RESOLUTION NO. 41-15

RESOLUTION ADOPTING THE FOND DU LAC COUNTY NATURAL HAZARDS MITIGATION PLAN: 2015-2020

WHEREAS, pursuant to 42 U.S.C.A. §5165(b), a mitigation plan developed by a local government shall describe actions to mitigate hazards, risks and vulnerabilities of the area identified under the plan and establish a strategy to implement those actions, and

WHEREAS, Resolution No. 40-14, adopted on August 19, 2014, authorized Fond du Lac County to receive a grant from the Federal Emergency Management Agency (FEMA), which was administered as a pass through by Wisconsin Emergency Management, to pay for the preparation, adoption and implementation of an updated multijurisdictional natural hazards mitigation plan, consistent with 44 C.F.R. §201.6, and

WHEREAS, all of the towns, villages and cities in the county were invited to participate in the preparation of the multijurisdictional natural hazards mitigation plan, and

WHEREAS, Fond du Lac County Emergency Management and its consultant worked in partnership with the participating municipalities to prepare a final natural hazards mitigation plan ("plan") in conformance with state and federal guidelines, and

WHEREAS, the plan was submitted for final review and approval by FEMA on April 9, 2015, and was conditionally approved by FEMA on June 4, 2015, pursuant to 44 C.F.R. §201.6(a)(4), which also requires each participating jurisdiction to officially adopt the plan, and

WHEREAS, the Public Safety Committee has reviewed the plan and has recommended it to the Fond du Lac County Board for review and adoption.

NOW, THEREFORE, BE IT RESOLVED that the Fond du Lac County Board hereby adopts the Fond du Lac County Natural Hazards Mitigation Plan: 2015-2020 and authorizes the Emergency Management Director to submit the plan to the appropriate local, state and federal offices, consistent with 44 C.F.R. §201.6(c)(5).

BE IT FURTHER RESOLVED that the Fond du Lac County Board authorizes the Fond du Lac County Emergency Management Director to make any non-substantive revisions to the adopted plan, as may be required.

BE IT FURTHER RESOLVED that the Fond du Lac County Board understands that, pursuant to 44 C.F.R. §201.6(d)(3), the plan must be reviewed and revised to reflect changes in development, progress in local mitigation efforts and changes in priorities and be resubmitted for approval within five (5) years, in order to be eligible for mitigation project grant funding.

Dated August 18, 2015

SUBMITTED BY:
PUBLIC SAFETY COMMITTEE

Martin E. Schroeder

Dean P. Will

Mary Jean Nicholson

Gary A. Will

Thomas R. Schumacher

FISCAL NOTE: This resolution does not require an appropriation from the county general fund.

APPROVED BY:
Allen J. Buechel
COUNTY EXECUTIVE

APPROVED BY:
Meggin R. McNamara
CORPORATION COUNSEL

FARRELL	AYE	GIESE	AYE
G. WILL	AYE	SKOG	AYE
MADIGAN	AYE	SCHROEDER	AYE
M. WILL	AYE	MYRECHUCK	AYE
EVERSON	AYE	LEVANDOWSKI	AYE
DORNBROOK	AYE	ZORN	AYE
WETZEL	AYE	ALDRICH	AYE
SCHUMACHER	AYE	D. WILL	AYE
KOCH	AYE	EISCHEID	EXCUSED
DEPPERMAN	AYE	RYAN	AYE
ABEL	AYE	NICHOLSON	(2) AYE
STENZ	AYE	GOLDSMITH	(M) AYE
SCHNEIDER	EXCUSED		

5A Res. 41-15 Passed (23 Y - 0 N - 0 A - 2 Absent) Majority Vote

RESOLUTION NO. 8584

A RESOLUTION ADOPTING THE 2015-2020 HAZARD MITIGATION PLAN

WHEREAS, the United States Congress passed the Disaster Mitigation Act of 2000, which requires that a local unit of government must have an approved all hazard mitigation plan before it can receive federal grant monies for pre-disaster mitigation projects; and

WHEREAS, the City of Fond du Lac worked with Fond du Lac County Emergency Management to update the countywide mitigation plan that was first adopted in 2004; and

WHEREAS, the City Council considered the updated plan at its meeting on February 10, 2016; and

WHEREAS, the City Council makes the following findings:

1. Natural disasters pose a tangible threat to residents and property.
2. Undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to residents and property and save taxpayers dollars.
3. Preparation of this plan is in the public interest.
4. This plan is intended to serve as a general strategy and may be amended from time to time.
5. Nothing in this plan obligates the city to undertake any of the recommended activities and/or projects.
6. Adoption of this plan is needed to apply for federal funding for mitigation projects.

