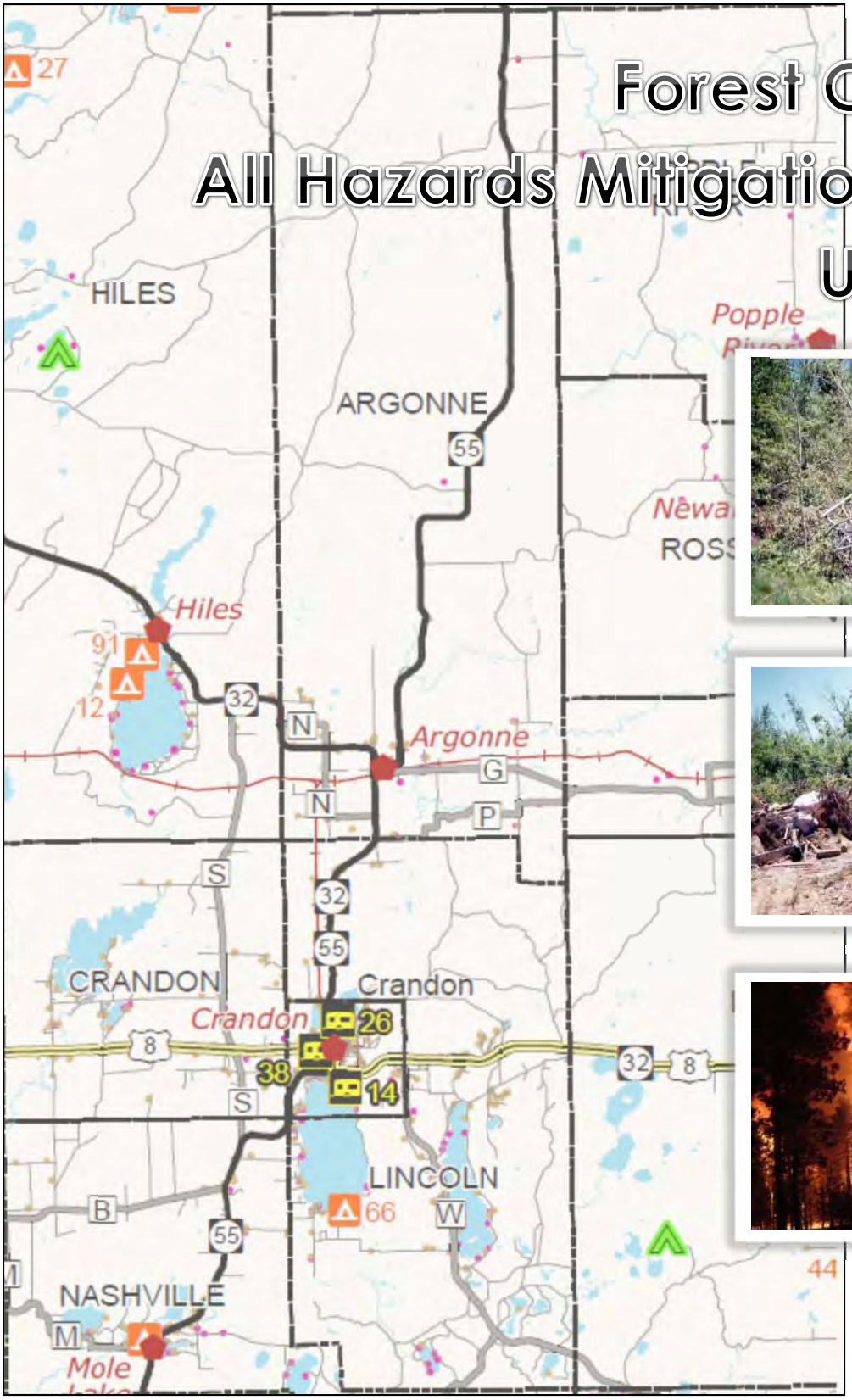
Forest County
All Hazards Mitigation Plan
Update



Prepared by:

North Central Wisconsin Regional Planning Commission

NCWRPC

FOREST COUNTY ALL HAZARDS MITIGATION PLAN UPDATE

prepared for:

Forest County Emergency Management

by:

North Central Wisconsin Regional Planning Commission

adopted by Forest County Board on:

November 10, 2015

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

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Introduction

Part I of the Forest County All Hazards Mitigation Plan (AHMP) Update describes and documents the process used to develop the Plan Update. This includes how it was prepared and who (committee, organizations, departments, staff, consultants, etc.) was involved in the update process. It also describes the local governments involvement, the time period in which the update 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 Forest County All Hazards Mitigation Plan Update is a response to the passage of the Disaster Mitigation Act of 2000 (DMA2K). On October 30, 2000, DMA2K was signed into law by the U.S. Congress 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 are 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 and Pre-Disaster Mitigation 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 All Hazards Mitigation Plan Update

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

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

Development of All Hazards Mitigation Plan Update

The Forest County Emergency Management Department received a Planning Grant in 2012 to develop an All Hazards Mitigation Plan Update through the Hazard Mitigation Grant Program (HMGP).

In early 2013, the North Central Wisconsin Regional Planning Commission (NCWRPC) finalized a work agreement with Forest County and began preparation of the All Hazards Mitigation Plan Update at the request of the County Sheriff and Justice Committee.

The update planning process included regular Committee meetings as well as extensive involvement from the local units of government within Forest County and the counties surrounding Forest. A variety of local and regional agencies were involved in the development of the update 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 update development process.

Key Elements Of The Update To The Original 2009 Plan

The major enhancements to the Forest County All Hazards Mitigation Plan developed through this update are as follows:

- ✓ Review of Recommended Revisions - The final Crosswalk for the original plan approval listed a number of "recommended revisions" which were addressed in this update through the experience of subsequent plan adoptions from other counties.

- ✓ Review and update of planning area chapter - The planning area description and inventory was expanded and improved with additional information and updated statistics.

- ✓ Review and update of risk assessment - The risk assessment was updated with documentation on recent hazard events. The priority level of hazards facing the County was also reviewed and updated. An additional category: cyber-attack was added to the hazards being addressed.

- ✓ Review and update of Mitigation Strategy - The mitigation strategies chapter begins with a complete progress report on the strategies from the 2009 plan, establishment of new set of strategies for next five-year cycle and an updated prioritization of projects.

All Hazards Mitigation Plan Update Taskforce

The Forest County All Hazard Mitigation Plan Update was prepared under the guidance of an advisory taskforce that consisted of the current members of the County Sheriff and Justice Committee as the committee of oversight for Emergency Management. Periodic meetings were held with the NCWRPC staff, the County Emergency Management Coordinator, and the Committee Task Force to provide input on the types of hazards to be considered, appropriate mitigation strategies, and to review draft reports. Committee members are as follows:

- Scott Shaffer:
  County Board / Risk Management Committee / Wabeno Fire

- Lance Laabs:
  County Board

- George Stamper:
  County Board / 911 Committee / Local Emergency Planning Committee / City of Crandon

Local Government Involvement

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

In July of 2014, 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 Update. Responses were received from 9 of 14 towns. A significant amount of information was gleaned from these questionnaires and incorporated into the update document.

On May 12, 2015, NCWRPC Staff met with City of Crandon Staff to discuss the planning update process. The participants at this meeting also discussed mitigation recommendations within the updated mitigation strategy that might apply to the City.

The City adopted its own mitigation plan update in 2012. That plan was discussed at length. NCWRPC staff explained how the City would be incorporated into the Forest County plan in a multi-jurisdictional effort as now encouraged by FEMA. Adoption of the County Plan could meet mitigation planning requirements for the City more cost effectively and relieve the burden of ongoing maintenance and updating of an individual plan.

Tribal Government Involvement

On October 21, 2014, NCWRPC Staff met with representatives from the Forest County Potawatomi and Sokaogon Chippewa Indian nations for their involvement in the Forest County All Hazards Mitigation Plan Update. Attendees included:

- Tina VanZile Sokaogon Chippewa
- Linda Thomaschefsky Forest County Potawatomi
- Bobbie Trucky Forest County Potawatomi
- Eric Oliphant BIA

The Sokaogon Chippewa All Hazards Mitigation Plan project was discussed along with the Forest County planning effort and the mitigation needs of the Tribes and how the Tribes could cooperate and coordinate with Forest County on Mitigation projects. The Potawatomi plan is due for update in 2017.

Neighboring Community Involvement

One of the requirements of the planning 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 e-conferenced during the course of the planning process with staff from Vilas, Oneida, Langlade, Oconto, Marinette, and Florence counties as well as Iron County, Michigan. Ideas were exchanged about All Hazards Mitigation planning processes and strategies between the various counties.

Local and Regional Agency Involvement

Another requirement of the update planning 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-private interests. To meet this objective, the NCWRPC invited a diverse group of stakeholders to discuss potential hazard mitigation strategies.

The meeting was held on November 3, 2014 at the County Courthouse in Crandon. Agencies and organizations represented include the following:

- Teresa Erler - Forest County Emergency Management
- Mark Gaffko - Wabeno Fire Department
- Amy Gatton - Forest County Health Department
- Pam LaBine - Forest County Zoning
- Scott Linn - United States Forest Service
- Steve Nelson - University of Wisconsin Extension
- Dan Packard - Crandon Police Department
- Darrell Wilson - Crandon Fire Department
- Liz Wood - Wisconsin Department of Natural Resources

A number of other agencies were invited but chose not to attend.

During the meeting, the Plan Update and its components were introduced to the attendees. A summary of proposed mitigation strategies was given to each person present. Each mitigation measure was discussed in length with the group. Part IV of the Plan was revised based on the meeting.

During the meeting a number of issues were discussed, including: the increasing threat of cyber-attack; dispatching coordination; communications problems; the propane shortage; and ice jams among others.

Public Review Process and Plan Update Adoption

Opportunities for public comment were provided to review the Plan Update during the drafting stage and prior to Plan Update approval. See APPENDIX A for copies of public meeting notices. A copy of the draft was made available on the Internet. Comments and questions about the Plan were directed to the Forest County Emergency Department.

A public informational meeting on the draft plan was held at the Forest County Courthouse on November 3, 2014. Notices were distributed to each local unit of government and posted in the local newspapers. However, no one from the public attended, and thus no public comments were received. In addition, no written comments were submitted.

Public meetings on the final draft plan were held by the County Sheriff and Justice Committee on November 2, 2015 and the County Board on November 10, 2015. No one from the public offered comment on the plan at either of these meetings. In addition, no written comments were submitted. The County Board approved the plan at a subsequent meeting, see the resolution in Appendix B for details on this meeting. A brief overview of the planning process and resulting plan was provided by Staff, and there was some general discussion by the Board.

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 County and other 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 Forest County All Hazards Mitigation Plan Update. These sources include but are not necessarily limited to the following:

Wisconsin Department of Natural Resources, North Central Wisconsin Regional Planning Commission and Forest County geographic information system databases provided much of the base data for the mapping and analysis within the Update. Statistical reports and data from the US Census and Wisconsin Departments of Administration, Revenue and Workforce Development where used for the demographic background in Part 2 of this Update. Land use data in Part 2 was obtained from the Forest 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 3 and 4 in Part 2 and Table 12 in Part 3. NFIP flood zone maps for Forest County provided the mapping of 100-year floodplain areas, Map 4 in Part 2, for flooding risk assessment, Map 12 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 update 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 Forest County Zoning Ordinance, the Forest County Land and Water Resource Management Plan, the Forest County Emergency Operations Plan, Hiles Mill Pond Dam Break Analysis and the City of Crandon All Hazards Mitigation Plan Update. Although these may not have been directly incorporated, the review provided valuable insight and direction to the update process.

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http://emergencymanagement.wi.gov/mitigation/default.asp

INTRODUCTION

Part II of the Forest County All Hazards Mitigation Plan Update provides general geographical information, 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

Forest County is located in northern Wisconsin (See Map 1). The largest city and county seat is Crandon, in the south-central portion of the county. There are also several unincorporated places dispersed around the county. The county is bounded on the north by Iron County, Michigan on the east by Florence and Marinette Counties, on the south by Oconto and Langlade Counties, and on the west by Oneida and Vilas Counties.

Forest County lies approximately 107 miles northwest of Green Bay; 211 miles northwest of Milwaukee; and 212 miles north of Madison. Major metropolitan areas outside of Wisconsin are Chicago, 296 miles southeast; Minneapolis-St. Paul, 243 miles west; and Duluth, 241 miles northwest.

Civil Divisions

There are 15 municipalities (14 towns and 1 city) and 2 American Indian Reservations in the Forest County planning area. These units of government provide the basic structure of the decision-making framework. The county has a total surface area of 1,046.4 square miles, of which 3.1% is water. The area and proportion of the County within each civil division are presented in Table 1.

Table 1 Geographical Size by Municipality				
Municipality	Area in square miles			Area as % of County
	Water area	Land area	Total area	
Alvin town	1.01	114.98	115.99	11.1%
Argonne town	0.07	108.24	108.31	10.4%
Armstrong Creek town	0.65	47.99	48.64	4.6%
Blackwell town	0.37	66.00	66.37	6.3%
Caswell town	0.17	47.74	47.91	4.6%
Crandon town	1.99	33.79	35.78	3.4%
Freedom town	2.03	34.06	36.09	3.4%
Hiles town	9.52	131.44	140.96	13.5%
Laona town	4.15	103.39	107.54	10.3%
Lincoln town	4.80	58.12	62.92	6.0%
Nashville town	5.18	67.17	72.35	6.9%
Popple River town	0.39	50.09	50.48	4.8%
Ross town	0.10	38.49	38.59	3.7%
Wabeno town	0.95	107.34	108.29	10.3%
Crandon city	0.95	5.22	6.17	0.6%
Forest County	32.33	1,014.10	1,046.39	100.0%

Source: U.S. Census

Topography

Forest County is part of the Northern Highlands geomorphic region, which is characterized by scattered outcroppings of older crystalline rock in a glaciated topography. The terrain, with high local relief occurring, is reminiscent of the northern Scandinavian countries. The landscape generally slopes from northwest to southeast. Elevations vary by more than 300 feet in many places. The fourth highest point in the state, Sugar Bush Hill, with an elevation of 1,939 feet above sea level, is located east of Crandon.

Forest County, Wisconsin

Map 1
Planning Context

Legend

Minor Civil Divisions

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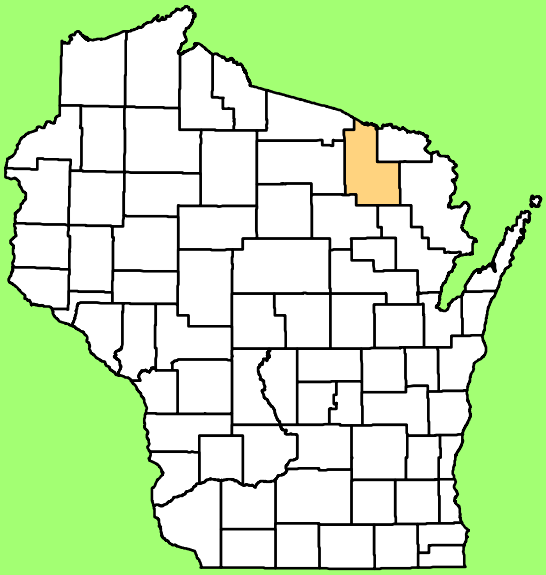

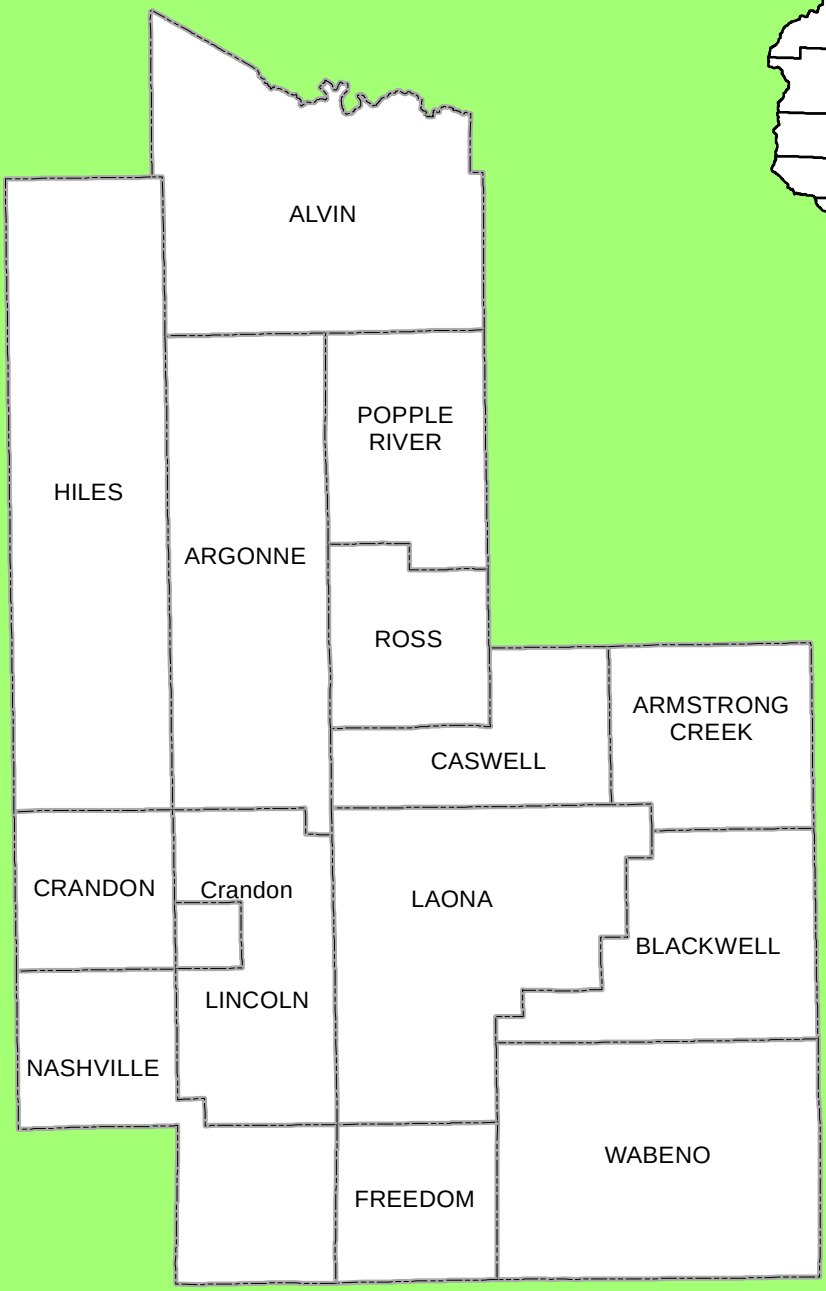

Source: WI DNR, NCWRPC

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Climate

Winters in Forest County are very cold, and the short summers are fairly warm. The short frost-free period during the summer limits cropping mainly to forage crops, small grains, and adapted vegetables. Precipitation is fairly well distributed throughout the year but reaches a peak in the summer. Snow covers the ground much of the time from late fall through early spring.

In winter, the average temperature is 14 degrees F and the average daily minimum temperature is 4 degrees. The lowest temperature on record, which occurred on January 17, 1982, is -39 degrees. In summer, the average temperature is 63 degrees and the average daily maximum temperature is 76 degrees. The highest recorded temperature, which occurred on July 26, 1955, is 100 degrees.

The total annual precipitation is about 30 inches. Of this total, more than 21 inches, or about 70 percent, usually falls between April and September. The growing season for crops falls within this period. In two years out of ten, the rainfall in April through September is less than 18 inches. Thunderstorms occur on about 34 days each year.

The average seasonal snowfall is about 67 inches. The greatest snow depth at any one time during the period of record was 56 inches. On average, 93 days of the year have at least one inch of snow on the ground. The number of such days varies greatly from year to year.

The sun shines 65 percent of the time possible in summer and 45 percent in winter. The prevailing wind is from the southwest. Average wind speed of 12 miles per hour occurs in spring.

DEMOGRAPHIC AND ECONOMIC PROFILE

Population and Households

The current population of Forest County according to the 2010 Census count is 9,304, while the 2000 Census reported 10,024 people. This figure represents about 0.16% of the State's total population. In 2010, approximately 80 percent of the county's population lived in the rural towns and 20 percent lived in the urban setting of the City of Crandon. Since 1990, the population of Forest County has increased by 6%, but in the last decade the population dropped by 7.2%, see Table 2. All but two (Oconto and Vilas) of the surrounding counties lost population in the last decade, and only Florence County lost a higher percentage of population. If the twenty-year trend continues, Forest County will have a population of 9,862 by 2030.

