Florence County, Wisconsin
Hazard Mitigation Plan

Updated February 2013

Prepared by:

Florence County
Hazard Mitigation Plan Steering Committee

With assistance from:

BAY-LAKE
REGIONAL PLANNING COMMISSION
Brown•Door•Florence•Kewaunee•Manitowoc•Marinette•Oconto•Sheboygan

Florence County, Wisconsin
2012-13

Florence County Board Members

District 1 - Sherry Schomer
District 2 - Bruce Osterberg
District 3 - Helen Wahlstrom-Stratton
District 4 - Gary Steber
District 5 - Donald Gardner
District 6 - Ronald Erickson
District 7 - Edward Wenger
District 8 - Edwin Kelley
District 9 - Jeanette Bomberg
District 10 - Larry Neuens
District 11 - John Halada
District 12 - James Horvath

Florence County Emergency Management Director

Dave Gribble

Hazard Mitigation Plan Steering Committee

Dave Gribble	Emergency Management Director
Angela Pierce	Bay-Lake Regional Planning Commission
Annette Seibold	County Health Administrator
Edwin Kelley	County Board Supervisor
Greg Gulan	USFS
Henry Sullivan	Wisconsin DNR Ranger
Jeff DeMuri	County Highway Commissioner
Jeff Rickaby	County Sheriff
Pat Smith	County Forest Administrator
Rich Wolosyn	County Zoning Administrator

Florence County, Wisconsin
Hazard Mitigation Plan

Adopted February 19, 2013

Prepared by:

Florence County Hazard Mitigation Plan Steering Committee

With assistance from:

Bay-Lake Regional Planning Commission
441 South Jackson Street
Green Bay, WI 54301
(920) 448-2820
www.baylakerpc.org

(This Page Intentionally Blank)

TABLE OF CONTENTS

RESOLUTION OF ADOPTION ..... **V**

FEMA/WEM APPROVAL LETTERS ..... **VII**

EXECUTIVE SUMMARY ..... **IX**

PLAN UPDATE SUMMARY IX

CHAPTER 1: INTRODUCTION **1-1**

PURPOSE OF THE PLAN 1-1
Disaster Mitigation Act of 2000 ..... *1-1*
Funding of this Hazard Mitigation Plan *1-2*
Five Parts of this Natural Hazards Mitigation Plan *1-2*
PLANNING PROCESS 1-2
Hazard Mitigation Plan Steering Committee *1-3*
Steering Committee Plan Review *1-4*
Public Involvement *1-4*
Neighboring Jurisdictions *1-4*
Plan Contact Information *1-5*

CHAPTER 2: PLANNING AREA **2-1**

GENERAL GEOGRAPHY 2-1
DEMOGRAPHIC PROFILE 2-1
Population Trends *2-1*
Population Projections *2-3*
Housing Trends *2-3*
EMPLOYMENT CHARACTERISTICS 2-3
GENERAL DEVELOPMENT PATTERN 2-4

CHAPTER 3: RISK ASSESSMENT **3-1**

NATURAL HAZARD IDENTIFICATION 3-1
Hazard Risk Assessment Survey *3-1*
Natural Hazard Events Historical Summary *3-2*
Natural Hazards Prioritization *3-3*
Other Natural Hazards Determined Not to Pose a Significant Risk *3-3*
RISK AND VULNERABILITY ASSESSMENT 3-5
Critical Facilities *3-5*
HAZARD PROFILES 3-6
Lightning Storms and Thunderstorms *3-7*
Flooding *3-9*
Winter Storms *3-12*
Tornadoes *3-14*
Drought *3-17*
Wildland Fires *3-19*
Extreme Cold *3-21*
Extreme Heat *3-23*
Fog *3-25*
Dam Failures *3-27*

CHAPTER 4: MITIGATION STRATEGY **4-1**

INTRODUCTION 4-1

MITIGATION GOALS 4-1
Lightning Storm and Thunderstorm *4-1*
Flooding *4-1*
Winter Storms *4-2*
Tornadoes *4-2*
Drought *4-2*
Wildland Fires *4-2*
Extreme Cold *4-2*
Extreme Heat *4-2*
Fog *4-2*
Dam Failure *4-2*
MITIGATION ACTION PLAN 4-2
Prioritization Process *4-3*
Cost-Benefit Review *4-3*
COMPLETED MITIGATION ACTIONS 4-3
Policies, Programs, and Resources for Mitigation *4-9*
Potential Funding Sources for Mitigation *4-10*

CHAPTER 5: PLAN MAINTENANCE AND ADOPTION PROCESS 5-1

PLAN ADOPTION PROCESS 5-1
PLAN MAINTENANCE 5-1
Plan Monitoring, Evaluation, and Updating *5-1*
Additional Plan Review *5-1*
PLAN COORDINATION 5-2

APPENDICES

APPENDIX A : STEERING COMMITTEE AND OPEN HOUSE SIGN-IN SHEETS A-1
APPENDIX B : RISK ASSESSMENT MATRIX WORKSHEET RESULTS B-1
APPENDIX C : PLAN REVIEW TOOL C-1

MAPS

MAP 2.1: LOCATION MAP, FLORENCE COUNTY 2-5
MAP 2.2: LAND USE 2-7
MAP 3.1: 100-YEAR FLOODPLAINS 3-31
MAP 3.2: PROPERTIES WITHIN THE 100-YEAR FLOODPLAINS 3-33
MAP 3.3: CRITICAL FACILITIES 3-35
MAP 3.4: CRITICAL FACILITIES WITHIN THE 100-YEAR FLOODPLAINS 3-37
MAP 3.5: BRIDGES AND CULVERTS WITHIN THE 100-YEAR FLOODPLAINS 3-39
MAP 3.6: AREAS OF GREATEST FIRE RISK 3-41
MAP 3.7: LOCATION OF DAMS 3-43

TABLES

TABLE 0.1: FLORENCE COUNTY HAZARD MITIGATION PLAN UPDATE SUMMARY XI
TABLE 1.1: FLORENCE COUNTY HAZARDS MITIGATION PLAN STEERING COMMITTEE 1-3
TABLE 2.1: PLANNING JURISDICTIONS 2-1
TABLE 2.2: FLORENCE COUNTY POPULATION TRENDS, 1950-2010 2-2
TABLE 2.3: FLORENCE COUNTY POPULATION CHANGES, 1980-2010 2-2
TABLE 2.4: POPULATION PROJECTIONS, FLORENCE COUNTY, 2000-2030 2-3
TABLE 2.5: HOUSING UNITS, FLORENCE COUNTY, 1980-2010 2-3
TABLE 2.6: AVERAGE CIVILIAN LABOR FORCE ESTIMATES, 2000-2011, FLORENCE COUNTY 2-4
TABLE 2.7: FLORENCE COUNTY LAND USE 2-4
TABLE 3.1: RISK ASSESSMENT RANKING 3-1
TABLE 3.2: NATURAL HAZARD OCCURRENCES DATA, FLORENCE COUNTY 1995-2011 3-3
TABLE 3.3: NUMBER OF CRITICAL FACILITIES BY TYPE, FLORENCE COUNTY 3-6
TABLE 3.4: CRITICAL FACILITY TYPES WITHIN THE 100-YEAR FLOODPLAINS 3-10
TABLE 3.5: TORNADO MAGNITUDE MEASUREMENT, FUJITA SCALE 3-15
TABLE 4.1: HAZARD MITIGATION ACTION PLAN, 2012 4-5

FIGURES

FIGURE 2.1: POPULATION TRENDS, FLORENCE COUNTY, 1950-2010 2-2

(This Page Intentionally Blank)

Resolution 2013 - 10

A RESOLUTION adopting the *Florence County, Wisconsin Natural Hazards Mitigation Plan (2013)*.

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

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted natural hazards mitigation plan is required as a condition of future grant funding for mitigation projects.

NOW, THEREFORE BE IT RESOLVED, that the County Board of Florence County, Wisconsin, hereby adopts the *Florence County Natural Hazards Mitigation Plan (2013)* as an official plan; and

BE IT FURTHER RESOLVED, that upon approval of the *Florence County, Wisconsin Hazard Mitigation Plan (2013)*, the Florence County Emergency Management Office will submit the Plan to Wisconsin Emergency Management and Federal Emergency Management Agency officials for final approval, as required under the Hazard Mitigation Grant Program.

I HEREBY CERTIFY that the foregoing Resolution was duly passed by the County Board of Florence County, Wisconsin, on the 19th day of February, 2013.

Jeanette Bomberg, Chair
Florence County Board of Supervisors

Donna Trudell, County Clerk

(This Page Intentionally Blank)

U.S. Department of Homeland Security
Region V
536 South Clark Street, Floor 6
Chicago, IL 60605

FEMA

MAR 1 5 2013

Ms. Roxanne Gray
State Hazard Mitigation Officer
Wisconsin Div. of Emergency Management
2400 Wright Street, P. O. Box 7865
Madison, WI 53707-7865

RECEIVED
MAR 1 8 2013
Name: _____

Dear Ms. ~~Gray~~ Rox:

Thank you for submitting the adoption documentation for the Florence County All Hazards Mitigation Plan update. The plan was reviewed based on the local plan criteria contained in 44 CFR Part 201, as authorized by the Disaster Mitigation Act of 2000. Florence County met the required criteria for a multi-jurisdiction hazard mitigation plan and the plan is now approved for the county. According to our records, the plan has now been adopted by all jurisdictions that participated in development of the plan.

The approval of this plan ensures continued availability of the full complement of Hazard Mitigation Assistance (HMA) Grants. All requests for funding, however, will be evaluated individually according to the specific eligibility and other requirements of the particular program under which the application is submitted.

We encourage the local governments to work with Florence County to follow the plan's schedule for monitoring and updating the plan, and continue their efforts to implement the mitigation measures. The plan must be reviewed, revised as appropriate, resubmitted, and approved within five years in order to continue project grant eligibility.

Please pass on our congratulations to the county on completing this significant action. If you or the community has any questions, please contact Kirstin Kuenzi at (312) 408-4460.

Sincerely,

for Christine Stack, Director
Mitigation Division

STATE OF WISCONSIN

DEPARTMENT OF MILITARY AFFAIRS

DIVISION OF EMERGENCY MANAGEMENT

Brian M. Satula
Administrator

Scott Walker
Governor

March 19, 2013

Mr. David Gribble, Director
Florence County Emergency Management
P.O. Box 678
Crandon, WI 54121

Dear Dave:

It gives me great pleasure to inform you that the *Florence County Hazard Mitigation Plan* update has been approved for the County by the Federal Emergency Management Agency. The plan complies with the requirements of the Disaster Mitigation Act of 2000. The County is eligible to apply for funding through the Hazard Mitigation Grant Program, the Pre-Disaster Mitigation Program, the Flood Mitigation Assistance Program, and the Repetitive Flood Claims Program through March 15, 2018, for projects identified in the Plan.

Per the regulations, the Plan is required to be updated and resubmitted for approval every five years to maintain eligibility for mitigation funding. With the FEMA Meets Requirements letter you also received the Local Mitigation Plan Review Tool which includes recommended revisions for the five-year update.

Congratulations on the approval of the plan! I also want to commend the County for its commitment to mitigation and reducing future disaster losses, and I look forward to working with you in the future.

If you have any questions, please call me at 608-242-3222 or Roxanne Gray at 608-242-3211.

Sincerely,

K Sommers

Katie Sommers
Disaster Response and Recovery Planner
Wisconsin Division of Emergency Management

Enclosure

Cc: Michelle Hartness, Northeast Regional Emergency Management Director
Janell Rucinski, Northeast Regional Office Operations Associate
Angela Pierce, Bay-Lake Regional Planning Commission

2400 Wright St. PO Box 7865 Madison, WI 53707-7865 24 Hour Emergency Hotline 1-800-943-0003

PLAN UPDATE SUMMARY

To aid in the identification of the changes that have been made to the *Florence County, Wisconsin Natural Hazards Mitigation Plan* in this current update to the original 2006 plan, Table 0.1 below lists the plan changes and the updates made to the identified mitigation actions.

(This Page Intentionally Blank)

Table 0.1: Florence County Hazard Mitigation Plan Update Summary

Plan Chapter	Overview of Plan Update
Chapter 1: Introduction	Updated recent disasters, planning process participants, and public review information. Several updates were made to the original steering committee to reflect changes in positions since the last plan was adopted. The steering committee updated the prioritized order of the hazards to be addressed and added drought.
Chapter 2: Planning Area	Updated demographic profile information using the 2010 Census. Updated land use information.
Chapter 3: Risk Assessment	All hazard profiles, occurrences, and probabilities were updated. In addition, the risk assessments were updated. Hazard occurrences were updated to include all from 1995 to 2011 (original plan went through November 2004). Hazard probabilities were updated based on updated occurrences. Updated estimates of potential dollar losses for hazards based on updated property values. Update critical facilities and changes some categories names. A drought risk assessment was added. Added a statement on NFIP participation under the section on flooding.
Chapter 4: Mitigation Strategy	Updated the mitigation action plan to account for completed projects, updated timetables, and new project additions.
Chapter 5: Plan Maintenance and Adoption Process	Updated plan maintenance process and plan update schedule.

Project	Changes
All Hazards	
Acquisition of Emergency Power Generators for Critical Facilities	No change.[1]
Mutual Aid Agreement with Wisconsin Public Service to Help Keep Debris off Power Lines.	Addition.
Identify Areas of Need for Burying Power Lines	Addition.
Feasibility of Partnering with Power Utilities in County on Burying Power Lines	Addition.
Bury Power Lines in Areas of Need	Addition.
Severe Weather Spotter Classes	Addition.
Severe Weather Outreach	Addition.

Table 0.1: Florence County Hazard Mitigation Plan Update Summary (continued)

Project	Changes
All Hazards (cont'd)	
Aquire Emergency Notification System (e.g. "Code Red")	Addition.
Weather Radio Warning Messages	Addition.
Lightning Storms and Thunderstorms	
Review of Building Codes	Changed Responsible Party from "Florence County" to "Florence County Zoning." Changed Project Timetable from "2006-2008" to "Ongoing."
Lightning Safety Guidelines	Completed.
Flooding	
Disaster Preparedness	No change.[1]
National Flood Insurance Program	Added "Florence County" to Responsible Party.
Preservation of Natural Resources in Floodplains	No change.[1]
Stormwater Management	No change.[1]
Flood Forecasting and Warning Systems and Emergency Plans	No change.[1]
Floodproofing Techniques	Changed Responsible Party from "Emergency Management" to "Zoning Dept." Changed Project Timetable from "2006 - 2011" to "Ongoing." Struck from notes: "but direct city assistance in floodproofing activities would only occur if grants become available (for existing structures)."
Acquire Countywide LiDAR Mapping	Addition.
Orthophotography Base Maps of Florence County	Removed "Florence County Highway Commission" from Responsible Party. Changed Project Timetable from "2006 - 2010" to "Ongoing." Changed Priority from "Low" to "Medium."
Inform Property Owners in Cases Where Property is Located in the 100-Year Floodplain	Changed Project Timetable from "2010" to "Ongoing." Added "Partially completed" to Notes.
Acquisition and Relocation	No change.[1]
Annual Review of Flood Mitigation Plan	No change.[1]

Table 0.1: Florence County Hazard Mitigation Plan Update Summary (continued)

Project	Changes
Flooding (cont'd)	
Flood Insurance Rate Map (FIRM) Amendments and Revisions	Changed Project Timetable from "2008-2009" to "2022" (based on WDNR feedback) and changed Priority from Medium to Low. Added information in notes.
Individual Property Measures for Basements	No change.[1]
Incorporation of Floodplain Management in Comprehensive Planning	Completed.
Hydrology Study of Florence County	Deleted mitigation measure "Hydrology Study of Florence County." because it is combined with the measure of "Flood Insurance Rate Map (FIRM) Amendments and Revisions."
Geographic Information System (GIS) Coverage	Completed.
Reevaluation of Floodplain Zoning Ordinances	This project was completed when the Florence County Floodplain Ordinance was updated to current requirements on 2-19-2008.
Stormwater Detention	Removed as it is covered under the "Stormwater Management" mitigation action.
Winter Storms	
Priority Policy for Salting and Plowing Streets and Highways	No change.[1]
Promote Winter Storm Hazard Awareness	No change.[1]
Tornadoes	
Review Emergency Shelter Deficit Locations	Change Mitigation Measure from "Identification of Emergency Shelter Deficit Locations" to Review Emergency Shelter Deficit Locations." Added "American Red Cross" to Responsible Parties.
Tornado Awareness Training	Addition.
Encourage Use of Tie-Downs with Ground Anchors for Manufactured Homes and Mobile Homes	No change.[1]
Enhanced Construction Standards and Techniques	No change.[1]

Table 0.1: Florence County Hazard Mitigation Plan Update Summary (continued)

Project	Changes
Drought	
Fire Education and Prevention	Addition.
Wildland Fires	
Fire Education and Prevention	Added "WDNR, USFS" to Responsible Party. Changed Project Timetable from "2006-2010" to "Ongoing." Added information to notes.
Extreme Cold	
Publicize Extreme Cold Events	No change.[1]
Extreme Heat	
Provide sheltering and water supplies for vulnerable populations.	Addition.
Publicize Extreme Heat Events	No change.[1]
Supplies for Vulnerable Populations	Deleted mitigation measure "Supplies for Vulnerable Populations." because it has been addressed with the measure of "Provide sheltering and water supplies for vulnerable populations."
Fog	
Publicize Fog Events	No change.[1]
Dam Failure	
Dam Failure Warning Systems and Emergency Plans	No change.[1]
Dam Failure Automated Warning Calls	Addition.

1. Due to constraints of financial or political support, a number of mitigation actions have had no changes from the 2006 plan and appear again in this plan update.

CHAPTER 1: INTRODUCTION

PURPOSE OF THE PLAN

The primary focus of the *Florence County Hazard Mitigation Plan* is to evaluate the planning area's potential exposure to natural hazards and to identify appropriate mitigation strategies. Consistent with the Code of Federal Regulations (44 CFR Part 201.6), the County decided to limit the scope of this planning effort to natural hazards at this time, though this plan conforms to Federal Emergency Management Agency (FEMA) requirements for local hazards mitigation planning.

This plan provides County-level information on areas of risk, magnitude of risk, and strategies for reducing this risk. Through the process of developing this plan, the County addressed issues related to the protection of lives and property from natural hazards, the protection of critical facilities, and the reduction of community and taxpayer costs associated with disaster relief and rescue efforts. Completion and approval of the plan makes Florence County eligible to apply for future FEMA disaster relief and mitigation project funds, helping the County to implement their recommended mitigation strategies.

Disaster Mitigation Act of 2000

The development and update of the *Florence County Hazard Mitigation Plan* is in response to passage of the Disaster Mitigation Act of 2000. This act was signed into law in October of 2000. The Act attempts to stem the losses from disasters, reduce future public and private expenditures, and speed up response and recovery from disasters. The Act (Public Law 106-390) was amended by the Robert T. Stafford Relief and Emergency Assistance Act. The following is a summary of the parts of the Disaster Mitigation Act of 2000 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 the Hazard Mitigation Grant Program.
- The Act establishes a requirement that natural hazards need to be addressed in the risk assessment/vulnerability analysis part of the All Hazards Mitigation Plan. Man-made/technological hazards 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 established 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; this deadline was November 1, 2003, for the 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 a current, FEMA-approved, and adopted hazard mitigation plan, local and tribal governments cannot utilize funding through the Pre-Disaster Mitigation Grant Program.

Funding of this Hazard Mitigation Plan

In July 2011, the Florence County received a planning grant to develop an update to the hazard mitigation plan in the amount of $29,838 through the FEMA Pre-Disaster Mitigation (PDM) program. Through the grant (Agreement #: PDMC-PL-05-WI-2011-010), FEMA provided 75 percent of the funds ($22,348), while 25 percent ($7,490) was required to be the local match.

Florence County entered into a contract (#10021-03) with the Bay-Lake Regional Planning Commission to prepare the update to the hazard mitigation plan. Development of the plan began in November 2011 and ended in January 2013.

Five Parts of this Natural Hazards Mitigation Plan

The *Florence County Hazard Mitigation Plan* was divided into five chapters in order to address FEMA's local mitigation plan requirements. The five chapters are as follows:

- Chapter 1 – Introduction (Planning Process);
- Chapter 2 – Planning Area;
- Chapter 3 – Risk Assessment;
- Chapter 4 – Mitigation Strategy; and
- Chapter 5 – Plan Maintenance and Adoption Process.

PLANNING PROCESS

Development of the *Florence County Hazard Mitigation Plan* was based on the planning requirements and guidance provided by FEMA and Wisconsin Emergency Management (WEM). Following these requirements and guidance, the plan meets the requirements of the Disaster Mitigation Act of 2000. Since the WEM guidance for hazard mitigation plans recommended that planning areas "be consistent with a community's comprehensive planning boundary," the planning area for this *Florence County Hazard Mitigation Plan* includes all of Florence County as well as the Towns of Aurora, Commonwealth, Fern, Fence, Florence, Homestead, Long Lake and Tipler, making this a multi-jurisdictional plan.

The steering committee comprised of county and state officials, emergency management personnel, and organizations, guided the plan development process over an 18-month timeframe beginning in November 2011. Professional planning support was provided by the Bay-Lake Regional Planning Commission. Public review and input was encouraged at all meetings and through an Open House to present the plan goals, mitigation actions plan, and mapped hazard areas.

Development of the plan was structured along a five-phase planning process:

Phase I: Pre-planning and review of steering committee appointments

Phase II: Reassessing risks and critical facilities

Phase III: Updating the mitigation action plan

Phase IV: Reviewing the policies and procedures for plan implementation

Phase V: Documenting the planning process and plan adoption

Phase I involved initial conversations and meetings aimed at reviewing the previous steering committee appointments, reconvening the steering committee, and outlining the planning process and responsibilities of the steering committee.

Phase II was comprised of a meeting with the steering committee to reassess natural hazards and potential risks to the County, and reassessing identified critical facilities.

Phase III involved updating the mitigation action plan to address identified risks including removing completed task and adding new mitigation methods to address risks.

Phase IV involved reviewing the policies that affect plan implementation and the procedures that would be followed to implement the plan.

Phase V involved documenting the planning process, developing a complete draft of the plan, and plan adoption.

Plan development was completed with the adoption of the plan by resolution at the Florence County Board meeting on February 19, 2013. The maps in the Planning Area and Risk Assessment chapters of the plan were completed using the Bay-Lake Regional Planning Commission's Geographic Information System (GIS), allowing greater manipulation and analysis from the use of a consistent base map. The FEMA HAZUS software was not utilized due to the availability of current local data and numerous differences between census boundaries and locally available map features. Maps included in this plan are for general planning purposes only, and are not for legal or formal survey purposes.

Hazard Mitigation Plan Steering Committee

Florence County established a Hazard Mitigation Plan Steering Committee, shown in Table 1.1. Committee members were selected from all County departments involved in emergency management issues, local electrical and gas utilities, and the Florence County Emergency Management Coordinator. Since Florence is a fairly small County, members of the steering committee were very knowledgeable about the issues and concerns of County residents. The steering committee was responsible for providing input, helping to guide the planning process, and reviewing draft chapters of the plan.