NOW THEREFORE, BE IT RESOLVED, the plan entitled "Fond du Lac County, Wisconsin 2015-2020 Hazard Mitigation Plan is adopted; and

BE IT FURTHER RESOLVED, the City Clerk is directed to send a signed copy of this resolution to Fond du Lac County; and

BE IT FURTHER RESOLVED, the City Council authorizes the City Clerk to make nonsubstantive revisions to the plan as may be required to

comply with the requirements of Wisconsin Emergency Management or the Federal Emergency Management Agency. Should the clerk make such authorized change, she shall notify the City Council of such change.

ADOPTED:
FEBRUARY 10, 2016

Lee Ann Lorrigan, President
Fond du Lac City Council

Attest:

Margaret Hefter, City Clerk

City Attorney:

Reviewed DAH

Fond du Lac County, Wisconsin

2015-2020 Hazard Mitigation Plan

A Plan for Preparedness, Response, Recovery, and Mitigation

Adopted

August 18, 2015

Prepared for

Fond du Lac County

Communication/Emergency Management

By

Angela Kowalzek-Adrians

Community Assistance Planning, LLC

Fond du Lac County, Wisconsin
Hazard Mitigation Plan 2015-2020
Steering Committee

Name	Organization
Beth Erdman	Department of Natural Resources
Bob Giese	Fond du Lac County Board
Bobbi Hicken	Fond du Lac County Communications and EM
Chuck Hornung	Village of North Fond du Lac
Craig Molitor	Fond du Lac Convention & Visitors Bureau
Dale Heeringa	Waupun Police Department
Darrin Parsons	North Fond du Lac Public Works
Diana Tscheschlok	UW Extension
James McNabb	Fond du Lac County Communications and EM
Jordan Skiff	City of Fond du Lac Public Works
Lisa Stanchfield	American Red Cross
Lori Rich	City of Ripon
Marty Schroeder	Fond du Lac County Board
Richard Flynn	Waupun Public Works
Rick Olig	Fond du Lac County Sheriff's Office
Russ Raube	Fond du Lac County Land Information
Steve Weston	Alliant Energy
Terry Dietzel	Fond du Lac County Land Information
Tom Janke	Fond du Lac County Highway Department
Tom Miller	MABAS President
Tony Zelhofer	Fond du Lac County Communications and EM

FOND DU LAC COUNTY, WISCONSIN
HAZARD MITIGATION PLAN 2015-2020

ADOPTED:
August 18, 2015

Prepared by:
Angela Kowalzek-Adrians
Community Assistance Planning, LLC
Angela.CAP.Planner@gmail.com
(920) 412-0075

COUNTY RESOLUTION OF ADOPTION

(Reserved)

FEMA/WEM APPROVAL LETTERS

(Reserved for letter)

(Reserved for letter)

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APPENDICES

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PLAN UPDATE SUMMARY

To highlight the changes that have been made to the previous version of the *Fond du Lac County Hazard Mitigation Plan* in this current update, Table 0-1 lists the plan changes and Table 0-2 lists the updates made to the identified mitigation strategies.

Table 0-1: *Fond du Lac County Hazard Mitigation Plan 2015-2020 Update* Summary

Plan Chapter	Overview of Plan Update
Chapter 1: Introduction and Planning Process	Updated recent disasters, planning process participants, and public review information. The steering committee updated the prioritized order of the hazards to be addressed.
Chapter 2: Community Profile	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 January 1, 2000 to January 31, 2014. Hazard probabilities were updated based on updated occurrences. Critical facilities were updated and a County-maintained GIS database was created.
Chapter 4: Mitigation Strategy	Updated the mitigation strategies to account for completed projects, updated timetables, new project additions, and some revisions.
Chapter 5: Plan Adoption and Maintenance	Updated plan maintenance process and plan update schedule.