Tribal population in the county includes the Forest County Potowatomi and Sokaogon Chippewa (Mole Lake). Population totals for the Potawatomi Reservation were 531 from the 2000 Census, increasing 11 percent to 588 by

2010. The Mole Lake Reservation had a population of 392 in 2000 and 414 in 2010, a 5 percent increase.

Table 2 Population of Adjacent Counties						
County	1990	2000	2010	1990-2010 Change	% Change 1990-2010	% Change 2000-2010
Forest	8,776	10,024	9,304	528	6%	-7.2%
Florence	4,590	5,088	4,423	-167	-3.6%	-13%
Marinette	40,548	43,384	41,749	1,201	2.9%	-3.8%
Oconto	30,226	35,684	37,660	7,434	24.6%	5.5%
Langlade	19,505	20,740	19,977	472	2.4%	-3.7%
Oneida	31,679	36,776	35,998	4,319	13.6%	-2.1%
Vilas	17,707	21,033	21,430	3,723	21%	1.9%
Wisconsin	4,891,769	5,363,690	5,686,986	795,217	16.2%	6%

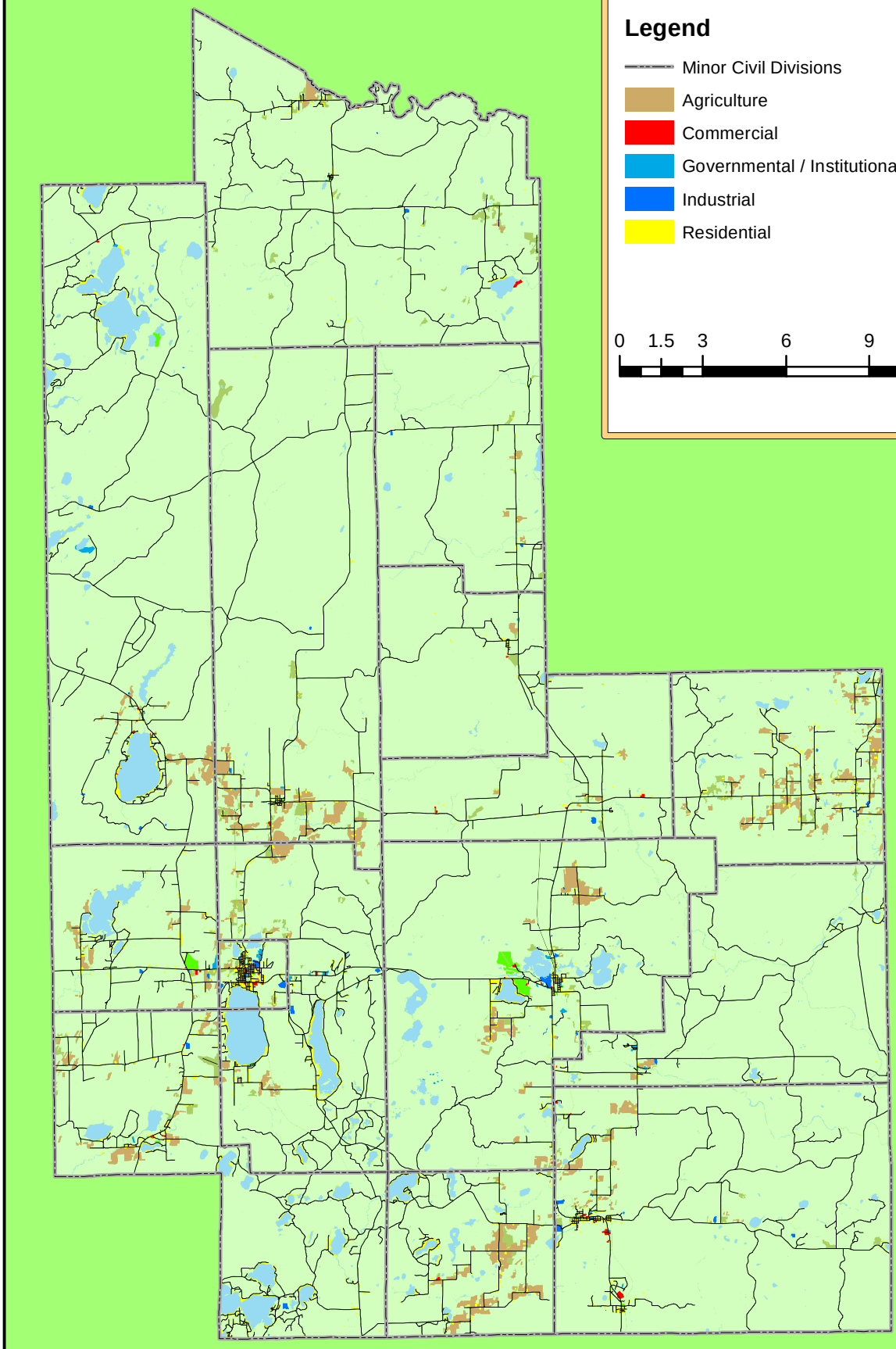
Source: U.S. Census

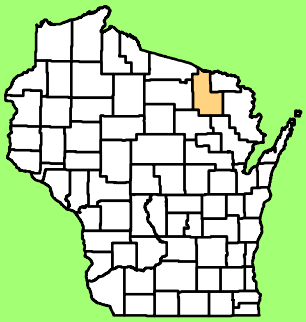
Between 2000 and 2010, all of the communities within Forest County except two (Towns of Crandon and Nashville) experienced a decrease in population (refer to Table 3). In most of the communities, population decreased at a higher rate than number of households, in fact, two towns (Argonne and Caswell) increased households even while population declined. The largest percentage decrease, 44% between 2000 and 2010, occurred in the Town of Popple River. The greatest amount of actual growth occurred in the Town of Crandon, which added 36 new residents between 2000 and 2010. Both of the towns that gained population (Nashville only gained seven residents and at the same time lost 37 households) are adjacent to the City of Crandon.

Population concentrations and trends are important when prioritizing hazard mitigation strategies. The City of Crandon is the most densely populated and developed area in the county. Other areas of population concentrations are waterfront development and 11 unincorporated places including Nelma, Alvin, Hiles, Argonne, Cavour, Armstrong Creek, Laona, Blackwell, Mole Lake, Wabeno and Carter. Map 2 (Land Use) shows areas of population concentrations in the County. Overall population density of the county is 8.9 persons per square mile which ranges from a high of 367.8 in the City of Crandon to lows of 0.83 in the Town of Alvin and 0.74 persons per square mile in Popple River.

Forest County, Wisconsin

Map 2
Generalized Land Use





Source: WI DNR, NCWRPC

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Table 3	Population and Households Size of Civil Divisions					
MINOR CIVIL DIVISION	**2000 Population**	**2000 Households**	**2010 Population**	**2010 Households**	**2000 – 2010 % Change in Population**	**2000 – 2010 % Change in Households**
Alvin town	186	96	157	84	-15.6%	-12.5%
Argonne town	532	194	512	202	-3.7%	4.1%
Armstrong Creek town	463	207	409	176	-11.6%	-15%
Blackwell town	347	45	332	41	-4.3%	-8.8%
Caswell town	102	41	91	43	-10.8%	4.9%
Crandon town	614	238	650	268	5.9%	12.6%
Freedom town	376	158	345	151	-8.2%	-4.4%
Hiles town	404	199	311	157	-23%	-21.1%
Laona town	1,367	564	1,212	525	-11.3%	-6.9%
Lincoln town	1,005	404	955	399	-5%	-1.2%
Nashville town	1,157	485	1,064	448	0.6%	-7.6%
Popple River town	79	37	44	23	-44.3%	-37.8%
Ross town	167	75	136	65	-18.5%	-13.3%
Wabeno town	1,264	497	1,166	483	-7.7%	-2.8%
Crandon city	1,961	803	1,920	771	-2.1%	-3.5%
Forest County Total	**10,024**	**4,043**	**9,304**	**3,836**	**-7.2%**	**-2.1%**

Source: U.S. Census

Seasonal Population

In addition to the full-time population, Forest County has a substantial number of seasonal and temporary residents. This reflects a housing stock which is more than half seasonal/recreational dwellings (52.7%). The impact of this seasonal population cannot be overlooked when planning for hazards. Table 4 shows an estimate of seasonal residents by municipality, based on average household size multiplied by the number of seasonal units. 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 populations might be.

Another component of the seasonal population includes short-term accommodation such as campgrounds or hotel-style lodging. The scope of this plan did not provide for detailed inventory of accommodations, however, the Wisconsin DNR completed a general inventory as part of its statewide comprehensive outdoor recreation plan. That inventory identified 329 hotel/motel beds, 23 bed & breakfast beds, and 82 beds in tourist homes. The DNR also identifies 291 campsites in campgrounds throughout the county, as well as educational/recreational camps with a capacity of 525.

Table 4 Estimated Seasonal Resident Population		
Municipality	**2010 Seasonal Housing Units**	**2010 Seasonal Population**
Alvin town	403	714
Argonne town	169	458
Armstrong Creek town	306	624
Blackwell town	82	315
Caswell town	120	231
Crandon town	147	394
Freedom town	277	718
Hiles town	562	1,196
Laona town	299	626
Lincoln town	674	1,630
Nashville town	753	2,156
Popple River town	54	227
Ross town	167	336
Wabeno town	353	721
Crandon city	64	238
County Total	4,430	10,346

Source: U.S. Census and NCWRPC

Employment

Like seasonal housing, employment facilities represent concentrations of people. In Forest County the Education, health care and social service sector, which includes educational services and nursing and residential care, along with social workers and other human services, accounts for 20.9 percent of total employment. The Leisure and hospitality sector makes up 16.8 percent of employment. Retail trade and Manufacturing each represent about a tenth of the workforce (10.8% and 10.4%, respectively), and Construction (8%) and Public Administration (7.8%) round out the top five occupations in Forest County.

Table 5 identifies the top employers and their general location in the county. The location of a large employment center is important when prioritizing hazard mitigation strategies.

Table 5 Top Employers in Forest County			
Company	**Product or Service**	**Size**	**Location**
FC Potawatomi Community	Tribal Government	500-999	Towns of Lincoln and Wabeno
Potawatomi Northern Lights Casino/Bingo	Casino	100-249	Town of Wabeno
Mole Lake Casino and Lodge	Casino	100-249	Town of Nashville
Crandon School District	Elementary & Secondary Schools	100-249	Various Locations
County of Forest	County Public Employment	100-249	Various Locations
Arizconsin Group	Elderly Housing	50-99	Various Locations
Schaefer Enterprises	Supermarkets	50-99	City of Crandon
Wabeno School District	Elementary & Secondary Schools	50-99	Various Locations
US Forest Service	Natural Resource Management	50-99	Various Locations
Mole Lake Band	Tribal Government	50-99	Various Locations

Source: Wisconsin DWD, 2013 and NCWRPC

LAND USE/COVER AND DEVELOPMENT PATTERNS

Land use is an important determinant in the potential impact a particular hazard may have, and in actions which may be taken to mitigate the impacts. An understanding of the amount, type, and spatial distribution of urban and rural land uses is an important consideration in the development of a sound hazard mitigation plan.

The North Central Wisconsin Regional Planning Commission (NCWRPC) has categorized land use in Forest County into general classifications using 2010 aerial photography to digitize a land use Geographic Information System (GIS) coverage. Map 2 shows the land use and development patterns in Forest County. Table 6 shows the acreage and percent of each classification.

Agriculture and Forestry

The dominant land-use in Forest County is forestry. Land area in the county is approximately 92 percent forested, comprised of approximately 615,600 acres of woodland, much of it within the Nicolet National Forest. Agricultural land covers another 12,300 acres or 1.9 percent of the county's land area, which is mostly located on previously forested tracts that were cleared by early settlers. Agricultural production in the county includes cattle & calves, egg chickens, horses & ponies, pheasants, elk, forage crops, corn for silage, oats, potatoes,

and cut Christmas trees. A short growing season, irregular topography, and relatively low soil productivity limits most of the agricultural production to the southern portions of the county.

Commercial, Industrial and Institutional Development

Commercial, industrial and institutional development makes up only about 0.2 percent of the total area of the county. Land use for commercial and industrial development is mostly located in the City of Crandon, but pockets are scattered around the county. Most industry is related to processing forest and agricultural products. There is one serviced industrial park in the county, an 18-acre site in Crandon. Government and other institutional facilities are also concentrated in Crandon, however there are a variety of facilities, such as rural schools and town halls, scattered throughout the county. Tribal facilities, including casino developments are located in three areas: Mole Lake in the Town of Nashville, the Potowatomi area in the Town of Lincoln, just east of Crandon and in the Town of Wabeno, at Carter. The U.S.F.S. Civilian Conservation Corps has a major facility on County Highway H in the Town of Blackwell.

Residential Development

Land in residential development makes up about one percent of the total county area. Residential concentrations are scattered throughout the county (see "Population and Households" above). Much of the scattered rural development is related to direct recreational demand as various types of housing have clustered along streams and lakes.

There are a number of mobile home parks in the county. According to the U.S. Census, there were 908 mobile homes in 2010. This is about 10 percent of housing units for the County compared to about 3.8 percent for the entire state. This is significant due to their vulnerability in natural hazards especially tornadoes. Map 11 (Tornado Vulnerability) displays the mobile home concentrations within the county.

Table 6 Land Use in Forest County

Description	Acres	Percent
Agriculture	12,332	1.9%
Commercial, Industrial, Institutional	1,423	0.2%
Forest/Woodland	615,672	92.0%
Recreation	676	0.1%
Residential	6,837	1.0%
Open Land	4,051	0.6%
Surface Waters	22,705	3.4%
Transportation	5,535	0.8%
Total	669,232	100.0%

Source: NCWRPC

Surface Water

Forest County is part of three major basins partially containing thirteen watersheds (see Map 3). The Upper Green Bay Basin has eight, the Upper Wisconsin River basin has three and the Wolf River basin has two watersheds within the county. Surface waters comprise about 22,700 acres or 3.4 % of the county area.

The county has 824 lakes and over 317 streams within the watersheds (see Map 3). Six of the lakes exceed 1,000 acres and account for nearly 40 % of total water surface area. The largest is Lake Metonga at 2,157 acres. Many of the lakes are small seepage lakes, particularly on the west side of the county. Major lakes number about 70 with the majority being drainage lakes, but about one-quarter are seepage lakes. Generally, greatest stream flow in the county occurs in late spring and autumn following increased periods of rainfall. Spring flooding is usually most pronounced in the western half of the county. All the streams, like the lakes, are important in the hydrological and ecological regime and should be protected by shoreland zoning and physical protective measures.

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

Floodplains

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 to streams or through storage in 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 a map 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, levees, 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 zoning maps identify areas where major floods occur. 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 otherwise flood-protected is allowed if it is in accordance with local ordinances. For regulatory purposes, a 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 FEMA approved Flood Insurance Rate Map or FIRM, has recently been adopted, allowing the County to participate in the National Flood Insurance Program. The City of Crandon entered the program back in 1987. See Table 7 for summary of NFIP status. The FIRMs delineate the "A" Zones including the floodway and flood fringe, those areas inundated by the 100-year flood within the County.

Table 7 FEMA Community Status Book Report
Communities Participating in the National Flood Insurance Program
Wisconsin - Forest County

Community	Initial FHBM	Initial FIRM	Current Map	Program Entry
Forest County	05/08/81	12/16/11	12/16/11	06/24/14
City of Crandon	06/07/74	01/02/87	12/16/11	01/02/87

Source: FEMA.

The NCWRPC made use of the new digital FIRMs, or DFIRMs, to map floodplains for use in this plan. The digital files indicate approximately 22,000 acres of floodplain in Forest County. Map 4 shows these approximate flood hazard boundary areas in Forest County. While this might only be 3 percent of total Forest County land, this represents a significant portion of the Town of Alvin and a significant portion of the total available private land.

Currently, there are no repetitive loss structures, those with multiple flood insurance claims in Forest County.

Wetlands

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

The DNR has identified the location of wetlands on their WISCLAND database according to which Forest County has 149,230 acres, or 23 percent of its total area. There are no main concentrations of wetlands, and Map 3 shows these wetland areas to be scattered throughout the county.

Forest County, Wisconsin

Map 3
Surface Water, Watersheds & Wetlands

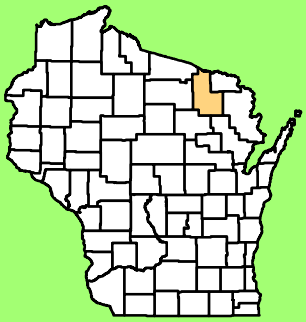
Legend

- Minor Civil Divisions
- Watershed Boundaries
- Water
- Wetlands

0 1.5 3 6 9 12 Miles

N W E S

Deerskin River
Brule River
ALVIN
Pine River
POPPLE RIVER
Eagle River
HILES
ARGONNE
Popple River
ROSS
ARMSTRONG CREEK
CASWELL
Upper Peshtigo River
Pelican River
CRANDON
Crandon
LAONA
Pike River
BLACKWELL
Otter Creek and Rat River
LINCOLN
Upper Wolf River and Post Lake
NASHVILLE
WABENO
Lily River
FREEDOM
Lower North Branch Oconto River
Middle Peshtigo & Thunder Rivers



Source: WI DNR, NCWRPC

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Forest County, Wisconsin

Map 4
Floodplains & Dams

Legend

Minor Civil Divisions

Dams

Large

Small

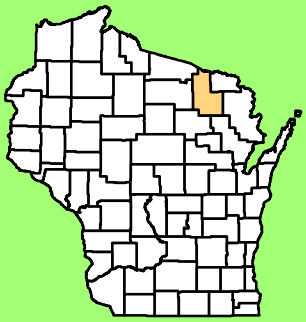
Water

DFIRM Floodplain

0 1.5 3 6 9 12 Miles

N W E S

BRULE LAKE DAM
WHEELER DAM
CAREY DAM
WEST ALLEN CREEK
ALVIN
USA FS (FOREST SERVICE)
BRISS LAKE
DAM # 3
HAY MEADOW CREEK
POPPLE RIVER
HILES
ARGONNE
ROSS
HILES MILL POND
INTERLAKE PAPER & PULP CO
ARMSTRONG CREEK
WILDCAT CREEK
FOREST CO.
COYOTE CREEK
CASWELL
ADAMS, HERBERT
CRANDON
Crandon
LAONA
LITTLE RICE LAKE
CONNORS DAM
BLACKWELL
VANDERLOOP, RICHARD
LINCOLN
FLANNER STEGER DAM
DAVISON EVRON E.
METONGA LAKE
NASHVILLE
SOKAOGAN CHIPPEWA COMMUNITY
SCHLAFKE, THEODORE
RIPARIANS
RUSCH DAM
JONES DAM
MENOMINEE BAY SHORE DAM
WABENO
PICHOTTA, H.A.
DEER CREEK
PICHOTTA, HAROLD A.
FREEDOM
KNOWLES CREEK
LILY LAKE
ABOVE BOG BROOK
BOG BROOK



Source: WI DNR, NCWRPC FEMA

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Destruction of wetlands can occur through the use of fill material. This can compromise 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.

Other Land Cover/Uses

Recreational lands including parks and outdoor sports facilities total about 676 acres or 0.1 percent of the county land area. Other lands may be used for recreational purposes, particularly woodlands. Open lands represent undeveloped land not wooded or part of a farm such as grassland. The transportation category is primarily the roadway travel corridors for federal, state, county and local highways and roads. Sometimes overlooked, transportation land use can be significant. In Forest County, surface transportation facilities consume about 5,500 acres of land or about 0.8 percent of total land area.

FUTURE GROWTH AND DEVELOPMENT IN FOREST COUINTY

After a decade of growth, the recent recession has largely reversed that trend. During the 1990s only two of fourteen towns lost population, while in the 2000s only two towns gained population. The Towns of Crandon and Nashville both are adjacent to the City of Crandon, and the third Town (Lincoln) that surrounds the city, although it lost fifty residents in the last decade, has still grown by 51.6 percent since 1990. Generally it is the towns with the smallest populations and the most rural locations that have shown the greatest population loss. Although the population in the City of Crandon has remained fairly constant (down less than 2% since 1990) the three towns around it grew by 36 percent during the 1990s, so it seems likely whatever growth occurs in the future will be strongest in the area around the city.

Development in Forest County has been historically driven by the agriculture and logging industries. If the trend of the last twenty years holds, by 2030 Forest County will have 9,864 residents, but in light of the seven percent decline in population of the last decade this is uncertain. The last decade has been particularly hard on the wood products industry, so a revival of the growth seen in the previous decade may be difficult.

