes town	Town Hall	\$1,484,200
	Library	\$2,271,800
	Misc. Recreation	\$659,000
	Town Garage	\$798,600
	Airport	\$938,100
	Misc. Property	\$86,400
Lincoln town	Town Hall	\$na
Manitowish Waters town	Town Hall / Community Center	\$1,301,342
	Lion's Pavilion and other recreational	\$320,342
	Town Garage and Misc. Storage	\$468,962
	Airport	\$1,185,952
	Library	\$1,328,986
Phelps town	Town Hall	\$na
Plum Lake town	Town Hall	\$4,719,100
	Town Garage/Salt Shed/Storage	"
	Library	"
	Misc Recreation & Other	"
	Fire Department	\$619,400
	Ambulance Station	\$308,400
Presque Isle town	Town Hall/ Community Cntr / Library	\$1,891,805
	Fire Department	\$733,833
	Town Garage	\$1,107,441
	Recycling Center	\$134,768
	Misc. Recreation	\$115,514
St. Germain town	Town Hall	\$na
	Fire Department	\$na
Washington town	Town Hall	\$344,900
	Town Garage	\$634,100
	Recycling Center	\$68,900
	Misc. Property	\$20,100
Winchester town	Library	\$572,480
	Park Pavillion	\$219,941
	Town Garages	\$139,818
	Emergency Services Bldg	\$526,876
	Recycling Center	\$109,664

Source: Local Gov. Insurance Policy Declarations & NCWRPC Estimates. \*includes contents & property in the open

<b>Table 8d Value of Tribal Owned Properties</b>	
<b>Name</b>	<b>Value</b>
Casino / Hotel	\$100,000,000
Tribal Police Dept.	\$500,000
Zaasijiwan Headstart	\$280,000
Cultural Center	\$3,000,000
Community Wellness Ctr	\$6,000,000
Youth Center	\$375,000
Tribal Planning & Info Ctr	\$500,000
Tribal Center	\$4,000,000
GLITC	\$500,000
Health Care Center	\$1,300,000
Family Resource Center	\$280,000
Total	\$116,735,000

Source: NCWRPC Estimates.



Vilas County Courthouse. (NCWRPC)

**INTRODUCTION**

Analyzing the hazards in a community is an important and vital step in the mitigation planning process. Before mitigation strategies can be determined, a risk assessment must be made. Part III of the Vilas County All-Hazards Mitigation Plan will focus on the following:

- Identification of all types of natural hazards that can affect Vilas County
- An analysis of the hazards identified as pertinent to Vilas County

The Hazard Analysis will consist of:

- Background Information
- History of previous occurrences of hazard events
- An analysis of the County's vulnerability to future events
- An estimate of future probability and potential losses from the hazard

**HAZARD IDENTIFICATION**

The process of identifying those hazards that should be specifically addressed in the Vilas County All-Hazards Mitigation Plan was based on consideration of a number of factors. The process included a review of past hazard events to determine the probability of future occurrences and threat to human safety and property damage.

Worksheets from the Wisconsin Guide to All-Hazards Mitigation Planning were used by the Planning Taskforce to evaluate and rank the listing of possible hazards to help identify which hazards should be included in the Plan according to threat to human safety and possible damage to property. During this discussion the County decided to add three hazards to the list, including: epidemic, hazardous materials incidents and power outage.

The resulting priority ranking of hazards accepted by the Committee is as follows:

- |  |                                  |
|--|----------------------------------|
| 1. Winter Storms/Extreme Cold                    | 6. Hazardous Materials Incidents |
| 2. Severe Thunderstorms/High Wind/Lightning/Hail |                                  |
| 3. Tornado                                       | 7. Power Outage                  |
| 4. Forest/Wild Fires                             | 8. Drought/Extreme Heat          |
| 5. Epidemic                                      | 9. Flood/Dam Failure             |

This Plan focuses on natural hazards that have or could cause disasters that can be mitigated on a local level. Technological or manmade hazards include things like transportation incidents, explosions and structural fire, civil or prison disturbances, mass casualty events, nuclear incidents, war, and terrorism. Vilas County already has action plans for these types of events, so they are not included in this planning process. Low magnitude earthquakes occur in Wisconsin every few years, but none have exceeded a magnitude of 3.9, which would have vibrations similar to the passing of a semi-truck, therefore,



earthquakes are not covered in this plan. Vilas County does not have coastal hazard issues and conditions for landslide or subsidence problems are not significant in the County.

### **HAZARD ANALYSIS**

The hazard analysis for each hazard included in this Plan is broken down into four components, as follows:

**1. Background on Hazard** - The next step after identifying a hazard is to define the hazard and give some general background behind it. This can include occurrence of the hazard within the County or State. This section may also give some indication of the risk to public health and safety and to personal and public property.

**2. History of Hazards** - Past experiences of disasters is an indication of the potential for future disasters for which Vilas County would be vulnerable. A review of past occurrences for each identified hazard in Vilas County was completed.

Some disasters have had damages that exceeded the capabilities of local communities and State agencies. Federal assistance is then requested. Federal assistance may be offered through a variety of programs. Assistance may be directed to agricultural producers, individuals and families, businesses, or local governments. There have been 4 natural disasters in Vilas where Presidential Declaration was requested from 1971-2011. They include the following:

- 1976 Drought - Emergency Declaration Approved
- 1984 Tornados - Emergency Declaration Approved
- 1999 Severe Storms/Flooding - Disaster Declaration Approved

It should be noted that this significantly underestimates the number of hazard events that have occurred in Vilas County. Almost every year there are significant weather events or disasters that cause thousands of dollars in damage for which no Federal disaster assistance is requested. Major indicators of hazard severity are the deaths, injuries, and economic losses resulting from natural hazards and disasters.

The National Oceanic and Atmospheric Administration (NOAA) and National Climatic Data Center (NCDC) publish the National Weather Service (NWS) data describing recorded weather events and resulting deaths, injuries, and damages. From January 1, 1950 to December 31, 2011, NCDC reported 353 severe weather events for Vilas County.

Note that since the earlier NCDC data is somewhat incomplete, this report focuses on the 10-year period from 2002 to 2011 for hazard analysis purposes.

Other sources of data are used to supplement the NCDC data. These sources included other plans and reports, documents from the Vilas County Emergency Management Department, past local newspaper articles, the Wisconsin Department of Natural Resources (DNR), Wisconsin Emergency Management (WEM), and the National Weather Service.

**3. Vulnerability Assessment For Hazards** - For each hazard identified, a summary of the impact that may be caused to the community is given. When possible, existing buildings, infrastructures, and critical facilities located in the hazard areas are identified. Critical facilities are community buildings that are especially important to the health and welfare of the population following hazard events. Examples of such facilities include hospitals, police & fire stations, town halls, and shelters.

Because this is a multi-jurisdictional plan, FEMA requires that the plan assess each jurisdiction's risks where they vary from the risks facing the entire planning area. This section of the plan will identify variations in vulnerability for specific municipalities where they occur.

**4. Future Probability and Potential Dollar Losses for Hazard** - The historic data and vulnerability assessment for each hazard is used to project the potential future probability of that hazard occurring in the County and the potential damages in dollars that might be reasonably expected. This section sets the benchmark to mitigate for each hazard.

## **HAZARD ANALYSIS: WINTER STORMS / EXTREME COLD**

### **Background on Winter Storms/Extreme Cold Hazard:**

A variety of weather phenomena and conditions can occur during winter storms. For clarification, the following are National Weather Service approved descriptions of winter storm elements:

*Heavy snowfall* – the accumulation of six or more inches of snow in a 12-hour period or eight or more inches in a 24-hour period.

*Lake Effect Snow* – Snow showers that are created when cold, dry air passes over a large warmer lake, such as one of the Great Lakes, and picks up moisture and heat resulting in heavy but localized snow fall. This type of snow storm has the potential to be a significant hazard or be life threatening.

*Blizzard* – the occurrence of sustained wind speeds in excess of 35 miles per hour accompanied by heavy snowfall or large amounts of blowing or drifting snow.

*Ice Storm* – an occurrence where rain falls from warmer upper layers of the atmosphere to the colder ground, freezing upon contact with the ground and exposed objects near the ground.

*Freezing drizzle/freezing rain* – the effect of drizzle or rain freezing upon impact on objects that have a temperature of 32 degrees Fahrenheit or below.

*Sleet* – solid grains or pellets of ice formed by the freezing of raindrops or the refreezing of largely melted snowflakes. This ice does not cling to surfaces.

*Wind chill* – an apparent temperature that describes the combined effect of wind and low air temperatures on exposed skin.

Winter storms can vary in size and strength and include heavy snowfall, blizzards, ice storms, freezing drizzle/freezing rain, sleet, wind chill, and blowing and drifting snow conditions. Extremely cold temperatures accompanied by strong winds can result in wind chills that cause bodily injury such as frostbite and death.

True blizzards are rare in Wisconsin. They are more likely to occur in the northwestern part of the state than in south-central Wisconsin, even though heavy snowfalls are more frequent in the southeast. However, blizzard-like conditions often exist during heavy snowstorms when gusty winds cause the severe blowing and drifting of snow. Heavy snow and ice storms have been part of nearly every winter in Vilas County.

Dangerously cold conditions can be the result of the combination of cold temperatures and high winds. The combination of cold temperatures and high wind creates a perceived temperature known as "wind chill". Wind chill is the apparent temperature that describes the combined effect of wind and air temperatures on exposed skin. When wind blows across the skin, it removes the insulating layer of warm air adjacent to the skin. When all factors are the same, the faster the wind blows the greater the heat loss, which results in a colder feeling. As winds increase, heat is carried away from the body at a faster rate, driving down both the skin temperature and eventually the internal body temperature.

The National Weather Service issues wind chill advisories when wind chill readings of -20 to -34 degrees are expected. Wind chill warnings are issued when wind chill values are expected at or below -35 degrees. Extreme cold events are most likely during the months of January and February.

#### **History of Winter Storms/Extreme Cold in Vilas County:**

The NCDC has reported 39 major winter storm events for Vilas County between 2002 and 2011. All of these storms contained some form of snow, sleet, freezing rain, or ice conditions.

Most recently on November 10, 2011, lake-effect snow showers developed behind a departing low pressure system as cold air passed over the much warmer waters of Lake Superior. Parts of northwest Vilas County received more than 8 inches of snow. The highest totals were 8.8 inches at Presque Isle, 8.4 inches two miles east of Presque Isle and 8.0 inches at Boulder Junction.

On April 16, 2003 the north-central part of the state was affected by an ice storm that brought significant freezing rain and sleet. Dozens of traffic accidents were reported on icy roads. The weight of accumulated freezing rain downed trees, limbs and power lines. A total of 15,000 people were without power into the morning of the 18<sup>th</sup> in Lincoln, Oneida and Vilas Counties.

In March 1996, a powerful storm brought two waves of winter weather to North Central Wisconsin over a 38 hour period. The heaviest snow occurred in Vilas, Oneida, Forest and Langlade counties where 6 to 9 inches were measured between the 23<sup>rd</sup> and 24<sup>th</sup>. Later, a mixture of freezing rain, sleet and snow redeveloped as a powerful cold front strengthened pushing colder air into the region. The mixed precipitation changed over to heavy snow northwest of a line from Merrill to Iron Mountain, Michigan. An additional 6 to 12 inches of snow fell in this area between the 24<sup>th</sup> and the 25<sup>th</sup>. Strong north winds gusting as high as 40 mph produced blizzard conditions at times, with visibilities as low as 100 feet. Snow drifts reached heights of 6 to 8 feet on some of the rural county roads in Oneida and Vilas counties. Total snow accumulations from the two day event included: 20 inches in northwest Vilas County with 19 inches at Arbor Vitae.

On November 15, 1996, Vilas County experienced one of the worst ice storms in a few decades. Trees, power lines, and roads were coated with up to 2 inches of ice. Damages were extensive and power was out over 3-days for some. Shelters were set up to keep people warm.

Blizzard conditions affected Vilas County on January 29, 1996 when a powerful arctic cold front roared across central and northeast Wisconsin. Strong winds gusting as high as 45 mph whipped fresh, powdery snow into a fury, resulting in zero visibility and icy roads. Cold temperatures and wind created wind chill readings in the 30 to 50 below zero range.

The National Weather Service issues wind chill advisories when wind chill readings of -20 to -34 degrees are expected. Wind chill warnings are issued when wind chill values are expected at or below -35 degrees. The NCDL has reported 4 extreme cold events for Vilas County between 2002 and 2011.

The most recent extreme cold event was on February 10, 2008. Strong northwest winds behind a departing low-pressure system brought cold air into Wisconsin. Temperatures fell into the 10 to 20 below zero range at most

locations overnight and combined with 10 to 30 mph winds, with gusts up to 40 mph, to produce bitter cold wind chills. Wind chills reached -40 at Eagle River.

In February 1996, actual temperature reached 44 degrees below zero at Arbor Vitae during a five-day cold spell that saw a number of record lows set and at least one death across central and northeastern Wisconsin. Wind chill readings were 50 to 70 degrees below zero. The cold weather was responsible for numerous school closures, stalled vehicles, frozen pipes and broken water lines. Electrical and telephone outages occurred due to snapped wires and lines. All of the outdoor events of the Badger State games had to be cancelled and ski hills were forced to close.

**Winter Storms / Extreme Cold Vulnerability Assessment:**

Winter storms and extreme cold present a serious threat to the health and safety of affected citizens and can result in significant damage to property. Heavy snow or accumulated ice can cause the structural collapse of buildings, down power lines, motor vehicle accidents or isolate people from assistance or services. Extreme cold includes the risk of frostbite and hypothermia.

The following is a list of things that may be adversely affected by a winter storm or extreme cold. Much of these community assets can be referenced in Part II.

- Infrastructure – operation of emergency services, operation of public facilities and schools
- Utilities – down power and telephone lines
- LP Gas at residences freezing in temps below -40 degrees.
- Septic systems - freezing
- Transportation – automobile accidents, roadway plowing, salting/sanding
- Residential – roofs
- Businesses – commerce
- Agricultural - livestock

Based on review of the historic events of winter storms and extreme cold, there are no specific areas in the County that have unusual risks. The risk for winter storms and extreme cold is relatively uniform and a countywide concern. Heavy snow and ice storms are a major concern with Vilas County officials and were ranked as a priority issue with the City of Eagle River due to the potential impacts of long term power outage during cold temperature conditions.

**Future Probability & Potential Dollar Losses – Winter Storms/Extreme Cold:**

Based on historical frequency, 2002 to 2011, Vilas County can expect 3.9 significant winter storms per year on average. In other words the probability is 1.0 or a 100 % chance in a given year.

For extreme cold temperatures, based on historical frequency, Vilas County can expect an occurrence about every 2.5 years on average for a probability of 0.4 or

a 40% chance in a given year. Although, since extreme cold temperatures often accompany winter storms, a probability of 100% chance in a given year cannot be ruled out.

Estimating potential future losses for winter storms is difficult. Damages and losses are typically widespread. Auto accidents and additional snow removal time are typical impacts of winter storms, and such claims are not aggregated or tracked for monetary damage. Winter storms do have the potential to be extremely destructive, particularly in the case of ice storms. Potential future losses per incident might range from \$5,000 to \$2 million based on experiences from other counties.

### **HAZARD ANALYSIS: SEVERE THUNDERSTORM / HIGH WIND / HAIL / LIGHTNING**

#### **Background on Severe Thunderstorm Hazard:**

The National Weather Service definition of a severe thunderstorm is a thunderstorm event that produces any of the following: downbursts with winds of 58 miles per hour or greater (often with gusts of 74 miles per hour or greater), hail 1 inch (recently increased from  $\frac{3}{4}$  inch) in diameter or greater or a tornado. Strong winds, hail, and lightning will be addressed in this section, however tornadoes will be referenced as a separate hazard.

Lightning results from discharge of energy between positive and negative areas separated by rising and falling air within a thunderstorm. This discharge heats the surrounding air to 50,000 degrees. Hail results as the warm rising air cools, forming ice crystals which are held by the updrafts until accumulating enough weight to fall. The hail size depends on strength of the updrafts keeping it up.

Thunderstorms frequency is measured in terms of incidence of thunderstorm days or days on which thunderstorms are observed. Wisconsin averages between 30 and 50 thunderstorm days per year depending on location. A given county may experience ten or more thunderstorm days per year. The southwestern area of the state normally has more thunderstorms than the rest of the state.

#### **History of Severe Thunderstorms in Vilas County:**

The NCDC has reported 43 severe storm events for Vilas County between 2002 and 2011, discounting multiple reports for the same event. These storms typically contain some form of heavy rain and strong winds. About 14 significant hail events, typically related to a severe thunderstorm, were listed during this time period. However, while lightning is associated with virtually every severe thunderstorm, there was only 1 notable lightning incident identified in the NCDC database between 2002 and 2011.

Most recently, isolated severe thunderstorms produced large hail and gusty winds across north-central Wisconsin on August 19, 2011. The storms knocked out electricity to 2,000 customers across the area and caused at least \$120,000 in damage. Nickel size hail fell near Conover, and Dime to quarter size hail fell at Boulder Junction. High winds downed power lines and large tree branches in Conover.

One of the three Presidential declarations involving Vilas County has been associated with severe thunderstorms since 1971. The declaration covered the cumulative effects of multiple storms that occurred during July of 1999 including July 5, 23, 29 and 30.

On July 23, trees and power lines were downed in Vilas County. Two campers were damaged by fallen trees at a campground in Boulder Junction but there were no injuries.