Table 1.1: Florence County Hazards Mitigation Plan Steering Committee

Name	Affiliation
Dave Gribble	County Emergency Management Director
Angela Pierce	Bay-Lake Regional Planning Commission
Annette Seibold	County Nurse
Edwin Kelley	County Board Supervisor
Greg Gulan	USFS
Henry Sullivan	Wisconsin DNR Ranger
Jeff DeMuri	County Highway Commissioner
Jeff Rickaby	County Sheriff
Pat Smith	County Forest Administrator
Rich Wolosyn	County Zoning Administrator
Robert Friberg	Florence Utilities
Ryan Grondin	WE Energies

During the assessment of natural hazard conditions, the plan steering committee reviewed the prioritization of the various potential natural hazards facing the planning area. Based on the results of this exercise, along with analysis of past natural hazards, the plan steering committee prioritized and selected the natural hazards to be the focus of this plan. The hazards are listed by order of priority.

1. Lightning Storms and Thunderstorms (also including hail storms and high winds)
2. Flooding (including flash, riverine, lake, and stormwater)
3. Winter Storms (includes heavy snow storms, ice storms and blizzards)
4. Tornadoes
5. Drought
6. Wildland Fires
7. Extreme Cold
8. Extreme
9. Fog
10. Dam Failures

Steering Committee Plan Review

The steering committee reviewed and analyzed each section of the plan, and considered Table 0.1 to evaluate which sections were revised as part of the update process. The steering committee held five meetings to update the plan: December 7, 2011; January 25, 2012; March 19, 2012; May 14, 2012; and September 18, 2012. Additional plan review thru e-mail occurred outside of these meetings. Copies of the sign-in sheets are included in Appendix A.

Public Involvement

Steering Committee Meetings

Opportunities for public comment during the drafting stage of the plan were held at all meetings of the steering committee, which were all open to the public. No comments were provided by the public at these meetings.

Public Informational Meeting

An informational meeting was held for the public on September 18, 2012 at the Florence County Courthouse This meeting was held to provide an opportunity for the public to review and comment on the draft plan and maps. No comments were provided by the public at this meeting.

Both the steering committee meetings and the public informational meeting were open to the public, notices were posted at the Florence County Courthouse and notice was provided to local media.

County Board Meeting

On February 19, 2013, the Florence County Board adopted this hazard mitigation plan update at a meeting open to the public. A copy of the resolution of adoption can be found at the front of this plan on page v.

Neighboring Jurisdictions

Prior to the public informational meeting, the Florence County Hazard Mitigation Plan was sent to the emergency management directors in Marinette, Forest, Dickinson (MI), and Iron (MI) counties for their review and comment. No comments were received.

Plan Contact Information

David Gribble, Chief Deputy
Florence County Sheriff's Office
P.O. Box 678
Florence, WI 54121
715.528.3346
dgribble@co.florence.wi.us

(This Page Intentionally Blank)

CHAPTER 2: PLANNING AREA

GENERAL GEOGRAPHY

The planning area for the *Florence County Hazards Mitigation Plan* completely covers Florence County and includes all of the towns within the county. The County does not have any incorporated communities.

Map 2.1 illustrates the location of Florence County and its towns. Table 2.1 indicates the geographical size of the County as well as the size of each town within the County.

Table 2.1: Planning Jurisdictions

Jurisdiction	Area		Percent of Planning Area
	Sq Miles	Acres	
Aurora	38.3	24,535	7.7%
Commonwealth	43.0	27,535	8.7%
Fence	90.2	57,701	18.1%
Fern	35.0	22,376	7.0%
Florence	157.5	100,799	31.7%
Homestead	54.4	34,799	10.9%
Long Lake	35.7	22,871	7.2%
Tipler	43.3	27,685	8.7%
Florence County	**497.3**	**318,301**	**100.0%**

Source: Bay-Lake Regional Planning Commission, 2012.

DEMOGRAPHIC PROFILE

Population Trends

From 1950 to 2010, Florence County has grown by 667 persons (17.8 percent). The County's growth has fluctuated over time with a downward trend from 1950 to 1970, when the county was at its lowest population of 3,298 persons. From 1970 to 2000, Florence County saw gains in population of more than 10 percent per decade. However, in 2010 population dipped by 13 percent to it current number of 4,423 persons.

Tables 2.2 and 2.3 and Figure 2.1 indicate the historic Census population counts by community in Florence County. Most of the permanent population resides primarily in the eastern half of the county, within the towns of Aurora and Florence. Since 1950, the towns of Florence and Aurora have comprised over 50 percent of the county's population. Areas of population concentration include the unincorporated communities of Florence, Aurora, Commonwealth, Spread Eagle, Long Lake, Tipler, and Fence. In addition, concentrations of population, especially seasonal residents, are associated with bodies of water such as the Spread Eagle Chain of Lakes and Keyes Lake.

The Town of Florence has seen the greatest percent growth in population since 1950. The county as a whole has seen an increase of 18 percent or more than 660 people since 1950. Nearly every town in Florence County, except Fern (which only gained six people), saw a decrease in population from 2000 to 2010.

It is noteworthy that Florence County officials believe that the 2010 U.S. Census data was incorrectly recorded lower than actual. It is suspected that Census data collectors may have

counted permanent residents as seasonal. The Florence County Task Force is pursuing an update to the data.

Table 2.2: Florence County Population Trends, 1950-2010

Area	Year 1950	1960	1970	1980	1990	2000	2010	1950-2010 Number	Percent
Aurora	951	914	920	1,050	1,036	1,186	1,036	85	8.9
Commonwealth	328	314	254	369	407	419	399	71	21.6
Fence	275	195	191	192	222	231	192	-83	-30.2
Fern	105	67	61	111	112	153	159	54	51.4
Florence	1,257	1,251	1,262	1,809	2,097	2,319	2,002	745	59.3
Homestead	348	302	258	272	337	378	336	-12	-3.4
Long Lake	211	211	190	199	205	197	157	-54	-25.6
Tipler	281	183	162	170	174	205	142	-139	-49.5
Florence County	3,756	3,437	3,298	4,172	4,590	5,088	4,423	667	17.8

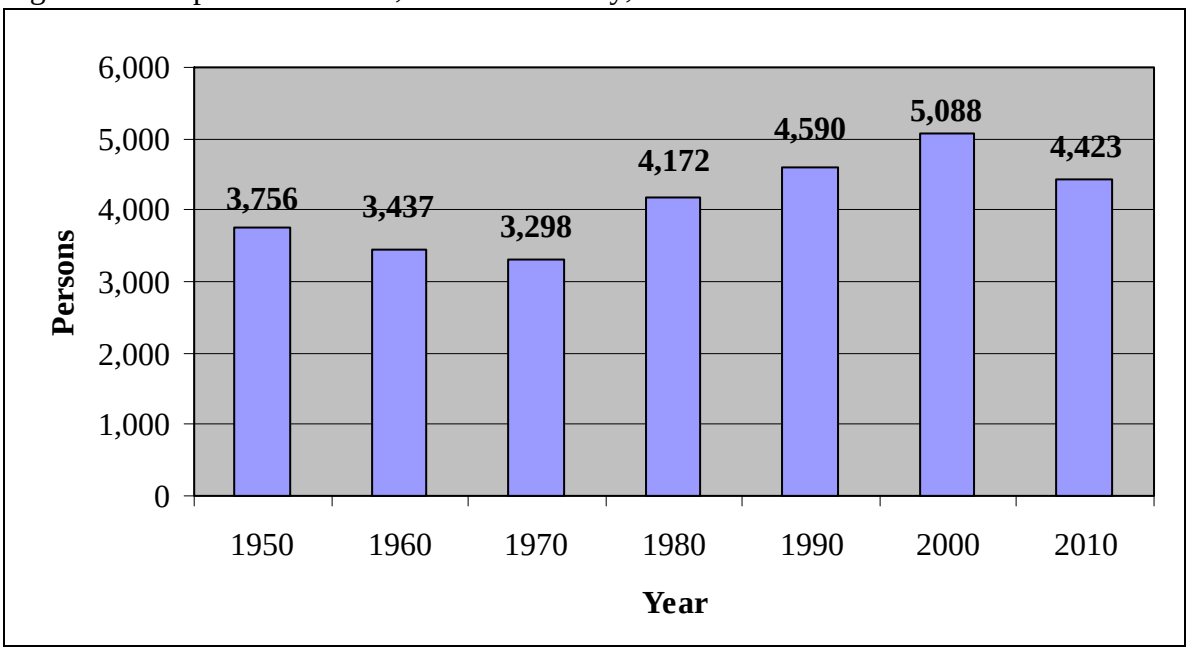
Source: U.S. Census General Population Characteristics 1840-1970, U.S. Census 1980-2010.

Table 2.3: Florence County Population Changes, 1980-2010

Area	Population 1980 Number	Percent	1990 Number	Percent	2000 Number	Percent	2010 Number	Percent	Change 1980-1990 Number	Percent	1990-2000 Number	Percent	2000-2010 Number	Percent
Aurora	1,050	27.2	1,036	22.6	1,186	23.3	1,036	23.4	-14	-1.3	150	14.5	-150	-12.6
Commonwealth	369	8.8	407	8.9	419	8.2	399	9.0	38	10.3	12	2.9	-20	-4.8
Fence	192	4.6	222	4.8	231	4.5	192	4.3	30	15.6	9	4.1	-39	-16.9
Fern	111	2.7	112	2.4	153	3.0	159	3.6	1	0.9	41	36.6	6	3.9
Florence	1,809	43.4	2,097	45.7	2,319	45.6	2,002	45.3	288	15.9	222	10.6	-317	-13.7
Homestead	272	6.5	337	7.3	378	7.4	336	7.6	65	23.9	41	12.2	-42	-11.1
Long Lake	199	4.8	205	4.5	197	3.9	157	3.5	6	3.0	-8	-3.9	-40	-20.3
Tipler	170	4.1	174	3.8	205	4.0	142	3.2	4	2.4	31	17.8	-63	-30.7
Florence County	4,172	100.0	4,590	100.0	5,088	100.0	4,423	100.0	418	10.0	498	10.8	-665	-13.1

Source: U.S. Census 1980-2010.

Figure 2.1: Population Trends, Florence County, 1950-2010



Source: U.S. Census General Population Characteristics 1840-1970, U.S. Census 1980-2010.

Population Projections

Florence County has seen a slow, but steady growth in its population since 1970. According to the Wisconsin Department of Administration (DOA), the county's population is expected to increase to 5,340 persons by the year 2030 (Table 2.4). It should be recognized that DOA projections are based on the 2000 Census, not the recent 2010 Census, which showed a dip in population. Also, DOA figures do not include seasonal residents; and it is estimated that the seasonal population could increase the county's total population by as much as 20 to 25 percent.

Table 2.4: Population Projections, Florence County, 2000-2030

Area	Census 2000	Census 2010	Projections 2005	2010	2015	2020	2025	2030	Number Change 2000-2030	Percent Change 2000-2030
Aurora	1,186	1,036	1,222	1,234	1,249	1,259	1,261	1,253	67	5.6
Commonwealth	419	399	415	407	400	393	383	372	-47	-11.2
Fence	231	192	231	229	227	225	221	216	-15	-6.5
Fern	153	159	156	161	166	170	173	174	21	13.7
Florence	2,319	2,002	2,383	2,412	2,448	2,471	2,479	2,465	146	6.3
Homestead	378	336	388	395	401	407	410	410	32	8.5
Long Lake	197	157	203	200	197	194	190	185	-12	-6.1
Tipler	205	142	225	235	245	254	261	265	60	29.3
Florence County	5,088	4,423	5,223	5,273	5,333	5,373	5,378	5,340	252	5.0

Source: Wisconsin Department of Administration, Official Municipal Population Projections, 2000-2030; and Official Population Estimates, 2011.

Housing Trends

From 1980 to 2010, Florence County gained 1,439 housing units. Growth has occurred consistently at a rate of approximately 13 percent per decade for the county (Table 2.6). However, the towns in the county saw more fluctuation from decade to decade. The Town of Florence held the greatest percentage of housing units in the county (more than three times that of other towns in the county) over all decades from 1980 to 2010. This is due to its large size, as well as to the hub of county activity being located in the eastern part of the town.

Table 2.5: Housing Units, Florence County, 1980-2010

	Housing Units								Change					
	1980		1990		1990		2010		1980-1990		1990-2000		2000-2010	
Area	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total	Number	Percent Change	Number	Percent Change	Number	Percent Change
Aurora	417	14.5	466	12.5	535	12.6	590	12.3	49	11.8	69	14.8	55	10.3
Commonwealth	287	5.3	333	8.6	326	7.7	378	7.9	46	16.0	-7	-2.1	52	16.0
Fence	288	9.8	344	8.6	373	8.8	445	9.3	56	19.4	29	8.4	72	19.3
Fern	250	6.9	281	7.5	334	7.9	373	7.8	31	12.4	53	18.9	39	11.7
Florence	1,417	43.8	1,538	42.4	1,724	40.7	1,892	39.6	121	8.5	186	12.1	168	9.7
Homestead	250	7.2	316	7.5	351	8.3	401	8.4	66	26.4	35	11.1	50	14.2
Long Lake	261	6.9	274	7.8	296	7.0	343	7.2	13	5.0	22	8.0	47	15.9
Tipler	171	5.5	223	5.1	300	7.1	358	7.5	52	30.4	77	34.5	58	19.3
Florence County	**3,341**	**100.0**	**3,775**	**100.0**	**4,239**	**100.0**	**4,780**	**100.0**	**434**	**13.0**	**464**	**12.3**	**541**	**12.8**

Source: U.S. Census 1980-2010.

EMPLOYMENT CHARACTERISTICS

As a result of the recession that affected the entire country, there was a significant jump in the county's unemployed between 2008 and 2009, from which it has not yet fully recovered. The unemployment rate reached its highest level, 10.6 percent during this period (Table 2.8).

Table 2.6: Average Civilian Labor Force Estimates, 2000-2011, Florence County

Year	Civilian Labor Force	Unemployed	Unemploy. Rate	Employed
2000	2,630	108	4.1	2,522
2001	2,664	122	4.6	2,542
2002	2,736	171	6.3	2,565
2003	2,667	172	6.4	2,495
2004	2,631	169	6.4	2,462
2005	2,570	177	6.9	2,393
2006	2,599	172	6.6	2,427
2007	2,509	146	5.8	2,363
2008	2,455	145	5.9	2,310
2009	2,411	255	10.6	2,156
2010	2,412	241	10.0	2,171
2011	2,402	208	8.7	2,194

Source: Wisconsin Department of Workforce Development, Office of Economic Advisors, 2000-2011.

The civilian labor force is comprised of employed persons and those seeking employment, and excludes persons in the armed forces and those under age 16. Variations in the number of persons in the labor force are the result of many factors. Shifts in the age and sex characteristics of the population, changes in the number of residents aged 16 and over, and the proportion of this group working or seeking employment are all factors affecting the size of the labor force.

GENERAL DEVELOPMENT PATTERN

A detailed field inventory of land uses in the county was conducted in 2009 by the Bay-Lake Regional Planning Commission (Map 2.2). Using GIS, land uses were tabulated to calculate the total area of Florence County at 318,349 acres, or approximately 497 square miles (Table 2.7).

The vast majority of the county is comprised of woodlands with nearly 275,000 acres or 86 percent of the land. Agricultural land (crops and pasture) comprise nearly 15,000 acres or 5 percent. Approximately 9,500 acres or 3 percent of Florence County is developed. Developed land is comprised of residential, commercial, industrial, transportation, communications/utilities, institutional/governmental, and recreation.

Table 2.7: Florence County Land Use

Land Use Type	Total (acres)	Total Land (%)
Residential	3,462	1.1
Commercial	237	0.1
Industrial	343	0.1
Transportation	4,454	1.4
Communications/Utilities	225	0.1
Institutional/Governmental	118	0.0
Recreational	654	0.2
Agricultural	14,989	4.7
Woodlands	274,907	86.4
Other Natural Areas	11,068	3.5
Water Features	7,893	2.5
Total	318,349	100.0

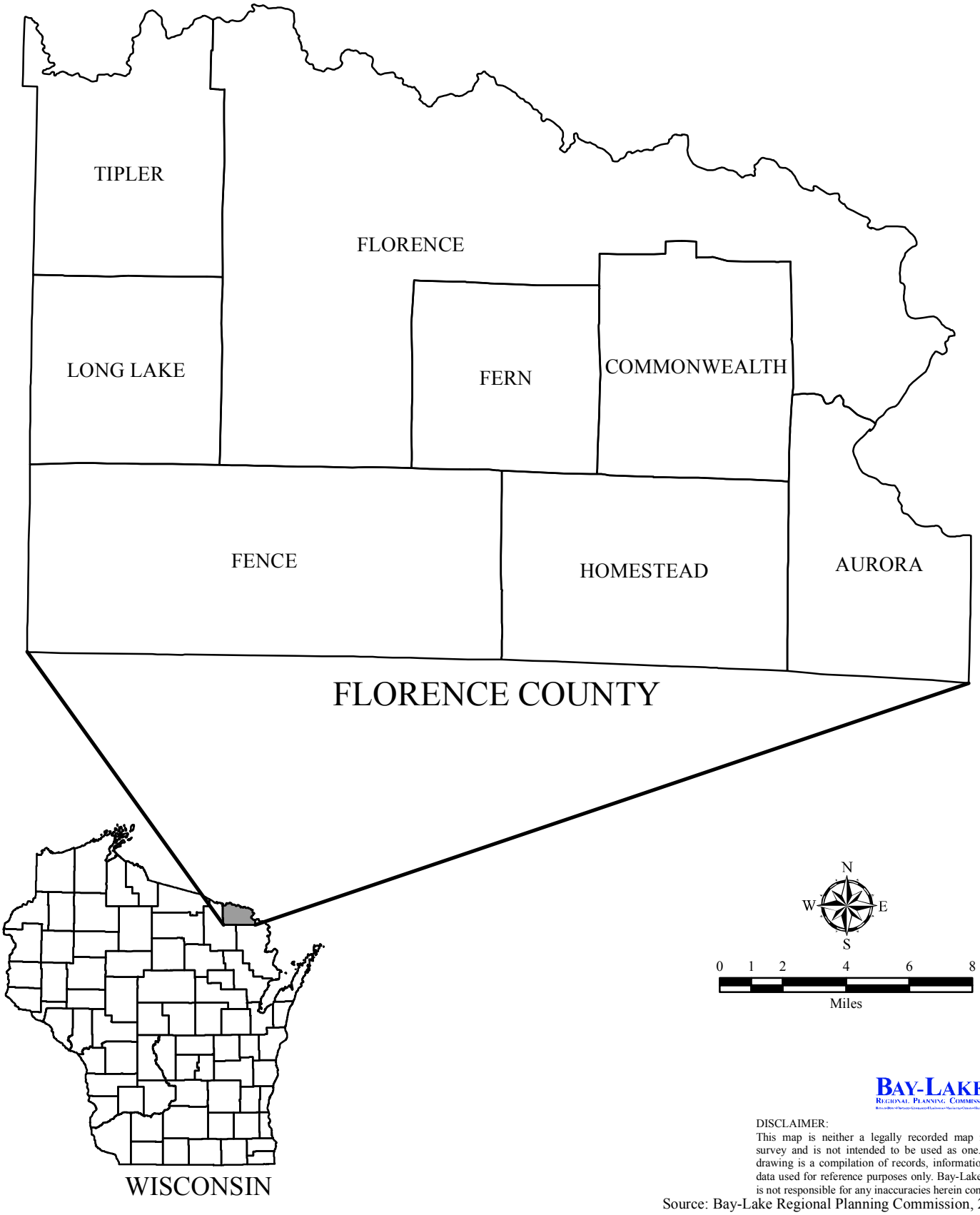
Source: Bay-Lake Regional Planning Commission, 2009.

Map 2.1

Location Map

Florence County Hazard Mitigation Plan

Florence County, Wisconsin



DISCLAIMER:
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. Bay-Lake RPC is not responsible for any inaccuracies herein contained.

Source: Bay-Lake Regional Planning Commission, 2012.

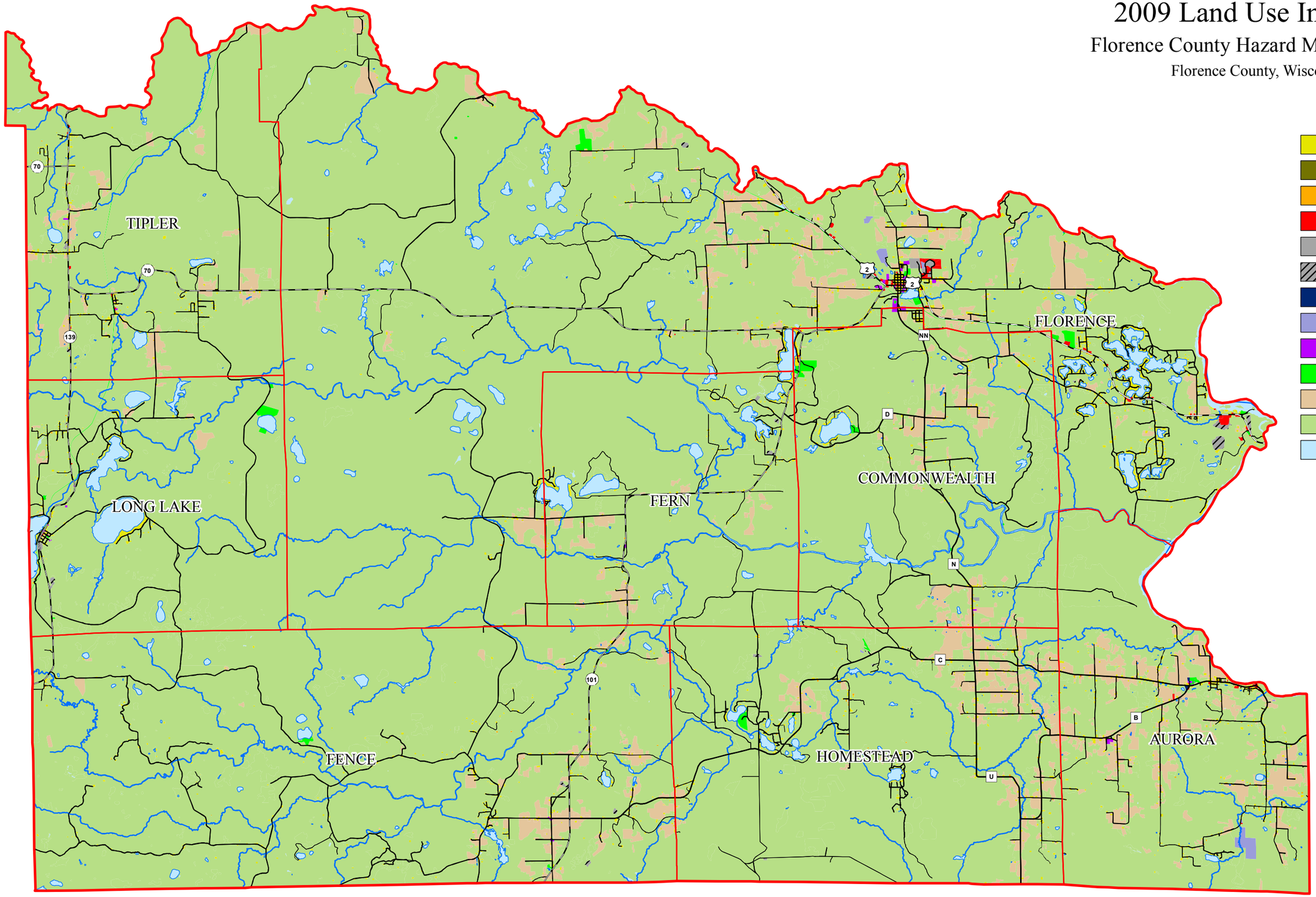
(This Page Intentionally Blank)

Map 2.2

2009 Land Use Inventory

Florence County Hazard Mitigation Plan

Florence County, Wisconsin



Residential
Multi-Family
Mobile Homes
Commercial
Industrial
Nonmetallic Mining
Transportation
Communications/Utilities
Governmental/Institutional
Parks and Recreation
Agricultural
Woodlands/Natural Areas
Water Features

Base Map Features

Community Boundary
U.S. Highway
State Highway
County Highway
Local Road
Surface Water

N
W E
S

0 0.5 1 2 3
Miles

BAY-LAKE
REGIONAL PLANNING COMMISSION

DISCLAIMER:
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. Bay-Lake RPC is not responsible for any inaccuracies herein contained.