Official population projections foresee only a 111 person increase by 2035. This was based on an assumption of a net, natural loss of 1,014 (births minus deaths) and in-migration of 1,125. Forest County's population continues to age. The median age is 43.9 in Forest County, four years higher than the state median, and more than a fifth of residents are over 65 years of age, six percent higher than the state, so natural increase is unlikely to turn positive in the foreseeable future. Any growth will be dependent on in-migration.

Most of the in-migration to Forest County in recent decades can be attributed to the conversion of seasonal dwellings to year-round residences. The character of the county's housing stock changed during the 1980s, when seasonal dwellings increased by 589 percent, in a decade that saw a three percent drop in the county's population. During the 1990s while the population increased by 14 percent, the number of seasonal dwellings went up by 7.8 percent, and since 2000, even though the population has fallen by seven percent, seasonal dwellings increased 14.8 percent.

Although the trend in natural increase is unlikely to change, the increasing rate of construction of seasonal dwellings promises that if the economic factors that may have slowed the conversion of seasonal to year-round dwellings change then in-migration may increase again, and lead to population growth in Forest County. This growth will be concentrated in areas around lakes and near the City of Crandon. Many new residents are likely to be of retirement age.

Tribal/reservation areas within Forest County have had fairly stable populations. The Potawatomi, have seen their population grow by 10 percent over the last decade, and continue developing extensive tribal government, including a casino expansion, and residential facilities in the Town of Lincoln. The Mole Lake Reservation in the Town of Nashville has gained 5 percent in population over the same period, and also added new tribal facilities, including a health care center, and has expanded its casino, including a hotel.

Natural features, including lakes and agricultural lands, have largely dictated the county's land use pattern. The Nicolet National Forest takes up a significant portion of the county and is a limiting factor on growth.

The dependence on forestry and agriculture in the county indicates a slow growth dispersed widely across the landscape over time. Although the City's industrial park has seen some reuse of existing buildings, commercial developments will be minimal around the county, and dominated by home-based businesses. New infrastructure or public facilities are expected to be minimal moving forward following the addition of new town halls in Lincoln and Nashville and a new Crandon Rescue building. The exception will be in the Reservation areas where additional Tribal development is expected.

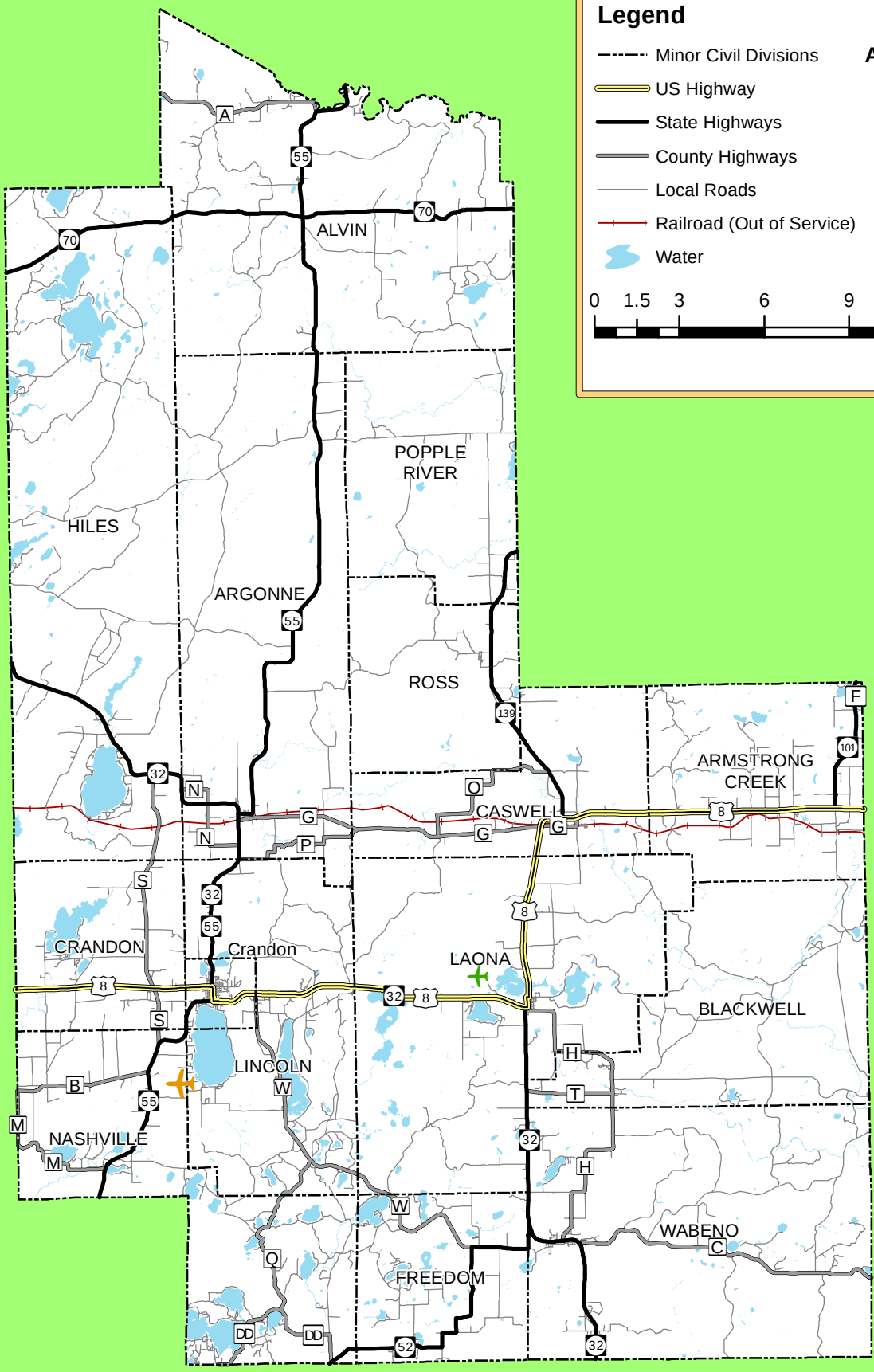
PUBLIC FACILITIES AND SERVICES

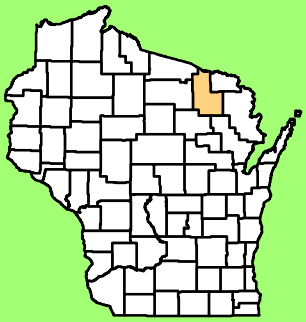
Transportation

The transportation system of Forest 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).

Forest County, Wisconsin

Map 5
Transportation





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One major U.S. Highway, U.S.H. 8 serves Forest County, running east-west through Crandon and Laona. This highway links the county to Rhinelander, its closest regional service center and to U.S.H. 51.

Six state highways serve the county. Highway 55 is the principle north-south route traversing the entire county from the southern county line to the border with Michigan in the north. Other north-south routes include STHs 101 and 139, both of which link U.S.H. 8 with other highways outside Forest County, and S.T.H. 52 which links to S.T.H. 32 in the south central part of the county. East-west routes, in addition to U.S.H. 8, include S.T.H. 70 across the extreme northern end of the county and S.T.H. 32 which tracks northwest – southeast across the southwest corner or the county through Crandon. These highways link the county with neighboring communities and are vital to the tourism and recreation-based economy.

A network of County trunk highways collects traffic from rural areas. These County highways serve an important role in linking agricultural and timber resources to the county's service centers and major highways. Local roads provide access to local development, farming and forest areas, as well as the county's lakes.

The Wisconsin Department of Transportation maintains 11 bridges on U.S./State highways within the county. Forest County itself owns another 6 bridges on various County highways. The U.S. Forest Service has 17 bridges, primarily on forest roads, but three carry local roads. The various towns are responsible for 13 bridges. There is also one rail-bridge over U.S.H. 8.

Forest County Commission on Aging coordinates transit services for the elderly and disabled. A mini-bus provides flexible-route service to various areas of the county on a weekly rotation for trips to regional medical centers as well as local service centers for groceries and other needs. The bus is available for dial-a-ride or specially planned trips when not on one of the scheduled routes. The county also has an accessible van for specialized transportation of disabled residents. A volunteer driver network is also available.

The Canadian National Railway (CN) has track running east-west through Forest County but service has been suspended for some time. A spur to Crandon is being abandoned by CN at the time of this writing.

The Crandon Municipal Airport located south of the City of Crandon is the public-use airport serving the area. The airport provides general aviation service for private airplanes and daily airfreight. The Crandon Airport is a basic utility airport, which is designed to accommodate aircraft of less than 6,000 pounds gross weight, with approach speeds below 91 knots and wingspans of less than 49 feet. There are private landing strips located in the county. The nearest commercial passenger service is available in Rhinelander.

Utilities

Utility systems are important in hazard mitigation planning because of the community's reliance 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, see Map 6.

The protection of the public water supply facilities from potential contamination from flooding and other threats is a consideration for hazard mitigation planning. The City of Crandon and the Laona and Wabeno Sanitary Districts provide municipal water supplies for domestic and commercial use, while the Blackwell Civilian Conservation Corps Center provides water for its staff and visitors. Both the Potawatomi and the Sokaogon Chippewa have public water systems serving parts of their reservation area. The Potawatomi have two separate systems with one in Lincoln, and another in Wabeno which serves its Carter facilities and residents.

The protection of the wastewater systems is an important consideration for hazard mitigation planning because of its potential to contaminate nearby waterbodies in the event of flooding. Also of concern during periods of high water is the threat of damage to treatment plants. Three municipal wastewater treatment facilities, the City of Crandon and the Laona and Wabeno Sanitary Districts, provide wastewater services. Again the Tribes each have sanitary sewer services in Mole Lake, Lincoln and Carter.

The infrastructure of electric and telephone lines should be considered in the events of high wind, ice storms, tornadoes, flooding, and fire. Wisconsin Public Service provides Forest County with electric service throughout the County. As of 2001, an independent company, American Transmission Company LLC (ATC), owns, maintains, and operates the major transmission facilities located in the State of Wisconsin, including Forest County. The general locations of the major electrical transmission facilities, owned by ATC are shown on Map 6. Six providers: Verizon, CenturyLink, Charter Communication, Charter Fiberlink LLC, Powercom, and Frontier supply telephone service in the county.

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. Signals generally cannot travel well in dense forest cover, over tall hills, or through thick or multiple cement walls, so limitations for receiving a signal include topography and the thickness & type of building materials. Spotty cell service continues to be an issue in Forest County.

Natural gas transmission across Forest County generally following USH 8 from the Town of Crandon through the Town of Armstrong Creek. This gas line is tapped by Wisconsin Public Service to provide local delivery in another pipeline

that generally serves the City of Crandon, the downtowns of Laona and Wabeno, and a 32-mile pipeline from Argonne to Hiles. The remainder of the county depends upon bottled gas from local suppliers.

Emergency Services and Facilities

The type and location of public emergency services are an important consideration in hazard mitigation planning, because of the crucial role of such facilities in certain hazard situations.

There are eleven fire departments that serve the local units of governments in Forest County. The Towns of Alvin, Argonne and Hiles provide their own service. Hiles, the county's largest town, has a north and a south service area to better serve its 140 square miles. The Crandon Area Fire Department serves the City and Town of Crandon as well as the Town of Lincoln and the northern half of Nashville. Nashville's southern half is covered by the fire station on CTH DD, which is part of the Pickerel Fire Department out of Langlade County. The Wabeno Fire Department provides service for the Towns of Wabeno, Freedom and Blackwell. The Town of Laona Fire Department serves Laona and Caswell. The Towns of Popple River, Ross and Armstrong Creek all share service with neighboring towns in adjacent counties. The location of each fire service area is shown on Map 7.

Fire Station B, Town of Hiles

There are nine EMS providers to the County. Alvin and northern Hiles get EMS services from Phelps and Eagle River in Vilas County, respectively. Oneida EMS serves a small area in the center of Hiles, while the southern part of Hiles partners with the City and Town of Crandon, northern Nashville, Lincoln and the Town of Argonne under Crandon Area Rescue. Pickerel Rescue covers southern Nashville. Wabeno, Freedom, Blackwell and part of Laona jointly form United Area Rescue. The majority of Laona and the Towns of Caswell and Ross are served by Laona Rescue. The Towns of Popple River and Armstrong Creek share service with neighboring towns in adjacent counties. First Responder groups are organized in the Towns of Hiles and Ross. Map 8 shows the locations of EMS service areas.

The Forest County Sheriff's Department provides service to all the towns and the city for law enforcement, and the City of Crandon also has its own police department. The Towns of Wabeno and Laona also have a part time officer. The locations of police service areas are on Map 9. The Forest County Jail in Crandon is the main correctional facility within the County.

To coordinate these services, Forest County has created an *Emergency Response Plan (ERP).* This provides a general overview for county and municipal emergency response personnel to a number of disasters. This document serves 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.

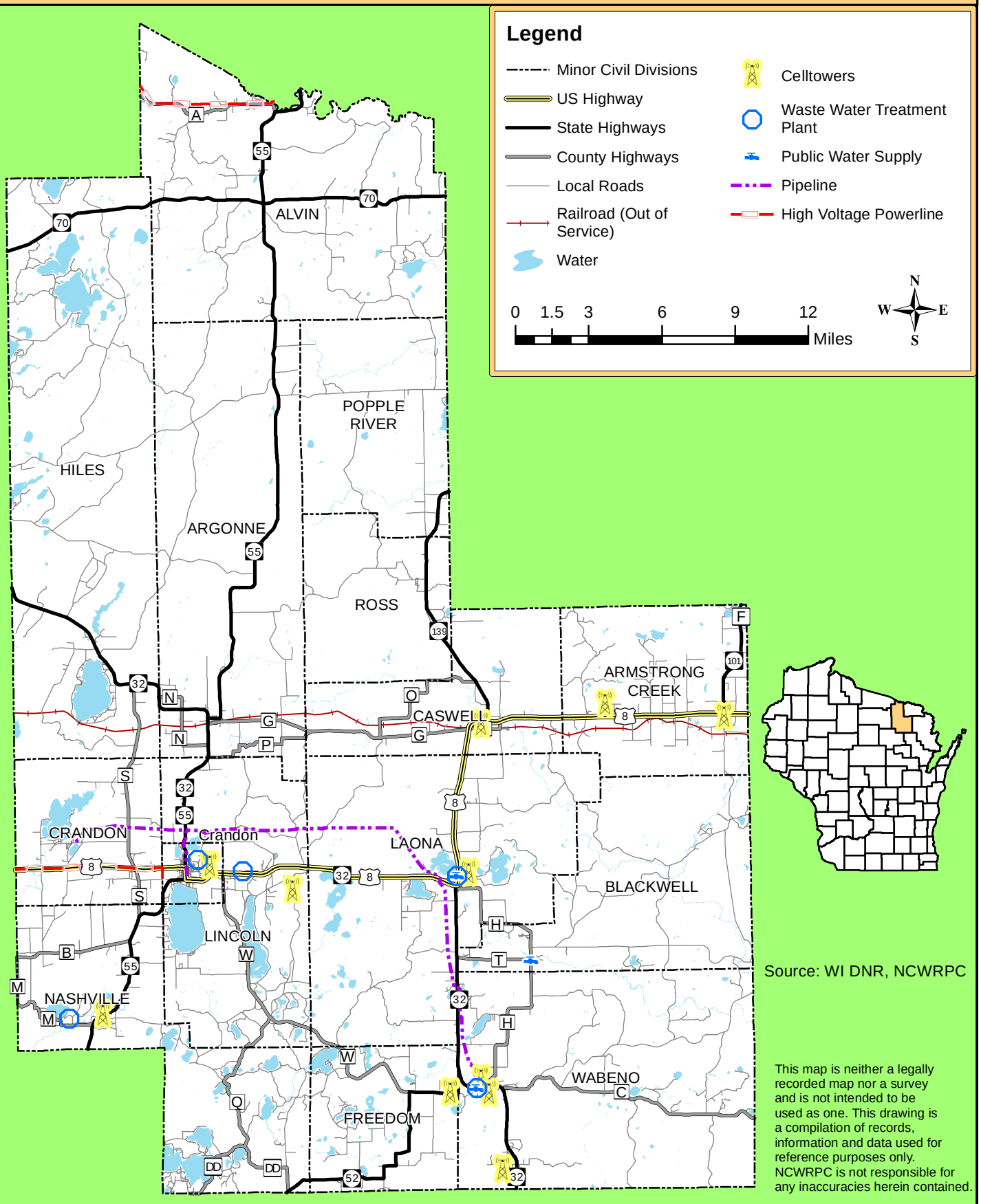
Critical Community Facilities

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. In the event of an emergency it is important to know the location of available medical facilities. Nursing homes are vulnerable, because of the high level of assistance required by the residents that live there. Since hundreds of the county's children are there for most of the year schools are important. Map 10 shows the location of selected types of critical community facilities within Forest County. Clinic facilities are located in the City of Crandon, the Town of Laona, and the Potawatomi (T. Lincoln) and Mole Lake (T. Nashville) reservations.

Forest County Courthouse, Crandon, WI

Forest County, Wisconsin

Map 6 Utilities



Source: WI DNR, NCWRPC

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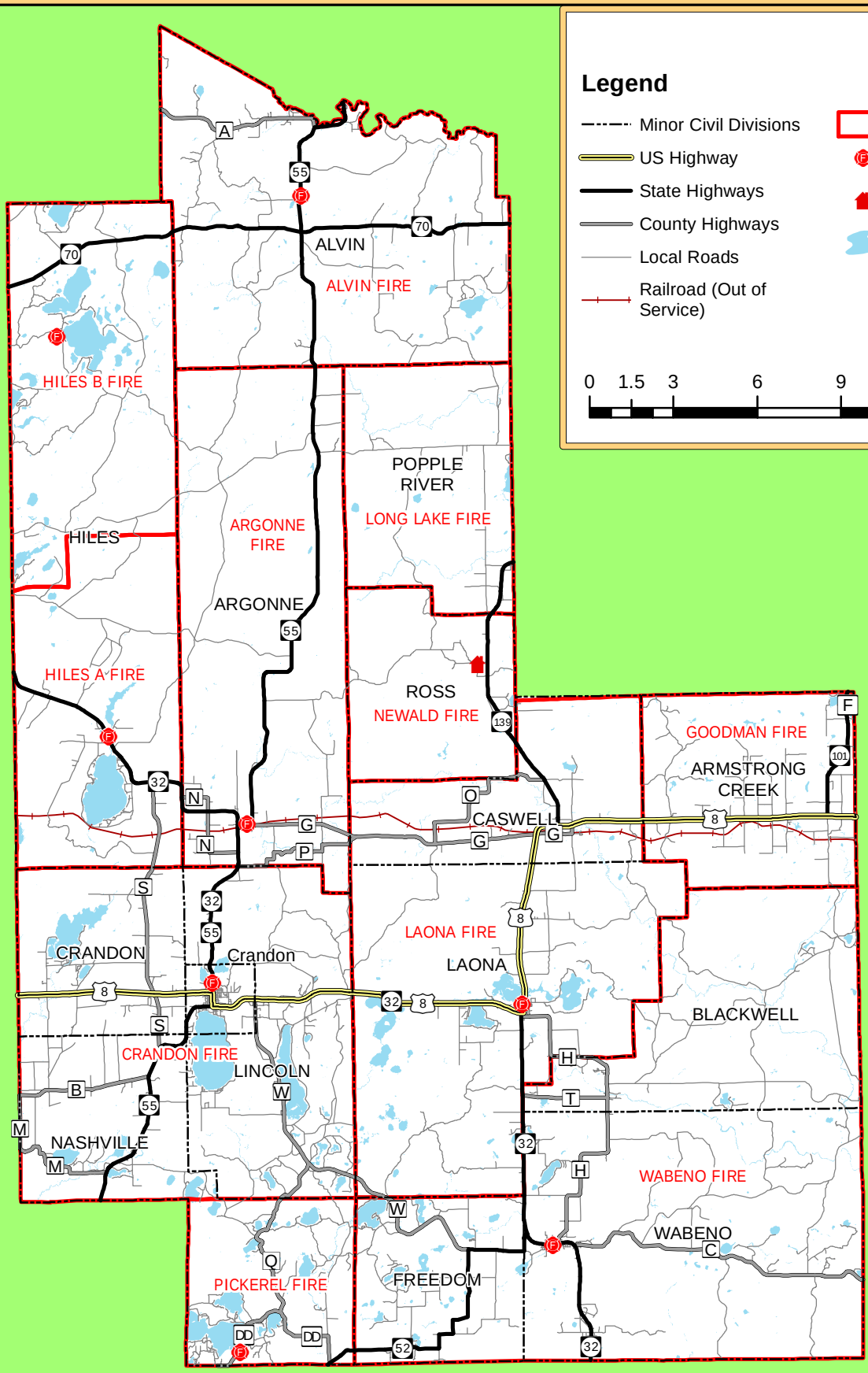
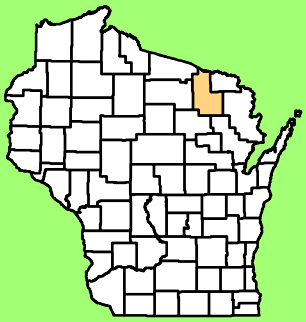
Forest County, Wisconsin