During the evening of July 30, thunderstorm wind gusts over 70 mph (and possibly as high as 100 mph) produced significant damage across the far north-central part of the state. The hardest hit areas were Vilas and Oneida Counties with damages around \$1 million reported by NCDC. In Vilas, an estimated 100,000 trees were downed by the storm that left a damage path 15 to 20 miles wide and 40 to 50 miles long across the County. Two people were killed by falling trees in Oneida County. The storm left 50,000 people without electrical service across the area, damaged 150 to 200 homes and blocked all major highways and secondary roads in the northern one-third of Oneida County. A falling tree damaged a bengal tiger cage at the zoo in Hazelhurst (Oneida county), allowing 2 tigers to escape for a brief period.

On July 11, 2010, a cold front moving across northern Wisconsin triggered scattered thunderstorms. Some of the storms merged and produced damaging winds in Vilas County with estimated gusts up to 58 mph. Thunderstorm winds downed power lines in Arbor Vitae and northeast of St. Germain.

On July 27, 2010, a cold front combined with a warm and humid air mass to trigger thunderstorms that moved across northeast Wisconsin. The storms produced hail to golf ball size, wind gusts to 95 mph, funnel clouds and heavy rainfall that led to flash flooding. Downed trees and power lines were common around Manitowish Waters and other scattered locations around Vilas County as thousands of homes lost power. The storms, produced downburst winds southwest of Conover with wind speeds of 80 to 90 mph and even higher gusts, snapping or uprooting hundreds of trees, some as large as three feet in diameter, along a 5 mile long path. Several homes and cabins were damaged by the fallen trees. The storm moved over a camp where 650 people were located. The camp staff heard the warning and was able to get everyone to safety before the storm hit. There were no injuries noted by the NCDC from the storm, but they reported damages of \$100,000.

On April 18, 2004, an intense area of low pressure moved toward Wisconsin from the plains as a warm front lifted north across the state. Severe thunderstorms developed in north-central Wisconsin in the vicinity of the front. Wind gusts estimated at 75 mph caused considerable damage in Eagle River where part of the roof was torn off a high school gymnasium, a wall of a convenience store was damaged and a tree toppled onto a church, puncturing a hole in the roof. A small building was destroyed at a marina 2 miles east of Eagle River. Trees and power lines were downed across much of the County and around 7,400 customers in the County lost electrical service. The NCDC reported damages of \$200,000.

In June of 1999, the Eagle River area was particularly hard-hit by hail up to 3 inches in diameter, causing nearly one-half million dollars in damage. One residence alone sustained \$60,000 in damage to cars and a home. In May 2008, large hail damaged vehicles and structures near St. Germain. Every car on the lot of an auto dealership sustained damaged as well as almost every vehicle at a repair shop in town. A man was unable to get his hand around a hailstone that crashed through the kitchen skylight of his home. The NCDC reported damages of \$250,000.

On July 21, 2002, thunderstorms developed along a warm front. Lightning from one of the thunderstorms set fire to a home in Arbor Vitae, destroying the entire structure. In June 1999, lightning struck a woman while she fished from a boat on Yellow Birch Lake near Eagle River. On the morning of April 3, 1999, lightning struck a 125 foot pine tree causing its trunk to explode in Boulder Junction. The lightning created a track several inches deep as it traveled through the ground to an attached garage. When it reached the garage it blew the phone and power line connections off the wall and started the electrical wiring on fire in the garage attic. The phone and electrical wiring in the house were so charred they scorched the walls around them. Natural gas lines leading to the house were destroyed.

#### **Severe Thunderstorm Vulnerability Assessment:**

The National Weather Service can forecast and track a line of thunderstorms that may be likely to produce severe high winds, hail, and lightning but where these related hazards form or touch down and how powerful they might be, remains unpredictable. The distribution of thunderstorms and related hazard events have been widely scattered throughout the County.

Many thunderstorm events (without tornadoes) have caused substantial property and infrastructure damage, and have the potential to cause future damage. In order to assess the vulnerability of the Vilas County area to thunderstorms and related storm hazards, a review of the past events indicate significant impacts to:

- Infrastructure – hospitals, schools, street signs, police and fire departments



- Utilities - electric lines/poles/transformers, telephone lines, radio communication
- Transportation – debris clean-up
- Residential - mobile homes, garages, trees and limbs, siding, windows
- Businesses – signs, windows, siding, billboards
- Agricultural - buildings, crops, livestock
- Vehicles – campers, boats, windshields, body, paint

Based on review of the historic patterns of thunderstorms associated with high wind, hail, or lightning, there are no specific municipalities that have unusual risks. The events are relatively uniform and a countywide concern. High wind is a primary concern with Vilas County officials and was ranked as a priority issue with the City of Eagle River.

**Future Probability and Potential Dollar Losses - Severe Thunderstorms:**

Based on historical frequency, Vilas County can expect 4.3 thunderstorm events per year on average. In other words, the probability is 1.0 or a 100% chance of multiple storms in a given year. The probability of a thunderstorm with damaging hail in Vilas County is also at 1.0 or 100% chance with about 1.4 incidents in a given year. The probability of a significant lightning event is about 0.1 or a 10% chance in a given year.

According to the NCDC, historic thunderstorm events with associated high wind averaged \$9,587 in damage per incident. Historic thunderstorm events with associated hail damage averaged \$17,857 in property damage. There was insufficient data to calculate average lightning damages for the time period, but historic lightning events have reached \$75,000 per incident. Losses in Vilas County associated with severe thunderstorms including high wind, hail and lightning could approach \$737,239 over the next ten-year period.

**HAZARD ANALYSIS: TORNADOS****Background on Tornado Hazard:**

A tornado is a relatively short-lived storm composed of an intense rotating column of air, extending from a thunderstorm cloud system. It is nearly always visible as a funnel, although its lower end does not necessarily touch the ground. Average winds in a tornado, although never accurately measured, are between 100 and 200 miles per hour, but some tornados may have winds in excess of 300 miles per hour.

A tornado path averages four miles, but may reach up to 300 miles in length. Widths average 300 to 400 yards, but severe tornados have cut swaths a mile or more in width, or have formed groups of two or three funnels traveling together. On average, tornados move between 25 and 45 miles per hour, but speeds over land of up to 70 miles per hour have been recorded. Tornados rarely last more

than a couple of minutes in a single location or more than 15 to 20 minutes in a ten-mile area.

<b>Table 9 Tornado Wind and Damage Scale</b>		
Tornado Scale	Wind Speeds	Damage
EF0	65 to 85 MPH	Some damage to chimneys, TV antennas, roof shingles, trees, and windows.
EF1	86 to 110 MPH	Automobiles overturned, carports destroyed, trees uprooted
EF2	111 to 135 MPH	Roofs blown off homes, sheds and outbuildings demolished, mobile homes overturned.
EF3	136 to 165 MPH	Exterior walls and roofs blown off homes. Metal buildings collapsed or are severely damaged. Forests and farmland flattened.
EF4	166 to 200 MPH	Few walls, if any, standing in well-built homes. Large steel and concrete missiles thrown far distances.
EF5	OVER 200 MPH	Homes leveled with all debris removed. Schools, motels, and other larger structures have considerable damage with exterior walls and roofs gone. Top stories demolished

*Source: National Weather Service*

Tornados are classified into six intensity categories, EF0-EF5. This scale is an updated or "enhanced" version of the Fujita Tornado Scale (or "F Scale"). The scale estimates wind speeds within tornados based upon the damage done to buildings and structures. It is used by the National Weather Service in investigating tornados and by engineers in correlating building design and construction standards against anticipated damage caused by different wind speeds.

Wisconsin lies along the northern edge of the nation's maximum frequency belt for tornados, known as "Tornado Alley". Tornado Alley extends northeast from Oklahoma into Iowa and then across to Michigan and Ohio. Winter, spring and fall tornados are more likely to occur in southern Wisconsin than in northern counties. Tornados have occurred in Wisconsin every month except February.

**History of Tornadoes in Vilas County:**

Vilas County has had 14 verified tornadoes, from 1950 to 2011 (Table 10). In addition, the NCDC data contains 3 funnel cloud and 1 dust devil report. Vilas hasn't had a confirmed tornado touch down since July of 1995.

Most recently, there have been three funnel clouds spotted but not confirmed on the ground. On May 22, 2011, unstable air combined with a surface boundary and an upper air disturbance to produce thunderstorms. Storms became severe during the afternoon and early evening, causing numerous incidents of large hail and isolated straight-line wind damage. A spotter saw a funnel cloud near Lac du Flambeau.

On July 27, 2010, a cold front combined with a warm and humid air mass to trigger thunderstorms that moved across northeast Wisconsin. The storms produced hail to golf ball size, wind gusts to 95 mph, funnel clouds and heavy rainfall that led to flash flooding. Downed trees and power lines were common and thousands of homes lost power. A funnel cloud was spotted at Lac du Flambeau.

On August 13, 2008, an upper level storm system produced weather conditions favorable for the development of funnel clouds across central and northern Wisconsin. A funnel cloud was seen and photographed by several people near Little St. Germain Lake. None of the funnels touched the ground as tornadoes.

In August of 1998, a large "dust devil" developed and picked up two lawn chairs and knocked over concrete parking markers in Arbor Vitae.

The strongest Vilas County tornado during this time period occurred on April 27, 1984 and warranted a Presidential Emergency Declaration. This was an EF-3 tornado which developed near Fawn Lake in Oneida County and travelled to Star Lake in Vilas County before dissipating. The tornado leveled several thousand acres of forest, destroyed or damaged 80 homes and cabins, ripped up docks and tossed boats in the air or wrapped them around trees. A Fawn Lake man was killed after getting his family to safety. The NCDC report indicates that three other people were injured during the event. In Vilas County, the hardest hit areas were St. Germain Lake, Lost Lake and Star Lake. The tornado travelled 29 miles and reached a maximum width of 880 yards with a duration of about 30 minutes. Damages were estimated at around \$25 million.

On July 7, 1970, an EF-1 tornado developed across Iron County in northwest Wisconsin and travelled east-southeastward for nearly 38 miles across Vilas County. The tornado travelled from Winchester to Boulder Junction to Conover. Extensive damage to woods and lake property were noted in the path of the tornado.

Date	Time CST	Location	EF Scale	Width Yards	Path Miles	Injuries	Est. Cost
5/4/64	1800	Saint Germain	1	125	2.0	1	25K
6/26/69	1630	2 mi W Manitowish Waters - 3 mi SW Presque Is.	1	35	9.0		250K
6/26/69	1700	Lac Du Flambeau - 9 mi NW Land O Lakes	2	35	28.9		250K
7/7/70	1900	Winchester - Boulder Junction - Conover	1	n/a	37.9		n/a
7/12/73	0300	Boulder Junction - Sayner	1	100	19.5		25K
6/13/81	2045	Sayner - 3 mi NE Sayner	1	50	3.0		25K
7/3/83	0439	Eagle River	1	20	0.5		250K
4/27/84	1437	Fawn Lake - Star Lake	3	880	29.0	3	25M
7/24/86	1415	Saint Germain	1	50	0.3		250K
7/24/88	2030	Eagle River	1	50	0.1		250K
8/1/88	1852	1 mi W Saint Germain	1	50	1.0		25K
8/1/88	1922	2 mi SE Eagle River	0	25	0.3		0
4/26/94	1455	1.5 mi N Conover - 3 mi SE Land O'Lakes	1	150	4.5		50K
7/14/95	1640	Phelps	1	250	3.5		50K
8/1/98	1310	Arbor Vitae	Dust Devil	n/a	n/a		0
8/13/08	1735	St. Germain	Funnel Cloud	n/a	n/a		0
7/27/10	1845	Lac du Flambeau	Funnel Cloud	n/a	n/a		0
5/22/11	1755	Lac du Flambeau	Funnel Cloud	n/a	n/a		0
<b>Totals:</b>						<b>4</b>	<b>26.53M</b>

Source: National Weather Service and NCDC

On May 4, 1964, an EF-1 tornado was first reported 10 miles southwest of St. Germain and travelled just over 7 miles before dissipating in St. Germain. The tornado had a maximum width of 125 yards. The local storm report indicated the tornado touched down twice and crossed over the Big St. Germain drawing water to a height of 200 feet. There was considerable damage to resorts and woods in the path of the tornado. The NCDC report indicated that one person was injured.

**Tornado Vulnerability Assessment:**

Although Vilas County is mostly a rural county, there are concentrations of population scattered throughout County. Subdivisions, rural unincorporated communities like Arbor Vitae, Lac du Flambeau, Boulder Junction, etc. and the Eagle River area can be regarded as more vulnerable because these areas pose more of a risk to human safety and property damage. Map 10 illustrates these areas within the County.

Mobile homes are of significant concern in assessing the hazard risks from tornadoes. In general, it is much easier for a tornado to damage and destroy a mobile home than standard constructed houses and buildings. Since 5.3 percent of Vilas County’s housing units are mobile homes, vulnerability to health and safety along with property damage is much greater. Research by the NWS

shows that between 1985 and 1998, 40 percent of all deaths in the nation from tornados were in mobile homes, compared to 29 percent in stick-built homes, and 11 percent in vehicles.

While mobile homes are scattered throughout the County, many are concentrated in mobile home parks. Vilas County has approximately 10 mobile home parks, see Map 10 for locations. The total number of mobile homes reported in the 2010 Census for Vilas County is 1,271.

Besides mobile homes, there are many other areas vulnerable to tornados such as campgrounds. Like mobile homes parks, campgrounds are of concern in the County because often times there is a concentration of people in them and there is little shelter provided. Map 10 also shows the location of campgrounds in the County.

Youth camps present another concern for Vilas County. Youth camps operate during the summer months and contain large populations of juveniles and young adults. Most youth camps consist of cabins used for sleeping and daily activities. A large number of these cabins are wood structures with no basements. This presents a problem for safely sheltering people in the event of a tornado.

The following is a list of things that may be affected by a tornado. Much of this list can be referenced in Part II.

- Community facilities – hospitals, schools, "prisons/jails"
- Public Service - police and fire departments
- Utilities - power lines, telephone lines, radio communication
- Transportation – debris clean-up
- Residential – nursing homes, garages, trees and limbs, siding, windows
- Businesses – signs, windows, siding, billboards
- Agricultural - buildings, crops, livestock

Based on review of historic tornado events, no specific areas in the county have unusual risks. The risk for tornado is relatively uniform and a countywide concern. High winds are a primary concern of the City of Eagle River, whether in the form of a tornado or otherwise.

#### **Future Probability and Potential Dollar Losses – Tornados:**

There has not been a tornado on the ground in Vilas County within the last 10-years. In fact, one would have to go back 17 years to 1995 for the last tornado that affected Vilas County. However, the funnel cloud sightings between 2008 and 2011 serve as reminders of the potential threat of a tornado in Vilas County.

Incorporating the extended historic data available from the National Weather Service (1950 to 2011), the tornado frequency in Vilas would be about every 4.4 years on average. This equates to a probability of 0.23 or about a 23 percent

chance in a given year. However, it is difficult to account for fluctuations in the occurrences where there is a very active period in the 1980's between periods of no activity in the 1950's and 2000's. Table 11 indicates the probability of tornados of a specific magnitude.

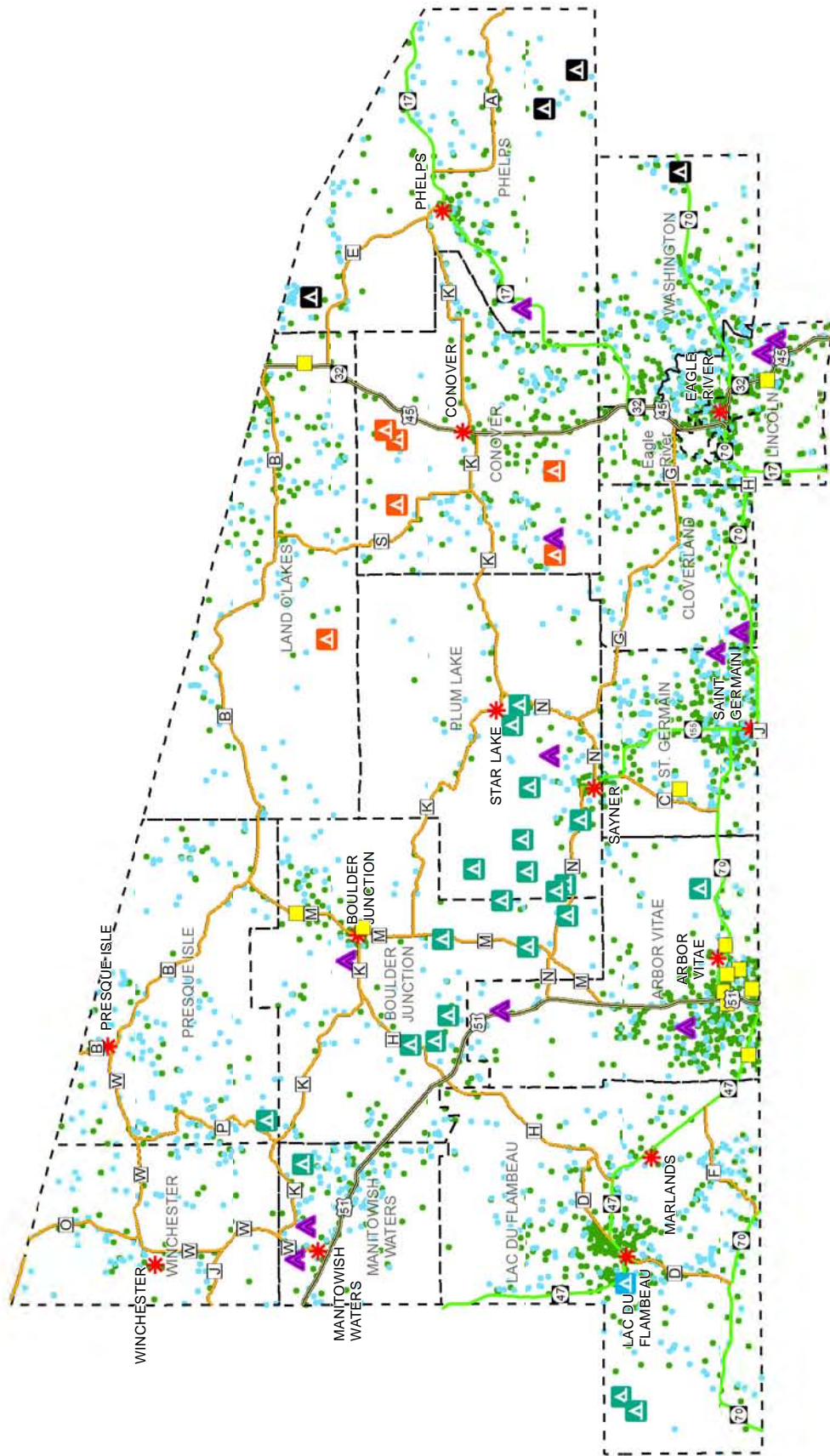
<b>Table 11 Probability of Intensity for any given Tornado in Vilas County</b>						
Tornado Scale	EF0	EF1	EF2	EF3	EF4	EF5
Number of Reported Tornados*	1	11	1	1	0	0
Probability of Occurrence	7.0%	78.0%	7.0%	7.0%	<1.0%	<1.0%

*Source: National Weather Service & NCWRPC – \*Based on historical data from 1950 to 2011.*

Historic data is again used to estimate potential future dollar losses due to tornado. Estimated damages resulting from various tornados in Vilas County range from \$0 to \$25 million. On average, Vilas County might expect damages of \$1.9 million per tornado, however, only one of these 14 historic tornados resulted in damages exceeding \$1 million, five others had \$250,000, and the rest were \$50,000 or less. Over the next ten-year period, tornado losses in Vilas County could approach \$4.3 million.