Table 0-2: *Mitigation Strategies Update* Summary

Project	Changes
All Hazards	
Develop and implement education programs aimed at mitigating natural hazards and reducing the risk to citizens, public agencies, private property owners, businesses, and schools.	Removed.
Create displays for use at public events such as the county fair and wellness fairs.	Completed.
Use public information displays about hazards at public events such as the county fair and wellness fairs.	Addition.
Work with the public and private schools within the county to promote hazard mitigation awareness and develop hazard mitigation plans.	Updated Timeline to "On-going."
Provide hazard-related information in Spanish and Hmong.	Revised Project from "Provide hazard-related information in Spanish and Hmong." to "Provide hazard-related information and materials to non-English speaking and hearing impaired communities." Updated Timeline to "On-going."
Continue to add/update Emergency Management Department links on the existing county web site (e.g., ARC, FEMA, WEM), especially focusing on preparedness bulletins.	Removed.
Create a webpage that allows private citizens and county damage assessment teams to input information.	Removed.
Link GIS maps to damage assessment information with the ability to highlight special facilities including those with hazardous chemicals.	Removed.
Develop and maintain a geographic database of natural hazard events that have occurred in the county, including location, event conditions, and resulting damage.	Removed.
Develop and maintain a webpage relating to mitigation planning and activities, to include the posting of the countywide natural hazards mitigation plan.	Updated Timeline to "On-going." Updated Priority from "High" to "Low."
Add links on websites maintained by local jurisdictions to the county's natural hazard mitigation website.	Removed.
Update and maintain the database of critical facilities.	Updated Timeline to "2015-2020."
Explore alternatives to increase public warning options (e.g., sirens, mass notification system).	Completed.
Apply for federal funding to purchase NOAA weather radios for county residents.	Removed.
Continue to host classes for severe weather spotters and maintain a network of spotters in the county.	Updated Priority from "Medium" to "High."

Table 0-2: Mitigation Strategies Update Summary (cont'd)

Project	Changes
All Hazards (cont'd)	
Identify and pursue funding opportunities to develop and implement local and county mitigation activities.	Updated Timeline to "2015-2020."
Periodically assess whether there are enough shelters to house displaced persons.	Removed.
Develop and implement strategies for debris management.	Removed.
Work with the local chapter of the American Red Cross to update its shelter evaluation assessment.	Updated Timeline to "On-going." Changed Responsible Entities to remove "Fond du Lac County Communications and Emergency Management."
Winter Storms	
Continue to promote informational campaigns about severe weather, such as Winter Awareness Week in November.	Revised Project from "Continue to promote informational campaigns about severe weather, such as Winter Awareness Week in November." to "Continue to promote information campaigns about all types of seasonal severe weather and all hazards."
Ensure the sufficient plow and sanding equipment and supplies is available and operational.	Addition
Tornado and Strong Wind	
Study the feasibility of, and support for adopting a local regulation which would require new mobile home/manufactured home parks and future expansions of existing parks to provide for a tornado shelter for residents.	Removed.
Install storm shelters near or in existing mobile home parks and high occupancy campgrounds.	Changed Cost Estimate from "Covered by Existing Budgets" to "Covered by Grants or Park Owners." Updated Timeline to "2015-2020."
Continue to promote informational campaigns about severe weather, such as Tornado and Severe Weather Awareness Week in April.	Revised Project to cover all hazards and moved to All Hazards.
Flooding	Merged Dam Failure Flooding and Stormwater Flooding
Post the current flood insurance rate maps on the County's on-line GIS system.	Removed.
Identify and analyze feasible mitigation options for those properties which are designated as a repetitive loss property.	Updated Timeline to "On-going." Revised Responsible Entities to remove "Fond du Lac County Communications and Emergency Management and added "Fond du Lac County Code Enforcement; and Fond du Lac County Planning and Development Department."