Map 7
Fire Service





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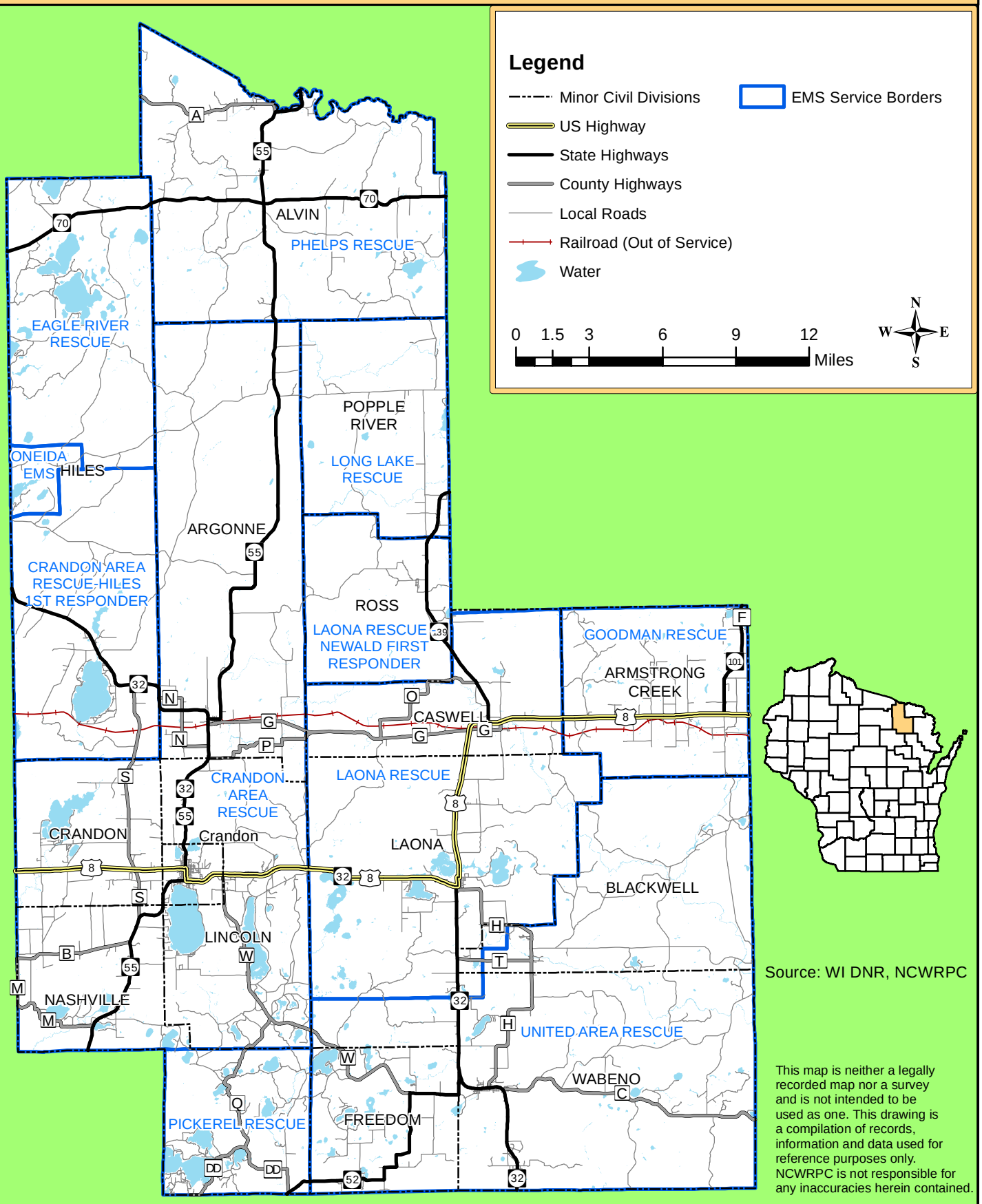
Forest County, Wisconsin

Map 8
EMS Service



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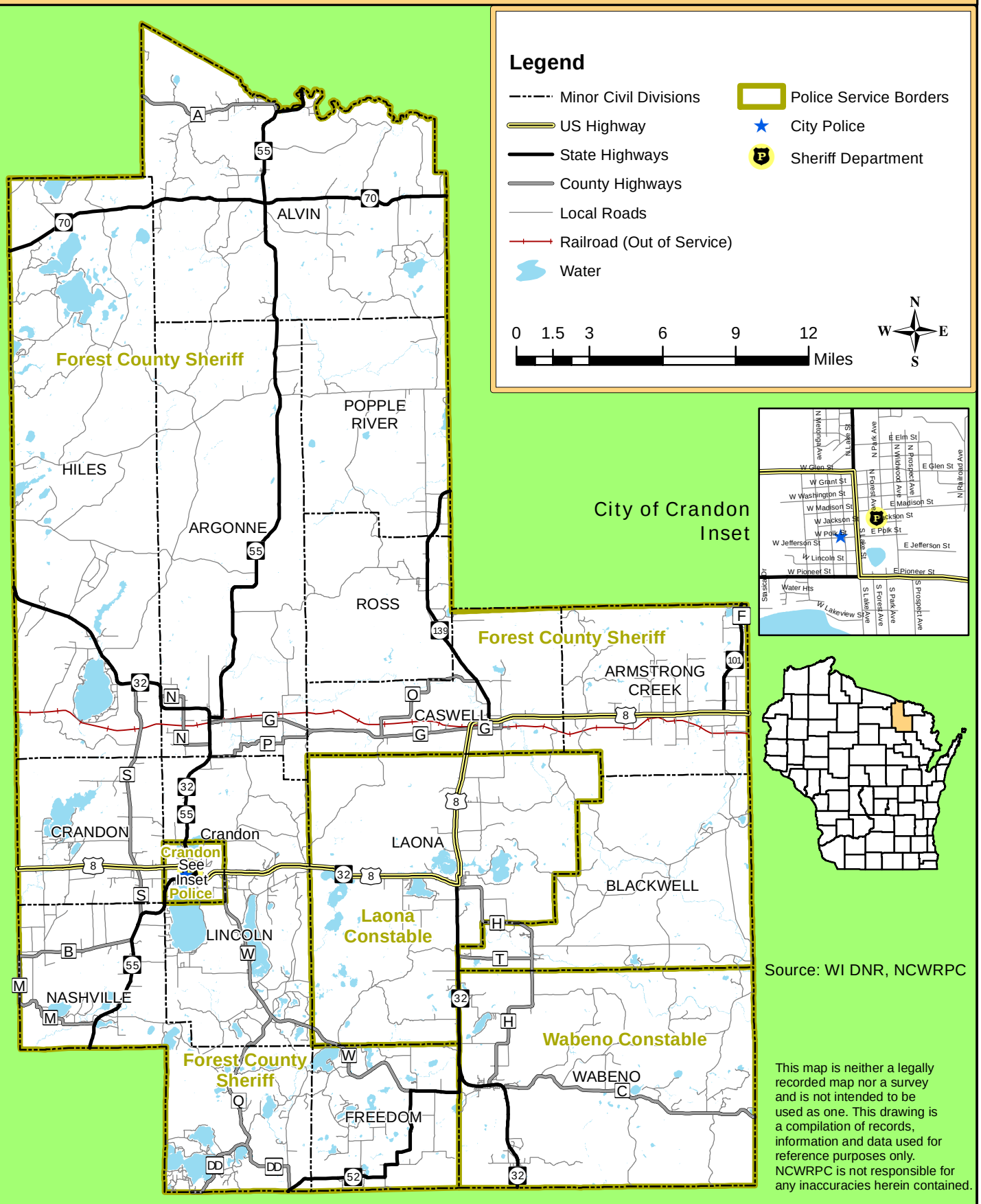
Forest County, Wisconsin

Map 9
Police Service



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Forest County, Wisconsin

Map 10
Critical Community Facilities

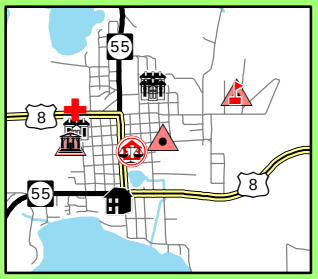
Legend

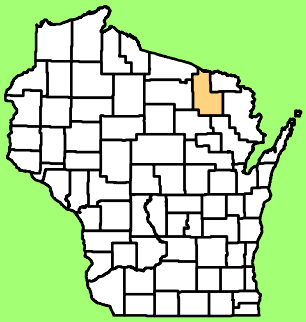
- Minor Civil Divisions
- US Highway
- State Highways
- County Highways
- Local Roads
- Railroad (Out of Service)
- Water
- City Hall
- Court House
- Emergency Operations Center
- Emergency Operations Center (Alt)
- Emergency Shelters
- Health Services
- Nursing Home
- Ranger Station
- Schools
- Senior Housing
- Town Halls
- Tribal Administration

0 1.5 3 6 9 12 Miles

N W E S

City of Crandon Inset





ALVIN
POPPLE RIVER
HILES
ARGONNE
ROSS
ARMSTRONG CREEK
CASWELL
CRANDON
Crandon
Crandon Inset
LAONA
BLACKWELL
LINCOLN
NASHVILLE
WABENO
FREEDOM

Source: WI DNR, NCWRPC

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INVENTORY & VALUE OF STRUCTURES/PROPERTY IN FOREST COUNTY

The value of the real estate and personal property 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 8 lists each municipality's total equalized values for real estate, personal property, and all property and the percent of the county total each municipality represents.

Table 8 Equalized Value by Municipality

Municipality	Real Estate	Personal Property	Total	% of Total
Alvin town	$34,863,000	$286,500	$35,149,500	3.20%
Argonne town	$35,348,900	$579,600	$35,928,500	3.27%
Armstrong Creek	$38,957,100	$423,100	$39,389,200	3.59%
Blackwell town	$22,055,800	$163,600	$22,219,400	2.02%
Caswell town	$10,513,600	$197,000	$10,710,600	0.98%
Crandon town	$56,397,700	$449,200	$56,846,900	5.18%
Freedom town	$71,948,100	$126,800	$72,074,900	6.57%
Hiles town	$153,572,200	$325,900	$153,898,100	14.02%
Laona town	$90,817,700	$1,187,600	$92,005,300	8.38%
Lincoln town	$187,297,000	$975,300	$188,272,300	17.16%
Nashville town	$201,633,100	$1,703,600	$203,633,700	18.56%
Popple River town	$12,139,100	$83,000	$12,222,100	1.11%
Ross town	$11,549,700	$247,500	$11,797,200	1.08%
Wabeno town	$63,315,700	$1,012,200	$69,327,900	6.32%
Crandon city	$92,397,400	$1,740,700	$94,138,100	8.58%
Forest County	$1,087,806,100	$9,510,600	$1,097,316,700	100.00%

Source: WI Department of Revenue, 2013

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 Forest 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 9a, the County owned critical facilities are listed with its general location and the value of the facilities. Estimates for local government facilities are given in Table 9b/c and Tribal facilities in Table 9d.

Table 9a Value of County Owned Properties		
Name	**Value***	**Location**
Courthouse / Sheriff	$20,538,229	Crandon city
Asphalt Plant	$87,634	Crandon city
Salt Shed	$113,038	Laona town
Salt Shed	$52,477	Alvin town
Fairgounds	$267,038	Crandon city
Veteran's Memorial Park	$486,221	Crandon city
Highway Department	$4,636,808	Lincoln town
Misc. Other	$3,017,080	Various Locations
Total	$29,198,525	Above Locations

*=Includes insured buildings, contents, and property in the open. Source: Statement of Values State of Wisconsin Local Government Property Insurance Fund.

Table 9b Value of City Owned Properties	
Property	**Value***
City Hall	$265,650
Police Department	$179,939
Fire Department	$693,000
Street Department	$157,239
Library	$854,008
Old Library	$102,486
Water/Sewer Plant	$2,835,779
Well and Pump Houses	$473,328
Water Tower & Reservoir	$329,154
Lift Stations 1 -11	$946,161
Booster Station –Hwy 8	$84,770
Storage Buildings	$189,181
Parks and Recreation	$195,094
Airport Building	$162,750
Cemetery	$69,510
Total	$7,538,049
*includes insured building contents Source: Local Government Property Insurance Statement of Values	

Table 9c: Value of Town Owned Properties		
Municipality	**Property**	**Value***
Alvin town	Town Hall	$330,750
	Garage 2	$66,150
	Garage 3 / Salt Shed	$200,550
	Recreation Area & Other	$67,200
Argonne town	Town Hall	$341,250
Armstrong Creek town	Town Hall / Garage	$437,850
Blackwell town	Town Hall	$215,488
	Recycling Center	$35,772
	Recreation Area	$118,000
Caswell town	Town Hall / Buildings	$358,050
Crandon town	Town Hall	$341,250
Freedom town	Town Hall/Garage/Salt Shed	$326,487
Hiles town	Town Hall	$341,250
Laona town	Town/Community Hall	$355,950
	Town Garage/Storage Bldgs	$255,150
	Beach Shelter & Storage	$89,250
	Municipal Building	$795,900
	Cemetary Storage Building	$123,900
	Wellhouse / Shed	$438,900
	Library	$119,700
	Water & Sewer Facility	$344,400
	Multi-purpose Facility	$449,400
	Parks Dept. & Other	$1,161,300
Lincoln town	Town Hall/Garage/Storage	$486,150
	Recycling Center	$4,200
Nashville town	Town Hall (N)	$341,250
	Community Bldg/FD/Garage	$2,400,000
	Salt Shed	$60,000
Popple River town	Town Hall	$341,250
Ross town	Town Hall	$341,250
Wabeno town	Town Hall	$341,250

*includes insured building contents and property in the open
Source: Local Government Insurance Policy Declarations and NCWRPC

Potawatomi Tribal Wellness Center

Table 9d-1	Value of Tribal Owned Properties	
Tribe	**Property**	**Value**
Potawatomi	Administration Building	$8,400,000
	Convenience Store	$1,575,000
	Accounting Building	$157,500
	Office Building	$262,500
	Casino / Hotel	$18,650,000
	Health Center	$2,100,000
	Head Start / Daycare	$183,750
	Wee Care Daycare	$131,250
	Natural Resources Bldg	$210,000
	Public Works	$525,000
	Aging / Housing	$525,000
	Tribal Hall	$210,000
	Ordinance Office	$105,000
	Language & Culture Office	$157,500
	Museum	$2,100,000
	Recreation Center	$262,500
Source: NCWRPC Estimate.		

Table 9d-2	Value of Tribal Owned Properties	
Tribe	**Property**	**Value**
Mole Lake	Casino/Restaurant	11,639,716
	Hotel Conference Ctr	11,171,580
	Casino/Hotel Storage	559,080
	Casino/Hotel Storage	146,990
	Youth Center	1,283,849
	Medical Clinic	2,113,449
	Water Tank	308,224
	C-Store Gas Station	482,759
	Historical Home	237,194
	SFI Office	358,000
	Old Motel	723,132
	Storage Bldg	131,140
	Gazebo	11,208
	Elder Apartments	1,733,100
	Day Care Center	142,052
	EPA Storage Garage	85,671
	Admin./Environmental	3,334,163
	Maintenance Bldg	381,200
	Commodities Dist.	162,464
	Fish Hatchery	187,547
	Pump House	307,168
	Recycling Bldg	204,142
	Family Services Bldg	263,469
	Multifamily Apartments	960,500
	Water Tank	448,328
	Housing Office	473,179
	Housing Maint. Bldg	874,700
	Randall Apartments	432,000
	Infrastructure	721,162
Source: NCWRPC Estimate		

Mole Lake Community Health Clinic

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INTRODUCTION

Analyzing the hazards facing a community is an important step in the mitigation plan update process. Before mitigation strategies can be determined, a risk assessment must be made. Part III of Forest County All Hazards Mitigation Plan Update will focus on the following:

- Identification of all types of natural hazards that can affect Forest County
- An analysis of each hazard identified as pertinent to Forest 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 Forest County All-Hazards Mitigation Plan Update 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 the threat to human safety and property damage.

Worksheets from the Wisconsin Guide to All-Hazard Mitigation Planning were used by to evaluate and rank a list of possible hazards to identify which hazards were included in the original Plan based on threat to human safety and possible damage to property. The Plan Update Committee reviewed that ranking and determined that severe thunderstorms should be moved to the top priority due to much greater frequency and cumulative impacts to tornado or flooding within Forest County. They also felt that wildfire posed a greater danger and should be moved up in the ranking as well. Cyber-attack was added to the list in recognition of this growing threat in today's technology based world.

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

1. Thunderstorm/High Wind/Lightning/Hail
2. Tornado
3. Flooding/Dam Failure
4. Winter Storm/Extreme Cold
5. Forest Fire/Wildfire
6. Drought/Extreme Heat
7. Cyber-Attack

This Plan Update focuses primarily on natural hazards that can be mitigated on a local level, and have or could cause disasters. Technological or manmade hazards include

things like transportation incidents, civil disturbances, hazardous material incidents, mass casualty events, war, and terrorism. Forest County already has action plans for these types of events, so they are not included in this update process, with the exception of cyber-attack, which is addressed here as indicated. Although of significant concern, human communicable diseases are not addressed in this Plan Update. The Forest County Health Department and area hospitals work with the Wisconsin Department of Health Services and the Center for Disease Control to monitor and plan for those situations.

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 Update. Forest 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 Update 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 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 Forest County would be vulnerable. A review of past occurrences for each identified hazard in Forest County was completed.

Some disasters have had damages that exceeded the capabilities of local communities and state agencies. Federal assistance is then requested, which may be offered through a variety of programs. Assistance may be directed to agricultural producers, individuals and families, businesses, or local governments. A Presidential Declaration was requested for five natural disasters in Forest County, from 1971 to 2013. They include the following:

- 1975 Army Worm Infestation
- 1976 Drought – Presidential Emergency Declaration
- 1977 High Winds / Hail – Presidential Emergency Declaration
- 2000 Severe Storms/Flooding/Tornado – Presidential Disaster Declaration
- 2010 Severe Storms – State Disaster Fund

It should be noted that this significantly underestimates the number of hazard events that have occurred in Forest County. Almost every year significant weather events or disasters cause thousands of dollars in damage when 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 September 3, 1958 to December 31, 2013, NCDC reported 270 severe weather events for Forest County.

Note that since the NCDC data is somewhat incomplete, this Plan Update focuses on the 10-year period from 2004 to 2013 for hazard analysis purposes. Other sources of data are used to supplement the NCDC data. These sources include Wisconsin Emergency Management, Wisconsin Department of Natural Resources, Forest County Emergency Management, and local news reports.

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 such a hazard event occurring in the county, and the potential damages in dollars that might be reasonably expected. This section sets a benchmark amount for mitigation of each hazard.

HAZARD ANALYSIS: THUNDERSTORM/HIGH WIND/LIGHTNING/HAIL

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 one inch (recently increased from ¾ of an inch) in diameter or greater, or a tornado. Strong winds, hail, and lightning will be addressed in this section, and tornadoes are discussed as a separate hazard.

Lightning results from discharge of energy between positive and negative areas within a thunderstorm separated by rising and falling air. 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 suspended.

Thunderstorm frequency is measured in terms of incidence of thunderstorm days or days on which thunderstorms are observed. Wisconsin averages between 30 and 50 incidence 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.

Measured wind speeds are typically in the range of an EF0 tornado and may even approach EF1 speeds. Strong winds can be associated with tornado episodes, thunderstorms, or even winter storms. The effects are often widespread, impacting areas hundreds of miles from the actual areas of thunderstorms or snow. Trees, signs, and power poles are the most commonly impacted by high wind events, but significant damage, bodily injury, or death can occur.

History of Severe Thunderstorm in Forest County:

The NCDC database reported 61 severe summer storm events for the county between 2004 and 2013. These storms typically contain some form of heavy rain, strong winds, lightning or hail, and NCDC shows one high wind events from 2004 to 2013. Thus, the county can expect a severe summer storm event every year. In other words, the probability is 1.0 or a 100 percent chance in a given year. Generally these events included an area larger than a single county.

Forest County Hail

The most recent severe summer storm event in Forest County took place on August 21, 2013. A broken line of severe storms developed in an unstable air mass ahead of an advancing cold front. The storms produced large hail and damaging wind gusts, at times in excess of 70 mph. A trained spotter reported 1.00 inch diameter hail near the town of Argonne. This storm affected most of northeastern Wisconsin with thunderstorm winds, as well as some hail and lightning.