*Storm Damage: Trees Down Near Conover, July 2010. (WDNR)*



- Public Campgrounds**
  - County
  - Federal
  - Tribal
  - State
- Resident Population Pattern
- Seasonal Housing Unit Pattern
- Minor Civil Divisions
- US Highways
- State Highways
- County Highways
- Communities
- Youth Camps
- Mobile Home Parks



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Source: WI DNR, NCWRPC, ATC  
 This map 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. NCWRPC is not responsible for any inaccuracies herein contained.

**HAZARD ANALYSIS: FOREST FIRES / WILDFIRES****Background on Forest Fire / Wildfire Hazard:**

*Wildfire Aftermath, Conover.(WDNR)*

A forest fire is an uncontrolled fire occurring in a forest or in woodlands generally outside the limits of incorporated villages or cities. A wildfire is any instance of uncontrolled burning in brush, marshes, grasslands or field lands. For the purpose of this analysis, both of these kinds of fires are being considered together.

Forest fires and wildfires can occur at any time the ground is not completely snow covered. The season length and peak months may vary appreciably from year to year. Land use, vegetation, amount of combustible materials present and weather conditions such as wind, low humidity and lack of precipitation are the chief factors for fire season length.

**History of Forest Fire / Wildfire in Vilas County:**

The Wisconsin DNR maintains a database of wildfire data. This data represents the most comprehensive source of information for analyzing fire trends in an area such as Vilas County. However, the data is only current through 2009, so the ten-year span of 2000 to 2009 is used for analysis. Between 2000 and 2009, there was an average of 70.9 fires that have burned 32 acres, annually. The typical fire in Vilas County burns about one-half an acre.

The principal reason these fires are small is the rapid response of municipal fire departments. This history of small fires is not indicative of the actual risk. For example, more recently there have been some larger fires in the County. In 2010, a single fire in Conover burned in excess of 30 acres. In 2012, a fire caused by a downed power line in Land O' Lakes covered 80 acres. This was the largest fire in Vilas County since 1979. The Duck Lake fire in the Upper Peninsula of Michigan may serve as an example of the potential threat. The damage assessment is still being compiled, but this 2012 fire consumed over 21,000 acres and destroyed 136 structures.

April is the leading month for wildfire in Vilas with 40% of the total number of fires between 2000 and 2009. Wildfires have occurred in each month of the year but January, February and December during this time period in Vilas.

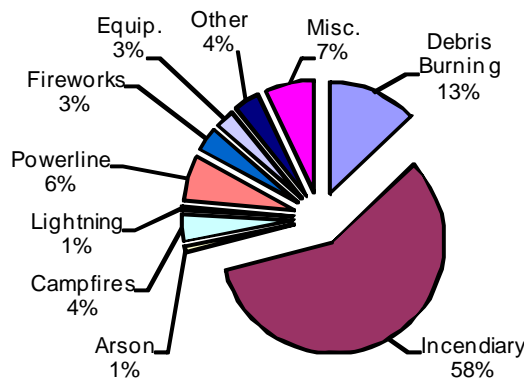
The Town of Lac du Flambeau experienced the most wildfires between 2000 and 2009 with 484 and also leads the County in total acres burned with 132. The Town of Manitowish Waters had the fewest fires with 9 over that period, but the Town of Winchester actually had the least area burned, among non-urban areas, with only 1.03 acres affected.



The chart below breaks down the causes of wildfire within Vilas County between 2000 and 2009 as classified by the WisDNR. The principle cause of wildfire in Wisconsin as a whole is generally debris burning, however, in Vilas County at least during this time period, the leading cause of wildfire was "Incendiary - Excitement" according to WisDNR coding. About 412 or 58% of wildfires in the database were classified in this way. The "Incendiary - Excitement" classification generally refers to fire "intentionally set for the purposes of making mischief" but not with the intent of arson. The arson tag was only given to 7 of the fires.

Debris Burning is the next leading category at 91 or 13%. Other categories of note include: campfires at 28 wildfires, fireworks at 25 and powerlines at 46. Miscellaneous includes a variety of factors such as smoking, structure fires, equipment, improper ash disposal and other causing 96 wildfires. Lightning, the only natural cause of fire, was responsible for only 4 fires.

**Fire Causes in Vilas Co. 2000-2009**



Source: WDNR

**Forest Fire / Wildfire Vulnerability Assessment:**

Vilas County has 496,000 acres of forestland, or 76 percent of the total land area, scattered throughout the County. The potential for property damage from fire increases each year as more recreational and retirement homes are developed on wooded land.

Rural buildings may be more vulnerable because of lack of access. Access to buildings off main roads is sometimes long, narrow driveways with minimal vertical clearance making it hard for emergency vehicles to combat fires. These buildings also may not have much of a defensible space because of little area between the structures themselves and highly flammable vegetation.

Campgrounds are also a concern because of campfires. Vilas County has federal, state, county and numerous privately owned campgrounds throughout the County. Locations of the campgrounds are shown on Map 11.

The trend toward introducing more human development into fire prone areas has brought about the term wildland urban interface or WUI. The WUI identifies areas where structures and human development meet or intermingle with undeveloped wildlands. It is within these areas where wildfire poses the greatest risk to human lives and property.

The WDNR has completed a statewide evaluation of fire risk, referred to as the CAR or Communities At Risk assessment. This assessment uses extensive DNR geo-databases to analyze and map hazardous woodland fuel types and the degree of the intermixing of development with wildlands. The maps identify the level of risk for each community on a scale of very high, high, moderate, or low, and also have a community of concern designation. The Towns of St Germain, Cloverland and Lincoln are rated very high. Lac du Flambeau, Arbor Vitae, Manitowish Waters, Boulder Junction, Plum Lake, Conover, Land O'Lakes, Washington and the City of Eagle River have a high risk level and the Town of Phelps is designated a community-of-concern. The Towns of Presque Isle and Winchester are rated low risk for wildfire.

#### **Future Probability and Potential Dollar Losses – Forest Fire / Wild Fire:**

Forest and wild fires are relatively common occurrences in Vilas County. Over the last 10 years, there has been an average of 71 fires per year in the County. In other words, the probability is 1.0 or 100% chance of wildfire each year.

Because of the relatively small impact of typical individual fires in the County, loss data is not tracked. This makes it difficult to develop an estimate of potential future dollar losses. However, with 71 fires per year, the County should expect some fires to "get out of hand" with the potential to easily meet or exceed the millions in damages of the Duck Lake Fire that recently occurred in the Upper Peninsula of Michigan.

### **HAZARD ANALYSIS: EPIDEMIC / PANDEMIC**

#### **Background on Epidemic / Pandemic Hazard:**

Communicable diseases, sometimes called infectious diseases, are illnesses caused by organisms such as bacteria, viruses, fungi and parasites. Sometimes the illness is not due to the organism itself, but rather a toxin that the organism produces after it has been introduced into a human host. Communicable diseases may be transmitted (spread) either by: one infected person to another, from an animal to a human, or from some inanimate object (doorknobs, table

tops, etc.) to an individual. Some communicable diseases can be spread in more than one way.

Pandemic Influenza is a global disease outbreak. An outbreak occurs when a new influenza virus emerges for which people have little or no immunity, and for which there is no vaccine. The disease spreads easily from person to person, causes serious illness or death, and can sweep across the county and around the world in a very short time frame.

**History of Epidemic / Pandemic in Vilas County:**

Influenza Pandemics are naturally occurring events. Global outbreaks have occurred four times in the last century, in 1918, 1957, 1968 and 2009. The greatest loss occurred in 1918 when the Spanish Flu (H1N1) killed an estimated 20-40 million people worldwide between 1918 and 1919. The mortality rate in the United States was 550,000. The Asian Flu (H2N2) occurred from 1957 to 1958 with a mortality rate of 70,000 in the United States. The Hong Kong Flu (H3N2) occurred from 1968 to 1969 with a mortality rate of 34,000 in the United States.

2009 saw the rise of a new variant of the H1N1 virus, popularly referred to as the Swine Flu. Lab confirmed deaths from Swine Flu total about 14,000 worldwide with 3,400 deaths in the United States. However, most experts now agree that the actual death toll attributable to the 2009 Swine Flu is 10 to 15 times the confirmed number. Spread of H1N1 flu occurs in the same way that seasonal flu spreads. Flu viruses are spread mainly from person to person through close range coughing or sneezing by people with influenza. As a result of preparation and mitigation strategies such as vaccinations and public education, the threat of a full blown H1N1 pandemic in the U.S. has receded. The possibility for a pandemic, though, still exists.

A previous pandemic flu threat that still looms is the avian flu. Birds can contract avian flu and pass it along to humans. Some strains of the avian flu are more virulent than others. Public health experts continue to be alert to the risk of a possible re-emergence of an epidemic of avian among people primarily in Asia in 2003. People who had been very close contact with infected birds (for example, people who lived with chickens in their houses) contracted a virulent form of avian flu and there was a high death rate from this disease. Thus far, the avian flu virus has not mutated and has not demonstrated easy transmission from person to person. However, were the virus to mutate in a highly virulent form and become easily transmissible from person to person, there would be significant potential for a pandemic that could disrupt all aspects of society and severely affect the economy.

The Vilas County Health Department tracks communicable disease through a channel of communications at the local, state and regional levels between public health, private physicians, hospitals, and labs. This communication channel

allows for prompt investigation of possible outbreaks and unusual situations, and to implement control measures to minimize further transmission of disease to others.

In Wisconsin, there were 13,511 confirmed or probable cases of the 2009 H1N1 from April 2009 to March 2010 with 1,320 hospitalized and 55 deaths. In Vilas County, there were 6 cases of H1N1 with 4 hospitalized and no deaths reported. In 2011, Vilas County Health Department’s disease control staff received 210 reports of communicable diseases such as Hepatitis C, Blastomycosis and Lyme disease with 100 being confirmed and reportable, see Table 12.

	<b>2009</b>	<b>2010</b>	<b>2011</b>
Lymes Disease	27	35	21
Blastomycosis	3	1	2
Hepatitis C	11	17	17
Chlamydia	32	26	57
Giardiasis	6	16	3
<i>Source: Vilas County Health Dept.</i>			

**Epidemic / Pandemic Vulnerability Assessment:**

Most communicable diseases are dealt with through traditional health department activities. The complexity and magnitude of a Pandemic Influenza outbreak would tax the normal capabilities of the medical service community and the Emergency Management Department would assist in all activities surrounding an event of this severity.

The possibility of a communicable disease epidemic or pandemic outbreak is equal across the County, but the ability to predict where and when an event will occur is very difficult.

**Future Probability and Potential Dollar Losses – Epidemic / Pandemic:**

The future probability of a communicable disease\pandemic influenza outbreak is difficult to determine. The probability would appear low, but the threat exists, and the impact of a widespread event is very severe. Significant economic disruption can occur due to loss of employee work time and costs of treating or preventing spread of the pathogen.

A probability of an outbreak might be calculated across a hundred year period. Based on the three major events identified here, the likelihood of an event occurring in any given year would be 3%.

**HAZARD ANALYSIS: HAZARDOUS MATERIALS INCIDENTS - FIXED SITE / TRANSPORT****Background on Hazardous Materials Incidents Hazard:**

This type of hazard occurs with the uncontrolled release or threatened release of hazardous materials from a fixed site or during transport that may impact public health and safety and/or the environment.

Under the Emergency Planning and Community Right to Know Act (EPCRA), a hazardous material is defined as any chemical that is a physical hazard or health hazard [defined at 29 CFR 1910.1200(c)] for which the Occupational Health and Safety Administration (OSHA) requires a facility to maintain a Material Safety Data Sheet (MSDS). Under EPCRA there is no specific list of hazardous materials. An extremely hazardous substance (EHS) is defined as one of 356 substances on the United States Environmental Protection Agency (EPA) list of extremely hazardous substances, identified at 40 CFR Part 355.

EPCRA of 1986, also known as SARA Title III, brings industry, government and the general public together to address emergency planning for accidental chemical releases. The emergency planning aspect requires communities to prepare for hazardous chemical releases through emergency planning. This provides essential information for emergency responders. The community right-to-know aspect increases public awareness of chemical hazards in their community and allows the public and local governments to obtain information about these chemical hazards.

Counties in Wisconsin, including Vilas County have a Local Emergency Planning Committee (LEPC) that is set up in accordance with the federal legislation and is responsible for implementation of EPCRA at the county level. The County Emergency Management Director is a member of the LEPC to ensure continuity and coordination of emergency response planning.

To meet the requirements of Title III of EPCRA, the LEPC developed the County Hazardous Materials Response Plan. This plan establishes policies and procedures for responding to hazardous material incidents. The LEPC is required to review, test, and update the Plan every two years. Methods for notification and reporting an incident are outlined in the plan. This plan also works in conjunction of the County Emergency Operations Plan (EOP) where alert to the public, communications, and response procedures are outlined. The plan is tested through tabletop, functional and full-scale exercises and actual response situations.

To provide a high level of hazardous materials response capabilities to local communities, Wisconsin Emergency Management contracts with eight Regional or "Level A" Hazardous Materials Response Teams. The Regional team for Vilas County is located at Wausau. The Regional Response Team may be activated

for an incident involving a hazardous materials spill, leak, explosion, injury or the potential of immediate threat to life, the environment, or property. The Regional or "Level A" Teams respond to the most serious of spills and releases requiring the highest level of skin and respiratory protective gear. This includes all chemical, biological, or radiological emergencies.

County or "Level B" Teams respond to chemical incidents which require a lower level of protective gear but still exceed the capabilities of standard fire departments. Currently, there are 36 counties that have a "Level B" team. Those teams may provide assistance to surrounding counties and are approved by the local Emergency Planning Committees. Vilas County contracts with Oneida County's "Level B" Hazardous Response Team which is made up of fire personnel from the Rhinelander Fire Department and area volunteer fire departments. In addition to the "Level B" hazardous Response team, members from the Rhinelander Fire Department are also a "Level A" Chemical Assessment Team (CAT) for the Wausau Regional or "Level A" Team. These HazMat Teams have the capabilities to respond to incidents that require a high degree of personal protection and respiratory protection.

#### **History of Hazardous Materials Incidents in Vilas County:**

Since 2005 Vilas County has recorded numerous hazardous material spills. Many of these spills consisted of small amounts of product that did not meet the reporting requirements. In most cases these incidents were quickly resolved by the response of a local municipal fire department and County Emergency Management. The following Table 13 displays the date, location and description of the spills.

The latest incident reported here occurred on November 26, 2011 when 29 gallons of mineral oil were spilled on the road and into a storm drain in Land O' Lakes.

#### **Hazardous Materials Incidents Vulnerability Assessment:**

Some of the risk factors that make hazardous materials incidents a keen concern in Vilas County are reviewed below:

##### Fixed Facilities

Twenty-six facilities within Vilas County have reported that they had a hazardous substance present at any one time.

Two notable hazardous substances at fixed facilities in the County include aviation fuel at area airports, liquefied petroleum gas and diesel fuel storage.

Also of note are temporary hot mix batch plants set up in various locations for limited times during construction season.