Source: Florence County 2008, 2012; Bay-Lake Regional Planning Commission, 2012.

CHAPTER 3: RISK ASSESSMENT

In order to more effectively evaluate potential hazard mitigation measures and develop useful strategies to address the risks associated with the identified natural hazards, this risk assessment has been prepared to identify the natural hazards which are thought to pose the greatest risk to residents of the county, to profile the extent and severity of past natural hazard events that have affected the county, and to assess the vulnerability of the county to the risk of future natural hazard events.

NATURAL HAZARD IDENTIFICATION

Although the county could potentially be at risk from several distinct natural hazards, this plan will attempt to narrow the scope of the natural hazards that will be addressed to those natural hazards that pose the greatest risk to residents and facilities of the county. Identification of the natural hazards was based on a priority rank ordering of the many different natural hazards identified in the Resource Guide to All Hazards Mitigation Planning in Wisconsin (prepared by the Association of Wisconsin Regional Planning Commissions through funding provided by the State of Wisconsin Department of Military Affairs, Wisconsin Emergency Management, and the Federal Emergency Management Agency).

Hazard Risk Assessment Survey

Members of the plan steering committee completed an update to the *Risk Assessment Matrix* worksheet in March 2012. The worksheet with the averaged scores from the steering committee members is included in Appendix B.

Each plan steering committee member was asked to assign a risk rating (1 = low, 2 = moderate, and 3 = high) to the various risk assessment criteria for each natural hazard. The total number of points for each of the identified natural hazards was then calculated. An averaged summary of the risk rating for each natural hazard that was rated is as follows.

Table 3.1: Risk Assessment Ranking

Rank	Natural Hazards	Risk Assessment Rating Total
1	Lightning Storms and Thunderstorms	17
2	Flooding	14
2	Winter Storms	14
3	Tornadoes	13
3	Drought	13
4	Wildland Fires	12
4	Extreme Cold	12
5	Extreme Heat	11
5	Fog	11
5	Dam Failures	11

Source: Florence County Hazard Mitigation Plan Steering Committee, 2012.

Natural Hazard Events Historical Summary

Statistics on past hazard occurrences assisted the steering committee in ranking the natural hazards to be evaluated in the plan. The National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center (NCDC) publishes National Weather Service (NWS) data describing past weather events and the resulting deaths, injuries, and damages associated with each of these events. Event occurrence information is available at a local, county, or regional level – depending on the area covered by the hazard event. Historical hazard events were evaluated from January 1, 1995 through July 31, 2011. The query for that time period resulted in 166 events recorded (Table 3.2).

Additionally, data was compiled from the Wisconsin Department of Natural Resources on the number of wildland fires recorded in Florence County between January 1, 1995 and July 31, 2011. The wildland fire data indicates that 190 wildland fire events have affected the county, with an average affected size of one acre.

The data from the NCDC shows that of the 166 events, winter storms (67 events), lightning and thunderstorms (49 events), drought (19 events), and extreme cold (10 events) have been the most frequently occurring natural hazards in Florence County, through July 31, 2011. Other events occurring less than 10 times in the county since 1995 include flooding (8 events), fog (7 events), extreme heat (4 events), and tornadoes (2 events). Some of these hazard events may not have been specific to the Florence County, as they may have been recorded for a larger regional area, or statewide. Additionally, some of the common hazard events, such as lightning storms/thunderstorms, may only get recorded by the NCDC if they are extreme events that cause property damage, injury, or death.

Few deaths were reported in Florence County from any hazard events since 1995, though more than 60 people died statewide as the result of an extreme heat event that affected the whole state, including Florence County. Few injuries were reported for any hazard events except extreme cold, which has had 21 associated injuries since 1995. The most costly events in terms of property damage since 1995 has been floods, lightning and thunderstorms (and their associated high winds), and tornadoes.

Table 3.2: Natural Hazard Occurrences Data, Florence County 1995-2011

Natural Hazard	# of Events[1]	Avg #/Year	Deaths	Injuries	Property Damage
Wildland Fires	190	11	unknown	unkown	unknown
Winter Storms	67	4	0	0	$0
Lightning Storms and Thunderstorms	49	3	2	2	$1,296,000
Drought	19	1	0	0	$0
Extreme Cold	10	1	4	21	$0
Flooding	8	0.5[2]	0	0	$16,002,000
Fog	7	0.4[2]	0	0	$0
Extreme Heat	4	0.2[3]	69	0	$0
Tornadoes	2	0.1[4]	0	0	$65,000
Total Events	356				

1. January 1, 1995 to July 31, 2011 (17 years)
2. 1 event every 2 years
3. 1 event every 4 years
4. 1 event every 8 years

Source: NOAA/NCDC, 2012; Wisconsin Department of Natural Resources, 2012; and Bay-Lake Regional Planning Commission, 2012.

Natural Hazards Prioritization

The 2012 plan steering committee identified the following ranked natural hazards to be the focus of the plan assessment and mitigation action strategies. Ranking the potential risks associated with each natural hazard helped the steering committee prioritize the mitigation action strategies that are addressed later in the plan. The following natural hazards combined more than one listing from the NCDC data for consistency (the additional listings are provided in parenthesis). The hazards are listed in order of their prioritized ranking.

1. Lightning Storms and Thunderstorms (includes hail, thunderstorm winds, strong winds, and high winds);
2. Flooding (including flash, riverine, lake, and stormwater flooding);
3. Winter Storms (includes snow, heavy snow, ice storms, freezing drizzle, freezing rain, blowing snow, glaze, and blizzards);
4. Tornadoes;
5. Drought (includes dry);
6. Wildland Fires;
7. Extreme Cold (includes cold and wind chill);
8. Extreme Heat (includes record warmth and excessive heat);
9. Fog; and
10. Dam Failures.

Other Natural Hazards Determined Not to Pose a Significant Risk

The following natural hazards were determined to have a minimal chance of occurring or pose minimal risk to the safety of residents or property in Florence County. These natural hazards are

excluded from the full assessment, but are briefly discussed here to meet the comprehensive requirements for developing a natural hazards mitigation plan under Federal law.

Landslides and Land Subsidence

The term “landslide” includes a wide range of ground movement, including rock falls, deep failure of slopes and shallow debris flows. Although gravity acting on an overly steep slope is the primary reason for a landslide, there can be other contributing factors, such as erosion by rivers, excess weight from the accumulation of rain or snow, or man-made and other structures stressing weak slopes to the point of failure. In addition, slope material that becomes saturated with water may develop a debris flow or mudflow.

The U.S. Geological Survey *Landslide Overview Map of the Coterminous United States* identifies no large-scale landslide risks for most of the county. The majority of the land within the county does not involve steep slopes and does not pose a landslide risk. While there are steeper portions of the county, the soils involved pose more of a gradual erosion risk, as opposed to the sudden, large-scale movement of ground associated with landslide hazards. Hillside erosion (minor landslides) within the county is very uncommon, and is the result of man-made impacts, such as the removal of vegetation. Hillside erosion has not posed substantial risk to life or property, and has been largely mitigated through subdivision law, site plan review and erosion control plans for construction sites.

Land subsidence is an event in which a portion of the land surface collapses or settles. Common causes of subsidence are location in an area with karst topography or location in an area where large amounts of groundwater have been withdrawn. Florence County is not an area of particularly karst topography, nor is there an overuse of groundwater for purposes of providing potable drinking water, industrial usage, or agricultural production, which could lead to land subsidence.

There are no records of substantial damage or injury from large landslides or land subsidence within the county, and these hazard threats are considered low, as reflected in the results of the risk assessment matrix (Appendix A).

Earthquakes

According to the U.S. Geological Survey (USGS), there have been 19 earthquake events in Wisconsin. The closest of these to the county occurred in northern Ozaukee County (Lake Church) in 1956, as well as in Fond du Lac County in 1922. Where readings were available, these events were relatively small, most being 3.0 to 4.2 on the Richter Scale in intensity, and the largest being an intensity of 5.3 (Beloit, 1909), which may be strong enough to crack some plaster, but typically does not cause serious damage. Due to the lack of recent events, some geologists question whether many of these events were true earthquakes, but rather were quarry collapses, blasts, etc.

The nearest active earthquake fault outside of Wisconsin is the New Madrid Fault, which stretches from northeast Arkansas to southern Illinois. Florence County falls within the lowest earthquake hazard shaking area, which represents the levels of horizontal shaking which have a 1-in-50 chance of being exceeded in a 50 year period. Similarly, Florence County falls within a 0%g to 1%g peak ground acceleration (PGA) zone as shown on the USGS PGA values map with a 10 percent chance of being exceeded over 50 years. Therefore, the county is considered

unlikely to be substantially affected by earthquakes in the long-term future. The earthquake threat to the county is considered very low.

RISK AND VULNERABILITY ASSESSMENT

The risk and vulnerability assessment is intended to describe the frequency, severity, and probability of future occurrence of natural hazards that could impact the planning area. The following hazard profiles attempt to historically describe the characteristics of each natural hazard and how they have affected the population, infrastructure, and environment of the planning area, and the potential risk to the population and property that could occur because of each of these natural hazards.

Critical Facilities

Although this assessment will attempt to focus on the risk potential to the overall planning area, critical facilities are of particular concern. Critical facilities are necessary to preserve health, welfare, and quality of life in the county, and fulfill important public safety, emergency response, and/or disaster recovery functions, or they house vulnerable populations (such as schools and mobile home parks). Critical facilities in the planning area have been identified and mapped, and are illustrated in Map 3.3. Table 3.3 lists the types and number of critical facilities within the county.

Table 3.3: Number of Critical Facilities by Type, Florence County

Type	# of Facilities
Culvert	29
Bridge	20
Communication	11
Dry Hydrant	9
Dam	8
Town Hall	8
Boat Launch	7
Campgrounds	7
Fire and EMT	7
Municipal Garage	7
Power	7
Primitive Campsite	6
Well	4
Post Office	3
School	3
Fuel	2
Mobile Home Park	2
Pump Station	2
Water Tower	2
Clinic	1
Courthouse	1
DNR Natural Resource Center	1
Fairgrounds	1
Fire Tower	1
Library	1
Recycling Facility	1
Sheriff Department/Jail	1
Waste Disposal	1
Waste Water Treatment Plant	1
Nursing Home	1
Natural Gas Pipeline	1
Total	**156**

Source: Bay-Lake Regional Planning Commission, 2012.

HAZARD PROFILES

Hazard profiles are intended to describe the frequency, severity, and probability of future natural hazards that could have an impact on Florence County. These hazard profiles attempt to historically describe the cause and characteristics of each natural hazard and how they have impacted the population, infrastructure, and environment of the county. These potential risks are evaluated to determine their likelihood of reoccurrence and to gauge the impacts to the existing (or planned) population and property that could occur as a result of these hazards.

Hazard probabilities are represented as high, medium, and low. High probability hazards are defined as hazards that occur an average of more than once per year; medium probability hazards

are those that occur an average of more than once every two years, but not more than once per year; and low probability hazards occur less than once every two years.

Lightning Storms and Thunderstorms

Description of Hazard

The lightning storms and thunderstorms include hail, thunderstorm winds, strong winds, and high winds. Thunderstorms are most likely to happen in the spring and summer months and during the afternoon and evening hours, but can occur throughout the year and at all hours. The biggest threats from thunderstorms are lightning, high winds, and hail.

Lightning, which occurs during all thunderstorms, can strike anywhere. Generated by the buildup of charged ions in a thundercloud, the discharge of a lightning bolt interacts with the best conducting object or surface on the ground. The air in the channel of a lightning strike reaches temperatures higher than 50,000 degrees Fahrenheit. The rapid heating and cooling of the air near the channel causes a shock wave which produces thunder.

Thunderstorms winds include downburst winds and high winds. Downburst winds are strong, concentrated, straight-line winds created by falling rain and sinking air that can reach speeds of 125 miles per hour. High winds are high speeds winds that can be as damaging as a tornado, but remaining nearly straight line and are not the rotating column of air that is characteristic of a tornado.

Hailstones are ice crystals that form within a low pressure front due to warm air rising rapidly into the upper atmosphere and the subsequent cooling of the air mass. Frozen droplets gradually accumulate on the ice crystals until, having developed sufficient weight, they fall as precipitation. The size of hailstones is a direct function of the severity and size of the storm. Significant damage does not result until the hailstones reach 1.5 inches in diameter, which occurs in less than half of all hailstorms.

The National Weather Service classifies a thunderstorm as severe if its winds reach or exceed 58 miles per hour, produces a tornado, or drops surface hail at least 0.75 inch in diameter. Compared with other atmospheric hazards (such as tropical cyclones and winter low pressure systems), individual thunderstorms affect relatively small geographic areas. The average thunderstorm system is approximately 15 miles in diameter, covers 75 square miles, and lasts less than 30 minutes at a single location. However, weather monitoring reports indicate that coherent thunderstorm systems can travel intact for distances in excess of 600 miles.

Previous Significant Hazard Occurrences

According to National Climatic Data Center (NCDC), Florence County has experienced 49 significant lightning storm and/or thunderstorm events (including hail, thunderstorm winds, strong winds, and high winds) in the last 17 years from January 1, 1995 to July 31, 2011. Some of these reported occurrences may not have been specific to Florence County, and may have been recorded for a larger regional area.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, Florence County experiences approximately three significant lightning storm and/or thunderstorm events per year.

Probability of Hazard Occurring in the Future

Based on the hazard frequency, Florence County is considered to have a **high** probability of experiencing a significant lightning storm and/or thunderstorm event in any given year.

Areas at Greatest Risk

Based on review of the historic patterns of lightning storms and thunderstorms, there are no specific areas that are a higher than average risk. The events are relatively uniform throughout Florence County. However, mobile home residents are often most vulnerable to death, injury, and property damage from lightning and thunderstorms. Therefore, mobile home parks in the planning area are the areas of greatest risk from this hazard.

Impacts from Hazard

Death and Injury

Two deaths and two injuries from lightning storms or thunderstorms have been reported for Florence County over the last 17 years from January 1, 1995 to July 31, 2011, according to NCDC data. These reported deaths and injuries may not have been specific to Florence County, and may have been recorded for a larger regional area.

Structures at Risk

Mobile homes are at a high risk to damage from thunderstorms. Garages are also frequently damaged by thunderstorms. Wind and water damage can result when windows are broken by flying debris or hail. Lightning can cause direct damage to structures (especially those without lightning protection systems), and can cause fires that damage trees and structures. In addition, hail can inflict severe damage to roofs, windows, and siding, depending on hailstone size and winds. Downed trees and limbs cause frequent damage to structures during lightning storms and thunderstorms.

Critical Facilities

Hospitals can see increases in patient load with sufficiently severe lightning storms and thunderstorms. Schools can sustain damage, and if they do not sustain damage, they often function as temporary shelters in the aftermath of severe thunderstorms. Police and fire departments often see an increased workload during and after lightning storms and/or severe thunderstorms. Emergency operations can be disrupted as lightning storms and thunderstorms affect radio and cellular communications, as antennas are a prime target for lightning.

Economic Impacts

Reported property damage from significant lightning storms and thunderstorm (including hail, thunderstorm winds, strong winds, and high winds) for Florence County has totaled approximately $1,296,000 over the last 17 years from January 1, 1995 to July 31, 2011 according to NCDC data. Some of this reported property damage may not have been specific to Florence County, and may have been recorded for a larger regional area.

Estimate of Potential Dollar Losses

Since mobile homes are the most vulnerable to lightning storms and thunderstorm, a “worst case scenario” for this hazard would involve the total destruction of all mobile homes in two mobile home parks in the county (Paragon Meadow and Woodlawn Court). In this “worst case scenario,” the total destruction of all buildings and facilities in the two mobile home parks (valued at approximately $193,700) would occur, along with an additional 50 percent of the

building value as the estimated value of building contents ($96,850), for total "worst case scenario" damages of $290,550.

Flooding

Description of Hazard

Floods happen when the water draining from a watershed, whether from rainfall or melting snow, exceeds the capacity of the river or stream channel to hold it. Water overflows onto the nearby low-lying lands (floodplains). In hilly and mountainous areas flooding is likely to be rapid, deep, and dangerous. In relatively flat floodplains, land may stay covered with shallow, slow moving water for days or even weeks.

Previous Significant Hazard Occurrences

According to National Climatic Data Center (NCDC), Florence County has experienced eight significant flooding events (including hail, thunderstorm winds, strong winds, and high winds) in the last 17 years from January 1, 1995 to July 31, 2011. Some of these reported occurrences may not have been specific to Florence County, and may have been recorded for a larger regional area.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, Florence County experiences approximately one significant flooding event every two years.

Probability of Hazard Occurring in the Future

FEMA uses the "base" flood as the basis for its regulatory requirements and flood insurance ratings. The hazards mitigation plan also uses the base flood for planning purposes. The base flood is the one percent chance flood, or the flood that has a one percent (one out of 100) chance of occurring in any given year. The one percent chance flood is commonly referred to as the "100-year flood."

Based on the hazard frequency, Florence County is considered to have a **medium** probability of sustaining a 100-year flood in any given year.

Areas at Greatest Risk

The areas at greatest risk from flooding include the "100-year floodplain" areas of Florence County. FEMA Flood Insurance Rate Maps also call this the Special Flood Hazard Area, or "A Zone." The base floodplains for the planning area are shown in Map 3.1. Properties that potentially lie within the floodplain and would be affected by the 100-year flood are shown in Map 3.4.

Impacts from Hazard

Death and Injury

No death or injuries from flooding has been reported for Florence County over the last 17 years from January 1, 1995 to July 31, 2011, according to NCDC data.

Structures at Risk

Analysis of the data used to produce Map 3.2 indicates that 914 buildings could potentially be impacted by the base flood in the planning area. All but 250 of the buildings are private or business owned. 98 of the properties are associated with power generation.

A review of FEMA flood insurance claims from January 1, 1978 through February 29, 2012, indicates that there was one claim in Florence County in the amount of 4,848.70 (NFIP, WR2C1040).

Repetitive Loss Properties

Repetitive loss structure is a term that is usually associated with the National Flood Insurance Program (NFIP) to describe a structure, covered by a contract of flood insurance under the NFIP, that has suffered flood damage on two or more occasions over a 10-year period ending on the date when a second claim is made, in which the cost to repair the flood damage, on average, equals or exceeds 25 percent of the market-value of the structure at the time of each flood loss event. For the Community Rating System (CRS) of the NFIP, a repetitive loss property is any property, which the NFIP has paid two or more flood claims of $1,000 or more in any, given 10-year period since 1978. A repetitive loss structure is important to the NFIP, since structures that flood frequently put a strain on the flood insurance fund. It should also be important to a community because residents' lives are disrupted and may be threatened by the continual flooding.

According to FEMA, there are no repetitive loss properties in Florence County.

Critical Facilities

Analysis of the GIS data used to produce Map 3.4, indicates that there are 36 critical facilities potentially located within 100-year floodplains in Florence County. Table 3.4 lists the critical facility types of those facilities potential within the 100-year floodplains.

Table 3.4: Critical Facility Types within the 100-Year Floodplains

Critical Facility Type	Count
Culvert	11
Bridge	7
Boat Launch	6
Dam	5
Power	3
Pump Station	2
Dry Hydrant	1
Primitive Campsite	1
Total	**36**

Economic Impacts

Property Damage

Reported property damage from flooding in Florence County has totaled approximately $16,002,000 over the last 17 years from January 1, 1995 to July 31, 2011 according to NCDC data. Some of this reported property damage may not have been specific to Florence County, and may have been recorded for a larger regional area.

Value of Structures at Risk

The value of all at-risk structures is estimated at $87,388,400. This information was obtained from Florence County database on improved values of real property. The parcel map and the 100-year floodplains were merged to determine at-risk structures in the planning area.

Transportation Route Interruptions

Loss of road access is a major flood impact that affects all residents and businesses, not just those who own property in the floodplain. Sometimes, the loss is temporary, such as during a flood. However, on some occasions, the loss of transportation lasts well after the disaster. When roads, bridges, or railroads are washed out by a flood, it can be weeks or months before they are repaired and reusable. A key evacuation and safety concern is when roads and bridges go under water. Generally, the larger the road, the more likely it will not flood, but this is not always the case.

Analysis of the GIS data used to produce Map 3.5, indicates that there are 12 culverts and four bridges that could potentially be underwater during a base flood. In addition to the sites shown on the map, there may be a number of additional bridges and culverts in areas that are not included in the mapped 100-year flood zones, such as areas located along small tributary streams.

Estimate of Potential Dollar Losses

The following is an estimate of potential dollar losses to vulnerable structures. “Vulnerable structures” are those structures located in the 100-year flood hazard area, as identified in Map 3.1. Since there is no reliable building height data for buildings in these flood hazard areas, a “worst case scenario” of total structural damage for buildings in all of the flood zones of the planning area was assumed in estimating potential dollar losses to vulnerable structures. Building height/elevation data should be collected in the future in order to better assess the risks of damage to structures because of the flood hazard.

It is estimated that over $87,388,400 in losses would occur with the 100-year flood in zones projected to be impacted by the 100-year flood in a “worst case scenario” of total structural damage for buildings in all of the flood zones in the county.

This information was obtained from a Florence County database on assessed values of real property. This only involves damage to structures themselves, and may not account for damage to personal property inside or adjacent to vulnerable structures.

In addition, there may be areas outside the 100-year flood zones that will flood during an event of that magnitude (or even of lesser magnitude); this planning process has no way of knowing the susceptibility of flooding outside of flood events that have been previously mapped by other governmental agencies.

Development in Areas Subject to Flooding

Development in floodplains, watersheds, and natural resource areas has been kept to a minimum in recent years through zoning. Florence County has a Shoreland and Wetland Ordinance, and a Floodplain Ordinance. These ordinances can be useful tools in keeping inappropriate development out of many flood hazard zones in the county.

NFIP Participation

Florence County has participated in the FEMA National Floodplain Insurance Program (NFIP) since May 1978 by adopting and enforcing floodplain management ordinances to reduce future flood damage. In exchange, the NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in the county.