Table 0-2: Mitigation Strategies Update Summary (cont'd)

Project	Changes
Flooding (cont'd)	
Apply for funding through the federal Hazard Mitigation Grant program, Flood Mitigation Assistance Program, and the Pre-Disaster Mitigation Program as well as any other resources that may be available to help floodproof repetitive loss sites or remove them through voluntary acquisition with demolition or relocation.	Updated Timeline to "On-going." Added "Fond du Lac County Code Enforcement; and Fond du Lac County Planning and Development Department" to Responsible Entities.
Design and construct stormwater management facilities consistent with adopted stormwater management plans than have been or will be prepared/amended.	Changed Priority from "Medium" to "High." Updated Timeline to "On-going." Added "Fond du Lac County Code Enforcement; Fond du Lac County Planning and Development Department" to the Responsible Entities.
Identify those culverts and bridges that are undersized or are otherwise unable to handle expected flood flows.	Updated Timeline to "On-going."
Prepare a strategy to prioritize road improvements for public roadways that are susceptible to flooding.	Revised Project to replace "road" with "stormwater." Updated Timeline to "On-going."
Re-evaluate and update the stormwater and erosion control ordinances as may be required.	Updated Timeline to "On-going."
Initiate a study to update hydrology data.	Updated Project to add "of problem areas." Updated Timeline to "On-going."
Distribute National Flood Insurance Program information.	Updated Timeline to "On-going."
Evaluate the support for and the feasibility of becoming part of the Community Rating System (CRS) to lower flood insurance premiums for property owners.	Completed, but consider again in 2015-2020. Updated Responsible Entity to remove "Fond du Lac County Communications and Emergency Management."
Identify undeveloped areas of the county with flood mitigation value and develop appropriate strategies to protect them from inappropriate development.	Removed.
Work with the Wisconsin DNR to ensure that an emergency action plan is prepared for large dams and that they are periodically updated.	Removed.
Ensure that dams are inspected consistent with state law.	Removed.
Revise local floodplain regulations to ensure they comply with the most recent (2008) model floodplain regulations developed by the Wisconsin DNR.	Revised Project to remove "(2008)" after the word "recent." Updated Timeline to "On-going." Changed Responsible Entities to remove "Fond du Lac County Communications and Emergency Management" and add "Fond du Lac County Code Enforcement."

Table 0-2: Mitigation Strategies Update Summary (cont'd)

Project	Changes
Flooding (cont'd)	
Conduct a study to determine feasible and cost-effective solutions to minimize flooding along the Fond du Lac River.	Revised Project to replace "Conduct a study" with "Study problem areas" and replace "the Fond du Lac River" with "local waterways." Revised Cost Estimate to replace "Unknown" with "Covered under existing budgets." Updated Timeline with "On-going." Added "Fond du Lac County Code Enforcement; Fond du Lac County Planning and Development Department" to the Responsible Entities.
Work with the owners of mobile home parks that are located in the 100-year floodplain to reduce the density of units and to ensure the remaining units are tied down.	Revised Cost Estimate to replace "Unknown" with "Covered under existing budgets." Updated Timeline to "On-going." Added "private owners" to Responsible Entities.
Continue to promote informational campaigns about severe weather, such as Flood Awareness in March.	Revised Project to include all hazards and moved to All Hazards.
Drought	
Adopt local regulations to control the use of water during drought conditions.	Updated Timeline to "2015-2020." Added "water utilities" to Responsible Entities.
Develop a set of procedures for water distribution during drought to those in need.	Updated Timeline to "2015-2020." Revised Responsible Entities to remove "Fond du Lac County Communications and Emergency Management" and add "EOC/Unified Command."
Extreme Heat	
Develop a directory of public buildings that would be open to the public during extended heat waves.	Completed.
Call a meeting of public and nonprofit organizations that may be able to mobilize a volunteer corps of individuals willing to assist vulnerable people during periods of extreme heat.	Completed.
Investigate the possibility of establishing a database of individuals who are vulnerable to temperature extremes and who have voluntarily placed their name on the call list.	Removed.
Publicize available programs that help low-income residents pay for their utility expenses.	Removed.
Amend the Fond du Lac County's emergency operations plan to address temperature extremes.	Updated Timeline to "On-going." Changed Responsible Entities from "Fond du Lac County Communications and Emergency Management " to "Fond du Lac County Health Department, and local media."