<b>Table 13 Reportable Hazardous Materials Spills in Vilas County Since 2005</b>		
<b>Date</b>	<b>Location</b>	<b>Description</b>
05/25/2005	St Germain	Not reported to Vilas County.
07/08/2005	Lincoln	Approximately 20 gallons diesel fuel on soil.
07/15/2005	Lincoln	2 gallons antifreeze on pavement.
08/12/2005	Lac du Flambeau	Approximately 5 gallons diesel fuel on soil.
08/31/2005	Arbor Vitae	15 to 20 gallons of diesel fuel on soil.
09/21/2005	Land O Lakes	2 gallons diesel fuel on soil.
10/03/2005	Lac du Flambeau	5 gallons hydro fluid on open soil.
12/15/2005	Phelps	Unknown quantity diesel fuel in boggy area.
09/03/2006	Lac du Flambeau	Approximately 6 gallons gasoline in lake.
11/29/2006	St Germain	10 to 12 gallons hydro fluid on soil.
12/08/2006	Presque Isle	Less than 1 gallon gasoline in water.
02/08/2007	Washington	3 grams liquid mercury in home.
05/15/2007	Boulder Junction	Unknown amount of propane leaked from underground pipe.
07/25/2007	Arbor Vitae	Approx. 6 liters of ether and peroxide discovered at site. The material was still contained. Containers were overpacked and removed under WDNR supervision.
04/08/2008	Eagle River	Approximately 20 gallons of diesel fuel in ditch of Highway 70.
09/11/2008	Arbor Vitae	65 gallons of aviation fuel on the soil.
11/06/2008	Eagle River	210 gallons antifreeze released into soil.
12/18/2008	Conover	Isocynate: 30 gallons released.
12/23/2008	Lac du Flambeau	Approximately 10 gallons of diesel fuel on soil.
05/25/2010	Arbor Vitae	Unknown quantity of gasoline on pavement.
07/28/2010	Land o Lakes	15 gallons of mineral oil on soil.
11/26/2011	Land O Lakes	29 gallons of mineral oil on road and storm drain.
<i>Source: Vilas County Emergency Management</i>		

### Highway

Trucks carry the bulk of hazardous materials to and through the County. Regular shipments of gasoline, propane, acid and other substances are delivered across the County. Every roadway in the County is a potential route for hazardous material transport, but major transportation routes are Federal and State Highways 51, 45, 17, 47, 70, 32 and 155 (See Map 3 Transportation Routes in Part II).

### Pipeline

ANR Pipeline Company provides a pipeline to move petroleum through the County. Natural gas service lines also run throughout much of the County. The locations of these facilities are not mapped for homeland security reasons.

Based on the location of the fixed facilities, the City of Eagle River has a higher probability of chemical release. A hazardous materials incident can have far reaching impacts, however, those communities which are traversed by major highways are also susceptible to a higher risk, refer to Maps 5 and 6.

**Future Probability & Potential Dollar Losses – Hazardous Materials Incidents:**

Based upon historical data presented (frequency of past events), Vilas County can expect about 3.7 hazardous material spills per year on average. This equates to a probability of 1.0 or a 100% chance in a given year. In addition to a significant event, the County can expect numerous smaller spills that often go unreported. These events still require resources and the response of local fire departments.

Historical data from hazardous material spills that have a known response cost, was used to determine an average cost for a hazardous material spill response. Nine incidents have associated response costs ranging from \$1,200 to \$25,000. Using this data, Vilas County can expect an average hazardous material response cost of \$4,000. This potential cost is only reflective of the initial response and clean up. Additional clean-up and disposal costs may apply. Costs of smaller less significant spills are usually absorbed by Fire Department budgets. These costs are hard to estimate as they are seldom reported and recorded. Over the next ten-year period Vilas County can expect \$148,000 in hazmat response costs as a result of hazardous materials incidents.

**HAZARD ANALYSIS: LONG TERM POWER OUTAGE****Background on Long Term Power Outage Hazard:**

A power failure is defined as any interruption or loss of electrical service due to disruption of power transmission caused by accident, sabotage, natural hazards or equipment failure. The reasons for a power failure can for instance be a defect in a power station, damage to a power line or other part of the distribution system, a short circuit, or the overloading of electricity mains. Power failure is usually the result of a cascade effect of other hazards including but not limited to thunderstorms, windstorms, ice storms, snow storms, and flooding.

A significant power failure is defined as any incident of a long duration which would require the involvement of the local and/or state emergency management organizations to coordinate provision of food, water, heating, shelter, etc. A power outage may be referred to as a blackout if power is lost completely. However if some power supply remains but the voltage level is below the minimum level specified for the system it is termed a brown out.



**Long Term Power Outage Vulnerability Assessment:**

Due to society's heavy reliance on electricity, the loss of service can disrupt many ordinary activities. Emergency communications may be impaired if it becomes necessary to rely on radio communications. Power failures pose a great threat to at risk populations such as the elderly, people who are hospitalized, and developmentally disabled. Power failures are particularly threatening to hospitals, since many life-critical medical devices and tasks require power. Though facilities like these have developed their own emergency plans to deal with issues such as these. Other life-critical systems such as telecommunications also require power in emergency situations.

A prolonged power failure can impact heating, food spoilage, inability to cook, water supplies, industrial processes, and businesses. The most likely cause of injury or death is from unsafe use of alternate fuel sources for heating, cooking and lighting. The entire community is vulnerable to the potential impacts of an electricity outage.

An extended utility outage in the County would represent an inconvenience for most residents, with economic losses for some businesses. The greatest economic loss would be for the utility itself, which must provide the crews and equipment to restore service. It is likely that a widespread and prolonged utility outage would occur making the entire county vulnerable to this hazard. Unlike other hazards, power failure has a history of being largely spread out, affecting more households during one event compared to other hazards. The loss of power generally results from damage to power lines (due to high wind, ice, traffic accidents, etc.) or transmission equipment (often resulting from animal damage). The ongoing maintenance and operational procedures of each utility provider are intended to minimize the risk of service disruption.

**History of Long Term Power Outage in Vilas County:**

The NCDRC database for Vilas County between 2002 and 2011 contains 39 storm events that list power outage of varying degrees in the narrative. A storm event typically results in 3 to 5 outages on average within the area, so the actual number of outages is actually much higher, in the range of 117 to 195.

The most recent event took place on August 19, 2011 when thunderstorm winds downed power lines and large tree branches in Conover. Isolated severe thunderstorms produced large hail and gusty winds across north-central Wisconsin. The storms knocked out electricity to 2,000 customers and caused at least \$120,000 in damage.

On October 27, 2010, an intense storm produced wind gusts over 60 mph across Northeast Wisconsin. The high winds caused widespread power outages with as many as 60,000 residents without power. A Vilas County After-Action report indicates that some areas remained without power for up to a week. The report details how the County dealt with mass care and sheltering,

communications, and emergency public information and warning issues. It was noted that the County's sheltering plan(s) worked well. Communications, however, presented some challenges. The principal broadcast radio station serving Vilas County was off the air because of the power outage. Telephone communication was further compromised by homeowners using land line telephone systems that are dependent on household power for their operation. Additionally, households without power were unable to recharge their cell phones.

On April 16, 2003, a cold front that moved through Wisconsin from the north brought a shallow layer of cold air into the north-central part of the state. Significant freezing rain and sleet fell as precipitation formed in warmer air aloft and then fell through a layer of cold air near the ground. Dozens of traffic accidents were reported on icy roads. The weight of accumulated freezing rain downed trees, tree limbs and power lines. A total of about 15,000 customers of one utility company were still without power on the morning of the 18th in the Eagle River, Rhinelander, Minocqua, Tomahawk and Merrill areas.

**Future Probability and Potential Dollar Losses – Long Term Power Outage:**

Based on historical data presented here (frequency of past events 2002-2011), Vilas County can expect regular power outages. Minor, localized power outages should be expected annually based on NCDC data showing 12 to 20 instances per year on average. The probability of a more significant power outage event like the October 2010 episode is more on the order of 0.10 or a 10% chance in a given year.

Loss data attributable to the effects of a power outage is not readily available at this time.

**HAZARD ANALYSIS: DROUGHT / EXTREME HEAT**

**Background on Drought / Extreme Heat Hazard:**

A drought is an extended period of unusually dry weather, which may be accompanied by extreme heat (temperatures which are 10 or more degrees above the normal high temperature for the period). There are basically two types of drought in Wisconsin: agricultural and hydrologic. Agricultural drought is a dry period of sufficient length and intensity that markedly reduces crop yields. Hydrologic drought is a dry period of sufficient length and intensity to affect lake and stream levels and the height of the groundwater table. These two types of drought may, but do not necessarily, occur at the same time.

Droughts, both agricultural and hydrologic, are relatively common in the state. Small droughts of shortened duration have occurred at an interval of about every ten years since the 1930's.

Extended periods of warm, humid weather can create significant risks for people, particularly the elderly who may lack air conditioning or proper insulation or ventilation in their homes. Animals are also at risk during extended periods of heat and humidity. The National Weather Service issues a Heat Advisory when the Heat Index ranges from 105 to 114 degrees daytime and remains at or above 80 degrees at night, during a 24-hour period. The heat index combines the effects of heat and humidity to better reflect the risk of warm weather to people and animals. When heat and humidity combine to reduce the amount of evaporation of sweat from the body, outdoor activity becomes dangerous even for those in good shape. The index measures the apparent temperature in the shade. People exposed to the sun would experience an even higher apparent temperature. A heat index of 105 is considered dangerous and prolonged exposure can result in heat stroke, exhaustion and cramps. People should be reminded to use extreme caution when the heat index is between 95 and 105. A heat index of 95 occurs when the temperature is 90 degrees and the relative humidity is 50 percent.

#### **History of Drought / Extreme Heat in Vilas County:**

An extended period of drought conditions going back to 2005 for Vilas County and much of Wisconsin eased a bit in 2011. Periods of below normal precipitation led to ongoing moisture deficits despite periodic storm events creating breaks in the dry pattern. One report on northern Wisconsin lake levels in early 2009 stated that Anvil Lake (Vilas Co.) was at its lowest level since 1943. This was 7.2 feet below the lake's highest recorded level. During this period, the Governor declared a state of emergency to get assistance to the state's agricultural sectors. The extended dry conditions posed serious challenges for farmers from drought stressed crops to issues providing feed for livestock.

NCDC reports indicate drought periods from September to October 2005, July 2006, from June to October of 2007, from December 2008 to November 2009, and from April to August 2010.

The drought of 1976-1977, affected an area stretching from north to south across the state. Stream flow measuring stations recorded recurrence intervals from 10 to 30 years. Numerous private and municipal wells went dry due to the lowered groundwater tables and agricultural losses during this drought were set at \$624 million. Vilas County was one of 64 counties that were declared federal drought areas and deemed eligible for assistance under the Disaster Relief Act. Federal monies totaled only 19% of losses attributed to the drought.

Vilas County also experienced the drought of 1987-1988 and a dry spell in 1999.

The NCDC lists one incidence of excessive heat for Vilas County. Between July 23 and July 31, 1999, consecutive days of high temperatures combined with high humidity levels again resulted in numerous heat related illnesses and three deaths resulted outside Vilas County. The heat caused some roads to buckle.

**Drought / Extreme Heat Vulnerability Assessment:**

Droughts can have a dramatic effect on the limited agriculture and cranberry operations located in Vilas County. Even small droughts of limited duration can reduce crop growth and yields, adversely affecting farm income. More substantial events can decimate croplands and result in total loss, hurting the local economy.

Irrigation and other groundwater withdrawal can negatively impact the environment by drawing water that naturally goes to aquifers and surface water. Drought can exacerbate the problem when high withdrawal rates versus little precipitation deplete waterbodies and aquifer supplies, therefore decreasing drinking water supplies, drying streams, and hindering aquatic and terrestrial wildlife. During severe droughts, some wells - mainly private wells - will go dry.

Another significant area of impact from drought includes the tourism sector of the economy. As lake levels go down, there is less tourism seen in the County. Recent drought conditions have left lake levels down significantly, and many boat launches cannot be used.

Droughts can trigger other natural and man-made hazards as well. They greatly increase the risk of forest fires and wildfires because of extreme dryness. In addition, the loss of vegetation in the absence of sufficient water can result in flooding, even from average rainfall, following drought conditions.

The following is a list of things that may be adversely affected by a drought. Much of these community assets can be referenced in Part II.

- Infrastructure – municipal water supplies
- Surface water –groundwater reserves, recreation, and wildlife
- Forests- forest productions industry
- Agricultural - crops, livestock

Essentially, the entire County is at risk from the impacts of drought on forestry and tourism. Specific areas more susceptible to drought conditions would be those with notable agricultural like Lincoln, Manitowish Waters and Washington.

According to Wisconsin Emergency Management, excessive heat has become the most deadly hazard in Wisconsin in recent times. Extreme heat can happen anywhere within Vilas County affecting everyone, however the elderly and young are the ones with the highest risk of getting heat related injuries, which can lead to death. Ways to prevent injuries include wearing light-colored clothing, drink plenty of water, slow down, and do not stay in the sun for too long.

**Future Probability and Potential Dollar Losses – Drought/Extreme Heat:**

Based on the historic data presented here (frequency of past events), Vilas County can expect a drought every ten years on average, which is a probability of 0.10 or a 10 percent chance in a given year. Significant severe drought is somewhat less common, affecting Wisconsin once about every 15 years.

Drought is another hazard lacking good loss figures at the county level. However, a look at aggregate data for the last two major droughts can give some indication of potential impact. The last two major droughts in Wisconsin resulted in losses of \$9.6 million (1976-77) to \$18 million (1987-88) per county on average.

Normally, central Wisconsin is known for its cold winters, however, extreme heat waves will affect Vilas County in the future. Vilas County can expect a heat wave once every 13 years or a 7.7 percent chance in a given year based on the historic data available.

**HAZARD ANALYSIS: FLOODING/DAM FAILURE****Background on Flooding/Dam Failure Hazard:**

There are a variety of classifications for flooding including coastal, dam failure, flash, lake, riverine, stormwater and urban/small stream. Vilas County has the potential for all these types except coastal. The following descriptions of the types of flooding are compiled from various FEMA and other notable hazard planning sources:

*Coastal* – Different from other types of flooding which relate to movement of water through a watershed, coastal flooding is due to the effect of severe storm systems on tides resulting in a storm surge. Primarily known as an ocean-based event, the Great Lakes coastal areas can also be affected.

*Dam Failure* – More of a technology related hazard than a natural hazard, various factors can result in the failure of the structural technology that is a dam, thus causing flooding of areas downstream of the dam often similar in effect to flash flooding.

*Flash* – Involves a rapid rise in water level moving at high velocity with large amounts of debris which can lead to damage including tearing out of trees, undermining buildings and bridges, and scouring new channels. Dam failure, ice jams and obstruction of the waterway can also lead to flash flooding. Urban /built-up areas are increasingly subject to flash flooding due to removal of vegetation, covering of ground with impermeable surfaces and construction of drainage systems.

*Lake* – Prolonged wet weather patterns can induce water-level rises that threaten lakeshore areas.

*Riverine* – Also known as overbank flooding, this is the most common type of flooding event. The amount of flooding is a function of the size and topography of the watershed, the regional climate, soil and land use characteristics. In steep valleys, flooding is usually rapid and deep, but of short duration, while flooding in flat areas is typically slow, relatively shallow, and may last for long periods.

The cause of flooding in rivers is typically prolonged periods of rainfall from weather systems covering large areas. These systems may saturate the ground and overload the streams and reservoirs in the smaller sub-basins that drain into larger rivers. Annual spring floods are typically due to the melting of snowpack.

*Stormwater* – Water from a storm event that exceeds the capacity of local drainage systems, either man-made or natural, can result in flooding. Inadequate storm sewers and drainage systems are often the primary factor resulting in this type of flooding.

*Urban and Small Stream* – Locally heavy rainfall can lead to flooding in smaller rivers and streams. Streams through urban or built-up areas are more susceptible due to increased surface runoff and constricted stream channels.

As with much of Wisconsin when it happens, flooding in Vilas County tends to occur in the spring when melting snow adds to normal runoff and in summer or early fall after intense rainfalls. Flooding occurs in the spring due to snowmelt and frozen soil. As described in Part II, there are approximately 402 miles of streams in Vilas County within thirteen watersheds. Floodplains along these tributaries as well as some lakes are narrow but extensive throughout the County.

There are about 71 dams listed in the WisDNR inventory for Vilas County (See Map 3 and Table 14). These dams serve many useful purposes including agricultural uses, providing recreational areas, electrical power generation, erosion control, water level control and flood control. From the inventory, Vilas County has 17 large dams (including Rest Lake and Otter Rapids). The Wisconsin DNR regulates all dams on waterways to some degree; however the small dams are not stringently regulated for safety purposes. The federal government has jurisdiction over large dams that produce hydroelectricity. In Vilas County, the Otter Rapids Dam has the ability to produce hydroelectricity and a number of the other dams are used in regulation of flow for downstream hydro-dams.

Table 14		Large Dams in Vilas County			
Name	EAP Year	Hazard Rating	Stream Name	Owner	Hydraulic Height
Long-On-Deerskin		Low	Deerskin River	WVIC	3
Little Saint Germain		Significant	Little St. Germain Creek	WVIC	5
Turtle Lake	2007	Low	Turtle River	Town of Winchester	2
Flambeau Lake		Low	Bear	Town of Lac du Flambeau	1
Little Tamarack Creek*		Low	Little Tamarack Creek	WDNR	7
Powell Marsh Pool 5	2007	Low	Trib. to Dead Pike Lake	WDNR	6.2
Kenu Lake		Low	Outlet Kenu Lake	Kenu Lake Family Foundation	5
Twin Lakes		Significant	Twin River	WVIC	4
Powell Marsh Pool 4	2007	Low	surface runoff	WDNR	2
Cranberry Lake	2001	Low	Inlet Cranberry Lake	Coleman	6
Rest Lake	2003	High	Manitowish River	Xcel Energy	10
Lac Vieux Desert		Significant	Wisconsin River	WVIC	7
Buckatabon		Significant	Buckatabon Creek	WVIC	5
Big Saint Germain		Significant	Saint Germain River	WVIC	2
Otter Rapids	2011	High	Wisconsin River	WPS	13
Fishtrap	2008	Significant	Manitowish River	WDNR	7
Mcfadyen		Low	Trib. to Pardee Creek	n/a	8
Burnt Rollways**	2011	Significant	Eagle River	WVIC	9

Source: WDNR Dams Database \* Noted as abandoned in DNR list. \*\*Located in Oneida Co, inundation are in VilasCo.