Winter Storms

Description of Hazard

Winter storms can vary in size and strength, and can include heavy snow storms, blizzards, freezing rain, sleet, ice storms and blowing and drifting snow conditions. Extremely cold temperatures accompanied by strong winds can result in wind chills that cause bodily injury such as frostbite and death. Winter storms can occur as a single event or they can occur in combination, which can make an event more severe. For example, a moderate snowfall could create severe conditions if it were followed by a freezing rain and subsequent extremely cold temperatures. The aftermath of a winter storm can impact a community or region for weeks, and even months.

A variety of weather phenomena and conditions can occur during winter storms. For purposes of classification, 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.

Winter Storm – the occurrence of heavy snowfall accompanied by significant blowing snow, low wind chills, sleet or freezing rain.

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.

Much of the snowfall in Wisconsin occurs in small amounts of between one and three inches per occurrence. Heavy snowfalls (producing at least eight to ten inches of accumulation) happen on the average only five times per season. True blizzards are rare in Wisconsin, and are more likely to occur in northwestern Wisconsin than in southern portions of the state, even though heavy snowfalls are more frequent in southeastern Wisconsin. However, blizzard-like conditions often exist during heavy snow storms when gusty winds cause the severe blowing and drifting of snow.

Both ice and sleet storms can occur at any time throughout the winter season from October into April. Early- and late-season ice and sleet storms are generally restricted to northern Wisconsin. Otherwise, the majority of these storms occur in southern Wisconsin. In a typical winter season, there are three to five freezing rain events, and a major ice storm occurs on a frequency of about once every other year. If a half inch of rain freezes on trees and utility wires, extensive damage can occur, especially if accompanied by high winds that compound the effects of the added

weight of the ice. There are also between three and five instances of glazing (less than one quarter inch of ice) throughout Wisconsin during a normal winter.

Winter storms present a serious threat to the health and safety of affected citizens, and can result in significant damage to property. This can occur when the heavy snow or accumulated ice causes structural collapse of buildings, downs power lines, severely affects electrical power distribution, or cuts off people from assistance or services.

Winter storms in Wisconsin are caused by Canadian and Arctic cold fronts that push snow and ice deep into the interior of the United States.

Previous Significant Hazard Occurrences

According to National Climatic Data Center (NCDC), Florence County has experienced 67 significant winter storm events in the last 17 years from January 1, 1995 to July 31, 2011 (including snow, heavy snow, ice storms, freezing drizzle, freezing rain, blowing snow, glaze, and blizzards). Many of these hazard events may not have been specific to Florence County, and may have been recorded for a larger regional area.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, Florence County experiences approximately four significant winter storm events per year (including snow, heavy snow, ice storms, freezing drizzle, freezing rain, blowing snow, glaze, and blizzards).

Probability of Hazards Occurring in the Future

Based on the hazard frequency, Florence County is considered to have a **high** probability of experiencing a significant winter storm event in any given year.

Winter storms tend to be a regional phenomenon in that they affect much of northeastern Wisconsin on nearly all of the occasions in which they affect Florence County.

Areas at Greatest Risk

Winter storms have no defined hazard area within the planning area. Past events have been relatively uniform across the planning area or the larger regional area.

Impacts from Hazard

Death and Injury

No deaths or injuries have been reported from significant winter storm events for Florence County over the last 17 years from January 1, 1995 to July 31, 2011 according to NCDC data.

Structures at Risk

Occasionally, heavy snow or accumulated ice will cause structural collapse of buildings (particularly roofs), but most buildings are now constructed with low temperatures, snow loads and ice storms in mind. In addition, with the modern focus on energy conservation, buildings are much better insulated than they were in the past. Therefore, for the most part, winter storms do not have a major impact on buildings in the planning area.

The major impacts of winter storms on infrastructure are to utilities and roads. Power lines and tree limbs can be coated with heavy ice in some winter storms, resulting in disrupted power and telephone service, often for days. Cable and satellite television services can also be negatively impacted in certain winter storm events. In the case of transportation, even small accumulations

of ice can be extremely dangerous to motorists and pedestrians. Bridges and overpasses are particularly dangerous because they freeze before other surfaces.

Critical Facilities

Street and road crews have an increased burden of snow removal (and salting in the case of ice storms) during and after winter storms. In some cases, winter storms can be so severe that these crews have to be called off the road for a period of time.

Hospitals and clinics can treat additional patients for frostbite, pedestrian and vehicular accident injuries, and conditions resulting from the shoveling of heavy snow during and following winter storms. Sometimes, these very hospitals and clinics have difficulty getting their own staff to report to work because of the storm, which increases the work load for the staff who is already there (double shifts, etc.).

Police department staff needs to respond to more accidents. Utility and telephone companies need to respond to downed electrical and telephone lines, especially in the case of ice storms. Rescue services can receive more calls because of accidents or health related circumstances. Schools may need to have early dismissal or cancel classes altogether. Shelters may take in additional homeless persons during winter storm events as well, although this has been less of an issue in Florence than it has been in larger cities.

Economic Impacts

Loss of power often means that businesses and manufacturing concerns must close down. Loss of access due to snow or ice covered roads can have a similar effect, especially when trucks cannot travel on major thoroughfares to make “just in time” deliveries to business and industry in the planning area. The effects are particularly difficult when the storm is widespread.

Property Damage

No property damages have been reported from winter storm events for Florence County over the last 17 years from January 1, 1995 to July 31, 2011 according to NCDC data.

Estimate of Potential Dollar Losses

An estimate of potential dollar losses cannot be calculated for winter storm events, since no vulnerable structures have been identified. Based on previous damages reported by the NCDC, property damages from winter storms has been minimal over the past 17 years.

Tornadoes

Description of Hazard

A tornado is a relatively short-lived storm comprised 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 tornadoes may have winds in excess of 300 miles per hour.

A tornado path averages four miles, but may reach up to 300 miles in length. Widths average 300 to 400 yards, but severe tornadoes have cut swaths a mile or more in width, or have formed groups of two or three funnels traveling together. On average, tornadoes move between 25 and 45 miles per hour, but speeds over land of up to 70 miles per hour have been recorded. Tornadoes rarely last more than a couple of minutes in a single location or more than 15 to 20

minutes in a ten mile area, but their short periods of existence do not limit their devastation of an area.

Table 3.5 shows the Fujita Scale, which is recognized as the acceptable tornado magnitude measurement rating.

Table 3.5: Tornado Magnitude Measurement, Fujita Scale

F-Scale	Wind Speed (Miles per Hour)	Character of Damage	Relative Frequency (Percent)
F0 (Weak)	40 - 72	Some damage to chimneys, TV antennas, roof shingles, trees and windows.	29
F1 (Weak)	73 - 112	Automobiles overturned, carports destroyed, trees uprooted.	40
F2 (Strong)	113 - 157	Roofs blown off homes, sheds and outbuildings demolished, mobile homes overturned.	24
F3 (Strong)	158 - 206	Exterior walls and roofs blown off homes. Metal buildings collapsed or are severely damaged. Forests and farmland flattened.	6
F4 (Violent)	207 - 260	Few walls, if any, standing in well-built homes. Large steel and concrete missiles thrown far distances.	2
F5 (Violent)	261 - 318	Homes leveled, with all debris removed. Schools, motels and other larger structures have considerable damage, with exterior walls and roofs gone. Top stories demolished.	<1

Source: National Weather Service (http://www.erh.noaa.gov/er/cae/svrwx/tornado.htm), 2010.

The destructive power of the tornado results primarily from its high wind velocities and sudden changes in pressure. Wind and pressure differentials probably account for 90 percent of the damage caused by tornadoes. Since tornadoes are generally associated with severe storm systems, they are usually accompanied by hail, torrential rain, and intense lightning. Depending on their intensity, tornadoes can uproot trees, down power lines and destroy buildings. Flying debris can cause serious injury and death.

On the basis of 40 years of tornado history and more than 100 years of hurricane history, the United States has been divided into four zones that geographically reflect the number and strength of extreme wind storms. The zone which includes most of the southern two-thirds of Wisconsin (known as Zone IV) has experienced the most and the strongest tornado activity that has affected the entire U.S., with wind speeds of up to 250 miles per hour being recorded at some point. This zone includes the entire county for this Natural Hazards Mitigation Plan.

Wisconsin lies along the northern edge of the nation's maximum frequency belt for tornadoes (commonly known as "tornado alley"), which extends northeastward from Oklahoma into Iowa and then across to Michigan and Ohio. Generally, the southern and western portions of Wisconsin have a higher frequency of tornadoes; however, every county in Wisconsin has had tornadoes and is considered to be susceptible to a tornado disaster. Tornadoes have occurred in Wisconsin in every month except February.

Wisconsin's tornado season runs from the beginning of April through September. The most severe tornadoes statewide typically occur during the months of April, May, and June. Many tornadoes strike in late afternoon or early evening. However, tornadoes have occurred during

other times of the day. Personal property damage, deaths, and injuries have and will continue to occur due to tornado events in Wisconsin.

Previous Significant Hazard Occurrences

According to National Climatic Data Center (NCDC), Florence County has experienced two significant tornado events in the last 17 years from January 1, 1995 to July 31, 2011. One was an F1 in Spread Eagle on September 30, 2002 and the other was an F0 in Long Lake on April 10, 2011.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, Florence County experiences approximately one significant tornado event every eight years.

Probability of Hazard Occurring in the Future

Based on the hazard frequency, Florence County is considered to have a **low** probability of experiencing a tornado event in any given year.

Areas at Greatest Risk

Tornadoes have no defined hazard area within the county. Past events have been relatively uniform across the planning area; however, mobile home residents are often most vulnerable to death, injury, and property damage from tornadoes. Therefore, mobile home parks in the planning area are the areas of greatest risk from this hazard.

Impacts from Hazard

Death and Injury

No deaths or injuries have been reported from significant tornado events for Florence County over the last 17 years from January 1, 1995 to July 31, 2011, according to NCDC data.

Structures at Risk

Although tornadoes strike at random, making all buildings vulnerable, there are three types of structures that are most likely to suffer damage. These structure types include mobile homes, homes on crawlspaces (because they are more susceptible to lift), and buildings with large spans (such as airplane hangars, gymnasiums and factories).

Structures within the direct path of a tornado vortex are often reduced to rubble. However, structures adjacent to the path of the tornado are often severely damaged by high winds flowing into the tornado vortex (these winds are known as inflow winds). It is here, adjacent to the tornado's path, where the building type and construction techniques are critical to the structure's survival.

Similar to severe thunderstorms, street signs often face disrepair after tornadoes, and debris often litter streets and highways following a tornado, requiring clean-up. Downed trees caused by tornadoes can be problematic in terms of impacting infrastructure (transportation) as well as critical facilities.

Critical Facilities

Hospitals can see increases in patient load following tornadoes. Schools can sustain damage, and if they do not sustain damage, they often function as temporary shelters in the aftermath of tornadoes. Police and fire departments often see an increased workload during and after tornadoes. Powerlines and communication towers are at risk on being blown down.

Any critical facility in the planning area is capable of being hit. However, schools are a main concern for two reasons: (1) they have large numbers of people present, either during school or as a storm shelter; and (2) they have large span areas, such as gyms and theaters. At this time, we do not know which critical facilities in the planning area may have large span structures.

Economic Impacts

The major impact of a tornado on the local economy is damage to businesses and infrastructure. A heavily damaged business, especially one that was barely making a profit, often has to be closed.

Infrastructure damage is usually limited to above ground utilities, such as power lines. Damage to utility lines can usually be repaired or replaced relatively quickly. Damage to roads and to railroads is also localized; if these facilities cannot be repaired promptly, alternate transportation routes are usually available.

Public expenditures include search and rescue, shelters and emergency protection measures. The largest public expenses are for repairs to public facilities and clean up and disposal of debris. Most public facilities are insured, so the economic impact on the local treasury is likely to be small. Clean up and disposal can be a larger problem, especially if there is limited landfill capacity near the damage site.

Many of the economic impacts identified under lightning storms and thunderstorms can also apply to tornadoes.

Property Damage

Reported property damage from significant tornadoes for Florence County has totaled approximately $65,000 over the last 17 years from January 1, 1995 to July 31, 2011 according to NCDC data.

Estimate of Potential Dollar Losses

Since mobile homes are the most vulnerable to tornadoes, a “worst case scenario” for this hazard would involve the total destruction of all mobile homes in two mobile home parks in the county (Paragon Meadow and Woodlawn Court). In this “worst case scenario,” the total destruction of all buildings and facilities in the two mobile home parks (valued at approximately $193,700) would occur, along with an additional 50 percent of the building value as the estimated value of building contents ($96,850), for total “worst case scenario” damages of $290,550.

Drought

Description of Hazard

A drought is an extended period of unusually dry weather, which may be accompanied by extreme heat. There are basically two types of drought in Wisconsin: agricultural drought and hydrologic drought. 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 as well as the height of the groundwater table. These two types of drought may, but do not necessarily, occur at the same time. The severity of a drought depends on a number of factors including duration, intensity, geographic extent, and regional water supply demands by humans and vegetation.

In general, droughts have the greatest impact on agriculture. Small droughts of limited duration can significantly reduce crop growth and yields. More substantial drought events can decimate

croplands and can result in a total loss. Droughts can also greatly increase the risk of forest fires and wildfires because of extreme dryness. In addition, the loss of vegetation in the absence of sufficient water can result in flooding, even from average rainfall, following drought conditions.

Previous Significant Hazard Occurrences

According to National Climatic Data Center (NCDC), Florence County has experienced 19 significant drought events in the last 17 years from January 1, 1995 to July 31, 2011. Many of these hazard events may not have been specific to Florence County, and may have been recorded for a larger regional area.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, Florence County experiences approximately one significant drought event every year.

Probability of Hazards Occurring in the Future

The future incidence of drought is highly unpredictable, as its occurrence is based on weather patterns, making it difficult to determine probability with any accuracy. Droughts tend to be a regional phenomenon in that they affect much of northeastern Wisconsin on nearly all of the occasions in which they affect Florence County. However, based strictly on the hazard frequency, Florence County is considered to have a **medium** probability of experiencing a significant drought event in any given year.

Areas at Greatest Risk

Droughts have no defined hazard area within the planning area. Past events have been relatively uniform across the planning area. However, agricultural croplands are most vulnerable to losses from drought events. Florence County contains 14,989 acres of agricultural lands (based on land use data shown in Table 2.7).

Impacts from Hazard

Death and Injury

No deaths or injuries have been reported from significant drought events for Florence County over the last 17 years from January 1, 1995 to July 31, 2011, according to NCDC data.

Structures at Risk

There are no direct impacts to buildings from a drought event. In terms of infrastructure, droughts have the most impact on municipal water supplies. Droughts will likely cause a shortage of water for human, industrial, and agricultural consumption, as wells and other water reserves may dry up. Also, water quality is generally an issue before and after a drought event, which may place an additional burden on wastewater treatment facilities.

Critical Facilities

In drought conditions, water shortages may occur and affect the amount of water available for human consumption. Hospitals may be called upon to treat individuals suffering from dehydration as a result. Parks that provide recreational water facilities are likely to experience increased usage during times of drought as well.

There are few other direct impacts on critical facilities as a result of drought conditions. However, droughts can trigger other natural and man-made hazards, such as wildfires and post-drought flooding, which can have an impact on these facilities.

Economic Impacts

Wisconsin is most susceptible to agricultural drought. Even small droughts of limited duration can significantly reduce crop growth and yields, which adversely affects farm income. Substantial drought events can lead to complete crop decimation, resulting in total loss. During severe drought periods farmers are often forced to seek financial assistance from the government to supplement lost income.

Livestock can also be adversely affected by droughts. Lack of water can lead to animal deaths. In addition, as drought conditions are often accompanied by periods of prolonged sunshine and high temperatures, animals are at risk to overexposure and heatstroke. Death of livestock can also lead to substantial loss of income for farmers.

Drought can also affect local commercial and industrial businesses. During times of severe drought, limitations are often placed on water usage. These limitations could have a negative impact on businesses such as car washes and landscapers as they will likely be unable to provide services to their customers. It is also likely that areas depending on tourism will see fewer people traveling to their area in times of drought. Industries which utilize large amounts of water in processing materials may also be subject to these limitations, which could potentially reduce their production capabilities.

Property Damage

No property damages have been reported from drought events for Florence County over the last 17 years from January 1, 1995 to July 31, 2011 according to NCDC data.

Estimate of Potential Dollar Losses

Agricultural croplands are most vulnerable to losses from drought events. A “worst case scenario” would involve the total destruction of all 14,989 acres of agricultural lands in the county (based on 2009 land use data, shown in Table 2.7). The USDA conducts a Census of Agriculture every 5 years based on a sample of farms to estimate the market value of agricultural land and buildings. Based on the 2007 Census of Agriculture, the average value per acre of agricultural land in Florence County was $2,363. Therefore, it can be estimated that if this “worst case scenario” were to occur, the total destruction of all agricultural land in Florence County would cause a loss of $ 35,419,007.

Wildland Fires

Description of Hazard

A wildland fire is any instance of unplanned burning in brush, marshes, grasslands, or field lands. Typical causes of these fires are lightning, human carelessness, or arson. The county has large expanses of forested areas that could be susceptible to wildland fires. Wildland fires can occur at any time of the year and during any time of the day. The primary factors that can contribute to the start of a wildland fire are land use, vegetation, amount of combustible materials present, and weather conditions such as wind, low humidity, and lack of precipitation. Generally, fires are more likely when vegetation is dry from a winter with little snow or a spring and summer with sparse rainfall. As fires remain a possibility, fire stations in Florence County are prepared to respond in accordance with established response procedures, while local zoning setback controls and building codes provide additional mitigation measures.

Previous Significant Hazard Occurrences

According to the Wisconsin Department of Resources (WDNR), Florence County has experienced 190 wildland fire events of various sizes (with the average being one acre) in the last 17 years from January 1, 1995 to July 31, 2011.

Hazard Frequency

Based on previous hazard occurrences as reported by the WDNR, Florence County experiences approximately eleven wildland fire events every year.

Probability of Hazard Occurring in the Future

According to the WDNR, Florence County lies within an "intensive protection area." Intensive protection areas are the most heavily forested and contain the most fire hazards and risk in the state. They have more DNR fire suppression resources and ranger stations. Fire detection is accomplished with fire towers, aerial detection, and citizen reporting. The most restrictive debris burning laws are in effect, which are regulated by the DNR and require a burning permit for debris burning whenever the ground is not snow covered throughout the year. Overall, the probability of a naturally occurring wildland fire is **high** for the county.

Areas at Greatest Risk

Map 3.6 shows areas of greatest fire risk. These areas were delineated through a collaborative process by the Florence County Forester, the Wisconsin DNR Forest Manager, and the USDA Forest Service Manager during development of the initial hazard mitigation plan. The assessed risk areas were determined based on the concentration of firs, as well as the amount of urban development that has taken place in the area. Other areas vulnerable to fire include woodlands and grasslands. Florence County contains 274,907 acres of woodlands (based on 2009 land use data, shown in Table 2.7).

Impacts from Hazard

Death and Injury

No data on deaths or injuries is available for significant wildland fire events for Florence County over the last 17 years from January 1, 1995 to July 31, 2011.

Structures at Risk

Homes and other structures located within the Wildland Urban Interface (WUI) are at high risk to damage from wildland fires. The WUI refers to the zone of transition between forestland/wildland and human development. The wildland fire risk increases in the WUI because buildings are typically surrounded by fuel sources such as unmowed grass, unraked leaves, flammable vegetation, and dead branches. Structures constructed from materials that may melt or ignite when exposed to a fire present a high risk. In general, the potential for property damage from wildland fires increases as more development occurs on wooded lands.

Residential housing is typically the most dominant type of structure found within the WUI. Though many parts of a home can be affected by wildfire damage, the roof is the most exposed portion of the building and is more at risk from flying embers. Attics may also be affected by airborne embers that enter through open eaves and vents. Structures attached to homes, such as decks, garages, and fences, can also carry a fire into a home.

Critical Facilities

Police, fire, and emergency response personnel are greatly affected by wildland fires – suffering increased workloads during and after events. Hospitals can see increases in patient load resulting from burn related injuries and individuals suffering from the effects of smoke inhalation. Schools, if not affected by a fire, could potentially be used as temporary shelter for individuals that can not return to their homes. All critical facilities located in the path of a wildland fire can be affected structurally and functionally if evacuation is deemed necessary.

Economic Impacts

Fires can have an extensive impact on the economy of an affected area by causing thousands of dollars in damages to citizens through loss of private property. Major direct costs associated with wildland fires are incurred by the salvage and removal of downed timber and debris; restoration of the burned area; and reconstruction. Wildland fires can also have a significant impact on local agriculture. Fires will strip the land of vegetation as well as harm the soil, waterways, and the land itself. Soil exposed to intense heat may lose its capability to absorb moisture and support life.

Property Damage

No property damage data is available for wildland fire events for Florence County over the last 17 years from January 1, 1995 to July 31, 2011.

Estimate of Potential Dollar Losses

Based on the land use data of the areas at greatest fire risk overlaid with parcel data, there are approximately 1,261 parcels potentially at risk throughout Florence County from wildland fires. The value of all structures on the at-risk parcels in Florence County is estimated at $27,241,900. This information was obtained from Florence County databases on improved values of real property.

Extreme Cold

Description of Hazard

Dangerously cold conditions can be the result of extremely cold temperatures, or the combination of cold temperatures and high winds. The combination of cold temperatures and wind creates a perceived temperature known as “wind chill.” Whenever temperatures drop well below normal and as wind speed increases, heat can leave your body more rapidly. 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. This weather related condition may lead to serious health problems. Extreme cold is a dangerous situation that can cause health emergencies for susceptible people, such as those without shelter, those who are stranded outdoors or in a disabled car, or those who live in a home that is poorly insulated or without heat.

Previous Significant Hazard Occurrences

According to National Climatic Data Center (NCDC), Florence County has experienced 10 significant extreme cold events in the last 17 years from January 1, 1995 to July 31, 2011. Many of these hazard events may not have been specific to Florence County, and may have been recorded for a larger regional area.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, Florence County experiences approximately one significant extreme cold event per year.

Probability of Hazard Occurring in the Future

Based on the hazard frequency, Florence County is considered to have a **medium** probability of experiencing a significant extreme cold event in any given year.

Areas at Greatest Risk

Extreme cold events have no defined hazard area within the planning area. Past events have been relatively uniform across the planning area.

Impacts from Hazard

Death and Injury

Four deaths and 21 injuries have been reported from significant extreme cold events for Florence County over the last 17 years from January 1, 1995 to July 31, 2011 according to NCDC data. A number of these reported death and injuries may not have been specific to Florence County, and may have been recorded for a larger regional area.

Structures at Risk

Extreme cold conditions can result in burst water pipes. In addition, it is more expensive to heat homes and other buildings during extreme cold events. Sometimes, residents of the planning area might consider use of space heaters during an extreme cold event. However, use of space heaters comes with its own risks, including a higher probability of fire to a structure if used improperly.

Public domain water pipes can burst in extreme cold conditions, which can also ruin the street above the water pipes. In addition, damage to fiber optic cables can occur during extreme cold episodes, which can negatively affect commerce and hospitals in the planning area.

Critical Facilities

All buildings involving critical facilities will have greater heating expenses during an extreme cold event. Increased demand will also affect Wisconsin Public Service, the local natural gas energy utility serving the planning area. Hospitals and clinics may be asked to treat patients exposed to the extreme cold conditions. Emergency shelters may take in additional individuals during the extreme cold event. Area schools may cancel classes or call for early dismissal in extreme cold events. The Florence Water Utility may need to repair damaged water mains caused by the extreme cold. Local fire departments and rescue services may also deal with direct or indirect consequences of the extreme cold event.