Most recently, on July 8, 2013, summer storms brought thunderstorm winds and hail into the Town of Nashville. The storms produced wind damage from a wet microburst, penny to nickel size hail, and heavy rainfall. The microburst, with winds estimated at 75 mph, downed about 30 trees. Numerous locations received more than two inches of rain in a three to four hour period.

Forest County has been fortunate to not experience any lightning events between 2004 and 2013. The last lightning event in Forest County took place in 2000 in the Town of Alvin.

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 Forest County area to thunderstorms and related storm hazards, a review of the past events indicates 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 locations that have unusual risks. The events are spread uniformly across the landscape and are a countywide concern.

Future Probability and Potential Dollar Losses – Severe Thunderstorm:
Based on NCDC data, from 2004 to 2013, Forest County has experienced damaging, thunderstorm related winds about 31 times or 3.1 events per year. The county has had damaging thunderstorm wind of 75 mph or higher (hurricane force) only once during this period, which is below the state average for the same span. With these past events in mind, the county has a 10 percent chance in a given year of experiencing winds of this magnitude.

The historical frequency for the occurrence of hail is slightly less, with 29 reported hail events between 2004 and 2013. Forest County averages 2.9 periods of hail per year. Size ranges from 0.75 to 2.75 inches in diameter. In 2005, hail up to 2.75 inches in diameter caused approximately $100,000 in damages in the Town of Laona.

Based on historical frequency, Forest County can expect 6.1 severe thunderstorm or high wind 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 (0.75 inch diameter or greater) is higher in Forest County at 1.0 or 100% chance in a given year. Not enough data is available regarding lightning events to indicate probability.

According to the NCDC, historic thunderstorm events with associated high wind and thunderstorm events with hail both reported damages ranging from zero to $100,000 in

property damage per incident, averaging $4,200 per storm with strong winds and $3,400 per storm with hail. Historic thunderstorm events with associated lightning that reported property damage averaged $5,000. Thunderstorm and high wind events caused a reported $230,000 in damages between 2004 and 2013. Losses in Forest County associated with severe thunderstorms could approach $235,000 over the next ten-year period based on historic probability of events and damages caused.

HAZARD ANALYSIS: TORNADO

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.

Table 10 Tornado Wind and Damage Scale

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

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

Tornados are classified into six intensity categories, EF0-EF5. This scale is an updated or “enhanced” version of the Fujita Tornado Scale ("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 speed.

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 in every month except February.

History of Tornados in Forest County:
Forest County has had six confirmed tornados since 1963, with four occurring prior to 1995. In addition, five funnel clouds and a water spout have also been reported since 1963. The most recent activity in Forest County occurred on September 19, 2012, when a funnel cloud was produced, along with large hail and damaging winds, by a thunderstorm system in the Town of Wabeno. Funnel clouds were also produced in the towns of Argonne and Nashville by a thunderstorm system on July 6, 2012.

The most recent tornado in Forest County occurred on April 10, 2011. On that day fifteen tornado were seen in the state, ten in northeast Wisconsin, which is a one-day record. Two twisters were spotted in Forest County that day. Both were spawned by major thunderstorms that developed along and ahead of a cold front as it encountered moist and unstable air across Wisconsin. These storms also produced straight line wind up to 100 miles per hour.

Tornado Damage, Forest County

The first tornado developed at 7:30 pm southeast of Argonne and travelled over nine miles to the northeast into Florence County. This was an EF2 storm. It downed hundreds of trees, many of which fell on vacation cabins, and blew the roof off a house east of Argonne. This storm did a reported $200,000 in damage. A second funnel formed just after 8 pm at Armstrong Creek and travelled for about three miles to the north and west. It damaged two houses and did $50,000 damage.

In June of 2010, a funnel cloud was observed near County Highway C in the town of Wabeno. This event took place in conjunction with severe thunderstorms and winds up

to 90 mph, which damaged trees and power lines across north central Wisconsin, knocking out power for more than 15,000 Wisconsin Public Service customers.

In June of 2005, two supercell storms moved through the southern part of the county causing significant wind damage and producing a funnel cloud three-miles east of Crandon. Three square miles of trees in the Nicolet National Forest were heavily damaged as winds estimated at 90 mph hit the south part of Birch Lake. The roof was torn from a metal building in Laona. Large hail was also associated with this event.

In June of 1994, a waterspout was observed over Lake Metonga, two miles south of Crandon. About a month prior to this sighting, Forest County experienced a major EF2 tornado that cut a 12-mile path between Crandon and Laona causing $5 million in property damages and $50,000 in crop damage. Three mobile homes were destroyed, injuring three people. Another 25 houses were damaged or destroyed and 600 acres of timber were leveled.

The county also experienced EF2 tornados in 1972 and 1968. The September 1972 tornado cut a 53-mile long swath with $250,000 in property damage. The June 1968 tornado had a one-mile path with $25,000 in damages. In September of 1963, EF1 tornado with a one-mile path caused about $25,000 in property damages.

Table 11 Reported Tornados/Funnel Clouds in Forest County

DATE	TIME	LOCATION	LENGTH (miles)	WIDTH (yards)	DEATHS	INJURIES	F-SCALE
9/19/2012	6:20 PM	T. Wabeno	n/a	n/a	0	0	n/a
7/6/2012	7:30 PM	T. Argonne T. Nashville	n/a	n/a	0	0	n/a
4/10/2011	7:30 PM	T. Argonne	9	250	0	0	EF2
4/10/2011	8:03 PM	T. Armstrong Cr.	3	150	0	0	EF1
6/23/2010	5:15 PM	T. Wabeno	n/a	n/a	0	0	n/a
6/7/2005	6:04 PM	T. Lincoln	n/a	n/a	0	0	n/a
6/28/1994	5:20 PM	C. Crandon	n/a	n/a	0	0	n/a
5/30/1994	8:50 PM	C. Crandon T. Lincoln T. Laona	12	800	0	3	EF2
9/16/1972	4:05 PM	T. Freedom T. Wabeno	53	200	0	0	EF2
6/30/1968	4:00 AM	T. Caswell	1	200	0	0	EF2
9/19/1963	6:00 PM	T. Laona	1	33	0	0	EF1

Source: National Climatic Data Center

Tornado Vulnerability Assessment:
Though Forest County is primarily rural, concentrations of population are scattered throughout the county. Subdivisions, rural unincorporated communities, and the City of Crandon can be regarded as more vulnerable, because tornados pose a greater threat to human safety and property damage in more concentrated areas, see Map 11.

Mobile homes are of significant concern in assessing the hazard risks from tornados. In general, it is much easier for a tornado to damage and destroy a mobile home than a site-built home. According to the U.S. Census Bureau, in 2010, Forest County had 977 mobile homes, approximately 11 percent of all housing units in the county. While mobile homes are scattered throughout the county, many are concentrated in mobile home parks. Map 11 also displays the location of the mobile home parks with approximate number of units.

In addition to mobile homes, campground patrons are vulnerable to tornados because minimal shelter is usually provided. The county is a popular camping destination with campgrounds throughout the Nicolet National Forest, and a number of public and private campgrounds. Refer to Map 11. The Forest Service CCC Camp in Blackwell and the Boy Scout Camp in Laona are also notable risk areas for tornados.

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
- Public Service – police and fire departments
- Utilities – power lines, & telephone lines
- Transportation – debris clean-up
- Residential – nursing homes, garages, trees and limbs, siding, & windows
- Businesses – signs, windows, siding, & billboards
- Agricultural – buildings, crops, & livestock

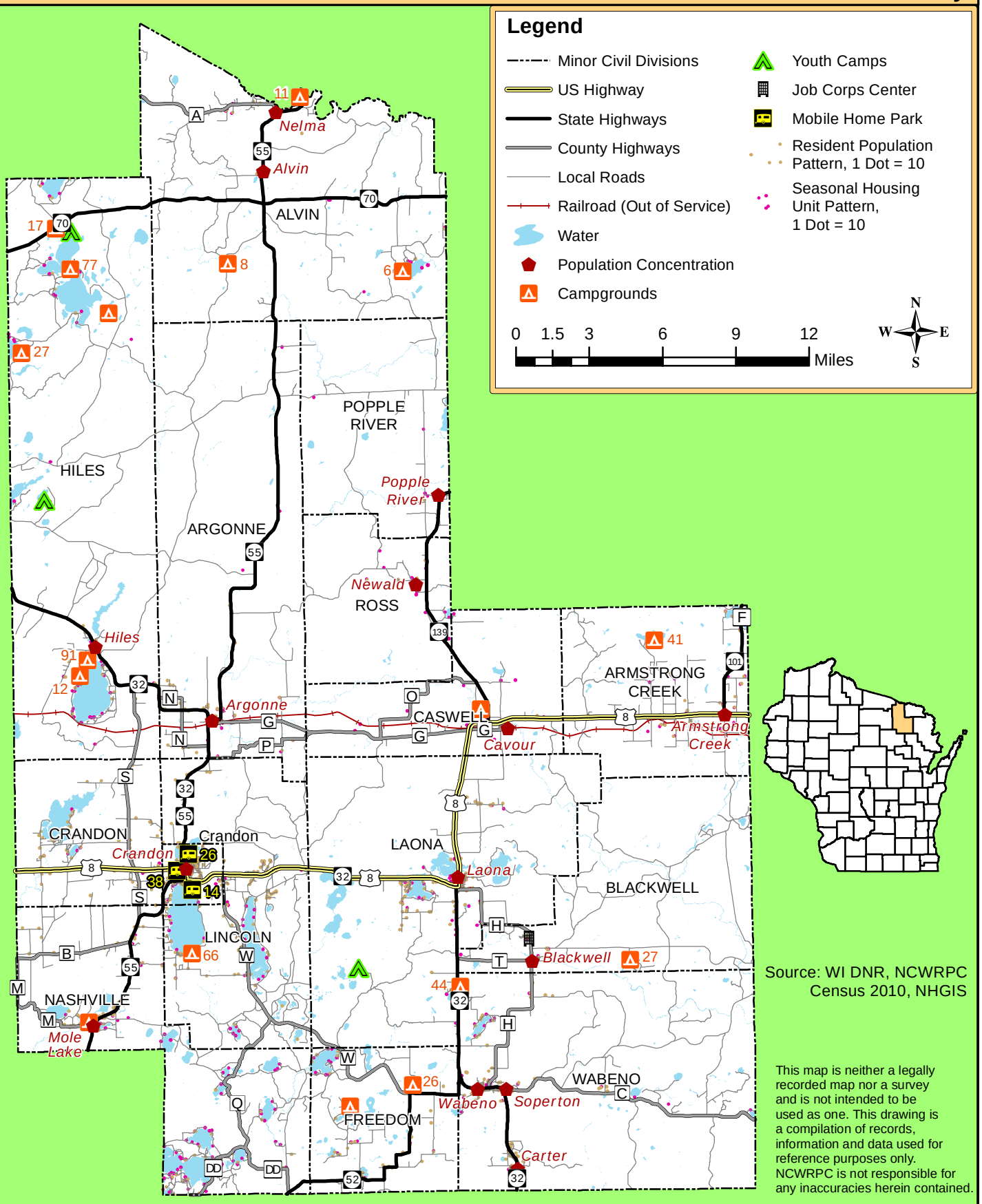
Based on review of the historic events of tornados, there are no specific areas in the county that have unusual risks. The events are a countywide concern. General vulnerability by geographic area (local unit of government) is identified in Map 11.

Future Probability and Potential Dollar Losses – Tornados:
Based on the historic data presented here, between 2004 and 2013 Forest County experienced a tornado event about every 5 years. This equates to a probability of 0.2 or about a 20 percent chance in a given year. While tornadoes are not especially common, funnel cloud sightings occur more often and serve as reminders of the potential threat of a tornado in Forest County. Not enough data exists to indicate the probability of tornados of a specific magnitude.

Historic data is again used to estimate potential future dollar losses due to a tornado. Estimated damages resulting from tornados in Forest County range from zero to $5 million. On average, Forest County might expect damages of $925,000 per tornado, however, only one of the six historic tornados resulted in damages exceeding $250,000, the most recent tornado did $200,000 in damage, one other did $250,000, and the rest were $50,000 or less. High wind damages are typically spread over a wide area making it difficult to single out a specific county. Damage estimates range between zero and $1.0 million per incident, affecting between 4 and 26 counties.

Forest County, Wisconsin

Map 11
Tornado Vulnerability



Source: WI DNR, NCWRPC
Census 2010, NHGIS

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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HAZARD ANALYSIS: FLOODING/DAM FAILURE

Background on Flood Hazard:
A variety of classifications are used to describe for flood events including coastal, dam failure, flash, lake, riverine, stormwater, and urban/small stream. Forest County has the potential for all these types of flooding, 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 components of 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 or 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 type, 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 which 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 – 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.

Flooding problems in Forest County tend 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. This build up continues until the river or stream overflows its banks, for as long as a week or two and then slowly recedes inch by inch. The timing and location of this type of flooding is fairly predictable and allows ample time for evacuation of people and protection of property.

Flooding is a potentially significant hazard in Forest County, particularly because of the extensive water features found throughout the County. As described in Part II, there are approximately 317 rivers and streams in Forest County within 13 main watersheds and 3 major drainage basins.

Floodplains are described in Part II and shown on Map 4. These floodplains are narrow along tributaries and lakes but extensive throughout the County. The North Central Wisconsin Regional Planning Commission digitized these floodplains from FEMA Flood Insurance Rate Maps (FIRMs) for planning purposes.

There are 26 dams in Forest County (see Map 4), but most do not pose a significant hazard if they fail. According to the DNR, Forest County has eleven large dams, fourteen small dams and the other one was not classified, see Table 12. Most of these dams are the "mill" type, built 50-plus years ago. There are also small dams for watering livestock and various recreational ponds around the County. The Wisconsin DNR regulates all dams on waterways to some degree, however the small dams are not stringently regulated for safety purposes.

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 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 that 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. In Forest County, two dams: Bog Brook and Little Rice Lake, have a high hazard rating. Two others: Connor's Dam and Hiles Mill Pond, have a rating of significant, however dam break analysis for Hiles Mill Pond indicates the rating should be elevated to high. Thirteen other dams have a low hazard rating, while nine remain unrated. Two dams, Lily Lake and Little Rice Lake, have emergency action plans (EAPs) currently in place.

Table 12 Dams in Forest County

Name	Size	Hazard Rating	Stream Name	Owner	EAP Date
Above Bog Brook	n/a	-	Bog Brook	Private	n/a
Adams	Small	-	unnamed	Private	n/a
Alvin Creek	Small	Low	Alvin Creek	USFS	n/a
Bog Brook	Large	High	Bog Creek	County	n/a
Briss Lake	Large	Low	Pine Creek Tributary	USFS	n/a
Connor's Dam	Small	Significant	Rat River	Private	n/a
Coyote Creek	Large	Low	Coyote Creek	USFS	n/a
Davison	Small	-	Lake Lucerne Tributary	Private	n/a
Deer Creek	Large	Low	Otter Creek Tributary	USFS	n/a
Hay Meadow Creek	Large	Low	Hay Meadow Creek	USFS	n/a
Hiles Mill Pond	Large	Significant*	Pine Creek	Town	n/a
Klescewski 1	Small	-	no waterway	Private	n/a
Klescewski 2	Small	-	no waterway	Private	n/a
Knowles Creek	Large	Low	Knowles Creek Tributary	USFS	n/a
Lily Lake	Large	Low	Lily River	Town	2007
Little Rice Lake	Large	High	Wolf River	DNR	2013
Metonga Lake	Small	Low	Swamp Creek Tributary	County	n/a
Pichotta 1	Small	-	Newman Creek	Private	n/a
Pichotta 2	Small	-	Newman Creek	Private	n/a
Pine Lake Outlet	Small	Low	Wolf River	Town	n/a
Roberts Lake	Small	Low	Lily River	Private	n/a
Rusch Dam	Small	-	N. Branch Oconto River	N/A	n/a
Schlafke	Small	-	no waterway	Private	n/a
Swamp Creek	Small	Low	Swamp Creek	Tribal	n/a
West Allen Creek	Large	Low	West Allen Creek	USFS	n/a
Wildcat Creek	Large	Low	Wildcat Creek	USFS	n/a

Source: WisDNR *Reports indicate hazard rating should be elevated to High.

History of Flooding in Forest County:

Flooding was a principal cause of damage in only one of four Presidential Disaster Declaration requests in Forest County from 1971 to 2013. This event occurred in 2000, when a nearly stationary front across Wisconsin combined with upper air and abundant moisture to produce a prolonged period of thunderstorms. Flooding from heavy rain caused the majority of problems, including flooded roads and basements.

Flood Damage. US Hwy 8

Rainfall totals ranged from 2 to 4 inches in a 24- hour period. Small streams and creeks overflowed their banks and rural areas suffered some crop damage.

The most recent flood event was in April 2002. Significant rainfall and snow melt resulted in flooding of roads and low-lying areas. In 1999, heavy rainfall caused flash flooding in the Town of Alvin. Roads were damaged and some homes and businesses suffered water damage to basements and minimal first floor inundation. In 1996, heavy runoff from spring snowmelt and rain resulted in widespread minor flooding across several northern counties including Forest. Numerous roads and culverts were washed out.

There are no records of significant dam failure within Forest County. Some of the dams have developed holes or other damage, but have not caused flooding problems.

Flood Vulnerability Assessment:
Flood events in the county have caused substantial property and infrastructure damage in the past and have the potential to cause future damage, since a significant number of structures still exist in the floodplain. Looking at past events, the following have been significantly impacted by flooding:

- Infrastructure – flooded public facilities, and schools
- Utilities - down electric lines/poles/transformers, telephone lines, and radio communication
- 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 Forest County to flooding hazards, basic inventory data in Part II must be analyzed. For this purpose, consideration should be given to structures (specifically critical facilities), infrastructure, and cropland within the flood plain.

One of the first reports to reference in assessing vulnerability to structures during flooding is the State of Wisconsin Repetitive Loss Report. This Report provides the status of repetitive loss structures by community. FEMA, through the Federal Insurance Administration, 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 administrated WEM. According to the report, there are no repetitive loss structures in Forest County. Since no structures are listed in the Repetitive Loss Report, structures within floodplains were analyzed. The floodplain boundaries (for watershed boundaries see Map 3) within Forest County are shown on Map 4.

Table 13 shows the number of structures in each municipality identified as “vulnerable to flooding” according to proximity to floodplains. A total of 187 structures were

identified in the designated floodplain boundaries as defined by WDNR DFIRMs, see Map 12. The Wisconsin DNR's Digital Flood Insurance Rate Maps (DFIRMs) show areas at risk to flooding overlain on aerial photos in a digital format as opposed to the old paper format for a higher quality, more accurate map.

Table 13
Approximate Values of Structures in Floodplains
Forest County

Municipality	Number	Total Value	Average Value
Alvin town	25	$3,482,500	$139,300
Argonne town	9	$1,107,000	$123,000
Armstrong Creek town	1	$115,300	$115,300
Blackwell town	12	$1,250,400	$104,200
Caswell town	16	$2,577,600	$161,100
Crandon town	44	$5,992,800	$136,200
Freedom town	9	$1,403,100	$155,900
Hiles town	3	$525,000	$175,000
Laona town	15	$1,447,500	$96,500
Lincoln town	3	$426,600	$142,200
Nashville town	18	$2,853,000	$158,500
Popple River town	6	$630,000	$105,000
Ross town	4	$302,000	$75,500
Wabeno town	10	$816,000	$81,600
Crandon city	12	$1,207,200	$100,600
Forest County	187	$22,047,300	$117,900

Source: U.S. Census and NCWRPC

Methodology – Structures within Floodplains:

1. *NCWRPC digitized (electronically traced) the individual FEMA FIRM floodplain maps into a GIS coverage for the County.*
2. *A building point cover was digitized from digital aerial photos along the floodplain areas.*
3. *The floodplain coverage was then combined with the building point coverage to identify those structures within the floodplain boundary.*
4. *Total structures within the floodplain were then tabulated by municipality.*
5. *Average values from U.S. Census data were used to determine the total value for the identified vulnerable structures.*

In addition to structural damage from flooding, there may also be significant damage to public roadways, particularly to roadway surfaces, culverts, and bridges. Flooding could inundate or close roadways from a period of a few days up to as much as three months. Such interruptions in the County transportation network would cause travel delays through detours.