A dam can fail for a number of reasons such as excessive rainfall or melting snow. It can also be the result of poor construction or maintenance, flood damage, weakening caused by burrowing animals or vegetation, surface erosion, vandalism or a combination of these factors. Dam failures can happen with little warning resulting in the loss of life and significant property damage in an extensive area downstream of the dam.

The WDNR assigns hazard ratings to large dams within the state. When assigning hazard ratings, two factors are considered: existing land use and land use controls (zoning) downstream of the dam. Dams are classified into three categories that identify the potential hazard to life and property downstream should the dam fail. A high hazard indicates that a failure would most probably result in the loss of life. A significant hazard indicates a failure could result in extensive property damage. A low hazard exists where failure would result in only minimal property damage and loss of life is unlikely. For Vilas County, only two dams, Otter Rapids and Rest Lake, have a high hazard rating, and seven have a rating of significant: Burnt Rollways, Little Saint Germain, Twin Lakes, Lac Vieux Desert, Buckatabon, Big Saint Germain, and Fishtrap. Otter Rapids, Rest

Lake, Burnt Rollways, Fishtrap, Powell Marsh Pool 4 & 5, Cranberry Lake and Turtle Lake have emergency action plans (EAPs) currently in place.

**History of Flooding/Dam Failure in Vilas County:**

Flooding was noted as a principal cause of damage in one of three Presidential Declarations in Vilas County since 1971. However, the storms that resulted in this declaration during 1999 affected a number of counties. County records indicate that within Vilas, flooding was not a significant issue as it was in many of the other affected counties. Flooding was limited to roadways and culverts.

Within the ten-year period of analysis for this report, the NCDC reports only one flooding event: flash flooding in the City of Eagle River. On July 17, 2011, the passage of a weak upper level disturbance through a very unstable air mass created a line of severe thunderstorms during the evening hours. Heavy rains caused a small section of Highway 70 to flood in a low-lying area. A home had a basement wall cave in due to high water. The NCDC reported damages of about \$5,000.

Beyond the ten-year window, the NCDC reports five other flooding events for Vilas County. In April 1996, heavy runoff from spring snow melt and rain resulted in widespread minor flooding across north central Wisconsin. Numerous roads and culverts were washed out in Vilas and other counties. Later in 1996, approximately 1.5 inches of rain fell over a one-hour period on August 5, causing flash flooding in the St. Germain vicinity. Heavy runoff from hillsides caused small mudslides, which deposited up to 2 feet of mud on area roads.

Two instances also occurred in 2000. On July 2, heavy rain fell over saturated ground in Vilas County and Oneida County, resulting in some street flooding and backed up storm sewers in Eagle River. Then, on August 14, severe thunderstorms developed in the vicinity of a front that was stalled across northeast Wisconsin. Heavy rainfall caused street flooding at several locations in the Lac du Flambeau area. Both were noted as urban and small stream type flooding.

In September of 2001, heavy rain from thunderstorms resulted in flooding of streets and low spots in the City of Eagle River. This event was also noted as urban and small stream type flooding by NCDC. It is noted by Emergency Management that Eagle River always has street flooding during periods of heavy rain. This is due to storm drain overflow and not small stream flooding.

Vilas County has not experienced a dam failure with any loss of life or substantial property damage. Dams occasionally develop holes or other damage, but have not caused flooding problems.



**Flooding/Dam Failure Vulnerability Assessment:**

Vilas County historically does not have a serious flooding problem. A majority of the floodplain area with the County is located on flowage type water bodies, such as the Manitowish Flowage, where water levels can be actively controlled. Flood events in the County have not caused substantial property or infrastructure damage in the past and are generally classified as minor. However, there is some potential to cause future damage, since a significant number of structures still exist in the floodplain. In addition, demand for shoreland property eventually results in pressure to develop less suitable areas.

Past flooding events in Wisconsin have typically impacted communities in the following areas:

- Infrastructure – flooded public facilities
- Roadways – washouts, inundated roadways, debris clean-up
- Residential structures – flooded basements, damaged septic systems
- Businesses – loss of commerce
- Agriculture - inundated cropland

To assess the vulnerability of the Vilas County area to flooding hazards, basic inventory data described in Part II must be analyzed. For this purpose, consideration should be given to structures (specifically critical facilities), infrastructure, and cropland.

One of the first reports to reference in assessing vulnerability to structures during flooding is the Wisconsin Repetitive Loss Report. The Repetitive Loss Report provides information to the status of repetitive loss properties by community. FEMA classifies a repetitive loss structure “when more than one flood insurance claim of at least \$1,000 is made within a ten-year period”. The information is used as a floodplain management tool and to supplement information provided by communities for flood mitigation grants administered by WEM. According to the report, there are no repetitive loss structures within Vilas County.

Since no structures are listed in the Repetitive Loss Report, structures within floodplains were analyzed, see methodology outlined below. The floodplain boundaries within Vilas County are shown on Map 11 (from Map 4). Table 15 shows the number of structures in each municipality identified as "vulnerable to flooding" according to proximity to floodplains. There were a total of 221 structures identified in the designated floodplain boundaries, see Map 11. Estimated value of structures located within the floodplain in Vilas County is over \$55 million.

<b>Table 15</b>			
<b>Improvement Values for Structures in Floodplains</b>			
<b>Municipality</b>	<b># of Structures</b>	<b>Median Value</b>	<b>Total Value</b>
Arbor Vitae	0	\$165,400	\$0
Boulder Junction	17	\$274,500	\$4,666,500
Cloverland	2	\$220,800	\$441,600
Conover	7	\$208,700	\$1,460,900
Lac du Flambeau	2	\$222,000	\$444,000
Land O' Lakes	2	\$219,900	\$439,800
Lincoln	8	\$170,800	\$1,366,400
Manitowish Waters	64	\$390,700	\$25,004,800
Phelps	0	\$166,100	\$0
Plum Lake	0	\$191,500	\$0
Presque Isle	0	\$331,100	\$0
St. Gremain	75	\$172,600	\$12,945,000
Washington	41	\$195,600	\$8,019,600
Winchester	0	\$311,900	\$0
Eagle River	3	\$121,300	\$363,900
<b>Vilas County</b>	<b>221</b>	<b>\$249,558</b>	<b>\$55,152,500</b>

Source: US Census, 2010 and NCWRPC

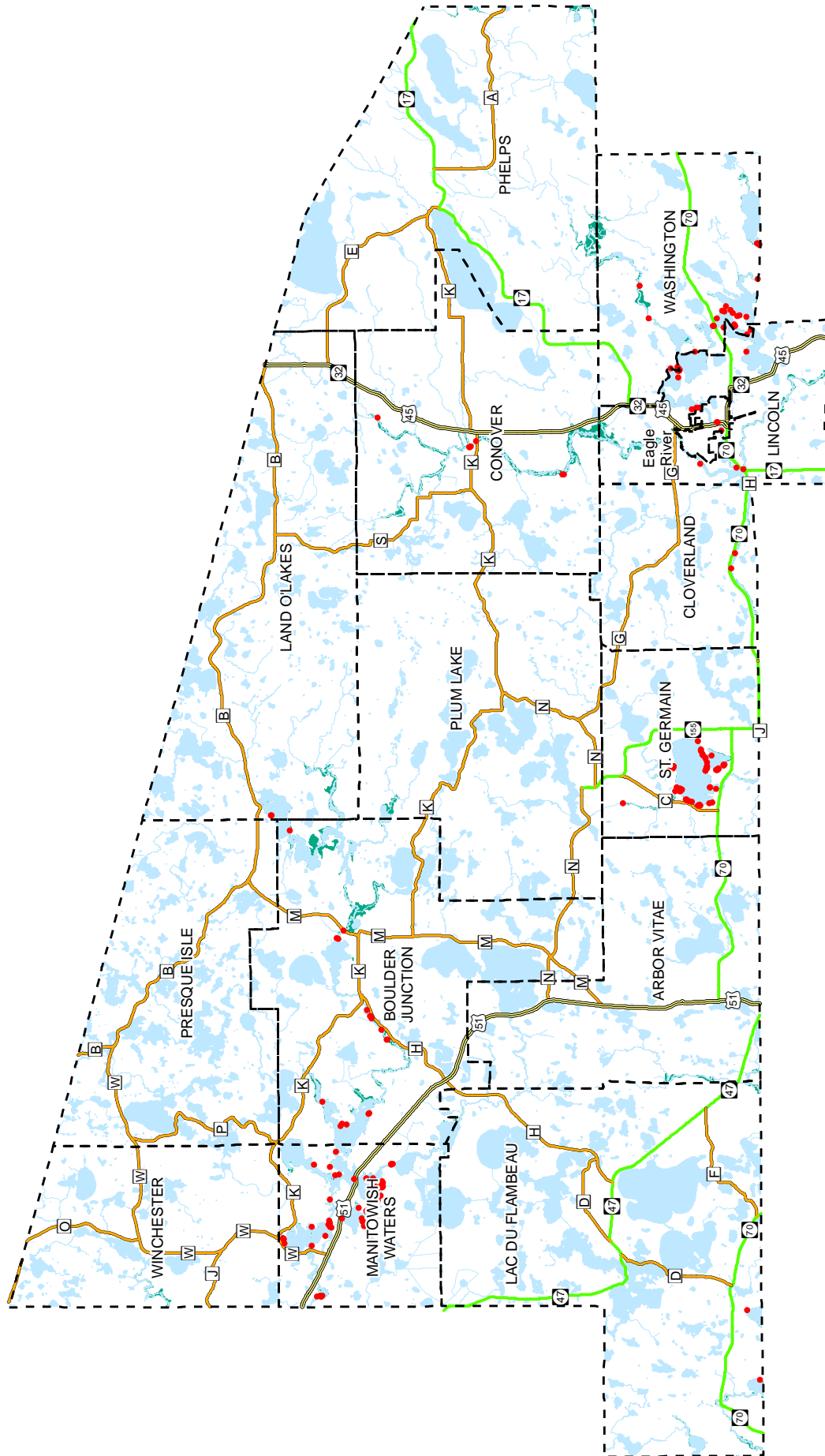
Methodology – Structures within Floodplains:

1. NCWRPC downloaded a digital GIS coverage of the updated FEMA floodplain maps from Vilas County Land Records.
2. A building point coverage was digitized from digital aerial photos along the flood plain areas.
3. The floodplain coverage was then combined with the building point coverage to identify those structures within the floodplain boundary.
4. Total structures with the floodplain were then tabulated by municipality.
5. Median values from U.S. Census data were used to estimate total value for the identified vulnerable structures by municipality.

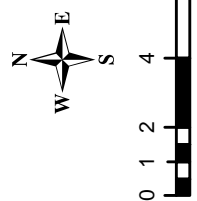
In addition to structural damage from flooding, there may also be significant damages to public roadways, particularly to roadway surfaces, culverts and bridges. Floods may inundate roadways in the County for varying periods. Such interruptions in the County transportation network may cause travel delays through detours.

The primary impact from damages to roadways is to businesses. The monetary impact is unknown but floods may restrict public access and even close businesses. Tourism is an important industry in the County and several campgrounds, lodges and restaurants may be affected by flooding.

The areas considered to have a higher risk for impact from flooding include those communities with structures in floodplains as shown in Map 11.



- Minor Civil Divisions
- Structures in Floodplain
- US Highways
- State Highways
- County Highways
- Water
- Flood Plain



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Source: WI DNR, FEMA, NCWRPC  
 This map 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. NCWRPC is not responsible for any inaccuracies herein contained.

**Future Probability and Potential Dollar Losses – Flooding/Dam Failure:**

Based on the historic data presented here (frequency of past events - 2002 to 2011), Vilas County can expect a flood event about every 10 years on average. This equates to a probability of 0.1 or about a 10 percent chance in a given year.

As indicated earlier, no dam breaks have been identified within Vilas County. Therefore, there is no historic frequency upon which to base a future probability, other than to say that the probability of a dam failure is very low. However, due to the significant number of dams and particularly large dams with high or significant hazard ratings, dam failure is an important hazard event to plan for in Vilas County.

Historic data is again used to estimate potential future dollar losses due to flood. Based on the 2011 flood event where the NCDC reported damages of approximately \$5,000, Vilas County can anticipate property losses of approximately \$5,000 on average, between the public and private sector for each flood occurrence. Over the next ten-year period, flood losses in Vilas County could approach \$5,000.

Potential flood losses for structures by jurisdiction are reflected in Table 15. While structures outside mapped floodplains may also be lost or damaged in a flood, structures within flood plains represent the greatest risk for flood damages. City of Eagle River officials consider flooding only minor and not a significant concern to the City.



*Rest Lake Dam. (WDNR)*

**INTRODUCTION**

Hazard mitigation is any action taken to reduce or eliminate the long-term risk to human life and property damage from natural hazards. This chapter describes the mitigation goals and actions to be taken by Vilas County, the City of Eagle River and other units of government within the county for each of the hazards identified in Part III – Risk Assessment. The intention is to reduce or avoid long-term vulnerability to the identified hazards.

Part IV of the Vilas County All Hazards Mitigation Plan will discuss the following factors in establishing the multi-jurisdictional mitigation strategies:

- Review of Mitigation Goals
- Prioritize Identified Mitigation Strategies
- Establish Mitigation Action Plan

**LOCAL HAZARD MITIGATION GOALS**

The mitigation strategy is based on a set of goals to reduce or avoid long-term vulnerabilities to the hazards identified in the Risk Assessment. The goals were established by the Mitigation Planning Team during the development of the plan. These goals represent the desired conditions to strive for through the mitigation efforts of the County, City and other units of government.

The mitigation goals for reducing or avoiding the long-term vulnerability of Vilas County are as follows:

- Prepare and protect residents and visitors from all hazards.
- Create safety awareness to citizens and travelers of Vilas County to protect them during and after winter storm events.
- Minimize the threat to human life and property damage caused by thunderstorms and associated hail, high wind and lightning.
- Protect the health, safety, and welfare of county residents and visitors, along with mitigating future loss of property from tornados.
- Protect the safety and property of residents from forest and wildfires.
- Improve County preparedness for dealing with an epidemic/pandemic.
- Protect people and natural resources from adverse affects of hazardous material incidents.
- Reduce the number of power outages due to natural hazards in Vilas County.
- Create safety awareness in citizens of Vilas County to help protect themselves during extreme heat events.
- Improve County preparedness for dealing with extended drought.
- Lessen the impact floods have on people, property, and the environment.
- Prevent loss of life and reduce the risk of property damage in downstream areas that result from a dam failure.

**PRIORITIZATION OF STRATEGIES**

The Mitigation Planning Team considered a number of factors in identifying and ranking proposed mitigation strategies. The matrix, below, describes the factors incorporated into the prioritization process. The resulting priority of each strategy is shown in the summary Table 16.

**Prioritization Factors for Vilas County Mitigation Strategies**

<i>Strategy Prioritization Factor</i>	<i>Description of Factor Considerations</i>
Priority of Hazard Type	The ranking of hazard types, tornado, flooding, etc., accounts for threat to human safety and possible property damage and was carried over to groups of strategies by hazard type. Strategies believed to benefit multiple hazards (listed under "All Hazards") were valued higher.
Ease of Implementation	Strategies where existing staff and resources are adequate were valued higher than those where additional resources are necessary. Consideration was also given to strategies that meet other countywide goals or incorporated as part of another county project. Project timing was also a consideration as to when funding such as grant applications might be available and when various activities could be scheduled.
Perceived Cost versus Potential Benefit	Although a detailed cost-benefit analysis was deemed beyond the scope of this study, the Committee weighed the perceived costs of each strategy against the potential benefit anticipated. Proposals that seemed economically unfeasible were rejected.
Multi-jurisdictional Application	Strategies benefiting multiple jurisdictions were valued more than those pertaining to fewer jurisdictions.

Members of the Team scored each strategy based on these prioritization factors and assigned a high, medium or low rating to reflect their relative level of priority for that strategy. A 3-point weighted scale was used to average the scores into the overall high, medium or low priority for the County or local units as shown in Table 16.

**MITIGATION ACTION PLAN**

The mitigation strategies are organized by hazard beginning with some overall strategies that apply to a number of different hazards and are listed under the category, “all hazards”. For each hazard, a goal was established as to what the County intends to achieve by implementing the specific action strategies and is based on the risk assessment findings. Each action strategy is then briefly described and followed by a discussion of the jurisdictions/agencies that will pursue the action including the proposed lead jurisdiction/agency.

Each section of this part is broken down as follows:

**Goal:**

Broad, long-term mitigation goals to reduce or avoid vulnerabilities to the identified hazard are stated.

**Action:**

Each action strategy proposed to aid in achieving the overall goal for the identified hazard is described. A given action strategy may be comprised of a number of related sub-actions.

**Participating Jurisdictions:**

The proposed lead agency or lead jurisdiction is identified along with a listing of the other agencies or jurisdictions that the recommended action applies to. This does not preclude other agencies or jurisdictions from participating in the action.

The chapter concludes with a summary of the recommended mitigation strategies shown in Table 16. Table 16 also contains project cost estimates where available, potential time frames, and existing and potential programs and resources to accomplish the mitigation strategy.

**Hazard: All Hazards****Goal:**

Prepare and protect residents and visitors from all hazards.