Table 0-2: Mitigation Strategies Update Summary (cont'd)

Project	Changes
Extreme Heat (cont'd)	
Continue to promote informational campaigns about severe weather, such as Heat Awareness Day in June.	Revised Responsible Entities to replace "Fond du Lac County Communications and Emergency Management" with "Fond du Lac County Public Heath Department."
Extreme Cold	
Call a meeting of public and nonprofit organizations that may be able to mobilize a volunteer corps of individuals willing to assist vulnerable people during periods of extreme cold.	Completed.
Investigate the possibility of establishing a database of individuals who are vulnerable to temperature extremes and who have voluntarily placed their name on the call list.	Removed.
Publicise available programs that help low-income residents pay for their utility expenses.	Removed.
Amend the Fond du Lac County's emergency operations plan to address temperature extremes.	Updated Timeline to "On-going." Changed Responsible Entities from "Fond du Lac County Communications and Emergency Management " to "Fond du Lac County Health Department, and local media."
Hail	
Continue offering information regarding insurance to farm operators for potential crop losses due to hail damage.	Revise Project from "Continue offering information regarding insurance to farm operators for potential crop losses due to hail damage." to "Continue to educate producers on risk management strategies that minimize the economic impact of extreme weather events for crops."
Lightning	
Place lightning safety materials in display racks around the county.	Removed.
Provide the public with information about proven lightning safety guidelines to reduce the risk of lightning hazards.	Updated Timeline to "2015-2020." Changed Responsible Entities from "Fond du Lac County Communications and Emergency Management" to "Local media, Fond du Lac County Communications/ Emergency Management, and Fire services."
Install or upgrade lightning grade surge protection devices for critical electronic components used by critical facilities, such as warning systems, control systems, communications, and computers.	Removed.
Dense Fog	
Dissemination of fog advisories	Addition

Table 0-2: Mitigation Strategies Update Summary (cont'd)

Project	Changes
Wildland Fires	
Apply for federal and state grants to enhance the capability of local fire departments.	Updated Timeline to "On-going."
Provide education to county and municipal personnel about federal cost-share and grant programs, fire protection agreements, and other related federal programs so the full array of assistance available to local agencies is understood.	Removed.
Study the feasibility of and support for adopting a local burning permit program at the Town level.	Removed.
Develop a digital database to keep track of wildfire events in the county.	Removed.
Investigate the establishment of a uniform way of providing information to the public regarding issuance of burning permits.	Removed.
Investigate the adoption of an ordinance to ensure that those parties conducting controlled burns are present and have the wherewithal to control and extinguish the fire if required.	Updated Timeline to "2015-2020."

CHAPTER 1 - INTRODUCTION AND PLANNING PROCESS

PURPOSE OF THE PLAN

The primary focus of the *Fond du Lac County Hazard Mitigation Plan 2015-2020* is to evaluate the planning area's potential exposure to natural hazards and to identify appropriate mitigation strategies. Although Fond du Lac County decided to limit the scope of this planning effort to natural hazards, this plan conforms to Federal Emergency Management Agency (FEMA) requirements for local hazards mitigation planning consistent with the Code of Federal Regulations (44 CFR Part 201.6).

This plan provides county-level information on areas of risk, magnitude of risk, and strategies for reducing impacts from risk. Through the process of developing this plan update, 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 continues Fond du Lac County's eligibility to apply for future FEMA disaster relief and mitigation project funds, helping the County to implement mitigation strategies.

Disaster Mitigation Act of 2000

The development and update of the Fond du Lac County Hazard Mitigation Plan is in response to passage of the Disaster Mitigation Act of 2000 (Public Law 106-390). This Act was signed into law in October 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 Disaster Mitigation Act 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 and tribal governments:

The Act authorized that a percentage of Hazard Mitigation Grant Program funds available to a state after a federal disaster be used for development of state, local and tribal hazard mitigation plans.

The Act establishes a requirement that natural hazards be addressed in the risk assessment/vulnerability analysis of a hazard mitigation plan. It is encouraged, but not required for man-made/technological hazards to be addressed.

The Act requires local and tribal governments to prepare and adopt their respective plans in order to be eligible for the FEMA grant programs.