Economic Impacts

Economic impacts of extreme cold events can include lack of motivation to participate in the local economy unless absolutely necessary during the event. Utility bills following the event will also be higher, which will give the consumer less ability to purchase discretionary goods about a month after the event (unless that consumer is on a monthly even payment plan with the local utility). If area school districts need to call off school early on extremely cold days, there may be expenses involved with early busing and with paying staff for a full day while only having the benefit of a partial day of instruction. Non-profit organizations will incur expenses in the

provision of emergency shelters. The private sector incurs economic losses and production decreases during an extreme cold event.

Property Damage

No property damages have been reported from extreme cold events for Florence County over the last 17 years from January 1, 1995 to July 31, 2011 according to NCDC data.

Estimate of Potential Dollar Losses

An estimate of potential dollar losses cannot be calculated for extreme cold events, since no vulnerable structures have been identified. Based on previous damages reported by the NCDC, property damages from extreme cold has been minimal over the past 17 years.

Extreme Heat

Description of Hazard

Extreme heat (often referred to as a heat wave) is primarily a public health concern. During extended periods of very high temperatures or high temperatures with high humidity, individuals can suffer from several ailments, including heat exhaustion and heat stroke. Heat stroke is a particularly life-threatening condition that requires immediate medical attention. In addition to posing a public health hazard, periods of excessive heat usually result in high electrical consumption, which can cause power outages and brown outs. A by-product of this hazard in Florence County often involves periods of high heat with loss of power. The elderly, disabled, and other vulnerable populations are especially susceptible to extreme heat.

Previous Significant Hazard Occurrences

According to National Climatic Data Center (NCDC), Florence County has experienced four significant extreme heat events in the last 17 years from January 1, 1995 to July 31, 2011. Many of these hazard events may not have been specific to Florence County, and may have been recorded for a larger regional area.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, Florence County experiences approximately one significant extreme heat event every four years.

Probability of Hazard Occurring in the Future

Based on the hazard frequency, Florence County is considered to have a **low** probability of experiencing a significant extreme heat event in any given year.

Extreme heat episodes tend to be a regional phenomenon in that they affect much of northeastern Wisconsin on nearly all of the occasions in which they affect the planning area.

Areas at Greatest Risk

Extreme heat events have no defined hazard area within the planning area. Past events have been relatively uniform across the planning area.

Impacts from Hazard

Death and Injury

62 deaths and no injuries have been reported from significant extreme heat events for Florence County over the last 17 years from January 1, 1995 to July 31, 2011 according to NCDC data. A number of these reported death and injuries were not specific to Florence County, but were

recorded for a larger regional area. Specifically, 57 of the deaths occurred during one statewide event that occurred on July 13, 1995 and impacted all of Wisconsin.

Structures at Risk

While there are no direct impacts on buildings, periods of excessive heat can impact the ability of buildings to be comfortable and safe for human habitation. Periods of excessive heat usually result in high electrical consumption for air conditioning, which can cause power outages and brown outs.

There are few impacts of extreme heat on publicly owned infrastructure. One impact that extreme heat can have on publicly owned infrastructure involves the buckling of certain streets and highways, which need to be repaired immediately.

Critical Facilities

Utilities may see peak demand for electricity during extreme heat episodes. There have been fears that an extreme heat episode could cause the power grid to collapse in a manner similar to what was experienced in the northeastern United States and in eastern Canada in the summer of 2003. Hospitals and clinics will like experience an increased demand due to heat related illnesses during an extreme heat episode. In some cases, rescue services will experience an increased demand due to these same heat related illnesses. If school is in session during the extreme heat episode, area school districts may dismiss classes early in the day, at least in older schools without air conditioning. Emergency shelters will experience higher demand during the extreme heat episode, with some emergency shelters being set up specifically in response to the episode. Finally, there is likely to be increased water demand during the episode, both for human consumption as well as for lawn watering in the event that the extreme heat episode includes a drought.

Economic Impacts

Economic impacts of an extreme heat episode which can affect private businesses and consumers include higher electrical consumption and increased demands for medical treatment. Local governments may need to incur expenses when repairing streets and highways in the planning area that have been damaged due to buckling. If area school districts need to call off school early on extreme heat days, there may be expenses involved with early busing and with paying staff for a full day while only having the benefit of a partial day of instruction. Non-profit organizations will incur expenses in the provision of emergency shelters. The Florence Water Utility will incur the expenses involved with additional demand for water during extreme heat episodes, and these expenses will be passed on to area consumers.

One less tangible economic impact of extreme heat involves lower productivity from persons who must work outside or in less than ideal conditions. In addition, people will be less motivated to shop at local businesses and may defer non-essential activities until the heat episode is over, negatively impacting the local economy. Extreme heat can negatively impact agriculture in the surrounding area when combined with drought.

<u>Property Damage</u>

No property damages have been reported from extreme heat events for Florence County over the last 17 years from January 1, 1995 to July 31, 2011 according to NCDC data.

Estimate of Potential Dollar Losses

An estimate of potential dollar losses cannot be calculated for extreme heat events, since no vulnerable structures have been identified. Based on previous damages reported by the NCDC, property damages from extreme heat has been minimal over the past 17 years.

Fog

Description of Hazard

Fog is a collection of liquid water droplets or ice crystals suspended in the air at or near the ground. While fog is a type of stratus cloud, the term "fog" is typically distinguished from the more generic term "cloud" in that fog is low-lying, and the moisture in the fog is often generated locally (such as from a nearby body of water, like a lake or stream, or from nearby moist ground or marshes). Fog is distinguished from mist because it has greater density and lower visibility than mist.

Fog is a hazard mainly because of reduced visibility. Airport delays, automobile accidents, ship wrecks, plane crashes, and many other problems are frequently caused by fog. The National Weather Service forecasts fog and issues dense fog advisories when visibility is decreased to less than one quarter of a mile. These advisories alert travelers to potentially dangerous conditions. Traveling in fog requires reduced speed and careful navigation. At night, traveling in fog is especially dangerous because darkness combines with fog to reduce visibility even more. In addition, light from automobile headlights and other navigational lights is scattered off the water droplets of the fog, limiting sight to only a short distance. In response to this problem, automobiles are often equipped with specially designed lights that illuminate a usually dry (and therefore clear) area just above the roadway surface.

Previous Significant Hazard Occurrences

According to National Climatic Data Center (NCDC), Florence County has experienced seven significant fog events in the last 17 years from January 1, 1995 to July 31, 2011. Many of these hazard events may not have been specific to Florence County, and may have been recorded for a larger regional area.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, Florence County experiences approximately one significant fog event every two years.

Probability of Hazard Occurring in the Future

Based on the hazard frequency, Florence County is considered to have a **low** probability of experiencing a significant fog event in any given year.

Areas at Greatest Risk

Portions of the planning area along waterways, wetlands, and low lying areas can be at greater risk for fog under certain meteorological conditions. However, no portion of the planning area is free of the possibility of experiencing fog events. Fog events can often be a regional phenomenon in that they affect much of the northeastern Wisconsin on many of the occasions in which they affect Florence County.

Impacts from Hazard

Death and Injury

No deaths or injuries have been reported from significant fog events for Florence County over the last 17 years from January 1, 1995 to July 31, 2011, according to NCDC data.

Structures at Risk

There are no direct impacts to buildings from a fog event. The main structures impacted are those associated with infrastructure during a fog event from vehicle accidents. This can result in rescue services helping injured drivers and passengers, clean-up of the affected portions of the street and highway network, and temporary rerouting of motorists after some incidents. In addition, motorists often must travel at slower speeds when fog is in the area, which adds travel time and can lead to vehicular congestion in cases where it would normally not occur.

In fog events during the winter, icing can sometimes be a problem. Power lines and tree limbs can be coated with heavy ice in some winter fog events, resulting in disrupted power and telephone service. In addition, in fog events during the winter, even small accumulations of ice can be extremely dangerous to motorists and pedestrians. Bridges and overpasses are particularly dangerous because they freeze before other surfaces.

Critical Facilities

Law enforcement will be asked to respond to an increased number of accidents during many fog events. Hospitals and clinics may be asked to treat individuals injured in accidents that likely would have not occurred in the absence of the fog event. Rescue services may be called to respond to accidents that resulted from the fog event. The starting time for schools may be delayed by the fog event for the safety of students and all involved. Courtrooms may see increased adjudication of traffic law violations resulting from accidents occurring during the fog event. Municipal public works and county highway departments may need to perform emergency repairs to streets and highways in worst-case scenario accidents resulting from the fog event. Airports can experience flight delays and cancellations during certain fog events.

Economic Impacts

There are economic costs in the accidents caused by fog events. Vehicular accidents almost always involve property damage, and some vehicular accidents during fog events involve injuries and/or fatalities. All of these consequences to vehicular accidents have costs both to the individual involved and to society. Fog events can also cost businesses in lost time involving late workers and/or late shipments. If area school districts need to delay school during a fog event, there may be expenses involved with delayed busing and with paying staff for a full day while only having the benefit of a partial day of instruction. Airline delays due to fog have economic impacts for travelers as well as for commerce. There are additional economic impacts if the fog event occurs in conjunction with the icing of power lines in cases where the power lines are damaged and residents lose power.

<u>Property Damage</u>

No property damages have been reported from fog events for Florence County over the last 17 years from January 1, 1995 to July 31, 2011, according to NCDC data.

Estimate of Potential Dollar Losses

An estimate of potential dollar losses cannot be calculated for fog events, since no vulnerable structures have been identified. Based on previous damages reported by the NCDC, property damages from fog have been minimal over the past 17 years.

Dam Failures

Description of Hazard

A "dam" is an artificial barrier, together with its appurtenant works, constructed in or across a waterway for the primary purpose of impounding or diverting water. Dam failure can occur for a number of reasons, including overtopping caused by floods that exceed the capacity of the dam, deliberate acts of sabotage, structural failure of materials used in dam construction, movement and/or failure of the foundation supporting the dam, settlement and cracking of concrete or embankment dams, piping and internal erosion of soil in embankment dams, or inadequate maintenance and upkeep. In extreme cases, dam failure can occur with little warning and can result in the loss of life and significant property damage in areas downstream of the dam. Other failures and breaches can take much longer to occur.

There are approximately 3,800 dams in existence in the State of Wisconsin. Since the late 19th century, more than 700 dams have been built, then washed out or removed. Since 1967, approximately 100 dams have been removed.

Almost 60 percent of the dams in Wisconsin are owned by a former company or private individual, 9 percent by the State of Wisconsin, 17 percent by a municipality such as a town or county government, and 14 percent by other ownership types.

The federal government has jurisdiction over dams in Wisconsin that produce hydroelectricity - approximately 5 percent or nearly 200 dams. The Wisconsin Department of Natural Resources regulates the rest of the dams.

A dam with a structural height of over 6 feet and impounding 50 acre-feet or more, or having a structural height of 25 feet or more and impounding more than 15 acre-feet is classified as a large dam. There are approximately 1,160 large dams in the State of Wisconsin. (Source: WDNR; http://dnr.wi.gov/topic/dams/damfacts.html).

Dams are classified as Low, Significant, or High Hazard. A dam is assigned a rating of High Hazard when its failure would put lives at risk. The hazard rating is not based on the physical attributes, quality, or strength of the dam itself, but rather the potential for loss of life or property damage should the dam fail.

The WDNR regulates the permitting of new dam construction, repairs, reconstruction, ownership transfers, water levels, and abandonment. Many dams in the state have been in place since the late 1800s, and a great deal of time must be invested in inspecting aging dams and making sure they comply with public safety requirements, and environmental regulations.

Previous Significant Hazard Occurrences

No record has been found of any significant dam failures in Florence County in the last 17 years from January 1, 1995 to July 31, 2011.

Hazard Frequency

No record has been found of any significant dam failures in Florence County in the last 17 years from January 1, 1995 to July 31, 2011 on which to base a hazard frequency.

Probability of Hazard Occurring in the Future

Based on the hazard frequency information available, Florence County is considered to have a **low** probability of experiencing a dam failure event in any given year.

Areas at Greatest Risk

As identified by the WDNR, there are a total of 30 dams in Florence County. Of these, nine are classified by the WDNR as large dams, meaning they have a structural height of over six feet and impound 50 acre-feet or more. The rest of the dams located in the county are regarded as small dams. Map 3.7 displays the small and large dams in the county.

The WDNR assigns hazard ratings to large dams within the state based on existing land use and land use controls (zoning) downstream of the dam. A high hazard rating indicates that a failure would likely result in loss of life. A significant hazard rating indicates that a failure could result in significant property damage. A low hazard rating is given when a failure would result in only minimal property damage and loss of life is unlikely.

In Florence County there are two dams that have a high hazard rating and one with a significant hazard rating. The Brule and Twin Falls dams are large dams with “high” hazard ratings, and the Kingsford dam is a large dam with a “significant” hazard ratings. Additionally, the Michigamme Falls dam, located in Iron County, Michigan poses a significant risk to Florence County. These four dams are owned by WE Energies.

The areas of greatest risk from dam failure are those areas within the hydraulic shadow of dam of these three dams. The hydraulic shadow of the dam is the area of land downstream from a dam that would be inundated by water upon failure of the dam during the regional flood (100-year flood).

WE Energies has prepared a Short Form Emergency Action Plan that outlines the action plan for the evacuation and/or notification of affected private partied in the event of flooding or failure of a dam. Each plan assesses a “worst-case” scenario for dam failure at the time of the normal flow or sunny day failure, failure during a 100-year flood, and a failure during the flood designated as the Inflow Design Flood (IDF) - the flood flow above which the incremental increase in water surface elevation due to the failure of a dam is no longer considered to present an unacceptable threat to downstream life and property. These assessments include the identification of all dams located upstream and downstream of the dam, identification of communities located downstream of the dam, coordination of responsibilities under the Emergency Action Plan, and evacuation maps. Copies of the plans are available at the office of the Florence County Emergency Management Director and the Florence County Sheriff’s office.

Two additional dams, which are outside the county, would impact the county include the Way Dam in Crystal Falls, Michigan; and PV Falls in Randall, Michigan.

Impacts from Hazard

Structures at Risk

Florence County would be affected if one or more of the electric power generating dams in the county was to fail. Though electric power generating dams within the area are the greatest

concern, consistent maintenance keeps them in good shape; therefore, the probability of dam failure is low. There has never been a problem at any of the major electric power generating dams and there is no history of dam failure for the three dams that are rated as “High” or “Significant” within the county. The risk of loss of life or significant property damaged is considered to be very low.

Analysis of Shadow of the Dam data obtained from WE Energies indicates that 220 structures (as determined by properties with improved values from county parcel data) could potentially be impacted by the dam failure flooding in the planning area.

Florence County also has a few recreational dams. If any of the recreational type dams failed, the runoff would hardly be noticed downstream. Recreational dams have developed leaks on occasion but have not caused any flooding problems. However, undetected failure of Halls Creek dam could cause overtopping of Pine Dam.

Critical Facilities

Critical facilities that could be impacted by dam failure flooding are those located within the hydraulic shadow of the dam area. There are five critical facilities within these areas in Florence County; however, they are all water-dependent facilities. They include two bridges, a boat ramp, a dam, and a pump station.

Economic Impacts

Floods cause problems for businesses and industry. Businesses disrupted by floods may have to be closed. Public expenditures on flood fighting, sandbags, fire department calls, clean up, and on repairs to damaged public property affect all residents of the planning area, not just those in the shadow of the dam.

Estimate of Potential Dollar Losses

There are 220 structures that would be impacted by dam failure at the four high and significant risk dams in the county. “Vulnerable structures” are those structures within the hydraulic shadow of the dam. Since there is no reliable building height data for all buildings in Florence County, a “worst case scenario” of total structural damage for buildings in all of the hydraulic shadow of the dam areas was assumed in estimating potential dollar losses to vulnerable structures. It is estimated that nearly $18 million in losses of improvements would occur with a “worst case scenario” of total loss of all structures in all of the shadow of the dam areas of the planning area. This information was obtained from a Florence County database on fair market and assessed values of real property (structures and land) overlaid on Shadow of the Dam mapping from WE Energies. The potential dollar losses estimate is for damage to the structures themselves, and does not account for damage to personal property inside or adjacent to vulnerable structures.

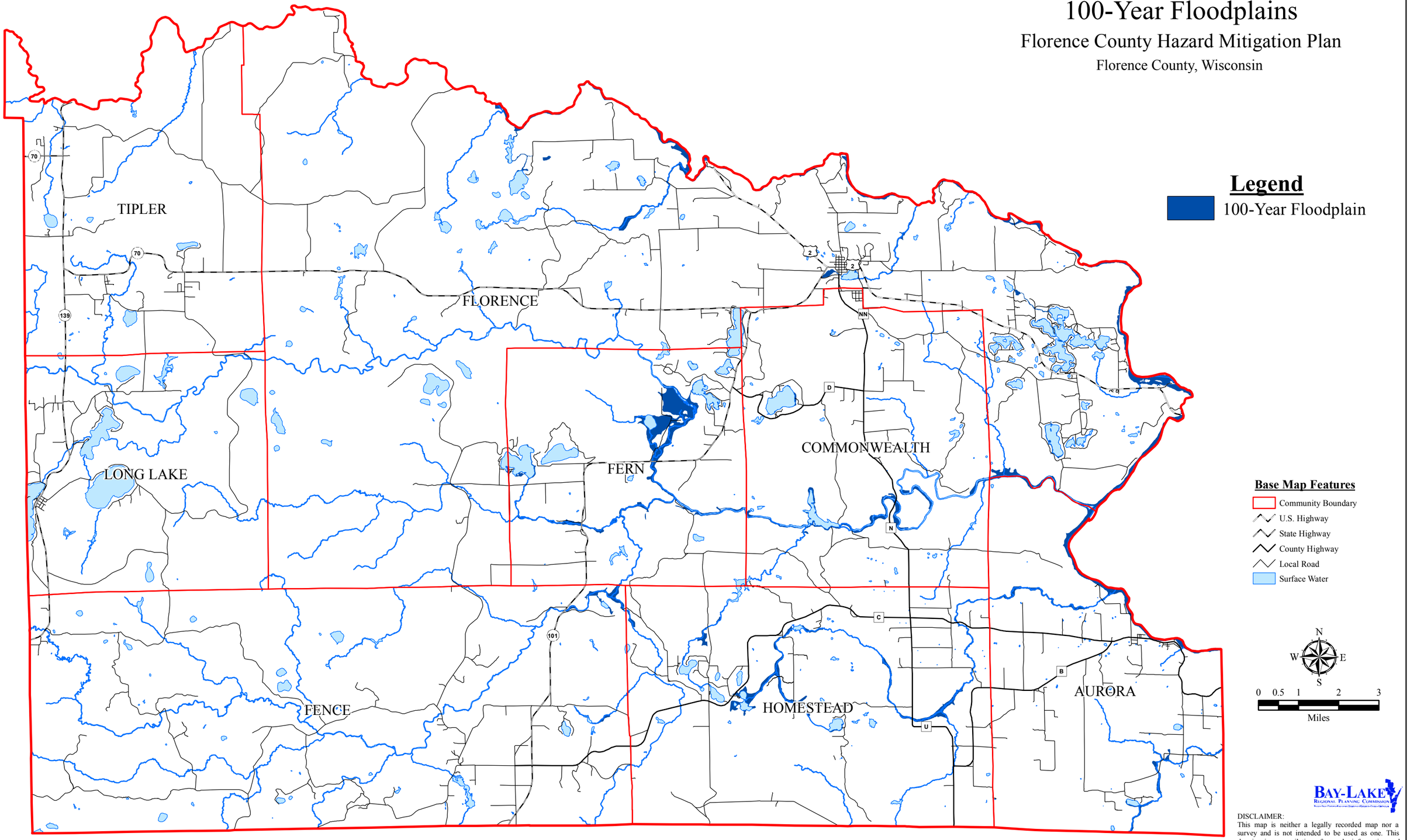
(This Page Intentionally Blank)

Map 3.1

100-Year Floodplains

Florence County Hazard Mitigation Plan

Florence County, Wisconsin



DISCLAIMER:
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. Bay-Lake RPC is not responsible for any inaccuracies herein contained.

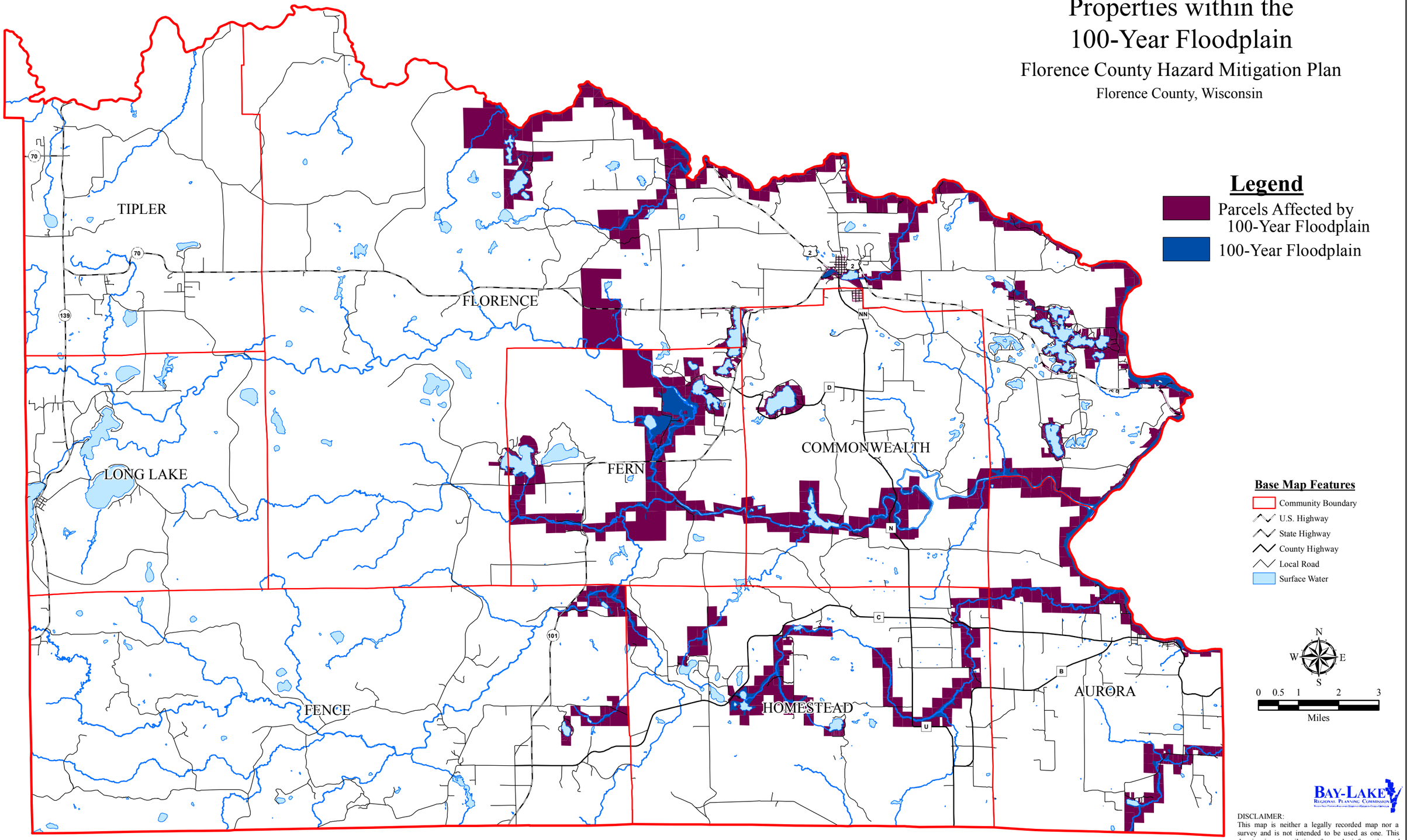
Source: FEMA, 1978; Florence County 2008, 2012; Bay-Lake Regional Planning Commission, 2012.