**Action 1:**

The County will continue to promote use of National Oceanic and Atmospheric Administration (NOAA) weather radios as a primary notification system for weather advisories to the general public and special locations. NOAA Weather Radio (NWR) is a nationwide network of radio stations broadcasting continuous weather information direct from a nearby National Weather Service office. NWR broadcasts National Weather Service warnings, watches, forecasts and other hazard information 24 hours a day. NWR is not only for tornados, but also for other hazards as well making it a single source for comprehensive weather and emergency information. NWR also broadcasts

warning and post-event information for all types of hazards--both natural and environmental (such as chemical releases).

***Participating Jurisdictions for Action 1:***

Lead agency will be Vilas County Emergency Management. Jurisdictions participating in this action will include: Vilas County, City of Eagle River, Lac du Flambeau Tribe and all Towns.

**Action 2:**

The County will continue to add and update information on its Emergency Management Department web site. The web site should contain information describing the types of natural and man-made hazard disasters in the County and how to respond when a hazard threatens. The site should also contain information on ordinances pertaining to hazards, locations of tornado shelters, and links to other sites with useful information on related matters such as burning permits and weather conditions.

***Participating Jurisdictions for Action 2:***

Lead agency will be Vilas County Emergency Management. The only directly participating jurisdiction will be Vilas County. Other jurisdictions may choose to maintain and update their websites with appropriate hazard related information or link to the County site.

**Action 3:**

The County will maintain its CodeRED emergency notification system and expand public outreach on the availability and use of the system. CodeRED is a web-based early warning system that can deliver targeted emergency notifications to phone numbers in an affected area. The selected area can be the entire county or as small as one block. The system also automatically issues alerts to areas included in National Weather Service warnings for severe storms or tornados. Residents must enroll to receive the notifications on their home or mobile phone.

***Participating Jurisdictions for Action 3:***

Lead agency will be Vilas County Emergency Management. The only directly participating jurisdiction will be Vilas County.

**Action 4:**

The County will promote Code Red system registration through media contacts, psa's and public appearances. Residents must enroll, at no cost, to receive CodeRED notifications. In addition, since the County upgraded its CodeRED service, residents may not realize they have to go back and re-register or update their preferences to receive the automated severe weather warnings.

***Participating Jurisdictions for Action 4:***

Lead agency will be Vilas County Emergency Management. The only directly participating jurisdiction will be Vilas County.



**Action 5:**

The County should continue and promote the training of Law Enforcement Officers, Municipal Fire Department Members, Emergency Medical Services Personnel, and Municipal First Responders in the identification of dangerous weather patterns. The National Weather Service provides this type of training through their Weather Spotter Program. Vilas County should continue to sponsor this training annually.

***Participating Jurisdictions for Action 5:***

Lead agency will be Vilas County Emergency Management in conjunction with the National Weather Service - Green Bay. Jurisdictions participating in this action will include Vilas County, City of Eagle River, Lac du Flambeau Tribe and all Towns including corresponding police and fire departments, EMS and First Responders.

**Action 6:**

The county-wide emergency response zone atlas should be updated. Often referred to as a fire zone atlas, these atlas books were originally conceived to help direct firefighting and evacuation operations in rural areas at high risk for wildfire. A number of counties across the state have developed, or are developing these atlases, typically sponsored by WisDNR. Recognizing their potential value in responding to a wide variety of hazard events, many counties are utilizing them as a tool in responding to and managing other situations beyond fire.

Zones are drawn around groups of structures based on factors related to access and evacuation. The zones are named, colored-coded and indexed for ease of reference. Atlas books are distributed to police, fire and EMS units responsible for responding to emergency situations in rural areas of the county covered by the atlas.

***Participating Jurisdictions for Action 6:***

Lead agency will be Vilas County Emergency Management in conjunction with the Wisconsin Department of Natural Resources. Jurisdictions participating in this action will include Vilas County, City of Eagle River, Lac du Flambeau Tribe and all Towns including corresponding police and fire departments.

**Action 7:**

The Town of St. Germain identified a need to install an emergency back-up generator at its Community Center, in response to the mitigation issues survey.

***Participating Jurisdictions for Action 7:***

Lead agency will be the Town of St. Germain. St. Germain will be the only directly participating jurisdiction.

**Action 8:**

The County and City should obtain new aerial photography to include LIDAR for use by their emergency services and for further improvement in flood zone mapping. LIDAR stands for light detection and ranging which uses a laser beam to map physical features

with a very high resolution. This has been identified as a project to cooperate with Oneida County on a joint effort.

Adding LIDAR, with its increased precision, to the County's next generation of aerial photos will be a very effective tool for use in risk assessment, disaster response and mitigation activities over the full spectrum of hazards facing the County and may enable the County Board to join the NFIP as a result of floodplain mapping become much more accurate and reliable than is currently available.

Periodic updating of the aerial photo / lidar imaging enables time comparison which can enhance assessment of change and trends. One example would be the monitoring and evaluation of vegetative growth as part of the effort to address power outage resulting from downed trees/limbs (see Action 24).

***Participating Jurisdictions for Action 8:***

Lead agencies will be the Vilas County Land Information Department, the City of Eagle River and the Lac du Flambeau Tribe in conjunction with Oneida County. Jurisdictions participating in this action will include Vilas County, City of Eagle River, and Lac du Flambeau Tribe.

**Action 9:**

In response to the mitigation issues survey, the need for a new fire/rescue hall with emergency shelter was identified by the Town of Land O' Lakes. The geographic size of the Town in conjunction with the number of lakes affects response time. The Town is exploring the possibility of establishing a second fire hall in order to provide additional response capabilities on the west side of the Town.

***Participating Jurisdictions for Action 9:***

Lead agency will be the Town of Land O' Lakes. Land O' Lakes will be the only directly participating jurisdiction.

**Hazard: Winter Storms / Extreme Cold**

**Goal:**

Create safety awareness in citizens and travelers of Vilas County to protect them during and after winter storm events.

**Action 10:**

The County should promote winter hazards awareness, including home and travel safety measures, such as avoiding travel during winter storms. If travel cannot be avoided, having a shovel, sand, warm clothing, food, water, etc. should be encouraged to have in vehicles. Other winter / extreme cold problems common in northwoods counties include freezing of septic systems and residential LP Gas (extreme cold).

***Participating Jurisdictions for Action 10:***

Lead agency will be Vilas County Emergency Management. Vilas County will be the only directly participating jurisdiction.

**Hazard: Severe Thunderstorms / Hail / Lightning / Wind**

**Goal:**

Minimize the threat to human life and property damage caused by associated hail, high wind and lightning.

**Action 11:**

Due to the wide variety of variety of recreation activities throughout the County, public awareness of proven lightning safety guidelines to reduce risk should be promoted. Areas of concern include golf courses, country clubs, parks ball fields (and other athletic fields), public beaches and boat launches. Efforts should be made to get managers and staff of such facilities "up to speed" with procedures and training for lightning safety. Another common measure is erecting of signs that inform people when to get out of the water or off a golf course (etc.) when lightning threatens.

***Participating Jurisdictions for Action 11:***

Lead agency will be Vilas County Emergency Management. Participating jurisdictions will include: Vilas County, City of Eagle River, Lac du Flambeau Tribe and all Towns.

**Hazard: Tornadoes**

**Goal:**

Protect health, safety, and welfare of county residents and visitors, along with mitigating future loss of property from tornadoes.

**Action 12:**

In response to the mitigation issues survey, the Town of St. Germain identified the need to install a tornado / emergency warning siren(s).

***Participating Jurisdictions for Action 12:***

Lead agency will be the Town of St. Germain. St. Germain will be the only directly participating jurisdiction.

**Action 13:**

In response to the mitigation issues survey, several Towns indicated a need for emergency shelters. In some cases, a new facility was recommended, but others suggested retro-fitting existing facilities such as a town hall or community center with necessary improvements and/or equipment such as back-up generators, heating or air conditioning units. The Eagle River Library has also expressed interest in establishing a shelter on site.

The older population demographic of the County results in a significant segment of the population with a higher susceptibility to extreme heat and cold. A useful mitigation tool is to have town halls/fire stations or community centers properly equipped to be utilized as warming or cooling locations (or even just a place to recharge cellphones) for these residents (and others) as necessary.

Funding for the construction of shelters may be available through the Wisconsin Department of Commerce's Community Development Block Grant (CDBG). Shelter development is also eligible under FEMA mitigation grants including construction of safe rooms. In some cases, the value of the land on which a shelter facility is built may be counted toward required match for the FEMA grants.

***Participating Jurisdictions for Action 13:***

Lead agencies will be the Towns of Arbor Vitae, Boulder Junction, Land O' Lakes, Manitowish Waters, Plum Lake, Presque Isle, and Winchester, as well as, the Eagle River Library. These will be the only directly participating jurisdictions. Vilas County Emergency Management will work with these entities as necessary to assist in establishing viable shelters.

## **Hazard: Forest Fires and Wildfires**

**Goal:**

Protect the safety and property of residents from forest and wildfires.

**Action 14:**

The County, in conjunction with the WDNR, should promote the Firewise program and related educational materials to increase community awareness of wildfire risk within the County. Outreach efforts should include information on how to protect homes and structures from wildfires. Since Vilas County is mostly rural with many industrial woodland parcels, emphasis should be placed on building construction materials and establishing defensible areas around structures. Roofs and exterior siding should be made of ignition-resistant materials. At least 30 feet should be left between homes and surrounding combustible vegetation. Outreach efforts can exist in the form of web sites, local newspaper articles, and pamphlets to homeowners.

***Participating Jurisdictions for Action 14:***

Lead agency will be Vilas County Emergency Management in conjunction with WDNR. Participating jurisdictions include Vilas County, Lac du Flambeau Tribe, and all Towns.

**Action 15:**

Towns with high risk of wildfire should develop Community Wildfire Protection Plans (CWPPs). In Vilas County, the majority of towns have been identified by WDNR as very high or high risk for wildfire including: St Germain, Cloverland, Lincoln, Lac du Flambeau, Arbor Vitae, Manitowish Waters, Boulder Junction, Plum Lake, Conover, Land O'Lakes and Washington. Phelps is designated as a community-of-concern.

A CWPP identifies and prioritizes areas for hazardous fuels reduction treatments and recommends types and methods of treatment that will protect at-risk areas and critical infrastructure. WisDNR has grant funding available for community wildfire protection planning.

***Participating Jurisdictions for Action 15:***

Lead agencies will be the Towns of St Germain, Cloverland, Lincoln, Lac du Flambeau, Arbor Vitae, Manitowish Waters, Boulder Junction, Plum Lake, Conover, Land O'Lakes, Washington and Phelps in conjunction with WDNR. Jurisdictions participating in this action will include: Vilas County, City of Eagle River, and all Towns.

**Action 16:**

In response to the mitigation issues survey, the Town of Boulder Junction identified the need to widen and clear firebreaks throughout the Town. Much of the forested land within the Town is part of the Northern Highlands - American Legion State Forest, so the Wisconsin Department of Natural Resources would be highly involved in this effort.

***Participating Jurisdictions for Action 16:***

Lead agency will be the Town of Boulder Junction in conjunction with WDNR. WDNR and Boulder Junction will be the only directly participating jurisdictions. Other jurisdictions may choose to participate in this type of action as the need arises.

**Action 17:**

In response to the mitigation issues survey, the Town of Arbor Vitae has identified the need to upgrade its fire equipment.

***Participating Jurisdictions for Action 17:***

Lead agency will be the Town of Arbor Vitae. Arbor Vitae will be the only directly participating jurisdiction. Other jurisdictions may choose to participate in this type of action as the need arises.

## **Hazard: Epidemic / Pandemic**

**Goal:**

Improve County preparedness for dealing with an epidemic/pandemic.

**Action 18:**

The County should update its Emergency Operations Plan (EOP) Annex H to include lessons learned from the 2009 H1N1 Influenza outbreak. Updating the County EOP to include a review of the pandemic H1N1 outbreak of 2009 will help County health officials better manage future epidemic/pandemic incidents. A severe epidemic/pandemic outbreak affecting Vilas County would quickly over-tax the normal capacities of the county's health services. While an incident of this magnitude would likely involve federal and state agencies, other county and local departments and agencies, including Emergency Management, would become involved. An update to

the EOP would be a first step in developing and strengthening partnerships with healthcare providers and other community agencies to coordinate responses and to educate clients and the public.

***Participating Jurisdictions for Action 18:***

Lead agency will be Vilas County Health Department in conjunction with Vilas County Emergency Management. The only directly participating jurisdiction will be Vilas County.

**Action 19:**

Vilas County should conduct an isolation and quarantine tabletop exercise to assist in planning and preparation for possible severe epidemic/pandemic situations. Implementing these (and other) interventions in a timely and coordinated manner will require advance planning. Communities must be prepared for consequences such as increased workplace absenteeism related to child-minding responsibilities if schools need to dismiss students or childcare programs close.

***Participating Jurisdictions for Action 19:***

Lead agency will be Vilas County Health Department in conjunction with Vilas County Emergency Management. Jurisdictions participating in this action will include: Vilas County, City of Eagle River, and Lac du Flambeau Tribe.

**Hazard: Hazardous Materials Incidents - Fixed Site / Transport****Goal:**

Protect people and natural resources from adverse effects of hazardous material incidents.

**Action 20:**

The County will continue to maintain its contract with Oneida County for the Level B Emergency Response Team to respond to serious hazardous materials release. Maintaining the Level B Team provides more immediate response to incidents that require a Hazardous Material Team response.

***Participating Jurisdictions for Action 20:***

Lead agency will be Vilas County Emergency Management. Vilas County will be the only directly participating jurisdiction.

**Action 21:**

The Eagle River Airport should work with the City of Eagle River and the FAA to relocate the LP storage tanks located on the Airport property close to the runway. These large LP tanks pose a risk for explosion resulting from a crash. A school, motel and other developments are in relatively close proximity and would also be at risk in the event of an explosion.

***Participating Jurisdictions for Action 21:***

Lead agency will be the Eagle River Airport in conjunction with the City of Eagle River. Participating jurisdictions will include the Airport, Eagle River and the FAA.

**Hazard: Power Outage****Goal:**

Reduce the number of power outages due to natural hazards in Vilas County.

**Action 22:**

The County will continue to implement the recommendations of the 2011 After Action Improvement Plan for Long Term Power Outage in Vilas County. Corrective actions or recommendations cover four main objective areas including: Mass Care & Sheltering, Communications & Response Coordination, Utility Restoration and Public Information. A number of the recommended corrective actions have been implemented, but others need further work. Some of these include: developing contact lists for shelter facilities, developing welfare check procedures, develop "comprehensive" special needs population list and client list sharing procedures, and other public information actions.

***Participating Jurisdictions for Action 22:***

Lead agency will be Vilas County Emergency Management. Vilas County will be the only directly participating jurisdiction.

**Action 23:**

The County will work to encourage WE Energies and Xcel Energy to establish a communications protocol similar to Wisconsin Public Service (WPS). Improved information sharing can mitigate public confusion and disappointment created by the lack of accurate information. The WPS model of utilizing a pre-designated liaison with other response agencies and the public is an effective tool in improving communications and coordination. Both WE and Xcel should adopt this model.

***Participating Jurisdictions for Action 23:***

Lead agency will be Vilas County Emergency Management in conjunction with WE Energies and Xcel Energy. Vilas County will be the only directly participating jurisdiction.

**Action 24:**

Vilas County will work with utilities to incorporate tree growth pattern information in planning trimming activities. With the American Legion State Forest in the middle and National Forest to the east and west, WDNR and USFS foresters knowledge of tree growth in Vilas County should be used to better plan proactive trimming in areas of power lines to reduce wind related lines down and resulting fires generated. County UW-Extension may be one conduit to coordinate this kind of effort.

***Participating Jurisdictions for Action 24:***

Lead agency will be Vilas County Emergency Management in conjunction with County UW-Extension, WPS, WE Energies and Xcel Energy. Vilas County will be the only directly participating jurisdiction.

**Action 25:**

Eagle River Light and Water Utility should work with the City of Eagle River to identify critical sections of aerial power line within the City which are vulnerable to downing for conversion to underground lines. Burying overhead power lines reduces the risk of power outage.

The primary programs that might fund such projects include mitigation grants under the Pre-Disaster Mitigation Program (PDM) or the Hazard Mitigation Grant Program (HMGP). The City of Eagle River would likely need to sponsor the application. The Eagle River Light and Water utility might be able to apply directly if WEM were to qualify the utilities participation in this county plan, or if the utility was qualified participant in the State Hazard Mitigation Plan Rural Electric Cooperative Annex. Private utilities like WPS would not be eligible to apply directly, but the City or County could work with one of these utilities to sponsor a project.

The HMGP funding becomes available when there is a disaster declaration in the state. There are two current declarations pending in Wisconsin. The Groundhog Day Blizzard declaration, which is set to close at the time of this writing, has received more applications than funding available. The "Duluth" flooding is a smaller declaration (includes Ashland, Bayfield and Douglas counties) that will not provide extensive funding levels. The PDM program has been a recent budget casualty, and it is uncertain when funding will be restored. This action recommendation may have to wait until declaration occurs.

A benefit-cost analysis is required for these applications and is completed by WEM using data provided by the applicant. Documentation of significant previous damages, ie costly power outage and damage to power lines in this case. However, 5% of HMGP funding for each disaster is made available for projects for which it is difficult to perform a benefit-cost analysis.

***Participating Jurisdictions for Action 25:***

Lead agency will be the City of Eagle River in conjunction with the Eagle River Light and Water Utility. The City will be the only directly participating jurisdiction.