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

The agriculture industry is a sector that faces substantial losses, during floods. Flood conditions cause the following economic setbacks for farmers:

- Delayed planting (reduced growing season)
- Prevention of fields from being seeded
- Seed and agricultural chemicals washing out of fields
- Rotting of plants due to excess moisture
- Areas where planted crops are left in the fields due to excessive moisture
- Crops not reaching full maturity or stunted growth
- Requirements of additional soil amendments by farmers causing expenditures of greater amounts of money
- Lower quality (nutritional value) of harvestable crops as a feed source.

Reductions in quantity can result in loss of revenues from cash crops and increased expenses for purchasing the needed livestock feed from outside sources. Additionally, reductions in crop quality result in lower prices received for cash crops and increased spending for nutritional supplements to animal feed, which need to be added even in much of the purchased feed.

Economic losses to farmers can generate a ripple effect in the local community as well. Reduction in farm income can curtail the farmers' ability to purchase new equipment and make other improvements. Farmers will have less money to spend at farm dealers, farm supplies, building/hardware suppliers, fertilizer, feed and seed dealers, and other agribusiness and retail establishments. The State itself will have reduced tax revenues. Farmers will have less money to save and invest, and suffer increasing debt loads.

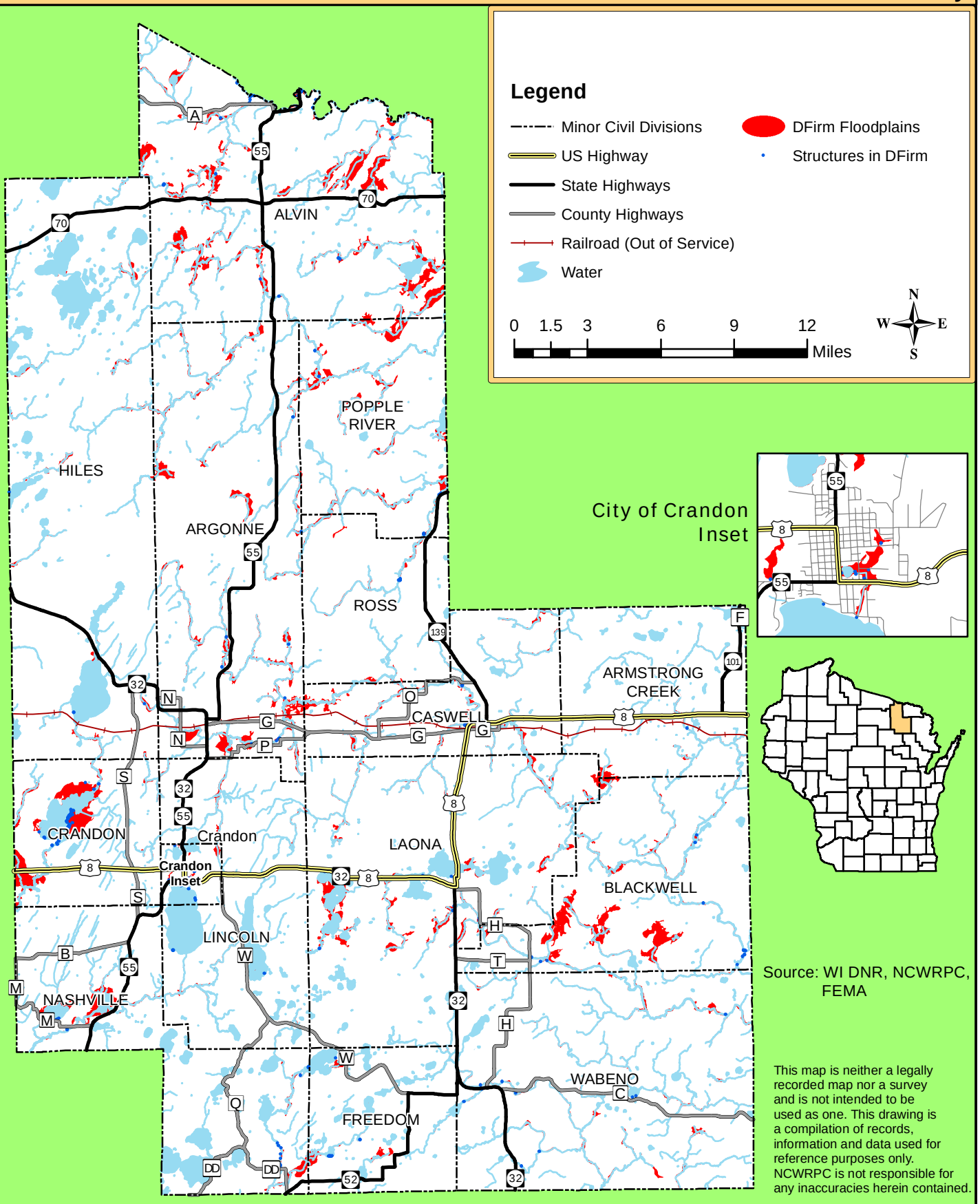
The forest products industry is affected similarly to agriculture. Forestlands become too wet for logging operations and many water-logged tree plantations suffer high mortality rates. Mill inventories become low, resulting in increased prices for consumers.

The areas considered to have a higher risk for impact from flooding include those communities with structures in floodplains as shown in Map 12.

Future Probability and Potential Dollar Losses – Flood:
The NCDC data reported that Forest County had four floods from 1994-2013 (due to the limited number of flood events, a 20 year period is examined). Based on historic data presented here (frequency of past events), Forest County can expect a significant flood event about every five years on average. This equates to a probability of 0.20 or about a 20 percent chance in a given year. The percentage chance of a dam failure is estimated to be less than one percent.

Forest County, Wisconsin

Map 12
Flood Vulnerability



Source: WI DNR, NCWRPC, FEMA

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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Historic data on the dollar losses due to flood in Forest County is spotty. Recorded losses range from zero to $154,000. Losses are surely higher than the $154,000 figure from past flood events. This plan recommends improved local data collection for use in future updates. Forest County can anticipate at least $154,000 in property and crop losses, on average, for each significant flood occurrence between the public and private sector. Over the next ten-year period, flood losses in Forest County will likely exceed $308,000.

Potential losses for structures by jurisdiction are reflected in Table 13. While structures outside mapped floodplains may also be lost or damaged in a flood, structures within flood plains represent the greatest risk from flood damages.

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.

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 even 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 are a part of nearly every winter in Forest County.

Dangerously cold conditions can be the result of the combination of cold temperatures and high winds, which creates a perceived sensation 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 December, January and February.

History of Winter Storms/Extreme Cold in Forest County:
The NCDC has reported 29 major winter storm events and 4 cold temperature events for Forest County between 2004 and 2013. These storms typically contain some form of heavy snow, blowing snow, ice, freezing rain or drizzle, or glaze.

The most recent heavy snow in Forest County took place on March 10, 2013. A narrow swath of heavy snow fell across mainly north central Wisconsin as low pressure moved from the Central Plains into southern Wisconsin. Generally, 5 to 8 inches of snow fell in about 12 hours. Between 2004 and 2013, Forest County was affected by 28 other winter storms and heavy snow events.

The most recent extreme cold or wind chill event took place on February 10, 2008, when strong northwest winds behind a departing low-pressure system brought cold air into Wisconsin. Temperatures fell into the 10 below zero 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 were around 40 degrees below zero. Three other cold temperature events have affected Mole Lake from 2004 to 2013.

A historic event of significance took place in February 1996, when an arctic air mass stalled over Wisconsin bringing extreme cold for an extended period (5+ days). Wind chills reached 70 degrees below zero in some areas. Significant damages and disruption occurred, including cancellation of all outdoor events at the Badger State Games. At least one person died from hypothermia, but this was not in Forest County.

Winter Storms/Extreme Cold Vulnerability Assessment:
Winter storms 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. Many 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 at temperatures below -40
- Septic system freezing
- Transportation – automobile accidents, roadway plowing, salting/sanding
- Residential – roofs
- Businesses –commerce
- Agricultural – livestock

There are no specific areas in the county that have an unusually high risk. Winter storms cover a broad area and are a region-wide concern. The extreme cold weather can affect the entire county. The risk to public health includes the chance of getting frostbite and hypothermia, and motor vehicle accidents. Everyone is at risk for becoming injured in extreme cold weather, either because of frail health or because of travel in a motor vehicle.

Future Probability and Potential Dollar Losses – Winter Storms/Extreme Cold:
Based on historical frequency, Forest County can expect 2.9 major winter storms per year on average. In other words the probability is 1.0 or a 100% chance of winter storms in a given year.

For extreme cold temperatures, based on historical frequency, Forest County can expect about one every 4 years. Although, because extreme cold temperatures often accompany winter storms, a probability of 100% chance in a given year cannot be ruled out.

Estimating potential future losses from winter storms is difficult. Damages and losses are typically widespread. Auto accidents and additional snow removal expense 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: FOREST FIRES/WILDFIRES

Background on Forest Fires/ Wildfires Hazard:
A forest fire is an uncontrolled fire occurring in a forest or in woodlands outside the limits of an incorporated village or city. A wildfire is any instance of uncontrolled burning in

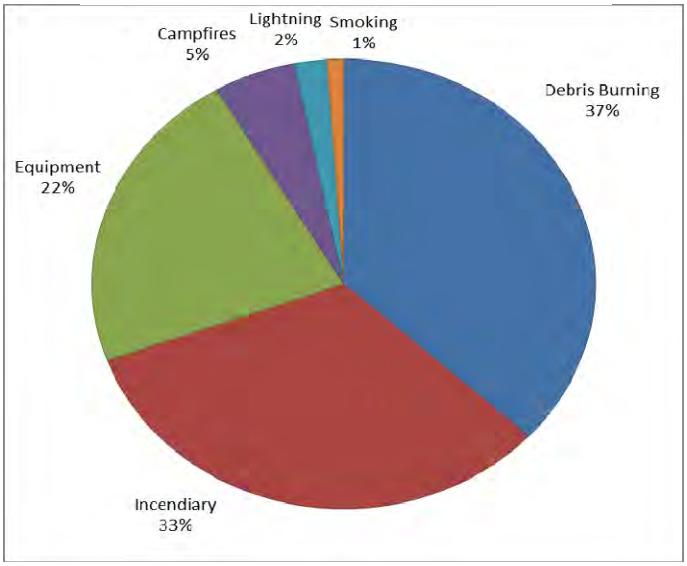
brush, marshes, grasslands or field lands. For the purpose of this analysis, both of these kinds of fires are being considered together.

Forest fires and wildfires can occur at any time whenever 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 Fires/Wildfires in Forest 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 Forest 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, 95 fires burned 158.3 acres of land. The typical fire in Forest County burns about 1.7 acres of land.

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. There have been some larger fires in the area. In 2003, a single fire burned more than 36 acres in the Town of Nashville. The Duck Lake fire in the Upper Peninsula of Michigan may serve as an example of the potential threat. This fire, in May of 2012, was started by lightning and consumed over 21,000 acres, destroying 136 structures.

Fire Causes in Forest Co. 2000 - 2009



April is the leading month for wildfire in Forest County, with 45 percent of the total number of fires between 2000 and 2009 taking place in April. Wildfires have occurred in each month of the year except February and December in Forest County. Forest County experienced both the most fires in a year and the most acres burned in a year in 2003, with 16 reported fires that burned a total of 61.97 acres of land.

The chart below breaks down the causes of wildfire within Forest County between 2000 and 2009, as classified by the WisDNR. The principle cause of wildfire in Wisconsin and in Forest County is debris burning. Of the 95 fires in Forest County between 2000 and 2009, 35 of them, 37 percent, were caused by debris burning.

Forest Fires/Wildfires Vulnerability Assessment:
Forest County has 615,672 acres of woodlands, or 92 percent of the area of 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. Building driveways off main roads are sometimes long and narrow with minimal vertical clearance and no turn around areas large enough for emergency vehicles making it hard to save individual dwellings. These buildings also may not have adequate forest clearance between the structure and the forest.

Campgrounds are also a concern because of campfires. Forest County has federal, state, county, and 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. Forest County has no Communities at Risk at either Very High or High levels. However, the Towns Armstrong Creek, Crandon, Hiles, Lincoln, and Nashville are designated as communities-of-concern.

Future Probability and Potential Dollar Losses – Forest Fires/Wildfires:
Forest and wild fires are relatively common occurrences in Forest County. In recent years, an average of about 9.5 fires per year in the County has burned, on average, 17.6 acres each year. In other words, the probability is 1.0 or a 100 percent chance of wildfire each year. However, these fires are typically contained rapidly and remain small, so that each has a minimal impact.

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 almost ten 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 occurred in the Upper Peninsula of Michigan in 2012. Annual losses would be maximized if a house was destroyed with each acre ("typical" residential parcel size) burned.

Forest Fire Watch Tower, Forest County, WI

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 ten 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 risk for people, particularly the elderly who may lack air conditioning, 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, during a 24-hour period, ranges from 105 to 114 degrees daytime and remains at or above 80 degrees at night. The heat index combines the effects of heat and humidity, better reflecting the risk of hot weather on 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 in 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 fifty percent.

History of Drought/Extreme Heat in Forest County:
The NCDC data has several drought periods recorded for Forest County in the past decade: between 2008 and 2010, in 2007, and in 2005. An extended period of drought affected Forest County from 2008 to 2010. Starting in September of 2008, sixteen of twenty-four months were described as drought. In 2010, Forest County experienced drought conditions, at severe and extreme levels, from April to August. A lack of rainfall, combined with above normal temperatures, led to near-record and record low stream flow levels. While Forest County was not included as a primary county in the Secretarial Drought Declaration made due to these years of drought, it was declared an adjacent county, based on the drought declaration of the entire Upper Peninsula of Michigan.

This may indicate a trend toward lower levels of precipitation in the future. At the national level, a drought, which in some states is in its third year, continues. According to NOAA at the end of 2012, 61 percent of the contiguous United States was in a drought condition and at the peak of summer nearly a quarter (a record) was in extreme or exceptional drought. By one measure (the Palmer Drought Indicator) the area of drought is slightly higher than the 1950s and the highest rating since 1939. The persistence of drought in large sections of the country indicates a strong likelihood that the current dry period will extend into the future.

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. Forest County was one of 64 counties that were declared federal drought areas and deemed eligible for assistance under the Disaster Relief Act.

Forest County was fortunate to experience no extreme heat waves from 2004 to 2013. The most recent extreme heat wave was in July of 1999 when, for over a week, extreme temperatures and humid weather swept across the state. In some places it was so hot that concrete roads began to buckle. Heat related illness was widespread and three deaths resulted outside Forest County.

Drought/Extreme Heat Vulnerability Assessment:
Droughts can have a dramatic effect on Forest County. The county has about 12,000 acres of farmland. With agriculture being a critical sector of the county's economy, droughts can have serious effects. Even small droughts of limited duration can significantly reduce crop yields, adversely affecting farm income. More substantial events can decimate croplands and result in total loss, hurting the local economy.

Irrigation can negatively impact the water table by drawing water that comes from aquifers and can affect surface water. Drought can exacerbate the problem when high withdrawal rates and little precipitation deplete water bodies and aquifer supplies, thereby decreasing drinking water supplies, drying streams, and hindering aquatic and terrestrial wildlife. During severe droughts, some wells—mainly private wells—will go dry.

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 that results from drought can cause flooding, even from average rainfall.

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

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

The areas most susceptible to drought conditions would be agricultural communities, scattered throughout the south and southeast parts of the county.

According to the Wisconsin Emergency Management, excessive heat has become the most deadly hazard in Wisconsin in recent times. Extreme heat can happen anywhere within Forest County affecting everyone, however the elderly and young are the ones with the highest risk of heat related conditions, 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), Forest 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 idea 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. Damage estimates for the current drought are not available at this time

Normally, northern Wisconsin is known for their cold winters, however, extreme heat waves will affect Forest County in the future. Forest County can expect a heat wave once every 11 years or a 9 percent chance in a given year based on historic data.

HAZARD ANALYSIS: CYBER ATTACK

Background on Cyber Attack Hazard:
A vast array of networks form the foundation of our means to communicate and travel, power our homes, run our economy, and provide government services. Yet, cyber-attacks have increased dramatically in the United States over the last decade, exposing sensitive personal and business information, disrupting critical operations, and imposing high costs on the economy.

A cyber-attack is the actual or potential disruption of government information systems. Information technology systems are connected in networks or through the Internet, and thus are at risk of cyber-attack. An attack may be a deliberate effort to gain access to the system or processes; or it may be the result of a randomly initiated threat, such as a worm or virus. Unlike physical threats that prompt immediate action, cyber threats are often difficult to identify and comprehend. Among these dangers are viruses erasing entire systems, intruders breaking into systems and altering files, or intruders stealing confidential information.

Cyber-attack may result in the loss of confidence in the government's ability to protect citizens. However, the support services performed in the aftermath of an event can rebuild the reputation of the government's ability to provide services to the people in time of need.

With the extensiveness of information technology (IT) and cyber networks in nearly all parts of society, effectively securing critical infrastructure requires investments in network resiliency as well as cyber infrastructure protection. As all levels of government now rely on cyber networks and assets to provide public safety and economic prosperity, their operations depend on information systems that are maintained, protected, and secured from exploitation and attack.

History of Cyber Attack in Forest County:
Cyber-attacks have increased throughout the world and are a major issue due to the increasing reliance on computers and networked technology. The probability of Forest County experiencing cyber-attacks is based on the increase of cyber-attacks throughout the country.

In 2014, the Crypto-locker virus affected Forest County resulting in the loss of about one month's worth of data from the Sheriff's Department file server including documents, pictures, pdf files, etc. One database had to be rebuilt. There was also a denial of service issue about 10 years ago. Denial of Service attacks are designed to overload a network with useless traffic preventing legitimate users access and crashing the system.

Cyber Attack Vulnerability Assessment:
The impact of a cyber-attack on property, facilities, and infrastructure is dependent on the type of event and the location in which it occurs. Cyber-attacks, in all probability, will have limited effect on buildings, properties, or infrastructure, but may severely affect the transportation of goods and services to and from critical facilities. Infrastructure damage or interruption of power to communication services could have a substantial impact; but effects are minimized through thorough planning on the part of the utility and its determination to resume critical services. Economic and financial systems could potentially be significantly impacted, depending on the scope, breadth, and success of the cyber-attack.

All government and personal computers and networks within Forest County are susceptible to cyber-attack. Current approaches to preventing cyber-attack may be inadequate. Attention must be given to security education and awareness so we do not place too much faith in technology's ability to protect data. Inadequate security can facilitate access to critical computer systems, making them vulnerable to attacks.

Cyber-attacks may last from minutes to days depending upon the type of intrusion, disruption, or infection. Generally, no direct effects are felt by the built environment, but secondary effects may occur depending upon the system being attacked.

The spectrum of cyber risks is limitless, and serious threats can have wide-ranging effects. Transportation, power, and other services may be disrupted by large scale cyber-attacks. The extent of the disruption is highly uncertain, as it will be determined by many unknown factors such as the target and size of the incident. Vulnerability to data breach and loss increases if a network is compromised. Information about citizens and employees can be at risk. Individually-owned devices such as computers, tablets, and mobile phones that connect to the internet are also vulnerable to intrusion.

Future Probability and Potential Dollar Losses – Cyber Attack:
Although there is currently insufficient data to determine an accurate probability, the data suggests that the percentage chance of a serious cyber-attack on Forest County in any given year is estimated to be 20 percent.

The threat of cyber-attack has been identified as a significant and growing threat to Forest County. The level of success or damage will vary greatly. Intrusion detection systems log attack attempts every month. There are constant probes by individuals and groups with intent to cause anything from total system shutdown to simply "seeing if they can do it."

No accurate method of estimating potential losses related to cyber-attack is available at this time for Forest County; however this will be monitored and reviewed for the next plan update.

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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 Forest County and the local 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 Forest County All Hazards Mitigation Plan Update will discuss the following factors in establishing the multi-jurisdictional mitigation strategies:

- Benchmark Progress of Previous Plan 2009-2014
- Review of Mitigation Goals
- Prioritize Identified Mitigation Strategies
- Establish Mitigation Action Plan

PROGRESS REPORT 2009 - 2014

Table 14 identifies the completed, deleted or deferred mitigation actions from the previous update in 2009. For each action recommendation, a brief status report is provided which describes the progress made on that measure. If an item remains unchanged, a description is provided as to why no action has been taken and whether that item is deferred to the new plan.

The table also provides the new status of each recommendation with regard to the updated plan alongside the previous timeframe target for comparison. Many of the recommendations are on-going efforts and are carried over as such in the updated action plan. Some have had significant progress or have been deferred, but are recommended for further action with new target date or on-going status. If the recommendation has been completed with no further specific action anticipated within the next five year planning period, it is shown as "deleted" and will not appear in the updated action plan. In some cases, an incomplete action is not selected for various reasons (noted) and is shown as deleted. In a few cases, related recommendations are combined as indicated.