Map 3.2

Properties within the 100-Year Floodplain

Florence County Hazard Mitigation Plan

Florence County, Wisconsin



DISCLAIMER:
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. Bay-Lake RPC is not responsible for any inaccuracies herein contained.

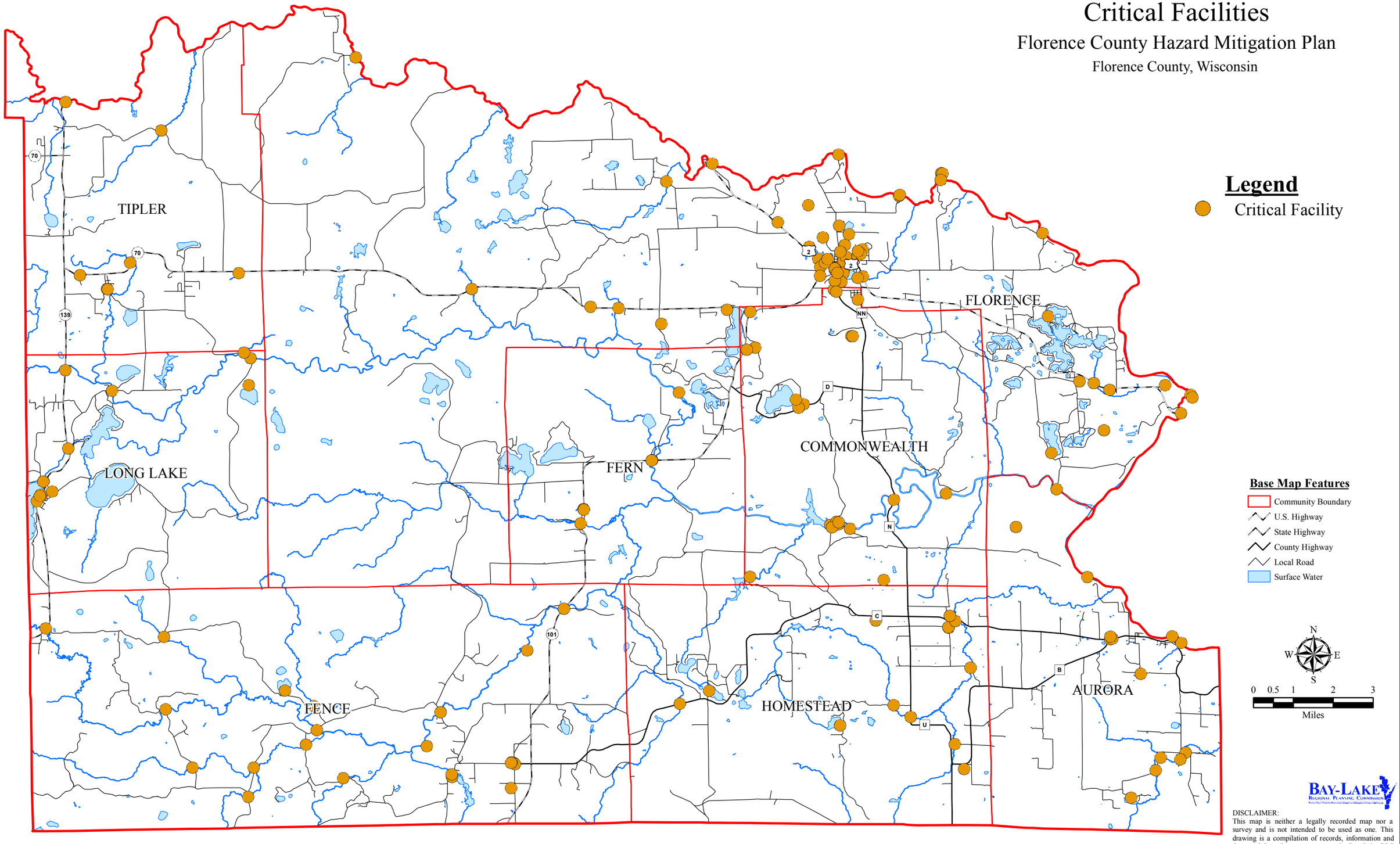
Source: FEMA, 1978; Florence County 2008, 2012; Bay-Lake Regional Planning Commission, 2012.

Map 3.3

Critical Facilities

Florence County Hazard Mitigation Plan

Florence County, Wisconsin



Source: Florence County 2008, 2012; Bay-Lake Regional Planning Commission, 2012.

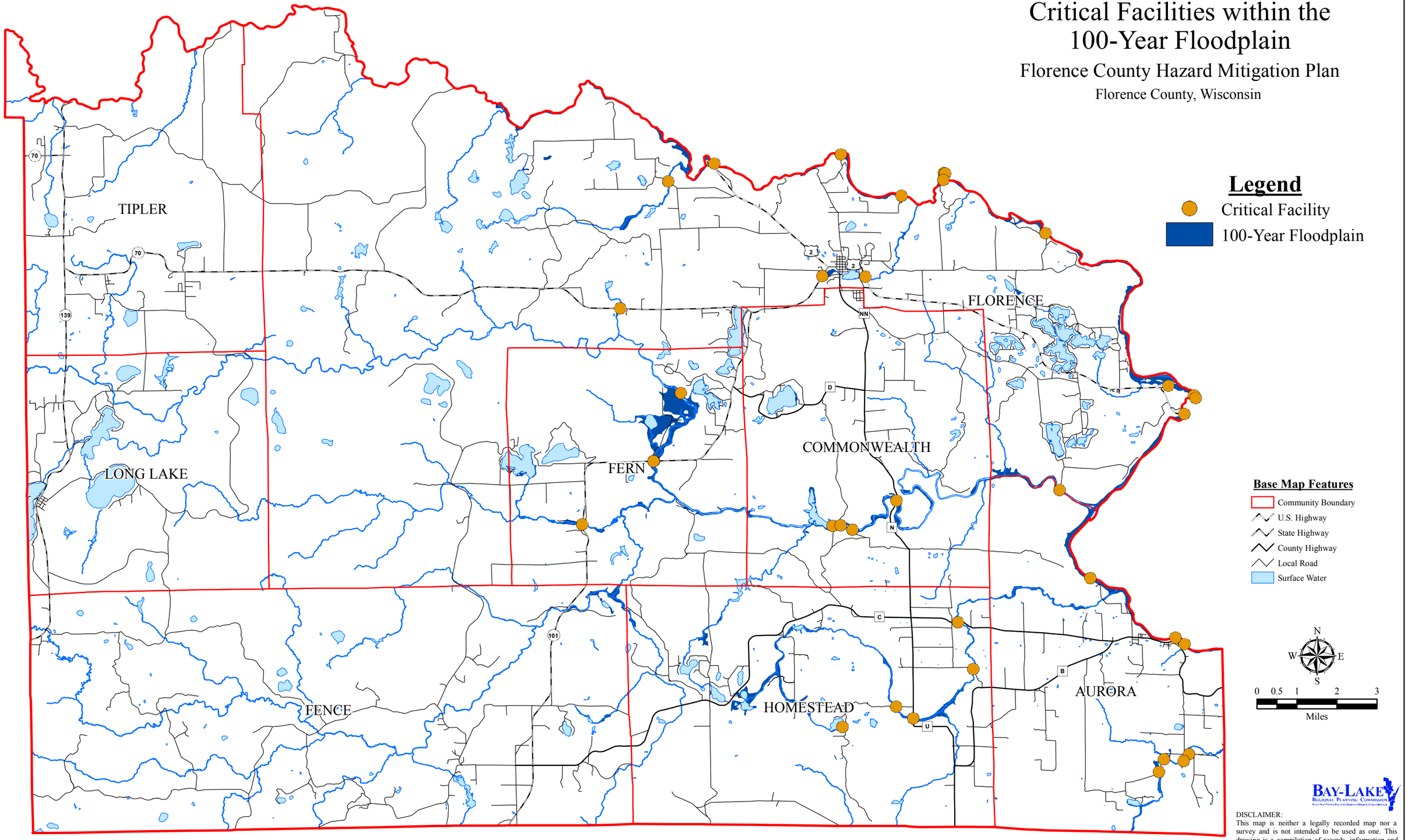
DISCLAIMER:
This map is neither a legally recorded map nor a survey and is not intended to be used as one. This drawing is a compilation of records, information and data used for reference purposes only. Bay-Lake RPC is not responsible for any inaccuracies herein contained.

Map 3.4

Critical Facilities within the 100-Year Floodplain

Florence County Hazard Mitigation Plan

Florence County, Wisconsin



DISCLAIMER:
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. Bay-Lake RPC is not responsible for any inaccuracies herein contained.

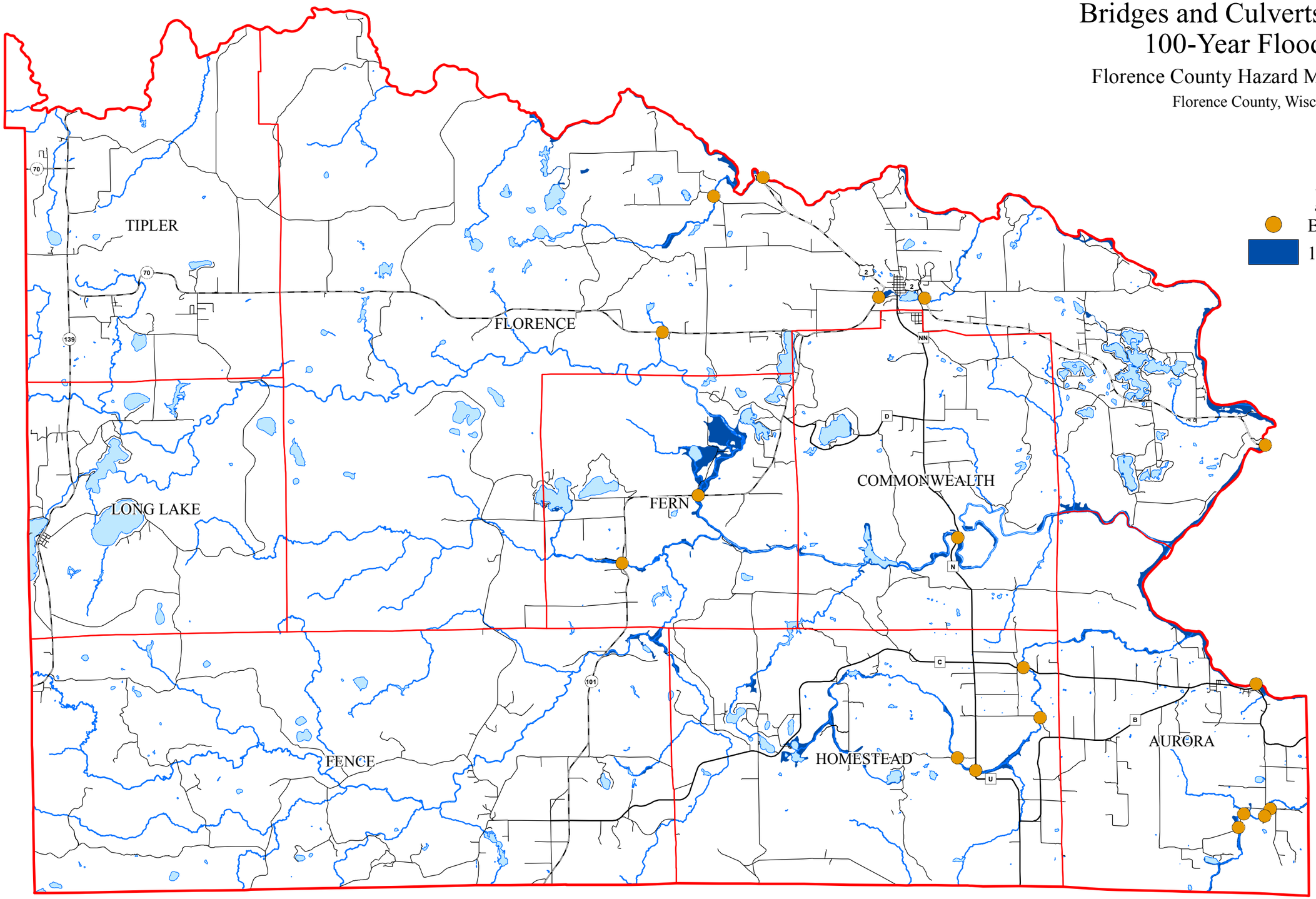
Source: FEMA, 1978; Florence County 2008, 2012; Bay-Lake Regional Planning Commission, 2012.

Map 3.5

Bridges and Culverts within the 100-Year Floodplain

Florence County Hazard Mitigation Plan

Florence County, Wisconsin



Legend

- Bridge/Culvert
- 100-Year Floodplain

Base Map Features

- Community Boundary
- U.S. Highway
- State Highway
- County Highway
- Local Road
- Surface Water

N W E S

0 0.5 1 2 3

Miles

BAY-LAKE Regional Planning Commission

DISCLAIMER:
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. Bay-Lake RPC is not responsible for any inaccuracies herein contained.

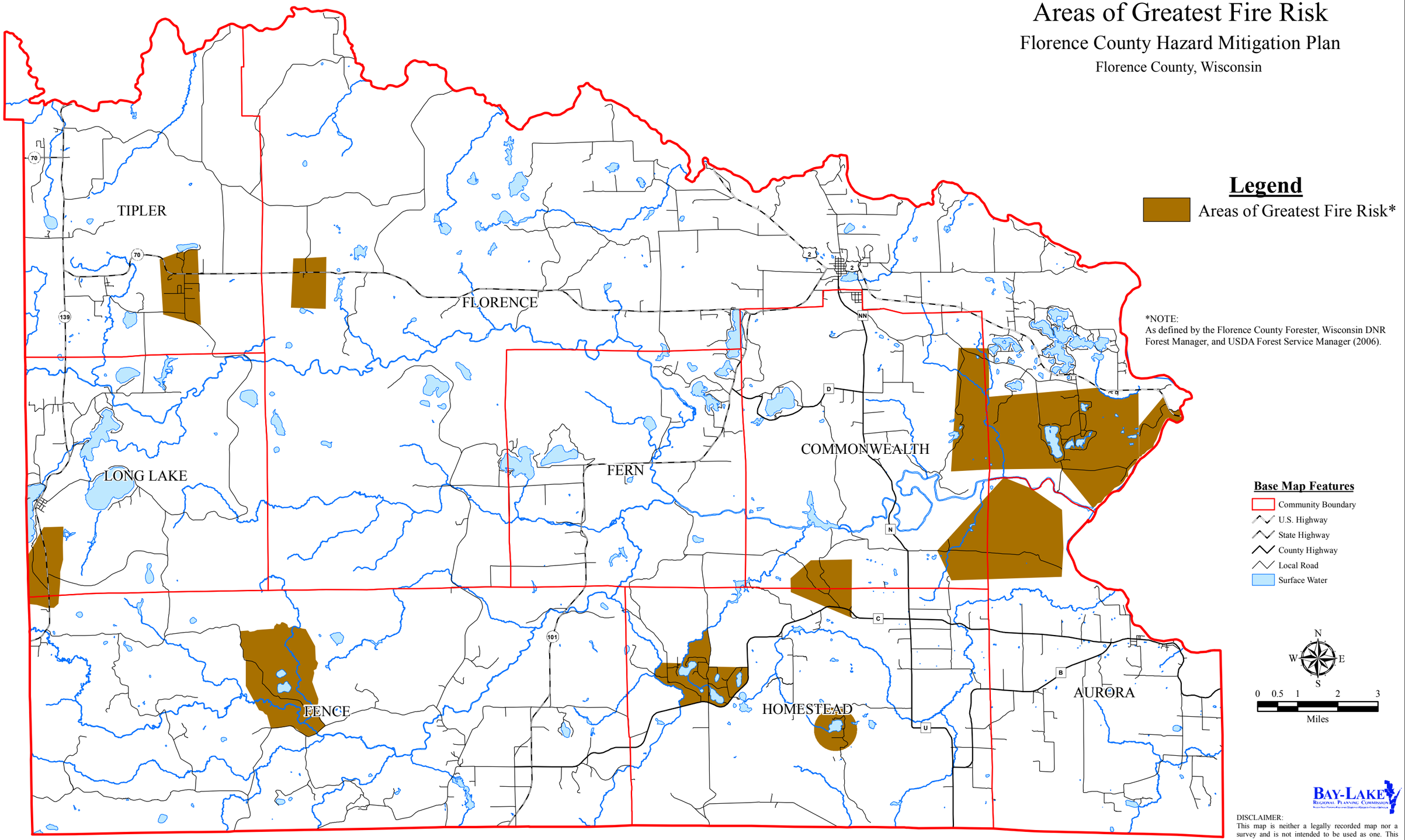
Source: FEMA, 1978; Florence County 2008, 2012; Bay-Lake Regional Planning Commission, 2012.

Map 3.6

Areas of Greatest Fire Risk

Florence County Hazard Mitigation Plan

Florence County, Wisconsin



DISCLAIMER:
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. Bay-Lake RPC is not responsible for any inaccuracies herein contained.

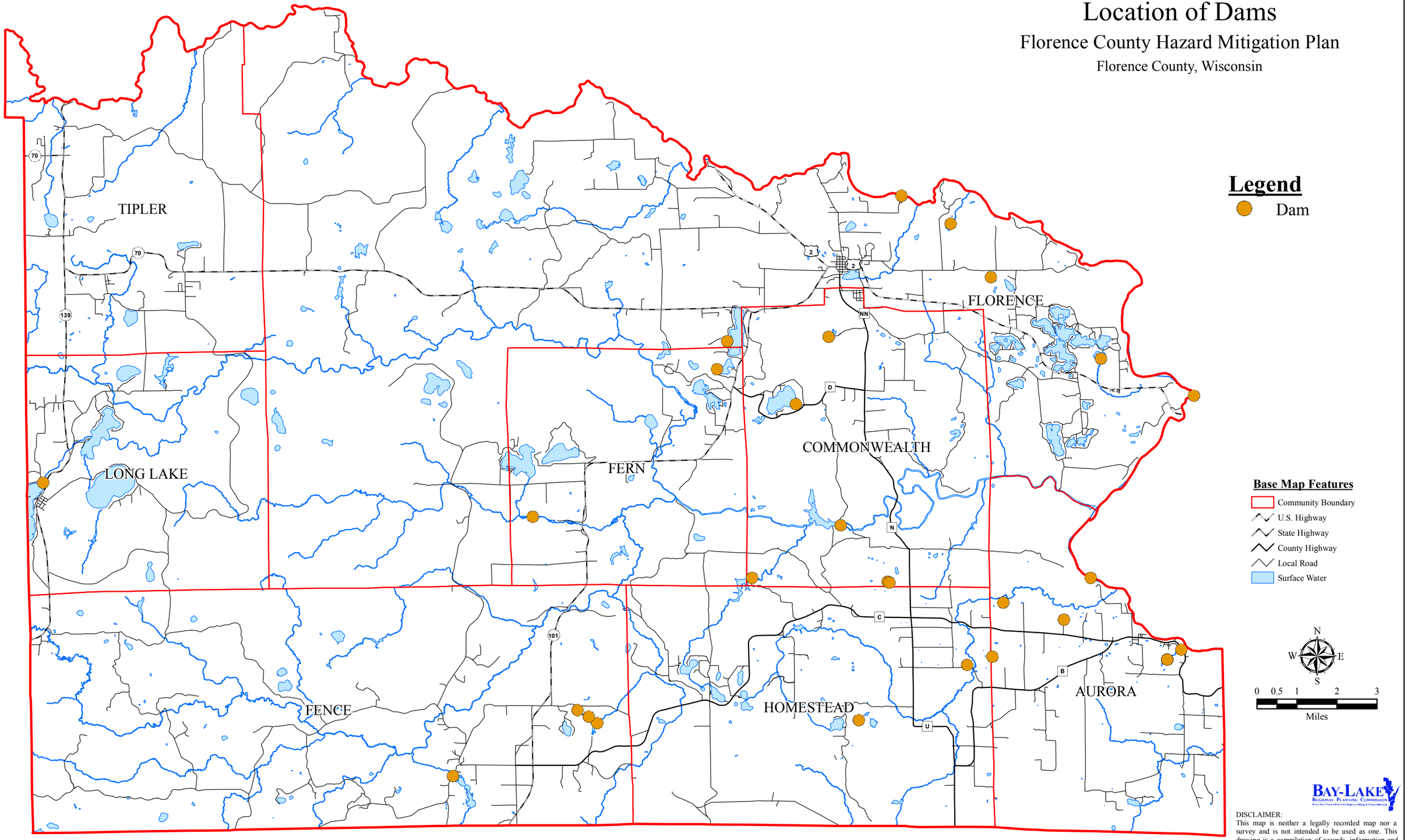
Source: Florence County 2006, 2008, 2012; Bay-Lake Regional Planning Commission, 2012.

Map 3.7

Location of Dams

Florence County Hazard Mitigation Plan

Florence County, Wisconsin



DISCLAIMER:
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. Bay-Lake RPC is not responsible for any inaccuracies herein contained.

Source: WDNR, 2009; Florence County 2008, 2012; Bay-Lake Regional Planning Commission, 2012.

CHAPTER 4: MITIGATION STRATEGY

INTRODUCTION

As defined by the Disaster Mitigation Act of 2000, mitigation is a "sustained action that reduces or eliminates long-term risk to people and property from natural hazards and their effects." Mitigation planning is the systematic process of learning about the hazards that can affect the planning area, setting clear goals, identifying appropriate actions, and following through with an effective mitigation strategy. Mitigation encourages long-term reduction of hazard vulnerability and can reduce the enormous cost of disasters to the government and property owners. Mitigation can also protect critical community facilities and infrastructure; reduce exposure to liability; and minimize community disruption.

The mitigation strategy outlines the general goals to be achieved through the implementation of the Florence County hazard mitigation plan. From the identified hazard mitigation goals, a mitigation strategy was developed to identify specific projects and activities that could help achieve the County's hazard mitigation goals to make them safer and better prepared for disasters.

This chapter includes a discussion of the mitigation efforts that are currently underway, the County's plan to implement the mitigation actions, an assessment of the County's pre- and post-disaster hazard management policies, programs, and capability to mitigate hazards, and an evaluation of the current and potential sources of federal, state, or private funding to implement mitigation activities.

MITIGATION GOALS

The following mitigation goals address each hazard. They are intended to be used by public officials and emergency response personnel as general guidelines to address the needs identified by the natural hazard risk assessment.