**Hazard: Drought / Extreme Heat****Goal:**

Improve County preparedness for dealing with extended drought.



**Goal:**

Create safety awareness in citizens of Vilas County to help protect themselves during extreme heat events.

**Action 26:**

The County should promote heat hazards awareness, including home and travel safety measures. Include suggestions regarding checking on neighbors or others known to live alone or that may be at a disadvantage in fending for themselves.

***Participating Jurisdictions for Action 26:***

Lead agency will be Vilas County Emergency Management. Participating jurisdictions include Vilas County, City of Eagle River, Lac du Flambeau Tribe and all Towns.

**Action 27:**

Develop countywide drought mitigation plan to encourage multi-agency approaches to deal with the negative consequences of extended severe drought in light of continued drought conditions within the County and the recent drought disaster declaration in 23 of the state's southern counties.

***Participating Jurisdictions for Action 27:***

Lead agencies will be Vilas County Emergency Management, Land and Water Conservation and UWEX departments. The only directly participating jurisdiction will be Vilas County. Other jurisdictions should also consider this type of action.

**Hazard: Flooding / Dam Failure****Goal:**

Lessen the impact floods have on people, property, and the environment.

**Goal:**

Prevent the loss of life and reduce the risk of property damage in downstream areas that result from a dam failure.

**Action 28:**

The County Board and City Council will periodically discuss the issue of their participation in the National Flood Insurance Program (NFIP). Vilas County and the City of Eagle River have historically not participated in the NFIP, in part due to inaccuracies in the available maps. Note, however, that federal lending regulations require flood insurance whether or not a community participates in the NFIP. NFIP participation reduces the cost of the insurance. In addition, with the recent tightening of lending regulations, many financial institutions are looking more carefully at NFIP status.

Now that the WDNR has updated the Vilas County maps, many of the discrepancies have been resolved. The revised maps have excluded nearly 2,000 acres from the area previously identified as floodplain. The County and City of Eagle River should

reconsider entry into the NFIP based on these new maps. Entry into the NFIP primarily entails adoption of a floodplain zoning ordinance as a complement to existing county shoreland zoning. A minimum standard model is available.

***Participating Jurisdictions for Action 28:***

Lead agencies will be Vilas County and the City of Eagle River. Participating jurisdictions will include Vilas County and the City of Eagle River.

***Action 29:***

Vilas County will continue to work with dam owners and operators to review and test the dam failure Emergency Action Plan (EAP) for each significant and high hazard dam within the County as well as other dams as appropriate including Powell Marsh 4 and 5.

Emergency situations and/or dam failures are not common events, but the dams within the County are aging and as a result becoming more of a concern. The EAP can become outdated, lose its effectiveness and no longer be workable if the plan is not practiced. Those involved may become unfamiliar with their roles and responsibilities, especially with the turnover of local officials. If the plan is not updated, the information contained in it may become outdated and useless.

FEMA guidelines for dam safety indicate that training and exercises are necessary to maintain operational readiness, timeliness and responsiveness. The status of training and levels of readiness should be evaluated in periodic simulated emergency exercises for response personnel and the dam owner/operator. There are five types of exercises, including: orientation seminar, drill, tabletop exercise, functional exercise and full-scale exercise. They range in complexity from simple to more complex, but it is not required that every exercise program include all five types.

***Participating Jurisdictions for Action 29:***

Lead agency will be Vilas County Emergency Management. Participating jurisdictions will include: Vilas County and towns with significant or high hazard dams in conjunction with dam owners/operators.

**Action 30:**

The City and County should work with the Wisconsin DNR and FEMA to advance floodplain map modernization. Acquisition of new digital aerial photography with LIDAR (see Action 10) would facilitate update and modernization of the floodplain maps to the new DFIRM or Digital Flood Insurance Rate Map standards with much greater accuracy than the existing maps. These more accurate and reliable maps may enable the County Board to join the NFIP. Flood zones could be more accurately depicted for insurance and zoning purposes.

**Participating Jurisdictions for Action 30:**

Lead agencies include Vilas County and the City of Eagle River. Participating jurisdictions will include Vilas County and City of Eagle River.

**TABLE 16 SUMMARY OF MITIGATION STRATEGIES  
VILAS COUNTY ALL HAZARDS MITIGATION PLAN**

<b>MITIGATION MEASURES (See Expanded Description in Plan Text)</b>	<b>RESPONSIBLE UNITS</b>	<b>COST ESTIMATE</b>	<b>EXISTING AND POTENTIAL RESOURCES TO IMPLEMENT</b>	<b>PROJECT * TIMEFRAME</b>	<b>PRIORITY LEVEL</b>
<b>ALL HAZARDS</b>					
1. Promote the increased use of National Oceanic and Atmospheric Administration (NOAA) weather radios.	County EM Dept.	Staff Time	Radio sales cover cost of radios.	On-going	HIGH
2. Continue to add/update Emergency Management Department link off existing County website.	County EM Dept.	Staff Time	Dept. Budget	On-going	MEDIUM
3. Maintain Code Red emergency notification system and expand public outreach on availability and use of system.	County EM Dept.	\$15,000/yr	Dept. Budget	On-going	HIGH
4. Promote Code Red system registration through media contacts, psa's and public appearances.	County EM Dept.	Staff Time	Dept. Budget	On-going	HIGH
5. Continue training for Law Enforcement, Fire, EMS, First Responders and the public in the identification of dangerous weather formations.	County EM Dept. / City of Eagle River / LdF Tribe	Staff Time	National Weather Service	Annual	MEDIUM
6. Update County Emergency Response Zone Atlas.	County EM Dept.	\$20,000	Wisconsin DNR tech. assist. and funding / WEM funding	2013	MEDIUM
7. Install back-up generator for community center.	St. Germain	\$20,000	Town Funds	2014	MEDIUM
8. Update aerial photography to include LIDAR for use by Vilas County and City of Eagle River emergency services and for further improvement in flood zone mapping.	Co. Land Info. Dept. / City of Eagle River / LdF Tribe	\$200,000	Dept. Budget / Local Match Funds / WI Land Information Program Retained Fees	2013	HIGH
9. Establish west side Land O' Lakes fire/rescue hall and shelter facility.	Land O'Lakes	Costs to be determined	Town Funds / federal Assistance to Firefighters Grant (AFG)	2016	MEDIUM
<b>WINTER STORM / EXTREME COLD</b>					
10. Promote winter hazards awareness including home and travel safety measures.	County EM Dept.	Staff Time	Dept. Budget	Annual	HIGH
<b>SEVERE THUNDERSTORM / HAIL / LIGHTNING / WIND</b>					
11. Promote lightning safety awareness to reduce risk.	County EM Dept. / City / All Towns / LdF Tribe	Staff Time	Dept. Budget / Local Funds	Annual	MEDIUM

MITIGATION MEASURES (See Expanded Description in Plan Text)	RESPONSIBLE UNITS	COST ESTIMATE	EXISTING AND POTENTIAL RESOURCES TO IMPLEMENT	PROJECT * TIMEFRAME	PRIORITY LEVEL
<b>TORNADO</b>					
12. Install emergency warning siren.	St. Germain	\$15,000	Town Funds	2012	MEDIUM
13. Develop emergency storm/tornado shelters through new facilities or retro-fitting existing facilities with necessary improvements and/or equipment.	Eagle River Library / Arbor Vitae / Boulder Junction / Land O' Lakes / Manitowish Waters/ Plum Lake / Presque Isle / Winchester	Costs to be determined	Local Funds / FEMA / Hazard Mitigation Grants / CBDG Program	2014	HIGH
<b>FOREST FIRE / WILDFIRE</b>					
14. Promote Firewise program and related educational materials to increase community awareness of wildfire risk within the County.	County EM Dept. / LdF Tribe / All Towns	Staff Time	Dept. Budget	Annual	MEDIUM
15. Develop Community Wildfire Protection Plans (CWPP) for high risk towns.	Affected Towns / WDNR	\$24,999 ea.	WisDNR National Fire Plan Funding	2013 - 2017	MEDIUM
16. Widen and clear firebreaks throughout the Town.	Boulder Junction / WDNR	Costs to be determined	State and Local Funds	2014	MEDIUM
17. Upgrade fire equipment	Arbor Vitae	Costs to be determined	Town Funds / federal Assistance to Firefighters Grant (AFG)	2015	MEDIUM
<b>EPIDEMIC / PANDEMIC</b>					
18. Update County Emergency Operations Plan Annex H to include lessons learned from 2009 H1N1 Influenza outbreak	County Health Dept. / County EM Dept.	Staff Time	Dept. Budgets	2015	HIGH
19. Conduct an Isolation and Quarantine Tabletop Exercise to assist in planning and preparation for possible epidemic / pandemic situation.	County Health Dept. / County EM Dept.	Staff Time	Dept. Budgets	2016	MEDIUM
<b>HAZARDOUS MATERIALS INCIDENTS - FIXED SITE / TRANSPORT</b>					
20. Continue support for Level B Emergency Response Team to deal with extremely hazardous spill situations.	County	\$5,000/yr	EPCRA / HazMat Grant	On-going	HIGH
21. Relocate LP storage tanks at Eagle River Airport	City of Eagle River Eagle River Airport	Costs to be determined	Local Match Funds / FAA / Hazard Mitigation Grants	2013	HIGH

MITIGATION MEASURES (See Expanded Description in Plan Text)	RESPONSIBLE UNITS	COST ESTIMATE	EXISTING AND POTENTIAL RESOURCES TO IMPLEMENT	PROJECT * TIMEFRAME	PRIORITY LEVEL
<b>POWER OUTAGE</b>					
22. Continue to implement recommendations of the 2011 After Action Improvement Plan for Long Term Power Outage in Vilas County	County EM Dept.	Staff Time / Costs to be determined	Dept. Budget	On-going	MEDIUM
23. Work with WE Energies and Xcel to establish a communication protocol similar to WPS.	County EM Dept.	Staff Time	Dept. Budget	On-going	HIGH
24. Work with utilities to incorporate tree growth pattern information in planning trimming activities	County EM Dept. / Co. UW-Extension	Staff Time	Dept. Budgets	On-going	MEDIUM
25. Identify critical power lines within the City vulnerable to downing and convert to underground lines (bury overhead powerlines).	City of Eagle River / Eagle River Light and Water Utility	Costs to be determined	Hazard Mitigation Grants / Local Funds	On-going	HIGH
<b>DROUGHT / EXTREME HEAT</b>					
26. Assist population with reducing heat disorders through awareness program as needed.	County EM Dept. / County Health Dept. / City / All Towns LdF Tribe	Staff Time	Dept. Budgets / Local Funds	As needed	MEDIUM
27. Develop countywide drought mitigation plans.	County EM Dept. / Co. Land & Water Conservation Dept. / Co. UW Extension	Staff Time	Dept. Budgets	As needed	MEDIUM
<b>FLOODING / DAM FAILURE</b>					
28. The County Board and City Council will periodically discuss the issue of their participation in the National Flood Insurance Program (NFIP)	County City of Eagle River	Staff Time	Dept. Budgets / Local Funds	On-going	HIGH
29. Continue to work with dam owners to review Emergency Action Plan (EAP) for each significant and high hazard dam.	County EM Dept.	Staff Time	Dept. Budget	On-going	MEDIUM
30. The County and City should work with WDNR and FEMA to advance floodplain map modernization.	County / City of Eagle River	Costs to be determined	Dept. Budgets / Local Funds	2016	HIGH
<b>*Actual project implementation dependent on funding and staff availability.</b>					



**INTRODUCTION**

Part V of the Vilas County All Hazards Mitigation Plan describes the plan adoption, implementation, and evaluation and maintenance.

**PLAN ADOPTION**

The adoption of the Vilas County All Hazards Mitigation Plan lends itself to serve as a guiding document for all local government officials. It also certifies to program and grant administrators from the FEMA and WEM that the Plan's recommendations have been properly considered and approved by the governing authority and the jurisdiction's citizens. Finally, it helps to ensure the continuity of mitigation programs and policies over time because elected officials, staff, and other community decision-makers can refer to the official document when making decisions about the community's future.

Before adoption of the Plan by the incorporated areas, the Plan must be sent to the state and federal level to verify that all DMA2K requirements are met. Once a draft of the Plan has been completed, it is submitted to the State Hazard Mitigation Officer (SHMO) at the state level at WEM. Previous drafts of the Plan have already been reviewed prior to this submittal. The SHMO will determine if the Plan meets DMA2K and/or other state program requirements. Upon approval of the draft by WEM, the SHMO is responsible for showing the Plan to the FEMA Region V Office for review.

Prior to final approval by WEM and FEMA, the Plan must be formally adopted by Vilas County and its incorporated areas by resolution. Incorporated communities that do not adopt the Plan cannot apply for mitigation grant funds unless they opt to prepare, adopt, and submit their own Plan. Adoption of the Plan gives the jurisdiction a legal basis to enact ordinances, policies, or programs to reduce hazard losses and to implement other mitigation actions.

All general purpose units of government (i.e. cities, towns) within Vilas County were offered one or more avenues to participate in the development of this Plan. Adoption of the Plan by a local unit of government certifies their participation. The Vilas County Board has adopted this Plan. Resolutions of adoption are contained in APPENDIX B.

**PLAN IMPLEMENTATION****ADMINISTRATIVE RESPONSIBILITIES**

Once the Plan has been approved, stakeholders must be informed. The County Emergency Management Director will distribute notice of availability to stakeholders. The County will also make the Plan available to the public by linking the report on their web site.

Along with monitoring the progress of the action projects, the County Emergency Management Director and Law Enforcement & Emergency Management Committee should also work to secure funding to implement the Plan. State and federal agencies, nonprofit organizations, and foundations continually make grants available. Emergency Management should research these grant opportunities to determine eligibility for the County and its local units of government.

When implementing this Plan, the County Law Enforcement & Emergency Management Committee and staff team should consider innovative ways to involve active participation from nonprofit organizations, businesses, and citizens to implement the Plan. The relationship between these groups will result in greater exposure of the Plan and provide greater probability of implementation of the action projects listed.

The role of department administrators, elected officials, and local administrators are to ensure that adopted actions from Part IV are considered in their budgets. It is understood that projects may not be carried out as they are scheduled in Part IV due to budget constraints. However, since many of these action projects are considered an investment in safeguarding the public's health, safety, and property, they should be carefully considered as a priority.

#### **PROMOTE SUCCESS OF IDENTIFIED PROJECTS**

Upon implementing a project covered by this Plan, it is important to promote the accomplishment to the stakeholders and to the communities. This will help inform people that the Plan is being implemented and is effective.

#### **INCORPORATION INTO OTHER LOCAL PLANNING MECHANISMS**

FEMA requires a process by which the mitigation plan is incorporated into other planning mechanisms where appropriate. When undergoing any planning process, County departments, local units of government and/or any professional staff assisting them, typically review and incorporate any related pre-existing plans as a matter of course. However, to help ensure this outcome, Vilas County has established a two-part process to incorporate the All Hazards Mitigation Plan into other County and local planning efforts as follows:

- Notification of County Departments and Local Units of Government - Upon adoption of the All Hazards Mitigation Plan, the County EM Director will distribute a letter that explains how the Plan applies to other planning efforts they might undertake and how to obtain copies of the Mitigation Plan.
- Promotion by EM Director - The EM Director will promote incorporation of the All Hazards Mitigation Plan as is made aware of or becomes a participant in any new planning process.



A number of upcoming planning efforts have been identified for incorporation of the All Hazards Mitigation Plan. Upcoming planning efforts at the County or local levels include: Community Wildfire Protection Plans (CWPPs), updates to the Comprehensive Plans for the all local units, and a county-wide Farmland Preservation Plan.

Currently, the County's All Hazard Mitigation Plan is already being incorporated into another planning process, the Vilas County Comprehensive Plan, as follows.

### **Vilas County Comprehensive Plan**

The following concepts were considered when developing the Vilas County Comprehensive Plan, based on the nine elements of the Wisconsin comprehensive planning law:

- *Issues and Opportunities Element* – a summary of major hazards local government is vulnerable to, and what is proposed to done to mitigate future losses from the hazards.
- *Housing Element* – an inventory of the properties that are in the floodplain boundaries, the location of mobile homes, recommendation on building codes, shelter opportunities, and a survey of homeowners that may be interested in a voluntary buyout and relocation program.
- *Utilities and Community Facilities Element* – identify critical facilities such as shelter, schools, medical, water infrastructure, etc. and make recommendations on how to mitigate specific risks factors
- *Transportation Element* – identify any transportation routes or facilities that are more at risk during flooding, winter storms, or hazardous material spills.
- *Agricultural, Natural Resources, and Cultural Resources Element* – identify the floodplains and agricultural areas that area at risk to hazardous events. Incorporate recommendations on how to mitigate future losses to agricultural areas.
- *Economic Development Element* – describe the impact past hazards have had on County and municipal business.
- *Intergovernmental Cooperation Element* - identify intergovernmental police, fire, and rescue service sharing agreements that are in effect, or which may merit further investigation, consider cost-sharing and resource pooling on government services and facilities.
- *Land Use Element* - describe how flooding have impacted land uses and what is being done to mitigate negative land use impacts from flooding; map and identify hazard areas such as floodplains, hazardous materials areas, and soils with limitations.
- *Implementation Element* – have action plans from this Plan implemented into comprehensive plans.

**PLAN EVALUATION AND MAINTENANCE**

Planning is an ongoing process. Because of this, this document should grow and adapt in order to keep pace with growth and change of the County and its local jurisdictions. DMA2K requires that local plans be evaluated and updated at least every five years to remain eligible for assistance.