If a FEMA-approved plan is not current and a major disaster is declared, local or tribal governments must agree to prepare a hazard mitigation plan within one year in order to be eligible to receive funding through the Hazard Mitigation Grant Program.

Additionally, failing to maintain a current FEMA-approved hazard mitigation plan prevents local and tribal governments from being eligible for FEMA funding for mitigation plans and projects.

Funding of the Hazard Mitigation Plan

In July 2013, Fond du Lac County received a planning grant from FEMA to develop an update to their hazard mitigation plan under a Pre-Disaster Mitigation grant. Through

the grant, FEMA provided 75 percent of the funds ($19,958) to develop the update. Fond du Lac County provided a required 25 percent match ($6,652.67) towards the plan.

In June 2014, Fond du Lac County entered into a contract with a planning consultant, Community Assistance Planning, LLC, to prepare the update to the hazard mitigation plan.

Five Parts of this Natural Hazards Mitigation Plan

The *Fond du Lac County Hazard Mitigation Plan 2015-2020* was divided into five chapters in order to address FEMA's local mitigation plan requirements. The five chapters are as follows:

Chapter 1 – Introduction and Planning Process;

Chapter 2 – Community Profile;

Chapter 3 – Risk Assessment;

Chapter 4 – Mitigation Strategy; and

Chapter 5 – Plan Adoption and Maintenance.

PLANNING PROCESS

Development of the *Fond du Lac County Hazard Mitigation Plan 2015-2020* was based on the planning requirements and guidance provided by FEMA and 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 *Fond du Lac County Hazard Mitigation Plan 2015-2020* covers all of Fond du Lac County including the three cities (Fond du Lac, Ripon, and Waupun), nine villages (Brandon, Campbellsport, Eden, Fairwater, Mount Calvary, North Fond du Lac, Oakfield, Rosendale, and St. Cloud), and 21 towns.

The steering committee comprised of county, city, and village representatives, emergency management personnel, organizations, business, and citizens guided the plan development process over a 16-month timeframe beginning in July 2014. Community Assistance Planning, LLC, provided professional planning support and facilitation. Public review and input was encouraged at all meetings and through an Open House to present the plan goals, mitigation strategies, 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 strategies
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 strategies 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 Fond du Lac County Board meeting on _____, 2015. The maps in the Planning Area and Risk Assessment chapters of the plan were completed using Fond du Lac County'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

Fond du Lac County established a Hazard Mitigation Plan Steering Committee (Table 1-1), which was responsible for providing input, helping to guide the planning process, and reviewing draft chapters of the plan.

Table 1-1: Fond du Lac County Hazard Mitigation Plan Steering Committee

Name	Organization
Beth Erdman	Department of Natural Resources
Bob Giese	Fond du Lac County Board
Bobbi Hicken	Fond du Lac County Communications and EM
Chuck Hornung	Village of North Fond du Lac
Craig Molitor	Fond du Lac Convention & Visitors Bureau
Dale Heeringa	Waupun Police Department
Darrin Parsons	North Fond du Lac Public Works
Diana Tscheschlok	UW Extension
James McNabb	Fond du Lac County Communications and EM
Jordan Skiff	City of Fond du Lac Public Works
Lisa Stanchfield	American Red Cross
Lori Rich	City of Ripon
Marty Schroeder	Fond du Lac County Board
Richard Flynn	Waupun Public Works
Rick Olig	Fond du Lac County Sheriff's Office
Russ Raube	Fond du Lac County Land Information
Steve Weston	Alliant Energy
Terry Dietzel	Fond du Lac County Land Information
Tom Janke	Fond du Lac County Highway Department
Tom Miller	MABAS President
Tony Zelhofer	Fond du Lac County Communications and EM

During the assessment of natural hazards, the plan steering committee reviewed the prioritization of the various potential natural hazards facing the planning area. The hazards addressed in this plan are listed below in order of priority.