This progress report serves as a benchmark for progress in achieving the multi-jurisdictional mitigation goals of Forest County and the local jurisdictions that participated in the Plan Update.

Table 14 Benchmark for Progress 2009 - 2014 Plan

	2009 - 2014 Plan Measure	Progress Report	Original Status	New Status
1	Continue to promote the increased use of National Oceanic and Atmospheric Administration (NOAA) weather radios.	County promotes NOAA alert radios. Supports Storm Spotter training.	On-going	On-going
2	Continue to add/update Emergency Management Department link off existing County website.	Website regularly maintained with hazard and other program information	On-going	On-going
3	Verify that back-up utilities are available at all critical facilities.	Many critical facilities have back-up power, water, etc., however more work needs to be done in this area.	On-going	On-going
4	Develop county-wide early warning systems possibly including all telephone message cast and cable TV broadcast, among others.	County is utilizing the Nixle system at this time. Nixle is a self-registration, reverse 911 type system that can be used for areawide or targeted alerts.	On-going	Completed
5	Update City's warning siren system including back-up power generators at each location.	City All Hazard Mitigation Plan indicates this is still a need.	2009	2017
6	Work to improve county's rural addressing system as part of Enhanced 911 development.	Work in progress; continual updates and improvements.	2009	On-going
7	Develop emergency response zone atlas.	Atlas due for an update.	2010	2016
8	Develop local emergency response plans.	Some towns have plans established, but mitigation survey results indicate others are still needed.	2008	2019
9	Establish Shelters in the Towns of Alvin, Hiles and Laona.	Mitigation survey results indicate shelter needs in various towns.	2010	2019
10	County/City continued compliance in the NFIP. - Convert FHBMs to FIRMs. Amend ordinances to comply with NR116. Dam break analysis.	FHBMs have been replaced with FIRMs. NFIP compliance is on-going.	2012	On-going
11	Require stormwater plans for new development on the urban fringe.	Limited progress, but new federal/state stormwater regulations emphasize need.	2009	2019
12	Review and test Emergency Action Plan (EAP) for each significant and high hazard dam.	Progress made completing for some dams. Others still needed.	On-going	On-going
13	Update lift stations including SCADA remote monitoring and controland back-up power generators.	Project not carried over into current City All Hazards Mitigation Plan.	2010	Removed from list
14	Town and Tribal Road / Culvert Maintenance and Improvements (re drainage).	Mitigation survey results indicate progress in many areas, but more needed.	2010	On-going
15	Replace culvert & storm sewer on Pioneer Rd (USH 8 & STH 32) near Prospect Avenue	Some work completed in this area, but City AHMP list related projects.	2010	2017
16	Support Area-wide Collapse Rescue Unit based with City of Antigo Fire Department (Langlade County).	This unit has been established and mutual-aid agreements are in place.	2008	Completed
17	Develop countywide drought mitigation plans for multi-agency approaches to water conservation, drought prediction, stream and groundwater monitoring.	No progress to date.	As needed	As needed
18	Assist population with reducing heat disorders through awareness program.	County does awareness PR as needed.	On-going	As needed
19	Determine if critical facilities are adequately grounded to eliminate lightning damage. Install surge protection as necessary.	Issue addressed by building codes. Deemed ineffective as plan strategy.	2010	Removed from list
20	Use education programs aimed at mitigating fires.	County has done limited awareness PR.	Annual	Annual
21	Develop driveway ordinances and private road standards to ensure emergency vehicle access.	Some towns have developed / updated ordinances.	2010	2019
22	Develop Community Wildfire Protection Plans in high risk Towns.	Limited progress to date, but new WDNR WUI Coordinator in area.	On-going	On-going
23	Town and Tribal road right-of-way maintenance and brushing.	Some progress but mitigation survey results indicate significant problem.	Annual	Annual

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 previous Mitigation Planning Taskforce during the development of the original plan. The update Plan Update Taskforce reviewed the goals and concurred that these goals, with some minor revisions, continue to represent the desired conditions to strive for through the mitigation efforts of the County and municipalities.

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

- Prepare residents and visitors of Forest County for natural hazard events and protect from the effects of such events to the extent possible.
- Protect health, safety, and welfare of County residents and visitors, along with mitigating future loss of property from tornados.
- Protect health and safety of County residents and visitors during and after winter storm events.
- Improve County preparedness for dealing with extended drought.
- Create safety awareness in citizens of Forest County to help protect themselves during extreme heat events.
- Continue compliance with the National Flood Insurance Program and work to reduce flood risk throughout Forest County and City of Crandon.
- Eliminate the loss of life and reduce the risk of property damage in downstream areas that result from a dam failure.
- Minimize the threat to human life and property damages caused by severe storms and associated lightning and high wind.
- Protect the safety and property of residents and visitors from forest and wildfires.
- Protect Forest County computer systems and data from cyber-attack.

PRIORITIZATION OF STRATEGIES

The Mitigation Plan Update Committee 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 15.

Prioritization Factors for Forest County Mitigation Strategies

Strategy Prioritization Factor	*Description of Factor Considerations*
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.

For the original Plan, each strategy was scored by the Committee 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 15.

Using the prioritization factors, the Plan Update Committee took the original ranking, making minor adjustments to reflect current conditions such as the shift in priority of hazard type from the original Plan to the Update.

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 15. Table 15 also contains project cost estimates where available and potential time frames.

ALL HAZARDS

Goal:
Prepare residents and visitors of Forest County for natural hazard events and protect from the effects of such events to the extent possible.

Action 1:
The County should continue to promote the increased use of National Oceanic and Atmospheric Administration (NOAA) weather radios. NOAA Weather Radio (NWR) is a nationwide network of radio stations broadcasting continuous weather information from the nearest National Weather Service office. NWR broadcasts National Weather Service forecasts, watches, warnings, and other hazard information 24 hours a day. The NOAA weather radio is the primary trigger for activating the Emergency Alert System (EAS) on commercial radio, television and cable systems.

Participating Jurisdictions for Action 1:
Lead agency will be Forest County Emergency Management in conjunction with the Towns and Tribes. Jurisdictions participating in this action will include Forest County, City of Crandon, FC Potawatomi Tribe, Sokaogon Chippewa Tribe, and all Towns including: Alvin, Argonne, Armstrong Creek, Blackwell, Caswell, Crandon, Freedom, Hiles, Laona, Lincoln, Nashville, Popple River, Ross, and Wabeno.

Action 2:
The County should continue to add and update information on an Emergency Management web page link off the existing County website. The web page should contain information describing the types of hazards and how to respond to a hazard threat. The site should also contain information on ordinances pertaining to hazards (i.e. County floodplain zoning), locations of shelters, and links to other sites that provide valuable information on weather conditions, burning permits, etc.

Participating Jurisdictions for Action 2:
Lead agency will be Forest County Emergency Management. The only directly participating jurisdiction will be Forest County.

Action 3:
There should be a countywide effort to itemize and test back-up utilities at all critical facilities. Critical facilities need operational utilities such as power, communications, water and sewer to function effectively. The need for back-up generators should electricity be cut off, obtaining alterative sources of potable water, and dealing with wastewater are issues that need to be examined. Existing back-up systems need to be maintained to ensure operation in time of need.

Participating Jurisdictions for Action 3:
Lead agency will be Forest County Emergency Management. The City, Towns and Tribes should coordinate for their areas. Jurisdictions participating in this action will include Forest County, City of Crandon, FC Potawatomi Tribe, Sokaogon Chippewa Tribe, and all Towns including: Alvin, Argonne, Armstrong Creek, Blackwell, Caswell, Crandon, Freedom, Hiles, Laona, Lincoln, Nashville, Popple River, Ross, and Wabeno.

Action 4:
This All Hazards Mitigation Plan, hereby, incorporates by reference the City of Crandon's 2012 All Hazards Mitigation Plan and recommends full integration with the County-wide Plan at the time of the next update.

Due to funding shortfalls in recent years, Wisconsin Emergency Management (WEM) is encouraging municipalities with single jurisdiction plans to roll them into their county multi-jurisdictional plans where possible. The City's current plan is set to expire in 2017. Having participated in the development of this current update of the County-wide Plan, the City would be eligible to adopt this plan as its own following the expiration of their plan and satisfy FEMA requirements until the next update. The NCWRPC has followed

the same process for this plan that it uses around the Region to create valid plans for other cities, such as: Eagle River, Rhinelander, Tomahawk, Merrill, Antigo and the Village of White Lake.

Participating Jurisdictions for Action 4:
Lead agency will be City of Crandon in conjunction with Forest County Emergency Management. The City and County would be the only directly participating jurisdictions.

Action 5:
According to the City's current All Hazards Mitigation Plan, the emergency siren has only a manual trigger with no back-up power. It recommends connecting the siren switch to the Sheriff's Department which would also allow the siren to be run off the Sheriff's Department generator in the event of power loss. This Plan also recommends the City consider modernizing its siren system and evaluating its protocols.

Participating Jurisdictions for Action 5:
Lead agency will be the City of Crandon. The City and potentially the Sheriff's Department would be the only directly participating jurisdictions.

Action 6:
The County should continue to improve its rural addressing system. With continual updates and improvements, this is a work progress. By improving the identification of existing roads and addresses and issuing more accurate addressing, emergency response will be facilitated.

Participating Jurisdictions for Action 6:
Lead agency will be Forest County Emergency Management Department. Jurisdictions participating in this action will include Forest County, City of Crandon, FC Potawatomi Tribe, Sokaogon Chippewa Tribe, and all Towns including: Alvin, Argonne, Armstrong Creek, Blackwell, Caswell, Crandon, Freedom, Hiles, Laona, Lincoln, Nashville, Popple River, Ross, and Wabeno.

Action 7:
The county-wide emergency response zone atlas should be updated and reprinted. Often referred to as a fire zone atlas, these atlas books were originally conceived to help direct fire fighting 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. In Adams County, the atlas was credited as being instrumental in fighting the Cottonville Fire. 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 7:
Lead agency will be Forest County Emergency Management Department. Jurisdictions participating in this action will include Forest County, FC Potawatomi Tribe, Sokaogon Chippewa Tribe, and all Towns including: Alvin, Argonne, Armstrong Creek, Blackwell, Caswell, Crandon, Freedom, Hiles, Laona, Lincoln, Nashville, Popple River, Ross, and Wabeno. The U.S. Forest Service and Wisconsin Department of Natural Resources should also be consulted.

Action 8:
Each Town should develop a local emergency response plan (ERP). Some towns indicated that they did not have an emergency response plan in place for their town in the mitigation planning survey distributed at the beginning of this process. An ERP helps the community determine the roles to be played by each emergency service, how communication channels will be utilized, lines of authority, and strategies or "game plans" for responding to different kinds of hazard situations. Wisconsin Emergency Management has plan templates that towns can use to fill in the blanks and begin formulating their own local EOP.

One area of concern identified as needing to be addressed in Forest County is the provision of aid and evacuation for elderly and other homebound as well as animals in the event of a disaster emergency. Towns should consider and plan for this issue when developing ERPs. Community groups and service organizations are a possible resource to tap in providing a mechanism to provide this aid.

ERP's should conform to the State and National Response Plans, which are organized by emergency support functions and incorporate the provisions of the National Incident Management System (NIMS). The NIMS is a comprehensive system that incorporates operations through the use of the Incident Command System (ICS) and application of standardized procedures and preparedness measures. It promotes development of cross-jurisdictional, statewide and interstate regional mechanisms for coordinating response and obtaining assistance during a large-scale or complex emergency incident.

Participating Jurisdictions for Action 8:
Lead agency will be each town. Jurisdictions participating in this action will include all Towns including: Alvin, Argonne, Armstrong Creek, Blackwell, Caswell, Crandon, Freedom, Hiles, Laona, Lincoln, Nashville, Popple River, Ross, and Wabeno.

HAZARD: SEVERE THUNDERSTORM/LIGHTNING/HAIL

Goal:
Minimize the threat to human life and property damaged caused by severe storms and associated lightning and high wind.

Action 9:
Entities with building code inspection / enforcement responsibilities should ensure that new manufactured homes follow Uniform Dwelling Code specifications regarding tie-downs to resist high winds.

Participating Jurisdictions for Action 9:
Lead agencies will be Forest County Zoning and City of Crandon. The Towns and Tribes should coordinate for their areas. Jurisdictions participating in this action will include those entities with building code inspection and enforcement responsibilities.

HAZARD: TORNADO

Goal:
Protect health, safety, and welfare of County residents and visitors, along with mitigating future loss of property from tornados.

Action 10:
Establish emergency "tornado" shelters in the Towns of Argonne and Wabeno. These indicated the need for shelters in their area in response to the mitigation planning survey distributed at the beginning of this process. In Argonne, they are looking for a backup generator to provide power to the Town Hall for emergency use. In Wabeno, they are looking for a shelter / warming center. The Fire Hall and Town Hall are possible locations for a shelter, and they have already installed a generator at the Fire Hall.

Participating Jurisdictions for Action 10:
Lead agencies will be the Towns of Argonne Wabeno. Jurisdictions participating in this action include the Towns of Argonne and Wabeno. The local American Red Cross Chapter should also be consulted.

HAZARD: FLOODING/DAM FAILURE

Goal:
Continue compliance with the National Flood Insurance Program and work to reduce flood risk throughout Forest County and City of Crandon.

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

Action 11:
Communities within Forest County currently participating in the National Flood Insurance Program (NFIP) should work to ensure continued compliance. Compliance primarily entails adopting and enforcing floodplain management regulations that meet minimum criteria. Forest County and the City of Crandon are in the program. All towns

are included under the umbrella of the County through the state mandated county shoreland zoning.

One action item associated with this recommendation is the identification of roads, culverts, bridges, etc below the 100 year flood elevation

In addition, dam break analysis is needed for the Bog Brook and Metonga Dams as well as other dams with residential development in the potential flood shadow.

Participating Jurisdictions for Action 11:
Lead agency will be the Forest County Zoning Office. Forest County and the City of Crandon would be the participating jurisdictions for their areas. FEMA and the WisDNR must be involved early in the process.

Action 12:
Local governments should require stormwater management plans for new development on the urban fringe. Areas adjacent to the City of Crandon will continue to see the most intensive land use in the County as rural lands are converted to subdivisions and a mixture of other uses. Without adequate design consideration, this development can lead to stormwater run-off issues. By requiring each new development to determine how it will handle its own stormwater, drainage problems are not allowed to build on one another, thereby minimize future flooding.

Participating Jurisdictions for Action 12:
Lead agency will be the City of Crandon. Jurisdictions participating in this action will include the City of Crandon and the Towns of Crandon, Lincoln and Nashville. Other Towns, particularly those with drainage problems, should also consider this action.

Action 13:
Review and test dam failure Emergency Action Plan (EAP) for each significant and high hazard dam within Forest County. 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.

Emergency situations and/or dam failures are not common events. 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 turn over of local officials. If the plan is not updated, the information contained in it may become outdated and useless.

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 13:
Lead agency will be Forest County Emergency Management and Land Conservation Departments. Participating jurisdictions will include those Towns that could be affected, including Alvin, Armstrong Creek, Crandon, Freedom, Hiles, Laona, Lincoln, Nashville and Wabeno. Federal and state officials should also be invited including DNR and State Patrol, as well as dam owners/operators.

Action 14:
The Towns and Tribal governments should look at maintenance and improvement of drainage of town / tribal roads and culverts to help reduce/eliminate erosion and washouts. The Town of Blackwell specified this as an action item in the All Mitigation Hazard Mitigation Local Government Survey, but the recommendation applies to all Towns and the Mole Lake and Potawatomi tribes, which have their own tribal roads. This is particularly important in areas that could become isolated and inaccessible during or after a disaster event hampering access by law enforcement or rescue personnel.

Participating Jurisdictions for Action 14:
Lead agency will be each town and tribe. Jurisdictions participating in this action will include Sokaogon Chippewa Tribe, FC Potawatomi Tribe and all Towns including: Alvin, Argonne, Armstrong Creek, Blackwell, Caswell, Crandon, Freedom, Hiles, Laona, Lincoln, Nashville, Popple River, Ross, and Wabeno.

Action 15:
As part of the Stormwater Management Plan, the City should seek funding to expand the overflow area between the culverts on Highway 8 and Prospect Avenue. This area could potentially function as a settling pond for runoff from the highway and protect nearby commercial development in the event of catastrophic flooding.

Participating Jurisdictions for Action 15:
Lead agency will be the City of Crandon. Jurisdictions participating will be the City of Crandon and the Wisconsin Department of Transportation.

HAZARD: WINTER STORMS/EXTREME COLD

Goal:
Protect health and safety of county residents and visitors during and after winter storm events.

Action 16:
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, stocking of vehicles with a shovel, sand, warm clothing, food, water, etc. should be encouraged.

This effort should also include suggestions regarding checking on neighbors or others known to live alone or that may be at a disadvantage in fending for themselves.

Other winter / extreme cold problems common in northwoods counties include freezing of septic systems and residential LP Gas (extreme cold) and planning ahead to ensure adequate supplies of LP Gas / Propane.

Participating Jurisdictions for Action 16:
Lead agency will be Forest County Emergency Management. Jurisdictions participating in this action will include Forest County, City of Crandon, Sokaogon Chippewa Tribe, FC Potawatomi Tribe and all Towns including: Alvin, Argonne, Armstrong Creek, Blackwell, Caswell, Crandon, Freedom, Hiles, Laona, Lincoln, Nashville, Popple River, Ross, and Wabeno.

HAZARD: FOREST FIRE / WILD FIRES

Goal:
Protect the safety and property of residents and visitors from forest and wildfires.

Action 17:
The County should develop education and information for homeowners on protecting their homes and other structures from fires. Since Forest County is mostly rural with vast woodlands, emphasis should be placed on construction 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 17:
Lead agency will be Forest County Emergency Management. The only directly participating jurisdiction will be Forest County.

Action 18:
Local units of government should develop driveway ordinances and minimum standards for private roads to support emergency vehicle access. The ability of emergency response units to reach a site is often the critical factor in the effectiveness of the response. Inadequate private access roads or driveways are common problems in rural areas. In some cases emergency units cannot physically reach a target site due to narrowness, tight corners, steep slopes, etc. Other problems include lack of space to maneuver or turn around.

Participating Jurisdictions for Action 18:
Lead agency will be each town government. Jurisdictions participating in this action will include all Towns including: Alvin, Argonne, Armstrong Creek, Blackwell, Caswell, Crandon, Freedom, Hiles, Laona, Lincoln, Nashville, Popple River, Ross, and Wabeno.

Action 19:
Towns with high risk of wildfire should develop Community Wildfire Protection Plans (CWPPs). The Towns of Alvin, Blackwell, Popple River and Wabeno indicated that wildfire was a significant potential hazard for their towns. A CWPP identifies and prioritizes areas for fire breaks or hazardous fuel 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 19:
Lead agency will be the Towns of Alvin, Blackwell, Popple River, and Wabeno. The only directly participating jurisdictions will be the Towns. WisDNR would also likely be involved.

Action 20:
Roads that are narrow with vegetative encroachment do little to mitigate fire hazard or impede fire movement, hinder evacuation, and provide poor access for fire trucks and apparatus. Treatment options include widening the open right-of-way by cutting back and brushing encroaching vegetation, establishing mineral soil barriers, or converting fuel types adjacent to the roadway from high hazard fuels like pine to more fire resistive types like hardwood.

The Town of Blackwell specified this as an action item in the All Mitigation Hazard Mitigation Local Government Survey, but the recommendation applies to all Towns and the Mole Lake and Potawatomi tribes, which have their own tribal roads. This is particularly important in areas that could become isolated and inaccessible during or after a disaster event hampering access by law enforcement or rescue personnel.

Participating Jurisdictions for Action 20:
Lead agency will be the Town governments. Jurisdictions participating in this action will include all Towns including: Alvin, Argonne, Armstrong Creek, Blackwell, Caswell, Crandon, Freedom, Hiles, Laona, Lincoln, Nashville, Popple River, Ross, and Wabeno.

HAZARD: DROUGHT/EXTREME HEAT

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

Goal:
Improve County preparedness for dealing with extended drought.

Action 21:
Develop countywide drought mitigation plan to encourage multi-agency approaches to water conservation, drought prediction and stream and groundwater monitoring.

Drought can have a significant impact on tourism and forest products; both major sectors of the County's economy. Drought probably has the greatest impact on agricultural areas, and ag-production has been on the increase in the County. Based on the potential significance of the impact on the County's economy, drought becomes an important hazard to prepare for.

Even 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, negatively impacting both the individual producer and the local economy. Similarly, drought can stress and damage forest crops. Drought impact on lake levels, for example, can curtain tourism. Continuous monitoring of hydrologic conditions is important to identify and assess drought conditions.