The Plan will be reviewed and evaluated on an annual basis. Within this period, the County Emergency Management Director will evaluate incoming information against the contents of the Plan as needed to prepare for revisions. It is recommended that the County Law Enforcement & Emergency Management Committee discuss evaluation and revisions to the Plan one year from its adoption and annually thereafter as it fits the Committee's scheduling. The Emergency Management Director is encouraged to consult/coordinate with the NCWRPC at the time of revision.

County Law Enforcement & Emergency Management Committee meetings are always open to the public, and the public can bring questions or comments regarding this Plan to any regular meeting. The final plan document will be available on the Internet until the next draft update is posted for review. The public can continue to submit questions or comments at any time via an email link.

The Plan must also be evaluated and revised following disaster events to determine if the recommended actions are appropriate given the impact of the event. The risk assessment (Part III) should also be reviewed to see if any changes are necessary based on the pattern of disaster damages.

Full updates are required every five years. As a result, every fifth year, the annual review will be expanded to an overall plan update to meet FEMA requirements. All stakeholders and the public will again be involved in the update. The County will conduct a survey and open comment meeting. This also provides an opportunity to inform on the progress of any projects.

The County Law Enforcement & Emergency Management Committee and County Board must approve all changes and updates to the Plan.

## **Appendix A – Meeting Notices**

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# City of Eagle River

525 E. Maple Street • P.O. Box 1269 • Eagle River • WI 54521

Phone: (715) 479-8682 • Fax: (715) 479-9674

[www.eagleriver.govoffice2.com](http://www.eagleriver.govoffice2.com)

## AMENDED AGENDA NOTICE

THE COMMON COUNCIL OF THE CITY OF EAGLE RIVER WILL HOLD A MEETING ON TUESDAY, JULY 9, 2013 AT 6 P.M. AT CITY HALL, 525 E. MAPLE STREET IN EAGLE RIVER.

- 1) CALL TO ORDER.
- 2) PLEDGE OF ALLEGIANCE.
- 3) ROLL CALL.
- 4) APPROVE MINUTES OF PREVIOUS MEETINGS.
- 5) DISCUSSION AND POSSIBLE ACTION ON THE FOLLOWING AGENDA ITEMS:
  - A) REQUEST BY CLAUDE JOHANN TO PLACE A SIDEWALK ON HOSPITAL ROAD.
  - B) REQUEST BY FIRE DEPT. FOR CONSIDERATION FOR USED DEPT. OF PUBLIC WORKS TRUCK
  - C) MSA - PAY REQUEST FOR SILVER LAKE ROAD OF \$99,291.12 AND OAK DRIVE OF \$28,041.56.
  - D) PLAN COMMISSION: 1) Conditional Use permit for AT&T for a backup generator at the water tower site.  
2) Re-plat of the nursing home site.
  - E) GOLF COURSE REPORT INCLUDING GENERAL COURSE ACTIVITIES AND REVIEW OF REVENUES FOR THE YEAR.
  - F) PURCHASE OF GOLF COURSE GREENS COVERS.
  - G) ORDINANCES: 1) ORDINANCE 513 ADOPTING COMPREHENSIVE PLAN.  
2) ORDINANCE 516 CONSTRUCTION & REPAIR OF SIDEWALKS.
  - H) RESOLUTIONS: 1) RESOLUTION 854 ALL HAZARD MITIGATION PLAN.  
2) RESOLUTION 855 BORROWING OF \$165,000 FROM STATE LAND TRUST AT 3.25%.  
3) RESOLUTION 856 AUTHORIZING THE ISSUANCE AND SALE OF \$3,220,000 GENERAL OBLIGATION REFUNDING BONDS.
  - I) THE CREATION OF A NEW LOT OUT OF THE 18 ACRES AT G & 45 CITY PROPERTY.
  - J) PURSUE LEASING OF THE SIGN AT G & 45 CITY PROPERTY.
  - K) DENIAL OF CLAIM FROM FRONTIER COMMUNICATIONS FROM INCIDENT ON FEBRUARY 5, 2013.
  - L) MSA PROFESSIONAL SERVICES - RENEWAL OF HOUSING GRANT CONTRACT.
  - M) APPROVAL OF CONTRACT FOR REVIEWING CITY CODE OF ORDINANCES.
  - N) ST. CLOSING/TEMPORARY SIGN/AMPLIFICATION/DISPLAY OF GOODS PERMITS:
    - 1) E.R. GUN SHOW AUGUST 30, 31 & SEPT. 1
    - 2) FOX WAKE BOARDING EVENT JULY 17
    - 3) E.R. ROTARY WINE & CHEESE TASTING JULY 15
    - 4) ROTARY ANTIQUE SHOW AUGUST 2 & 3
    - 5) IMPROV IN THE "NUT SHELL" PICNIC & PARODY JULY 30<sup>TH</sup>
  - O) OPERATOR'S LICENSES: R. GENSLER, A. GINGERICH, L. HILSBACK, B. KIEFER, T. MAYACK, C. MIGNIN, K. RANDALL, J. SMOLA, A. SNEDDEN, C. YOUNG.
  - P) APPROVE PAYMENT OF THE BILLS FOR THE CITY AND THE GOLF COURSE.
  - Q) Administrator's Report including activities of all departments & Administrator general monthly duties.
  - R) Police Chief Report on departmental activities.
  - S) Approve Picnic license for Festival of Flavors & waive 15 day waiting period.
  - T) Antique show signs at various locations in the city at authorized and un-authorized City locations.
  - U) PUBLIC COMMENTS.
  - 6) ADJOURN.

Debra A. Brown, WCMC-CMC-CMTW, Clerk/Treasurer

Please note that, upon reasonable notice, at least 24 hours in advance, efforts will be made to accommodate the needs of disabled individuals through appropriate aids and services. For additional information to request this service, please contact the City Clerk's Office at 479-8682 ext. 222, 525 E. Maple Street, P.O. Box 1269, Eagle River WI 54521

REGULAR MEETING OF THE VILAS COUNTY BOARD OF SUPERVISORS, TUESDAY, MAY 28, 2013 AT 6:30 P.M., AT THE TOWN OF ST. GERMAIN COMMUNITY CENTER, 545 STH 155, ST. GERMAIN, WISCONSIN.

**1<sup>st</sup> AMENDED AGENDA**

Call to order.

Public meeting notice requirements were fulfilled by posting a notice of this meeting on bulletin boards located in the Vilas County Courthouse, Olson Memorial Library and Eagle River City Hall. Notice of this meeting was posted to the Vilas County Government website. All media outlets and members of the public requesting notification of this meeting were notified on May 24, 2013 more than twenty-four hours prior to the meeting.

**The Chair requests that all cell phones and pagers be silenced for the duration of the meeting.**

1. Pledge of Allegiance
2. Roll call
3. Approval of the agenda to be discussed in any order at the Chair's discretion
4. Approval of the minutes of the April 23, 2013 regular meeting
5. Omit reading of all resolutions and ordinances by the County Clerk unless requested
6. Resolutions tabled or postponed to a day certain – none
7. Committee Reports
8. Introduce and act on all current resolutions and ordinances as posted

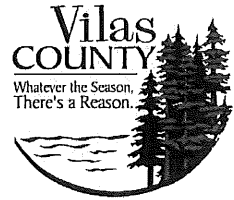
- 2013-41 Information Technology Services Contract
- 2013-42 NCHIP eReferral Implementation Grant Application
- 2013-43 Proclaiming June 15, 2013 as World Elder Abuse Awareness Day in Vilas County
- 2013-44 Grant Support for Vilas County Lakes Program Staff – Lakes & Watersheds
- 2013-45 Grant Support for Vilas County Lakes Program Staff – Shorelands Grant
- 2013-46 Fee Increases – County Coroner
- 2013-47 Sheriff's Department Spillman System Computer Server
- 2013-48 Authorization to Purchase Equipment for Highway Department
- 2013-49 Designating Public Depository and Authorization for Withdrawal of County Funds
- 2013-50 Authorize Vilas County to Join and Participate in the Central Wisconsin Regional Loan Fund
- 2013-51 Legal Endorsement Coverage Procedures
- 2013-52 Approve Memorandum of Agreement with the Wisconsin Department of Natural Resources Division of Forestry to Participate in the Knowles-Nelson Stewardship Land Acquisition Grant Program
- 2013-53 Amending the 2006-2020 Vilas County Forest Comprehensive land Use Plan (Private Utility Service Lines)
- 2013-54 Budget Amendment – 2012 General Fund Expenditures in Excess of Budget
- 2013-55 Budget Amendment – Public Health Board
- Ord 2013-04 All-Terrain Vehicle (ATV) Ordinance

9. Resolutions and ordinances received after the ten day deadline, but received in time to properly post:

- 2013-56 COPS FY2013 Grant Application for School Resource Officer
- 2013-57 Plan Adoption / Vilas County All Hazards Mitigation Plan

**Members:** Ronald DeBruyne  
Sigurd Hjemvick  
James Behling  
Charles Rayala  
Christopher Mayer

**VILAS COUNTY  
LAW ENFORCEMENT AND  
EMERGENCY MANAGEMENT  
COMMITTEE**



330 Court Street  
Eagle River, WI 54521-8362  
Telephone (715) 479-4441  
FAX (715) 479-0624

**Ronald DeBruyne**  
*Interim Chair*

**NOTICE OF MEETING**

**COMMITTEE:** Law Enforcement and Emergency Management Committee  
**PLACE:** Vilas County Courthouse, Conference Room #2  
330 Court Street, Eagle River, Wisconsin 54521  
**DATE:** Thursday, April 18, 2013  
**TIME:** 9:00 a.m.

*Notice: A quorum of the Vilas County Board and various County Board committees may be present at this meeting. No business will be discussed nor any action taken by the Vilas County Board or any other County Board committee, other than the committee listed on this notice.*

**AGENDA**

1. Call to Order.
2. Approve the agenda to be discussed in any order by the Chair.
3. Approve the minutes of the March 18, 2013 committee meeting.
4. Resignations/New Appointments.
5. Emergency Management Report.
6. Resolution – Plan Adoption/Vilas County All Hazards Mitigation Plan.
7. Resolution – Approval of EPTEC, Inc. Contract for Services.
8. Jail Maintenance Floor Tile Repair/Replacement.
9. Equipment Purchases – Sheriff Budget.
10. Equipment Purchases – Jail Budget.
11. Approve paid bills.
12. 2014 Budget.
13. Letters and Communications.
14. Future meeting date is scheduled for: Thursday, May 16, 2013, at 9:00 a.m.
15. Adjournment.

**If a committee member cannot be present for this meeting through its entirety, please notify the chairperson of your committee or department relative to your meeting. A new meeting date may have to be rescheduled in order for your committee to obtain a full quorum.**

**Please note: If you have any special needs, or require special accommodations, please call (715) 479-4441, or write 330 Court St., Eagle River, Wisconsin 54521.**

**NOTICE OF POSTING: 04-11-2013**

All Committee Members  
County Board Chairman Stephen Favorite  
Corporation Counsel Martha Milanowski  
Sheriff Tomlanovich  
Chief Deputy Fath  
Emergency Management Director Galloway

Vilas County Courthouse  
Vilas County News Review  
Lakeland Times  
FYI Northwoods  
Northwoods River News  
Eagle River City Hall  
Olson Memorial Library

**VILAS COUNTY  
HAZARD MITIGATION PLAN  
PUBLIC INFORMATIONAL MEETING**

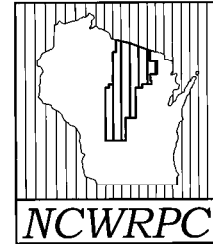
Notice is hereby given by the Vilas County Law Enforcement & Emergency Management Committee that there will be a public informational meeting at the Arbor Vitae Town Hall, 10672 Big Arbor Vitae Drive, Arbor Vitae, on Tuesday, June 26 starting at 6 p.m. to discuss the county's draft All Hazards Mitigation Plan.

The meeting will be an open house format and provide information about the natural hazards that can affect the county and the strategies being developed to mitigate against future losses and reduce public expenditure for response and recovery. A copy of the draft plan can be reviewed on the web at <http://www.ncwrpc.org/vilas/vilashzdplan.html>.

All interested parties are encouraged to attend. Contact County Emergency Management Director Jim Galloway at 715-479-3690 for more information.



# NORTH CENTRAL WISCONSIN REGIONAL PLANNING COMMISSION



210 McClellan Street, Suite 210, Wausau, Wisconsin 54403  
Telephone: (715) 849-5510 Fax: (715) 849-5110  
Web Page: [www.ncwrpc.org](http://www.ncwrpc.org) Email: [staff@ncwrpc.org](mailto:staff@ncwrpc.org)

SERVING ONEIDA, FOREST, JUNEAU, LANGLADE, LINCOLN, MARATHON, ONEIDA, PORTAGE, VILAS AND WOOD COUNTIES

## MEMORANDUM

TO: Government agencies, County department staff, and other private or non-profit organizations within Vilas County  
FROM: Darryl L. Landeau, AICP: Senior Planner  
DATE: June 11, 2012  
RE: Vilas County All-Hazards Mitigation Plan Interest Group Meeting Notice

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Vilas County has received a grant through the Federal Emergency Management Agency (FEMA) to complete an All-Hazards Mitigation Plan to protect the health and safety of residents from the impacts of natural hazards and to minimize and prevent damages caused by these events. The North Central Wisconsin Regional Planning Commission (NCWRPC) is assisting Vilas County with this plan.

As a requirement of the planning process, an opportunity must be provided to local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as business, academia and private and non profit interests to be involved. To meet this requirement, an interest group meeting is scheduled for the following date and place:

**When: Tuesday, June 26, 2012 at 2:00 p.m.**  
**Where: Arbor Vitae Town Hall**  
**10672 Big Arbor Vitae Drive**  
**Arbor Vitae, WI 54568**

In addition to meeting FEMA requirements, the interest group meeting will be a way to gather ideas on how to safeguard the residents and visitors of Vilas County and protect property in the event of natural disasters. Since you live and/or do business in or around Oneida County, your input in this process is very valuable.

Please call or email me if you have any questions regarding this meeting. My number is 715-849-5510 ext. 308, and my email is [dlandeau@ncwrpc.org](mailto:dlandeau@ncwrpc.org) . Or, contact Jim Galloway, the County's Emergency Management Director at 715-479-3690 or [jagall@co.vilas.wi.us](mailto:jagall@co.vilas.wi.us) . I highly encourage at least one staff person from your department or agency with responsibilities relating to or potentially impacted by natural hazards / disaster to attend.

Thank you.

C:\DARRYL\VILAS\VC\_AHMP\WORKING\INTERESTGRPMTG.DOC



## **Appendix B – Resolutions of Plan Adoption**

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**RESOLUTION 2013 - 57**

**Re: Plan Adoption/Vilas County All Hazards Mitigation Plan**

**WHEREAS**, Vilas County is required by the Federal Emergency Management Agency (FEMA) to develop and adopt a County All Hazards Mitigation Plan; and

**WHEREAS**, Vilas County's ability to secure Federal assistance for disaster response / recovery, and grant funding for mitigation projects is linked to the County's adoption of said plan; and

**WHEREAS**, said plan has been developed by Vilas County Emergency Management with the assistance of the North Central Wisconsin Regional Planning Commission and under the oversight of the Vilas County Law Enforcement Emergency Management Committee and the Vilas County Local Emergency Planning Committee; and

**WHEREAS**, said plan has been reviewed and approved by Wisconsin Emergency Management and FEMA and is now ready for adoption by Vilas County; and

**WHEREAS**, a majority vote of the Board of Supervisors is required for adoption of this plan.

**NOW, THEREFORE BE IT RESOLVED** by the Vilas County Board of Supervisors in session this 28th day of May, 2013 that the Vilas County All Hazards Mitigation Plan is hereby adopted by Vilas County.

**SUBMITTED BY: Law Enforcement & Emergency Management Committee**

s/ Ron De Bruyne, Interim Chair

Sig Hjemvick

s/ Jim Behling

s/ Christopher Mayer

s/ Charles Rayala, Jr.

**SUBMITTED BY: Vilas County Board Supervisors**

s/ Kathleen Rushlow

s/ Leon Kukanich

RESOLUTION # 854

**ADOPTING THE VILAS COUNTY ALL HAZARDS MITIGATION PLAN**

**WHEREAS**, the City of Eagle River recognizes the threat that natural hazards pose to people and property; and

**WHEREAS**, under taking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save tax payer dollars; and

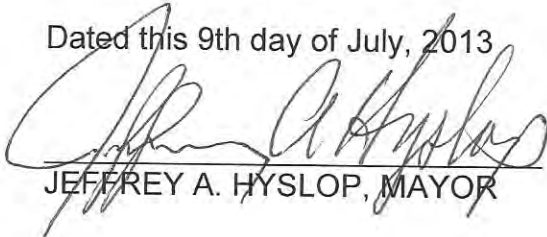
**WHEREAS**, an adopted all hazards mitigation plan is required as a condition of future grant funding for mitigation projects; and

**WHEREAS**, City of Eagle River participated jointly in the planning process with Vilas County and the other local units of government within the County to prepare an All Hazards Mitigation Plan;

**NOW, THEREFORE, BE IT RESOLVED**, that the City Council of the City of Eagle River, hereby adopts the Vilas County All Hazards Mitigation Plan as an official plan; and

**BE IT FURTHER RESOLVED**, that the Vilas County Emergency Management Department will submit, on behalf of the City, the adopted All Hazards Mitigation Plan to Wisconsin Emergency Management and Federal Emergency Management Agency officials for final review and approval.

Dated this 9th day of July, 2013

  
JEFFREY A. HYSLOP, MAYOR

  
DEBRA A. BROWN, CLERK/TREASURER