Lightning Storm and Thunderstorm

Minimize the threat to human life and property damage caused by lightning storms and thunderstorms, including the high winds that often accompany such storms, through public education and interagency cooperation.

Flooding

Reduce the impacts that floods have on people, property and the environment, through:

- disaster preparedness;
- the use of floodplain regulations (zoning ordinances, subdivision regulations, building codes, etc.);
- the use of development and redevelopment policies;
- the use of wetland regulations;
- the use of tax adjustments;
- informing and educating the public;
- the use of environmental corridors, open space, and wetland and riparian restoration;
- acquisition and relocation of structures in flood prone areas;
- individual protection measures;
- flood forecasting and warning systems (National Weather Service - Advanced Hydrologic Prediction Service);

- emergency plans;
- flood insurance (including maintaining compliance with National Flood Insurance Program regulations); and
- structural measures (dams, reservoirs, dikes, levees, floodwalls, channel alterations, land treatment measures, on-site detention, etc.).

Winter Storms

Create safety awareness for residents of and travelers to the planning area to protect these individuals during and after winter storm events.

Tornadoes

Minimize threats to human life, health, and safety posed by tornadoes through public education and interagency cooperation.

Drought

Minimize threats to health and the economy posed by drought through public education.

Wildland Fires

Minimize threats to human life, health, and safety posed by wildland fires through public education and interagency cooperation.

Extreme Cold

Minimize threats to human life, health, and safety posed by extreme cold episodes through public education and interagency cooperation.

Extreme Heat

Minimize threats to human life, health, and safety posed by extreme heat episodes through public education and interagency cooperation.

Fog

Minimize threats to human life and safety when fog affects the ability to safely travel on roadways through public education and greater publicizing of fog advisories.

Dam Failure

Reduce the impacts that dam failures have on people, property and the environment, through:

- disaster preparedness;
- forecasting and warning systems; and
- emergency plans

MITIGATION ACTION PLAN

Mitigation actions form the core of the mitigation plan. Table 4.1 lists the mitigation action plan developed for Florence County. The table lists the hazard type, associated mitigation actions, the estimated costs of each project (where known), responsible agencies, the project timetable, and potential funding sources available for each mitigation action identified. The identified actions and projects address reducing the effects of hazards on the population, services, and existing and new buildings and infrastructure.

The County Emergency Management Department will track the implementation of mitigation actions over time. Information on completed or revised actions will be documented in future five-year updates of the County hazard mitigation plan.

Prioritization Process

In developing this mitigation strategy, members of the plan steering committee considered, from their perspective, the various proposed action items and came to consensus on how each would be ranked, “high,” “medium” or “low,” based on need, funding, cost-benefit, and anticipated political support.

Cost-Benefit Review

In developing this mitigation strategy, members of the plan steering committee considered, from their perspective, the costs and benefits of the various proposed action items. The cost-benefit review was a factor of the prioritization process. Full-blown cost-benefit calculations were not prepared for each action item included in the plan. The cost effectiveness of each action item will be addressed and completed through the project development process.

COMPLETED MITIGATION ACTIONS

Since the preparation of the 2006 hazard mitigation plan for Florence County, some of mitigation actions identified in the action plan have been completed. The following lists those actions that have been completed in Florence County.

- Incorporation of Floodplain Management in Comprehensive Planning has been completed along with comprehensive planning efforts undertaken throughout the county in 2010.
- Geographic Information System (GIS) Coverage has been completed along with a land use assessment that was completed as part of the comprehensive planning efforts in 2009.
- Lightning Safety Guidelines has been established for the county.

(This Page Intentionally Blank)

Table 4.1: Hazard Mitigation Action Plan, 2012

Hazard Type	Mitigation Measures	Budget	Responsible Party	Project Timetable	Priority	Notes
All Hazards	Acquisition of Emergency Power Generators for Critical Facilities	Costs to be Determined	Florence County Emergency Management, and Critical Facilities Managers	Ongoing	High Priority	For use at critical facilities that impact health and safety when the power supply is temporarily interrupted.
	Mutual Aid Agreement with Wisconsin Public Service to Help Keep Debris off Power Lines	Covered by Existing Annual Budgets	Florence County Emergency Management, and WPS	2012-2017	High Priority	Address recurring (prolonged) power outage issues.
	Identify Areas of Need for Burying Power Lines	Covered by Existing Annual Budgets	Florence County Emergency Management, WPS, Florence Utilities, WE Energies	2012-2017	High Priority	Address recurring (prolonged) power outage issues.
	Feasibility of Partnering with Power Utilities in County on Burying Power Lines	Covered by Existing Annual Budgets	Florence County Emergency Management, WPS, Florence Utilities, and WE Energies	2012-2017	High Priority	Address recurring (prolonged) power outage issues.
	Bury Power Lines in Areas of Need	Covered by Existing Annual Budgets	Florence County Emergency Management, WPS, Florence Utilities, WE Energies	2012-2017	High Priority	Address recurring (prolonged) power outage issues.
	Severe Weather Spotter Classes	Covered by Existing Annual Budgets	Florence County Emergency Management, National Weather Service	Ongoing	Medium Priority	Held as needed.
	Severe Weather Outreach (including Tornadoes, Winter Weather, and Extreme Heat)	Covered by Existing Annual Budgets	Florence County Emergency Management, and Wisconsin Emergency Management	Ongoing	Medium Priority	Severe Weather Awareness Week held annually.
	Aquire Emergency Notification System (e.g. "Code Red")	$10,000 - $15,000	Sheriff's Department/911 Dispatch	Ongoing	Medium Priority	
	Weather Radio Warning Messages	Covered by Existing NOAA Budgets	National Weather Service	Ongoing	Medium Priority	

Table 4.1: Hazard Mitigation Action Plan, 2012 (continued)

Hazard Type	Mitigation Measures	Budget	Responsible Party	Project Timetable	Priority	Notes
Lightning Storms and Thunderstorms	Review of Building Codes	Covered by Existing Annual Budgets	Florence County Zoning	Ongoing	Medium Priority	
Flooding	Disaster Preparedness	Covered by Existing Annual Budgets	Florence County Emergency Management	Ongoing	High Priority	
	National Flood Insurance Program*	Covered by Existing Annual Budgets	Federal Emergency Management Agency, Florence County, and Towns	Ongoing	High Priority	Enactment and enforcement of floodplain management regulations consistent with NFIP requirements.
	Preservation of Natural Resources in Floodplains*	Covered by Existing Annual Budgets	Florence County Zoning	Ongoing	High Priority	Florence County Zoning Department can provide technical advice concerning this action item
	Stormwater Management	Covered by Existing Annual Budgets	Florence County Zoning, and WDNR	Ongoing	High Priority	Involves implementation of stormwater management ordinances.
	Flood Forecasting and Warning Systems and Emergency Plans	Covered by Existing Annual Budgets	National Weather Service, Florence County Emergency Management, and We Energies	Ongoing	Medium Priority	
	Floodproofing Techniques*	Costs to be Determined	Florence County Zoning	Ongoing	Medium Priority	Covered under existing budgets in the case of review of proposed new construction, but city assistance in floodproofing existing structures would only occur if grants become available.
	Acquire Countywide LiDAR Mapping*	$120,000 - $130,000	Florence County Zoning	2012-2017	Medium Priority	LiDAR data will enable WDNR to update floodplains data.
	Orthophotography Base Maps of Florence County	Costs to be Determined	Florence County Zoning	Ongoing	Medium Priority	
	Inform Property Owners in Cases Where Property is Located in the 100-Year Floodplain*	Covered by Existing Annual Budgets	Florence County Zoning	Ongoing	Medium Priority	Partially completed.

Table 4.1: Hazard Mitigation Action Plan, 2012 (continued)

Hazard Type	Mitigation Measures	Budget	Responsible Party	Project Timetable	Priority	Notes
Flooding (cont'd)	Acquisition and Relocation*	Costs to be Determined	Florence County	Ongoing	Medium Priority	
	Annual Review of Flood Mitigation Plan*	Covered by Existing Annual Budgets	Florence County Zoning	Ongoing	Medium Priority	
	Flood Insurance Rate Map (FIRM) Amendments and Revisions*	Costs to be Determined	Florence County, and WDNR	2022	Low Priority	The WDNR has determined this to be a low priority in the state based on unavailability of LIDAR mapping in the county and low population.
	Individual Property Measures for Basements*	Review of Building and Other Local Codes	Florence County Zoning	Ongoing	Low Priority	
Winter Storms	Priority Policy for Salting and Plowing Streets and Highways	Covered by Existing Annual Budgets	Florence County Highway Department	Ongoing	High Priority	Educate the public about priority policy for salting and plowing. This policy gives top priority to the more highly traveled principal arterials, and gives lowest priority to low traveled local roads.
	Promote Winter Storm Hazard Awareness	Covered by Existing Annual Budgets	Florence County Emergency Management, and American Red Cross	Ongoing	Medium Priority	
Tornadoes	Review Emergency Shelter Deficit Locations	Covered by Existing Annual Budgets	Florence County Emergency Management, American Red Cross, and Towns	Ongoing	Medium Priority	
	Tornado Awareness Training	Covered by Existing NOAA Budgets	National Weather Service	Ongoing	Medium Priority	
	Encourage Use of Tie-Downs with Ground Anchors for Manufactured Homes and Mobile Homes	Covered by Existing Annual Budgets	Florence County Emergency Management, and Towns	Ongoing	Medium Priority	

Table 4.1: Hazard Mitigation Action Plan, 2012 (continued)

Hazard Type	Mitigation Measures	Budget	Responsible Party	Project Timetable	Priority	Notes
Tornadoes (cont'd)	Enhanced Construction Standards and Techniques	Covered by Existing Annual Budgets	Florence County Emergency Management, and Florence County Zoning	Ongoing	Low Priority	
Drought	Fire Education and Prevention	Covered by Existing Annual Budgets	Florence County Fire Response Unit, WDNR, and USFS	Ongoing	Medium Priority	Wildland Urban Interface education handouts distributed. Fire Prevention Week annually. Booth at Florence County Fair.
Wildland Fires	Fire Education and Prevention	Covered by Existing Annual Budgets	Florence County Fire Response Unit, WDNR, and USFS	Ongoing	Medium Priority	Wildland Urban Interface education handouts distributed. Fire Prevention Week annually. Booth at Florence County Fair.
Extreme Cold	Publicize Extreme Cold Events	Covered by Existing Annual Budgets	Florence County Emergency Management, and American Red Cross	Ongoing	Medium Priority	
Extreme Heat	Provide sheltering and water supplies for vulnerable populations	Covered by Existing Annual Budgets	Florence County Emergency Management, County Nurse, and American Red Cross	Ongoing	High Priority	Opening cooling shelter, provide information via radio, and distrubute water to vulnerable populations during heat index days coupled with power outages.
	Publicize Extreme Heat Events	Covered by Existing Annual Budgets	Florence County	Ongoing	High Priority	
Fog	Publicize Fog Events	Covered by Existing Annual Budgets	Florence County Emergency Management, and American Red Cross	Ongoing	Medium Priority	Encourage area news media to broadcast emergency information concerning fog that addresses safety precautions during a fog event.
Dam Failure	Dam Failure Warning Systems and Emergency Plans	Covered by Existing Annual Budgets	We Energies, and Florence County Emergency Management	Ongoing	Medium Priority	WE Energies has plans in place that address specific actions and notifications in case of dam failure.
	Dam Failure Automated Warning Calls	Covered by Existing We Energies Budget	We Energies	Ongoing	Medium Priority	Service provided in sparsely populated areas outside the range of sirens.

Note: The actions items that address NIFP compliance are indicated with an asterisks (*).

Policies, Programs, and Resources for Mitigation

Florence County has a number of authorities that enforce polices, execute programs, and provide resources that support the mitigation action plan for reducing potential losses identified in the risk assessment. These authorities have been identified under the responsible parties (where applicable) in the mitigation action plan (Table 4.1), and include the following;

- Florence County Zoning
  - Relevant policies and programs include planning and zoning (including enforcement of county shoreland and floodplain management regulations).
- Fire Departments
  - Relevant policies and programs include coordinating emergency preparedness, mitigation, response, and recovery efforts.
- Florence County Emergency Management
  - Relevant policies and programs include coordinating effective disaster response and recovery efforts in the county through response, recovery, planning, training, and exercises, and mitigation.
- Florence County Highway Department
  - Relevant policies and programs include road maintenance, stormwater management, and management of salt storage for winter storms.
- Florence County Health Department
  - Relevant policies and programs focus on protecting and promoting the health and safety of the people in the county in cooperation with community partners (includes assisting citizens with emergency preparedness).
- Wisconsin Emergency Management
  - Relevant policies and programs include supporting effective disaster response and recovery efforts in support of local government through planning, training, and exercises.
- Wisconsin Department of Natural Resources
  - Relevant policies and programs include regulation enforcement of state shoreland and floodplain management rules, and wildland fire response and education.
- Florence Utilities, Wisconsin Public Service, and WE Energies
  - Relevant policies and programs include maintaining electrical power and transmission facilities.
- American Red Cross
  - Relevant policies and programs include disaster relief and educational programs that promote health and safety.
- National Weather Service (Green Bay Regional Office)
  - Relevant policies and programs include publicizing information, and providing outreach and education about hazardous weather.

- USDA Forest Service
    - Relevant policies and programs include reducing hazardous fuels (vegetation) and wildland fire response in the Chequamegon-Nicolet National Forest, which encompasses approximately the western third of the county.

These authorities have the ability to expand or modify their programs when needed to improve existing tools to address mitigation. Florence County has taxing authority through property taxes to raise funds for the purpose hazard mitigation. Additional funding sources for hazard mitigation actions are available from a number of federal and state grant programs.

Potential Funding Sources for Mitigation

Funding for hazard mitigation programs and projects can come from a number of sources both public and private. Non-local funding can come from a number of sources, either in the form of a grant or a loan. The following text provides a description of a number of potential grant programs available to Florence County (or other entities seeking to carry out hazard mitigation actions) in funding future mitigation actions identified in this plan:

Federal Programs

EDA Public Works and Development Facilities

These funds are available for local units of government to enhance regional competitiveness and promote long-term economic development in regions experiencing substantial economic distress. EDA provides Public Works investments to help distressed communities and regions revitalize, expand, and upgrade their physical infrastructure to attract new industry, encourage business expansion, diversify local economies, and generate or retain long-term private sector jobs and investment.

FEMA Assistance to Firefighters Grant

The primary goal of the Assistance to Firefighters Grants (AFG) is to meet the firefighting and emergency response needs of fire departments and nonaffiliated emergency medical services organizations. The AFG program has helps firefighters and other first responders to obtain critically needed equipment, protective gear, emergency vehicles, training, and other resources needed to protect the public and emergency personnel from fire and related hazards. The National Preparedness Directorate in the Federal Emergency Management Agency administers the grants in cooperation with the U.S. Fire Administration.

The Fire Prevention and Safety Grants (FP&S) are part of the Assistance to Firefighters Grants (AFG) and are under the purview of the National Preparedness Directorate in the Federal Emergency Management Agency. FP&S grants support projects that enhance the safety of the public and firefighters from fire and related hazards. The primary goal is to target high-risk populations and mitigate high incidences of death and injury.

FEMA Flood Mitigation Assistance Program

The Flood Mitigation Assistance (FMA) program was created as part of the National Flood Insurance Reform Act (NFIRA) of 1994 with the goal of reducing or eliminating claims under the National Flood Insurance Program (NFIP). FEMA provides FMA funds to assist States and communities implement measures that reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the National Flood Insurance Program. Eligible activities include: acquisition, relocation, elevation, and flood-

proofing of flood-prone insured properties; flood mitigation planning; and technical assistance. In order to be eligible for funding through this program the local government must be in compliance with the National Flood Insurance Program.

FEMA Hazard Mitigation Grant Program

The Hazard Mitigation Grant Program (HMGP) provides grants to States and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the HMGP is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster. Eligible activities include: flood proofing; acquisition and relocation of flood prone properties; elevation of flood prone properties; retrofitting properties to be wind resistent; stormwater improvements; and education and awareness. In order to be eligible for funding through this program, the local government must be in compliance with the National Flood Insurance Program. All projects must be cost-effective, environmentally sound, and solve a problem. Funds area available anytime after a Presidential Disaster Declaration has been made in the State of Wisconsin.

FEMA Pre-Disaster Mitigation Program

The Pre-Disaster Mitigation (PDM) program provides funds to states, territories, Indian tribal governments, communities, and universities for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event. Funding these plans and projects reduces overall risks to the population and structures, while also reducing reliance on funding from actual disaster declarations. PDM grants are to be awarded on a competitive basis and without reference to state allocations, quotas, or other formula-based allocation of funds. Grant funds can be used to cover management costs, information dissemination, planning, technical assistance, and mitigation projects. In order to be eligible for funding through this program the local government must be in compliance with the National Flood Insurance Program. All projects must be cost-effective and environmentally sound.

Pipeline and Hazardous Materials Safety Administration, Hazardous Materials Emergency Preparedness

The Hazardous Materials Emergency Preparedness (HMEP) grant program is intended to provide financial and technical assistance as well as national direction and guidance to enhance State, Territorial, Tribal, and local hazardous materials emergency planning and training. The HMEP Grant Program distributes fees collected from shippers and carriers of hazardous materials to emergency responders for hazmat training and to Local Emergency Planning Committees (LEPCs) for hazmat planning.

U.S. Department of Education School Emergency Response and Crisis Management Plan Discretionary Grant Program

This grant program is designed to provide funds to Local Education Agencies (LEA) to strengthen and improve their emergency response and crisis plans, at the district and school-building level. Grantees are required to address all four phases of crisis planning: prevention and mitigation, preparedness, response, and recovery. In addition, LEAs are required to form partnerships and collaborate with community organizations, local law enforcement agencies, heads of local governments, and offices of public safety, health, and mental health as they review and revise school crisis plans. Plans must be coordinated with state or local homeland security plans and support implementation of the National Incident Management System (NIMS). Grant

funds may be used for the following activities: training school safety teams and students; conducting building and facilities audits; communicating emergency response policies to parents and guardians; implementing an Incident Command System (ICS); purchasing school safety equipment (to a limited extent); conducting drills and tabletop simulation exercises; and preparing and distributing copies of crisis plans.

State of Wisconsin Programs

WDNR Lake Planning Grant Program

Counties, towns, cities, villages, tribes, qualified non-profit conservation organizations, qualified lake associations, school districts (in partnership with another eligible party), public inland lake protection and rehabilitation districts, town sanitary districts, and other local governmental units that are established for the purpose of lake management, are eligible to apply for funding to collect and analyze information needed to protect and restore lakes and their watersheds.

Eligible activities include: gathering and analysis of physical, chemical, and biological information on lakes; describing present and potential land uses within lake watersheds and on shorelines; reviewing jurisdictional boundaries and evaluating ordinances that relate to zoning, sanitation, or pollution control or surface use; assessments of fish, aquatic life, wildlife, and their habitats; and developing, evaluating, publishing, and distributing alternative courses of action and recommendations in a lake management plan.

WDNR Municipal Flood Control Grant Program

The Wisconsin Department of Natural Resources, Bureau of Community Financial Assistance and Bureau of Watershed Management, offers this grant assistance package to all cities, villages, towns, Indian Tribes, and metropolitan sewerage districts concerned with municipal flood control management in the State of Wisconsin. Assistance is provided with the availability of Acquisition and Development grants to purchase property or vacant land, structure removal, construction or other development costs and with Local Assistance Grants for providing administrative support activities.

WDNR River Planning Grant Program

Under this grant program, counties, cities, towns, villages, tribes, other local governmental units, qualified river management organizations, and qualified nonprofit conservation organizations are eligible to apply for funding under this program. Projects funded by this program must be designed to collect, assess and disseminate information on riverine ecosystems; assist in developing organizations to help manage rivers; assist the public in understanding riverine ecosystems; and/or create management plans for the long term protection and improvement of riverine ecosystems. Eligible activities include: organizational development for existing river protection/improvement organizations; assistance with the formation of a qualified river management organization; public education projects; and planning and assessment projects. Capital improvement projects are not eligible for funding under this grant.

WDNR Volunteer Fire Assistance Grant

Volunteer Fire Assistance (VFA) grants are available to Wisconsin county/area fire associations statewide. Grant funding is intended to support wildland fire suppression capabilities in an area through broad-ranging projects of benefit to all of the local fire departments. Successful applications will have a positive impact on the prevention, detection, and suppression of wildland fires in all of the communities served by a county/area fire association. Grant funds can

be used for: fire fighter safety; fire fighter training; fire prevention (particularly in the Wildland Urban Interface); dry hydrants and other water resources; mapping; enhanced communications; wildland fire suppression equipment; and the organization of a new fire department.

WDOA Comprehensive Planning Grant Program

The Division of Intergovernmental Relations administers the Wisconsin Comprehensive Planning Grant Program to assist local governments in the development and adoption of comprehensive plans. The Comprehensive Planning Grant Program has established a framework that promotes cooperation, collaboration and the exchange of ideas relating to planning and land use issues.

WDOA, Division of Housing and Intergovernmental Relations, Emergency Housing Grant Program

This program makes available funds for acquisition, rehabilitation, and/or demolition projects after a disaster event has occurred. These funds can be used as a local match to receive FEMA mitigation funds. The project must be used to benefit low and moderate income individuals.

(This Page Intentionally Blank)

CHAPTER 5: PLAN MAINTENANCE AND ADOPTION PROCESS

PLAN ADOPTION PROCESS

The Florence County Hazard Mitigation Plan development process was guided by the County Hazard Mitigation Plan Steering Committee over an 18-month timeframe, with professional planning support from the Bay-Lake Regional Planning Commission. A list of Steering Committee members is located in Table 1.1 of this document.

Both WEM and FEMA reviewed a final draft of the County's hazard mitigation plan prior to adoption by the Florence County Board. Comments received from WEM and FEMA were reviewed by the Steering Committee and necessary revisions were made. The plan was adopted by resolution by the Florence County Board on February 19, 2013. The resolution adopting the plan can be found on page v, just after the Table of Contents. After the plan was adopted by the Florence County Board, it was approved by WEM and FEMA. Approval letters from WEM and FEMA can be found on page vii.

PLAN MAINTENANCE

Planning is an ongoing process, and this plan should grow and adapt in order to keep pace with growth and change in the planning area and its local jurisdictions. The Disaster Mitigation Act of 2000 requires that local plans be evaluated and updated at least every five years in order to remain eligible for assistance.

Plan Monitoring, Evaluation, and Updating

This Florence County Hazard Mitigation Plan is an update to the initial 2006 plan, and will continue to be monitored, evaluated, and updated by Florence County Emergency Management. Every five years, the Florence County Hazards Mitigation Plan will be comprehensively reviewed, and fully updated. This update shall involve the collection of the most current data to support the plan and the development of new mitigation strategies and an implementation plan. This planning effort will be comprehensive, and will incorporate opportunities for public involvement to meet all requirements of 44 CFR Part 201.6 and/or any applicable requirements or regulations developed over the next five years.

The five-year plan update will be coordinated by the Florence County Emergency Management Director for Florence County Board approval. All meetings to update the plan shall be subject to the Wisconsin Open Meeting Law, and shall be properly noticed to allow for public involvement and comment.