Participating Jurisdictions for Action 21:
Lead agency will be Forest County Land and Water Conservation Department and County UW-Extension. Jurisdictions participating in this action will include Forest County, City of Crandon, FC Potawatomi Tribe, Sokaogon Chippewa Tribe, and all Towns including: Alvin, Argonne, Armstrong Creek, Blackwell, Caswell, Crandon, Freedom, Hiles, Laona, Lincoln, Nashville, Popple River, Ross, and Wabeno.

Action 22:
To assist the population in reducing heat disorders, the County should promote extreme heat hazards awareness, including safety tips, medical information, and contact information for health officials.

Participating Jurisdictions for Action 22:
Lead agency will be the Forest County Emergency Management and Health Departments. Jurisdictions participating in this action will include Forest County, City of Crandon, FC Potawatomi Tribe, Sokaogon Chippewa Tribe, and all Towns including: Alvin, Argonne, Armstrong Creek, Blackwell, Caswell, Crandon, Freedom, Hiles, Laona, Lincoln, Nashville, Popple River, Ross, and Wabeno.

HAZARD: CYBER ATTACK

Goal:
Protect Forest County computer systems and data from cyber-attack.

Action 23:
Counties must plan to respond to catastrophic cyber events the way plan to manage tornadoes, blizzards or other emergencies: determine which assets are at risk, figure out what they are worth to the county, and put in place the security controls to protect them so that if attacked, the worst does not happen.

The County should implement a multi-layered process of assessment, patching and training to prevent cyber-attacks. These preventive measures are described as follows:

- *Assessment*: ongoing analysis of networks and processes to check for weaknesses
- *Patching*: regularly updating software to fix vulnerabilities
- *Training*: educating staff, elected officials, and all others who access the network about the risks of cyber-attacks and what they can do to keep the network safe

Participating Jurisdictions for Action 23:
Lead agency will be the Forest County IT Department. Other jurisdictions with significant computer infrastructure should also follow this recommendation. Jurisdictions participating in this action will include Forest County, City of Crandon, FC Potawatomi Tribe, and Sokaogon Chippewa Tribe.

Action 24:
Establish cyber-attack warning and communications procedures; eg: antivirus programs that notify staff when an intrusion is detected, staff monitoring of the system, and automated alert systems.

Participating Jurisdictions for Action 24:
Lead agency will be the Forest County IT Department. Other jurisdictions with significant computer infrastructure should also follow this recommendation. Jurisdictions participating in this action will include Forest County, City of Crandon, FC Potawatomi Tribe, and Sokaogon Chippewa Tribe.

Table 15 - Summary of Mitigation Strategies

	Mitigation Measures (See Expanded Text in Plan)	Costs of Project	Existing and Potential Resources to Implement	Responsible Unit	Project Timeframe*	Priority Level
	All Hazards					
1	Continue to promote the use of National Oceanic and Atmospheric Administration (NOAA) weather radios.	Staff Time	Radio sales cover cost of radios.	County EM Dept. / FC Potawatomi / Sokaogon Chippewa / All Towns	On-going	HIGH
2	Continue to add/update Emergency Management Department link off existing County website.	Staff Time	Dept. Budget	County EM Dept.	On-going	HIGH
3	Verify that back-up utilities are available at all critical facilities.	Staff Time	Dept. Budgets	Co. EM Dept. / City / FC Potawatomi / Sokaogon Chippewa / All Towns	On-going	HIGH
4	Incorporate by reference the City of Crandon's 2012 AHMP and fully integrate City of Crandon as a participating jurisidiction in next County Update.	Costs to be Determined	Dept. Budgets	Co. EM Dept. / City of Crandon	2017	HIGH
5	Update City's warning siren including back-up power generator.	60,000	City Funds	City of Crandon	2017	MEDIUM
6	Continue to improve county's rural addressing system as part of Enhanced 911 development.	Staff Time	Dept.Budget	County EM Dept.	On-going	HIGH
7	Update & reprint emergency response zone atlas.	10,000	WisDNR / WEM Funding	County EM Dept.	2016	HIGH
8	Develop local emergency response plans.	Costs Vary	Town Funds	All Towns	2019	HIGH
	Thunderstorm / High Wind / Lightning / Hail					
9	Ensure that manufactured home follow uniform dwelling code specifications regarding tie-downs to resist high winds.	Staff Time	Dept Budgets	County Zoning	On-going	HIGH
	Tornado					
10	Establish Shelters in the Towns of Argonne (backup generator) and Wabeno (w/ warming capability).	200,000	Town Funds / Assistance to Firefigthers Grant	Towns of Argonne and Wabeno.	2019	MEDIUM
	Flooding / Dam Failure					
11	County/City continued compliance in the NFIP. - ID roads, culverts, bridges below 100 yr flood elevation. Complete / Update Dam break analysis.	TBD	Dept Budgets	County Zoning Office / City of Crandon	On-going	MEDIUM

	Mitigation Measures	Costs of Project	Existing and Potential Resources to Implement	Responsible Unit	Project Timetable*	Priority Level
12	Require stormwater plans for new development on the urban fringe.	Costs Vary	Private sector/developer funds	City of Crandon & adjoining Towns	2019	MEDIUM
13	Continue to review and test Emergency Action Plan (EAP) for each significant and high hazard dam.	Staff Time	Dept Budgets	County EM Dept. / County Land Conservation Dept.	On-going	MEDIUM
14	Town and Tribal Road / Culvert Maintenance and Improvements (re drainage).	Unknown at this time.	Town or Tribal Funds (BIA)	All Towns / City / FC Potawatomi / Sokaogon Chippewa	On-going	MEDIUM
15	Improve storm water management conditions between USH 8 and Prospect Avenue.	Unknown at this time.	City Funds	City of Crandon	2017	MEDIUM
	Winter Storm / Extreme Cold					
16	Promote winter hazards awareness including home and travel safety measures.	Staff Time	Dept. Budget	County EM Dept.	On-going	MEDIUM
	Forest Fire / Wild Fire					
17	Use education programs aimed at mitigation fires.	Staff Time	Dept. Budget	County EM Dept.	Annual	MEDIUM
18	Develop driveway ordinances and private road standards to ensure emergency vehicle access.	Staff Time	Town Funds	All Towns	2019	MEDIUM
19	Develop Community Wildfire Protection Plans in high risk Towns and the tribal areas.	20,000 ea.	WDNR National Fire Plan Funding	Various Towns / FC Potawatomi / Sokaogon	On-going	MEDIUM
20	Town and Tribal Road right-of-way maintenance and brushing.	Staff Time	Town Funds / Maint. Crews	Town of Blackwell / All Towns / FC Potawatomi / Sokaogon Chippewa	Annual	LOW
	Drought / Extreme Heat					
21	Develop countywide drought mitigation plans for multi-agency approaches to water conservation, drought prediction, stream and groundwater monitoring.	Staff Time	Dept. Budgets	County UWEX / County Land Conservation Dept.	As Needed	LOW
22	Assist population with reducing heat disorder through awareness program.	Staff Time	Dept. Budgets	County EM Dept. / County Health Dept.	As Needed	LOW
	Cyber Attack					
23	Implement multi-layered process of assessment, patching, and training to prevent cyber attacks.	Costs to be Determined	Dept. Budgets	Co. IT Dept. / City / FC Potawatomi / Sokaogon	On-going	MEDIUM
24	Establish cyber attack warning and communications procedures; eg: antivirus programs that notify staff when an intrusion is detected, staff monitoring of the system, and automated alert systems.	Costs to be Determined	Dept Budgets	Co. IT Dept. / City / FC Potawatomi / Sokaogon Chippewa	On-going	MEDIUM

*Actual project implementation dependent on funding and staff availability.

INTRODUCTION

Part V of the Forest County All Hazards Mitigation Plan Update describes the Update adoption, implementation, and evaluation & maintenance processes.

PLAN UPDATE ADOPTION

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

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

IMPLEMENTATION OF CITY OF CRANDON PLAN

As noted earlier, the City of Crandon has adopted its own independent all hazards mitigation plan. The Forest County All Hazards Mitigation Plan Update recommends and supports the implementation of this mitigation planning effort through its 5-year lifecycle.

As that plan comes due for its 5-year update, it is recommended that the City of Crandon incorporate their mitigation planning efforts into the countywide, multi-jurisdictional program and adopt the Forest County All Hazards Mitigation Plan Update in the spirit of intergovernmental cooperation and to promote economies-of-scale in the planning effort.

Participation in the development and adoption of the countywide plan would meet mitigation planning requirements for the City. This Plan Update was prepared to include the necessary requirements, such as participation and community specific recommendations, to be approved by FEMA for the City of Crandon.

PLAN UPDATE IMPLEMENTATION

Administrative Responsibilities

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

Along with monitoring the progress of the action projects, the County Emergency Management Director and Committee(s) of jurisdiction should also work to secure funding to implement the Plan Update. 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 Update, the Committee and staff team should consider innovative ways to involve active participation from nonprofit organizations, businesses, and citizens to implement the Plan Update. The relationship between these groups will result in greater exposure of the Plan Update 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 publics' 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 Update, it is important to promote the accomplishment to the stakeholders and to the communities. This will help inform people that the Plan Update 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, Forest

County has established a two-part process to incorporate the updated 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 Update, the County EM Director will distribute a letter that explains how the Plan Update applies to other planning efforts they might undertake and how to obtain copies of the updated Mitigation Plan.

- Promotion by EM Director - The EM Director will promote incorporation of the updated All Hazards Mitigation Plan as they are made aware of or become a participant in any new planning process.

At least one upcoming planning effort has been identified for incorporation of the updated All Hazards Mitigation Plan; this includes the updates to the Comprehensive Plans for the County and all local units.

Forest County Comprehensive Plan
The following concepts should be considered when developing updates to the Comprehensive Plan for Forest County, the City of Crandon, or any other local units within the County, 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 be 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 shelters, 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 economies.
- *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 has 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 Update 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 updated 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 Update as needed to prepare for revisions. It is recommended that the 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 Committee meetings are always open to the public, and the public can bring questions or comments regarding this Plan Update to any regular meeting. The final plan document will be available on the internet until the next draft is posted for review. The public can continue to submit questions or comments at any time via an email link.

The Plan Update 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 Sheriff and Justice Committee and County Board must approve all changes and updates to the Plan.

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Appendix A – Meeting Notices

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FOREST COUNTY
MEETING NOTICE

COMMITTEE: SHERIFF & JUSTICE COMMITTEE

DATE: MONDAY, MAY 4, 2015

TIME: 3:00 P.M.

PLACE: LAW ENFORCEMENT CENTER

AGENDA

1. Call to Order
2. Roll Call
3. Approve Agenda
4. Approve minutes from the April 6, 2015 Sheriff & Justice meeting
5. Approve school requests, if any
6. Approve April vouchers for payment
7. Appearance by Darryl Landeau – Review of Draft Mitigation Plan
8. Any other business that may lawfully come before the committee
9. Future agenda items
10. Adjournment

Agenda was e-mailed to committee members, the Forest Republican, The Human Service Center, WLSL Radio, and WERL-WRJO Radio on April 29, 2015.

The agenda was posted to the public at the east/west entrances of the Forest County Courthouse, on the east door of the Law Enforcement Center, and in the office of the Forest Republican on April 29, 2015.

Every effort will be made to reasonably accommodate persons with special needs. Please contact the County Clerk's Office at 715-478-2422 to address your concerns.

Posted at 2:22 P.M. April 29, 2015 by Ashley Thompson, Law Enforcement Secretary.

FOREST COUNTY
HAZARD MITIGATION PLAN
PUBLIC INFORMATIONAL MEETING

Notice is hereby given by the Forest County Sherriff and Justice Committee that there will be a public informational meeting at the Forest County Courthouse – Board Room, 200 E. Madison St., Crandon on Monday, November 3, 2014 from 4 to 5:30 pm 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 loses and reduce public expenditure for response and recovery. A copy of the draft material can be reviewed on the web at http://www.ncwrpc.org/counties/Forest/ForestHzdPlan.html

All interested parties are encouraged to attend. Contact Forest County Emergency Management Director Teresa Erler at (715) 478-3430 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 Email: staff@ncwrpc.org

NCWRPC

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

MEMORANDUM

DATE: October 10, 2014

TO: Town Clerks in Forest County

FROM: Darryl L. Landeau, AICP

RE: Forest County All Hazards Mitigation Planning Meeting

Forest County Emergency Management and the NCWRPC will be hosting an open house / public informational meeting on strategies to mitigate the effects of future natural disasters in Forest County. The meeting will take place in an open house format between 4 and 5:30 pm on Monday, November 3 in the Forest County Board Room, 200 E. Madison Street, Crandon.

This meeting will provide an update on the project and an opportunity to provide input on possible recommendations to protect life and property within the County. The draft will incorporate information from the survey sent to the towns. If possible, please share this information with your chairperson and other supervisors in case they are interested in attending this session.

These strategies will become part of the County's All Hazards Mitigation Plan update currently being developed. Counties are required to make such plans as a result of the federal Disaster Mitigation Act of 2000 (DMA2K). This Act put a national priority on hazard mitigation by requiring mitigation plans in order to be eligible for disaster mitigation grant programs from FEMA. Forest County is developing a multi-jurisdictional plan to establish eligibility for both the county and each municipality in the same way the county-wide outdoor recreation plan works with DNR grants. This in no way obligates or commits any local jurisdiction.

The meetings will provide information about the natural hazards that can affect Forest County, and copies of the draft plan material will be available for review. Public Comment will also be solicited, so we request that you post this notice at your primary posting location to help us encourage public attendance. We have already published legal notice in the newspaper, so that is not something we are asking any of you to do.

If you have any questions, please feel free to contact me at 715-849-5510 extension 308 or email to dlandeau@ncwrpc.org.

C:\DARRYL\FOREST\COUNTY\FOAHMP\FC_AHMP_UPDATE1\FO_CLERKNOTICE.DOC

Forest County All Hazards Mitigation Plan

Public Informational Meeting SIGN-IN

November 3, 2014 - 4 to 5:30 PM

	Name		Address
1	Daryl Landeau		NCWRPC
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Teresa Erler
Director

Telephone 715-478-3430
Fax 715-478-3431

Office of Emergency Management
Forest County
200 E. Madison
Crandon, WI 54520

MEMORANDUM

TO: Government agencies, County department staff, and other private or non-profit organizations within Forest County

FROM: Teresa Erler, Forest County Emergency Management *TE*

DATE: October 10, 2014

RE: Forest Co. All-Hazards Mitigation Plan Update Interest Group Meeting Notice

Forest County has received a grant through the Federal Emergency Management Agency (FEMA) to complete an update of its 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 Forest 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: **Monday, November 3, 2014 at 2:30 p.m.**
Where: **Forest County Courthouse - Forest County Board Room**
200 E. Madison Street, Crandon

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 Forest County and protect property in the event of natural disasters. Since you live and/or do business in or around Forest 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 715-478-3430 or fcem@co.Forest.wi.us . Or, contact Darryl Landeau at the NCWRPC at 715-849-5510 ext. 308, or dlandeau@ncwrpc.org . 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.

Forest County All Hazards Mitigation Plan

Agency & Interest Group Meeting SIGN-IN

November 3, 2014- 2:30 PM

	Name	Department	Email
1	TERESA ERLICK	FOREST CO EM	freem@co.forest.wi.us
2	DAN ACKARD	CPD	cpdchief@frontiernet.net
3	Darrell B. Wilson Sr	Crandon Fire Dept	
4	Liz Wood	DNR	elizabeth.wood@wi.gov
5	Scott Linn	US FS	Slinn@fs.fed.us
6	Mark D. Galffke	Wabeno Fire	
7	Steve Nelson	UW Extension	steve.nelson@ces.uwex.edu
8	Pamela J. LaBine	L & W Resources	fczone@co.forest.wi.us
9	Amy Gatton	Forest Co. Health Dept.	agatton@co.forest.wi.us
10	Darryl Landeau	NCWRPC	—
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FOREST COUNTY
MEETING NOTICE

COMMITTEE: SHERIFF & JUSTICE COMMITTEE

DATE: MONDAY, SEPTEMBER 8, 2014

TIME: 3:30 P.M.

PLACE: LAW ENFORCEMENT CENTER

AGENDA

1. Call to Order
2. Roll Call
3. Approve Agenda
4. Approve minutes from the August 4, 2014 Sheriff & Justice meeting
5. Approve school requests, if any
6. Approve August vouchers for payment
7. Discuss and approve Title III purchases
8. Discuss and approve Deputy Josh Collette's Education Incentive Pay
9. Appearance by Darryl Landeau to discuss All-Hazard Mitigation Plan
10. Any other business that may lawfully come before the committee
11. Future agenda items
12. Adjournment

Agenda was e-mailed to committee members, the Forest Republican, WLSL Radio, and WERL-WRJO Radio on September 3, 2014.

The agenda was posted to the public at the east/west entrances of the Forest County Courthouse, on the east door of the Law Enforcement Center, and in the office of the Forest Republican on September 3, 2014.

Every effort will be made to reasonably accommodate persons with special needs. Please contact the County Clerk's Office at 715-478-2422 to address your concerns.

Posted at 3:15 P.M. on September 3, 2014 by Ashley Thompson, Law Enforcement Secretary.

FOREST COUNTY
MEETING NOTICE

COMMITTEE: SHERIFF & JUSTICE COMMITTEE

DATE: MONDAY, MAY 6, 2013

TIME: 6:00 P.M.

PLACE: LAW ENFORCEMENT CENTER

AMENDED AGENDA

1. Call to Order
2. Roll Call
3. Approve Agenda
4. Approve minutes from the April 1, 2013 Sheriff & Justice meeting
5. Approve school requests, if any
6. Approve April vouchers for payment
7. Appearance by Darryl Landeau to discuss updates to the mitigation plan
8. Discuss selling the washer & dryer located in the Jail
9. Discuss Title III purchases
10. Any other business that may lawfully come before the committee
11. Future agenda items
12. Adjournment

Amended Agenda was e-mailed to committee members, the Forest Republican, WLSL Radio, and WERL-WRJO Radio on May 2, 2013.

The agenda was posted to the public at the east/west entrances of the Forest County Courthouse, on the east door of the Law Enforcement Center, and in the office of the Forest Republican on May 2, 2013.

Every effort will be made to reasonably accommodate persons with special needs. Please contact the County Clerk's Office at 715-478-2422 to address your concerns.

Posted at 2:40 P.M. on May 2, 2013 by Ashley Thompson, Law Enforcement Secretary.

NCWRPC Forest County Mitigation Plan - Kick Off Meeting 5/6/13	
NAME	**POSITION** **(Please include multiple titles if they apply.)**
John Dennee	Forest Co. Sheriff
Jim Shormer	Forest Co Board
Scott Shaffer Sr.	Forest Co. Board #7
ERHARD HUETTL	FOREST Co. BOARD
TERESA ERLER	FOREST CO EMG MNGT

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Appendix B – Resolutions of Plan Adoption

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RESOLUTION NO. 49-2015

Resolution offered by SHERIFF AND JUSTICE COMMITTEE

RESOLVED by the Board of Supervisors of Forest County, Wisconsin, That

WHEREAS, Forest County recognizes the threat that natural hazards pose to people and property; and

WHEREAS, under taking hazard mitigation action 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, Forest County adopted its initial All Hazards Mitigation Plan on November 12, 2008; and

WHEREAS, Forest County participated jointly in the planning process with the other local units of government within the County to prepare an update to the existing multi-jurisdictional All Hazards Mitigation Plan, a copy of said updated plan is available on line or in the Emergency Management office for Forest County.

NOW, THEREFORE, BE IT RESOLVED, that the Forest County Board of Supervisors, hereby adopts the Forest County All Hazards Mitigation Plan Update as an official plan; and

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

I, County Clerk, in and for the said County of Forest, State of Wisconsin, do hereby certify that the foregoing is a true and correct copy of a Resolution adopted by the County Board of Supervisors of Forest County, Wisconsin, in legal session on the 10th day of November, 2015.

Jean Kalata
Forest County Clerk

Dated this 10th day of November, 2015

Scott E Stephens
Supervisor

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RESOLUTION # _____

ADOPTING THE FOREST COUNTY ALL HAZARDS MITIGATION PLAN UPDATE

WHEREAS, the City of Crandon 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, the City of Crandon adopted its initial All Hazards Mitigation Plan in 2006 and an update in 2012; and

WHEREAS, City of Crandon participated jointly in the planning process with Forest County and the other local units of government within the County to prepare an update to the existing multi-jurisdictional All Hazards Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the City Council of the City of Crandon, hereby adopts the Forest County All Hazards Mitigation Plan Update as an official plan; and

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

PASSED:_____.

_____
Certifying Official

DATE: _____