Additional Plan Review

Within three to six months following a significant natural hazard event (as determined by the Steering Committee), a special post-disaster review will occur. Information concerning the disaster shall be collected by the Florence County Emergency Management Coordinator from local law enforcement personnel, fire department personnel, disaster response personnel, Wisconsin Emergency Management staff, FEMA staff, affected citizens, and any other pertinent entities. This information shall be provided to the Steering Committee for its review.

At a public meeting, the Steering Committees for the plan will analyze factors that contributed to any impacts of the hazard event, the likelihood of the event recurring, and any strategies that should be implemented to mitigate the impacts in the event of a recurrence. The County Emergency Management Director will have primary responsibility for establishing post-disaster

review meeting dates, distributing related materials, facilitating the meetings, and advertising these special meetings to affected county department heads and citizens and community groups, so that additional input and comment can be received. Special post-disaster review meetings shall be subject to the Wisconsin Open Meeting Law and shall be properly noticed to allow for public involvement and comment.

The Steering Committee may choose to revise or amend the existing County plan based on what is learned in the review process. Any recommended changes to the plan shall be forwarded to the Florence County Board for its action and consideration.

PLAN COORDINATION

The mitigation action plan in Chapter 4 ties the mitigation strategies to related plans or policies. As the county and jurisdictions in the planning area develop or update their comprehensive plans, incorporation of this Hazard Mitigation Plan is highly recommended. The Wisconsin comprehensive planning law includes a detailed description of elements that need to be addressed in all comprehensive plans. The following items must be considered when incorporating this Hazard Mitigation Plan into the required elements of local comprehensive plans for jurisdictions in the planning area:

- Issues and Opportunities Element – A summary of major hazards that local governments are 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, recommendations concerning building codes, shelter opportunities, and a survey of homeowners that may be interested in a voluntary buyout and relocation program.
- Transportation Element – Identify any transportation routes or facilities that are more at risk during flooding or winter storms.
- Agricultural, and Natural and Cultural Resources Element – Identify the floodplains and agricultural areas that are at risk during hazardous events. Incorporate recommendations on how to mitigate future losses to these areas.
- Economic Development Element – Describe the impacts that past hazards have had on area businesses.
- Intergovernmental Cooperation Element – Identify intergovernmental police, fire and rescue service sharing agreements that are in effect or which may merit further investigation, and consider cost sharing and resource pooling of 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 natural hazard areas, such as floodplains and soils with limitations.
- Implementation Element – Have recommended actions from this plan included in the implementation element of comprehensive plans of all jurisdictions in the planning area.

To maximize coordination with other related plans for Florence County, mitigation strategies recommended in this plan have been and should continue to be considered when developing capital improvement plans, stormwater management plans, or flood mitigation plans.

A number of plans, reports, and technical data were referenced and incorporated into the Florence County Hazard Mitigation Plan. The following is a comprehensive list of the data and reports that were utilized in plan development:

- Population, housing, and employment data from the Bureau of the Census (2000 and 2010);
- Land use data from Bay-Lake Regional Planning Commission land use inventory dataset (2009);
- Risk Assessment Matrix Worksheet adapted from the *Resource Guide to All Hazards Mitigation Planning in Wisconsin* (AWRPC, 2003);
- Local Hazard Mitigation Plan Review Crosswalk, Completed for Florence County in 2006 was used to complete the updated Crosswalk;
- *State of Wisconsin Hazard Mitigation Plan* (2008) was used to develop hazard descriptions for the risk assessment;
- FEMA *Local Mitigation Plan Review Guide* (2011) was used to ensure the plan contained all required information;
- Past hazard occurrences were obtained from National Oceanic and Atmospheric Administration (NOAA) – National Climatic Data Center – severe weather event data (1995 – July 2011);
- U.S. Geological Survey maps on landslides, land subsidence and earthquakes were used to describe those hazards;
- FEMA Flood Insurance Studies and FEMA Flood Insurance Rate Maps (FIRMs) were used to map floodplain areas;
- Parcel data from Florence County was used to determine impacts of hazards with defined areas;
- Assessed valuation data from Florence County was used to derive estimates of potential dollar losses;
- *Florence County Emergency Operations Plan* (2003) contributed to the development of the mitigation action plan;
- *Florence County Comprehensive Plan* (2010) was used to develop the community profile and contributed to the development of the mitigation action plan; and
- FEMA *Mitigation Ideas: Possible Mitigation Measures by Hazard Type* (2002) contributed to the development of the mitigation action plan.

It is recommended that similar materials be referenced when completing any updates to the hazard mitigation plan.

(This Page Intentionally Blank)

APPENDIX A: STEERING COMMITTEE AND OPEN HOUSE SIGN-IN SHEETS

In order to assist in plan development, Florence County established a Hazard Mitigation Plan Steering Committee. Table 1.1 in Chapter 1 lists all members of the Committee. The plan steering committee met on five occasions: December 7, 2011; January 25, 2012; March 19, 2012; May 14, 2012, and September 18, 2012. This Appendix contains the sign-in sheets from each of these meetings to verify attendance and participation by Committee members. The sign-in sheet from the open house/public informational meeting is also included in this appendix.

Steering Committee 12-7-11

Name	Agency
David Gribble	Florence Co EM
Annette Seibold	Florence Co H.D.
[illegible]	Highway Deport.
Angela Pierce	Bay-Lake RPC
Pat Smith	Florence Cty F+D
John Queen	USFS
JEFF RICKABY	FCSO
Ed [illegible]	FLORENCE CNTY BD

Steering Committee Meeting
1-25-12

Name	Agency
David Gribble	Florence Co. EM
RYAN GRONDIN	WE ENERGIES
Greg Gulan	U.S. Forest Service
Angela Pierce	Bay-Lake RPC
JEFF RICKABY	FCSO
Annette Seibold	FlCo. Health Dept.
Pat Smith	Flor. Cty Forestry

Hazard Mitigation Steering Committee Meeting
3-19-12

Name	Agency
David Gribble	Florence Co. EM
Angela Pierce	Bay-Lake RPC
RYAN GRONDIN	We Energies
ED KELLEY	FCOR CNTY Bd
Henry Sullivan	WI DNR
Pat Smith	Flo. F+P
Jeff DeMuri	Florence Co. Highway

Steering Committe Meeting
5-14-12

Name	Agency
David Gribble	Florence Co. EM
Angela Pierce	Bay-Lake RPC
RYAN GRONDIN	We ENERGIES
ED KELLEY	FLORENCE CNTY
Bob FRIBERG	Florence utilities
Jeff DeMuri	Florence Highway
Annette Seibold	Health Department
Henry Sullivan	WI DNR
Pat Smith	Florence Forestry

Florence County Hazard Mitigation Plan

Open House/Public Informational Meeting Sign-In

September 18, 2012

Name	Affiliation or Address
Holly W. Stratton	Florence Co. Board Supervisor 1505 Co. B Aurora, WI
Susan Sheer	Co. Board Supervisor 4411 W. Lake Ellwood Rd, Florence WI
Ed Kelly	FLOR CNTY SUP Bx 233 Florence Wis 54121
Terry Hebert	Flor Cnty Sup 109 South St. Florence 54121
[illegible] Thorson	Florence Co Sup 1979 Island St Aurora, WI
[illegible]	Florence Co. EM 501 Lake Ave.

APPENDIX B: RISK ASSESSMENT MATRIX WORKSHEET RESULTS

Members of the plan steering committee completed an update to the *Risk Assessment Matrix* worksheet in March 2012. The following table is the worksheet with the averaged scores from the steering committee members.

Each plan steering committee member was asked to assign a risk rating (1 = low, 2 = moderate, and 3 = high) to the various risk assessment criteria for each natural hazard. The total number of points for each of the identified natural hazards was then calculated.

Column 1 lists the natural hazards that pose a risk in Florence County. Columns 2-11 provide a set of criteria that are designed to assist you in determining which hazards pose the highest risks to the county.

A low, medium, or high numerical rating of 1, 2, or 3 respectively is assigned to each criterion, and then each hazard row is totaled. The hazards with the highest rating in column 12 should be the hazards posing the highest risk to a planning area.

This matrix should not be construed as a precise method for determining hazard risks; rather it is used to assist in reaching a consensus on which hazards pose a higher risk.

2012 FLORENCE COUNTY HAZARD RISK ASSESSMENT MATRIX

1	2	3	4	5	6	7	8	9	10	11	11
Hazard Identification	**Hazard Frequency**	**Hazard Probability**	**Health & Public Safety**	**Home Damage**	**Business Disruption**	**Public Expenditures**	**Magnitude of Population at Risk**	**Magnitude of Homes at Risk**	**Magnitude of Businesses at Risk**	**Adjustment**	**Risk Assessment Rating Total**
Hazard Type	*Frequency of past hazard occurrences* *1, 2 or 3*	*Probability of hazard occurring in the future* *1, 2 or 3*	*Degree of past hazard events causing injuries, sickness and/or deaths* *1, 2 or 3*	*Degree of past hazard events causing damage to homes* *1, 2 or 3*	*Degree of past hazard events causing damage to business and/or interruption of business trade* *1, 2 or 3*	*Amount of local, state, and federal funds expended on past hazard recovery activities* *1, 2 or 3*	*Amount of population still vulnerable to injury, sickness, and/or death from hazard* *1, 2 or 3*	*Amount of homes still vulnerable to damage from hazard* *1, 2 or 3*	*Amount of businesses still vulnerable to damage or interruption of business trade* *1, 2 or 3*		
Flooding (including flash, riverine, lake, and stormwater)	2	2	1	2	1	2	1	1	2	0	**14**
Lightning Storms and Thunderstorms (also including hail storms and high winds)	2	3	1	2	2	1	2	2	2	0	**17**
Tornadoes	1	2	1	1	1	1	2	2	2	0	**13**
Winter Storms (includes heavy snow storms, ice storms and blizzards)	2	2	1	1	1	2	1	1	1	0	**14**
Wildland Fires	2	2	1	1	1	1	1	1	1	0	**12**
Drought	2	2	1	1	1	1	1	1	1	0	**13**
Extreme Heat	1	2	1	1	1	1	2	1	1	0	**11**
Extreme Cold	2	2	1	1	1	1	2	1	1	0	**12**
Fog	1	2	1	1	1	1	1	1	1	0	**11**
Dam Failures	1	1	1	1	1	1	1	1	1	0	**11**

APPENDIX C: PLAN REVIEW TOOL

The Plan Review Tool is a FEMA form completed to accompany the Florence County Hazard Mitigation Plan to demonstrate how the plan meets federal regulations for hazard mitigation planning.

(This Page Intentionally Blank)

APPENDIX A:
LOCAL MITIGATION PLAN REVIEW TOOL

The *Local Mitigation Plan Review Tool* demonstrates how the Local Mitigation Plan meets the regulation in 44 CFR §201.6 and offers States and FEMA Mitigation Planners an opportunity to provide feedback to the community.

The *Local Mitigation Plan Review Tool* offers FEMA an opportunity to provide the community with feedback on various plan sections.

- The Regulation Checklist provides a summary of FEMA's evaluation of whether the Plan has addressed all requirements.
- The Plan Assessment identifies the plan's strengths as well as documents areas for future improvement.
- The Multi-jurisdiction Summary Sheet is an optional worksheet that can be used to document how each jurisdiction met the requirements of the each Element of the Plan (Planning Process; Hazard Identification and Risk Assessment; Mitigation Strategy; Plan Review, Evaluation, and Implementation; and Plan Adoption).

The FEMA Mitigation Planner must reference this *Local Mitigation Plan Review Guide* when completing the *Local Mitigation Plan Review Tool.*

Jurisdiction: **Florence County**	**Title of Plan: Florence County, Wisconsin Hazard Mitigation Plan**	**Date of Plan:** **September 2012**

Local Point of Contact: **David Gribble**	**Address:** **P.O. Box 678** **Florence, WI 54121**
Title: **Emergency Management Director**	
Agency: **Florence County Emergency Management**	
Phone Number: **(715) 528-3346**	**E-Mail:** **dgribble@co.florence.wi.us**

State Reviewer: **Katie Sommers**	**Title:** **Disaster Response and Recovery Planner**	**Date:** **9/27/2012**

FEMA Reviewer: **Rebecca Leitschuh**	**Title:** **Community Planning Specialist**	**Date:** **12/18/12**
Date Received in FEMA Region *(insert #)*	**9/27/12**	
Plan Not Approved		
Plan Approvable Pending Adoption	**12/19/12**	
Plan Approved		

SECTION 1:

REGULATION CHECKLIST

INSTRUCTIONS: The Regulation Checklist must be completed by FEMA. The purpose of the Checklist is to identify the location of relevant or applicable content in the Plan by Element/sub-element and to determine if each requirement has been 'Met' or 'Not Met.' The 'Required Revisions' summary at the bottom of each Element must be completed by FEMA to provide a clear explanation of the revisions that are required for plan approval. Required revisions must be explained for each plan sub-element that is 'Not Met.' Sub-elements should be referenced in each summary by using the appropriate numbers (A1, B3, etc.), where applicable. Requirements for each Element and sub-element are described in detail in this *Plan Review Guide* in Section 4, Regulation Checklist.

1. REGULATION CHECKLIST **Regulation** (44 CFR 201.6 Local Mitigation Plans)	**Location in Plan** (section and/or page number)	**Met**	**Not Met**
ELEMENT A. PLANNING PROCESS			
A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))	1-2 to 1-4 and page 2	x	
A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))	1-3 to 1-4	x	
A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))	1-4	x	
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))	5-2 to 5-3	x	
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))	5-1 to 5-2	x	
A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))	4-2, 5-1 to 5-2	x	
ELEMENT A: REQUIRED REVISIONS			
ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT			
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))	3-3 to 3-4, 3-6 to 3-43 (specifically maps displaying risk 3-31 to 3-43)	x	
B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))	3-1 to 3-2, 3-6 to 3-27	x	

1. REGULATION CHECKLIST Regulation (44 CFR 201.6 Local Mitigation Plans)	Location in Plan (section and/or page number)	Met	Not Met
B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))	3-2, 3-6 to 3-28	x	
B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))	3-9	x	
ELEMENT B: REQUIRED REVISIONS			
ELEMENT C. MITIGATION STRATEGY			
C1. Does the plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))	4-9 to 4-13	x	
C2. Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))	3-9, 3-11, 4-2, 4-5 to 4-6	x	
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))	4-1 to 4-2	x	
C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))	4-4 to 4-7	x	
C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))	4-2 to 4-8, 4-9 to 4-13	x	
C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))	5-2 to 5-3	x	
ELEMENT C: REQUIRED REVISION			
ELEMENT D. PLAN REVIEW, EVALUATION, AND IMPLEMENTATION (applicable to plan updates only)			
D1. Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))	2-1 to 2-7	x	
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))	X to xiii, 4-2 to 4-3	x	
D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))	X to xiii, 4-3, 4-4 to 4-7	x	
ELEMENT D: REQUIRED REVISIONS			

1. REGULATION CHECKLIST Regulation (44 CFR 201.6 Local Mitigation Plans)	Location in Plan (section and/or page number)	Met	Not Met
ELEMENT E. PLAN ADOPTION			
E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))	Pending Adoption		X
E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))	Pending Adoption		x
ELEMENT E: REQUIRED REVISIONS			
ELEMENT F. ADDITIONAL STATE REQUIREMENTS (OPTIONAL FOR STATE REVIEWERS ONLY; NOT TO BE COMPLETED BY FEMA)			
F1.			
F2.			
ELEMENT F: REQUIRED REVISIONS			

SECTION 2:
PLAN ASSESSMENT

Element A: Planning Process

- Strength – Language and table identifying updates made to the former plan are prepared in a straightforward, organized manner and are worthwhile. (xi to xiv)
- Strength – The planning process was robust for the update with diverse participation, open and advertised meetings which resulted in a comprehensive review and revision of the existing plan. (1-2 to 1-4)

Element B: Hazard Identification and Risk Assessment

- Strength – Table 3.2 Natural Hazard Occurrences Data reveals trends in local hazards and their historical impact on the county. This synthesis of historical data and trends guides the later prioritization of such hazards. (3-3)
- Strength – Plan includes detailed inventory of critical facilities. (3-5 to 3-6)
- Strength – The section which narrates possible hazard impacts is organized in a very logical fashion. The separation into categories (Death/Injuries, Structures, Critical Facilities, Economic Impacts) enables to reader to focus on their specific area of concern. It also forces a comprehensive evaluation of these categories for all hazards addressed. (3-6 to 3-29)
- Strength – The maps provide a clear overview of the risks faced across the county. (3-31 to 3-43)
- Opportunity – Although none of the communities in Florence County are incorporated, it still may be of benefit to assess their independent risks for some of the towns depending on their specific vulnerabilities and assets. For example, where are the mobile home parks? Is a safe room provided onsite for tornadoes? Do the schools and nursing home have specific vulnerabilities because of their populations served?

Element C: Mitigation Strategy

- Strength – The list of existing authorities and resources demonstrates shared interests across professional fields and agencies, which will help lay the groundwork for future coordination. (4-9 to 4-13)
- Strength – The plan identifies a breadth of funding sources, which could support mitigation activities across disciplines. (4-10 to 4-13)

B. Resources for Implementing Your Approved Plan

The plan identifies some valuable mitigation strategies possible sources to fund these strategies (4-10 to 4-13).

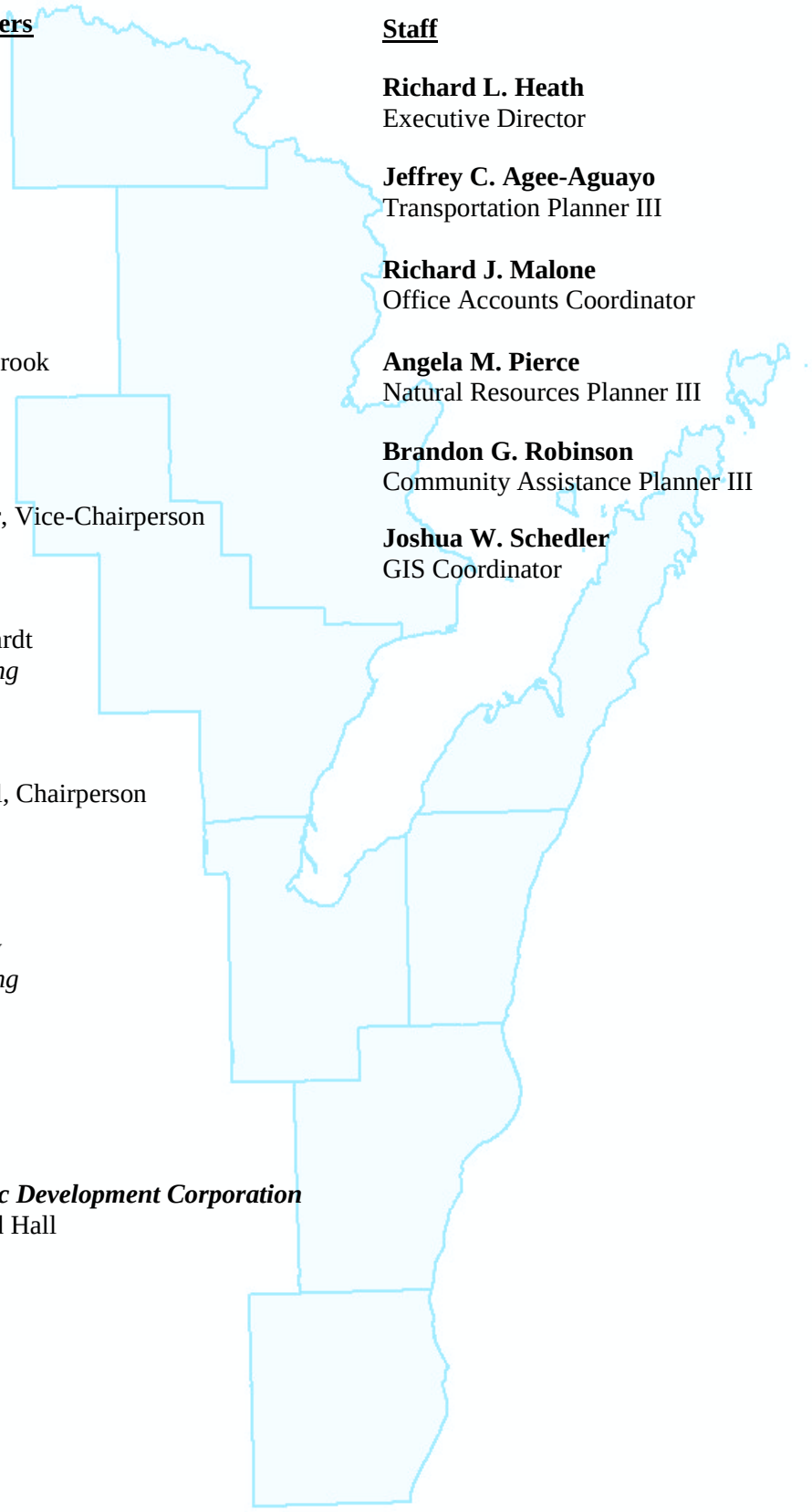
SECTION 3:
MULTI-JURISDICTION SUMMARY SHEET (OPTIONAL)

INSTRUCTIONS: For multi-jurisdictional plans, a Multi-jurisdiction Summary Spreadsheet may be completed by listing each participating jurisdiction, which required Elements for each jurisdiction were 'Met' or 'Not Met,' and when the adoption resolutions were received. This Summary Sheet does not imply that a mini-plan be developed for each jurisdiction; it should be used as an optional worksheet to ensure that each jurisdiction participating in the Plan has been documented and has met the requirements for those Elements (A through E).

MULTI-JURISDICTION SUMMARY SHEET

#	Jurisdiction Name	Jurisdiction Type (city/borough/ township/ village, etc.)	Plan POC	Mailing Address	Email	Phone	Requirements Met (Y/N)					
							A. Planning Process	B. Hazard Identification & Risk Assessment	C. Mitigation Strategy	D. Plan Review, Evaluation & Implementation	E. Plan Adoption	F. State Require-ments
1	Florence	County					X	X	X	X		
2	Aurora	Town	All towns in Florence County are unincorporated.									
3	Commonwealth	Town										
4	Fern	Town										
5	Fence	Town										
6	Florence	Town										
7	Homestead	Town										
8	Long Lake	Town										
9	Tipler	Town										

Bay-Lake Regional Planning Commission



Commission Members

Brown County
Tom Sieber

Door County
Ken Fisher

Florence County
Edwin A. Kelley
Bruce Osterberg
Yvonne Van Pembrook

Kewaunee County
Eric Corroy
Bruce Heidmann
Charles R. Wagner, Vice-Chairperson

Manitowoc County
Chuck Hoffman
Donald C. Markwardt
Nomination Pending

Marinette County
Alice Baumgarten
Cheryl R. Maxwell, Chairperson
Mary G. Meyer

Oconto County
Donald A. Glynn
Thomas D. Kussow
Nomination Pending

Sheboygan County
Mike Hotz
Ed Procek
Traci Robinson

Wisconsin Economic Development Corporation
Interim CEO, Reed Hall

Staff

Richard L. Heath
Executive Director

Jeffrey C. Agee-Aguayo
Transportation Planner III

Richard J. Malone
Office Accounts Coordinator

Angela M. Pierce
Natural Resources Planner III

Brandon G. Robinson
Community Assistance Planner III

Joshua W. Schedler
GIS Coordinator