1. Winter Storm
2. Tornado and Strong Wind
3. Flooding
4. Drought
5. Extreme Heat
6. Extreme Cold
7. Hail
8. Lightning
9. Dense Fog
10. Wildland Fire

Steering Committee Plan Review

The steering committee reviewed and analyzed each section of the plan, and subsequently Table 0-1 was developed to document the sections of the plan that were revised as part of the update process. The steering committee held five meetings to update the plan: August 28, 2014; September 30, 2014; October 23, 2014; November 18, 2014; and January 14, 2014. Additional plan review through 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 January 23, 2015 at the Fond du Lac City/County Government Center. This meeting was held to provide additional opportunity for the public to review and comment on the draft plan and maps. No comments were provided by the public at this meeting. Appendix E contains the public notice.

Both the steering committee meetings and the public informational meeting were open to the public. Meeting notices were posted at the Fond du Lac City/County Government Center, sent to local municipal clerks, and provided to local media.

County Board Meeting

On _____, the Fond du Lac County Board adopted this hazard mitigation plan update at a public meeting. A copy of the resolution of adoption can be found at the front of this plan on page iii.

Neighboring Jurisdictions

The Fond du Lac County Hazard Mitigation Plan was sent to the emergency management directors in the adjacent counties for their review and comment. Adjacent counties include Winnebago County (north), Calumet County (northeast), Sheboygan County (east), Washington County (southeast), Dodge County (southwest), Green Lake County (west). No comments were received.

Contact Information

James P. Mc Nabb
Director
Fond du Lac County Communications and Emergency Management
160 S Macy Street, Fond du Lac, WI 54935
(920) 906-4646
james.mcnabb@fdlco.wi.us

CHAPTER 2 - COMMUNITY PROFILE

GENERAL GEOGRAPHY

The planning area for the *Fond du Lac County Hazards Mitigation Plan* completely covers Fond du Lac County and includes all of the municipalities within the county. Fond du Lac County is located in east central Wisconsin with a total land area of 725 square miles. The county has 34 municipalities comprised of 13 incorporated communities including the cities of Fond du Lac, Ripon, and Waupun (partially in Dodge County); and the villages of Brandon, Campbellsport, Eden, Fairwater, Kewaskum (mostly in Washington County), Mount Calvary, North Fond du Lac, Oakfield, Rosendale, St. Cloud; and 21 towns.[1]

Winnebago and Calumet counties border Fond du Lac County to the north; Green Lake County borders the west; Dodge and Washington counties border the south; and Sheboygan County borders the east. Map 2.1 illustrates the location of Fond du Lac County and municipalities in the county.

COUNTY INFORMATION

Fond du Lac County was incorporated on April 1, 1839. Fond du Lac County currently has a population of approximately 101,633 persons. For 2013, the total property valuation was $6,652,706,000.[1]

GENERAL DEVELOPMENT PATTERN

A land use inventory assessment of the county was conducted in 2007 by the East Central Wisconsin Regional Planning Commission (Map 2.1). Table 2-1 provides a tabulated summary of the land use data. The information shows that 90 percent of the county is classified as undeveloped, primarily agricultural lands, while existing development covers ten percent of the county. The vast majority of the county, nearly 61 percent, is comprised of agricultural lands with nearly 282,800 acres.

Developed land is comprised of residential, transportation, commercial, industrial, public/institutional, and recreation/open space land uses. Transportation and residential land uses make up most of the developed land in the county, comprising 41 percent and 38 percent of the developed area, respectively.

[1] Fond du Lac County, Wisconsin website. http://www.fdlco.wi.gov/about-the-county/county-facts. Retrieved 09/2014; and Fond du Lac County Land Information Department, 09/2014.

Table 2-1: Land Use, 2007, Fond du Lac County

Land Use Type	Acres
DEVELOPED	
Transportation	18,354
Residential	17,043
Single Family Residential	*16,197*
Multi-Family Residential	*447*
Manufactured Homes	*400*
Industrial	3,171
Recreation/Open Space	2,774
Commercial	2,023
Public/Institutional	1,794
Total Developed	**45,161**
UNDEVELOPED	
Agricultural	282,770
Open Space/Undeveloped	72,296
Woodlands	58,742
Water	6,854
Total Undeveloped	**420,661**
Total Area	**465,822**

Source: East Central Wisconsin Regional Planning Commission, 2007; Fond du Lac County; and Community Assistance Planning, LLC; 2014.

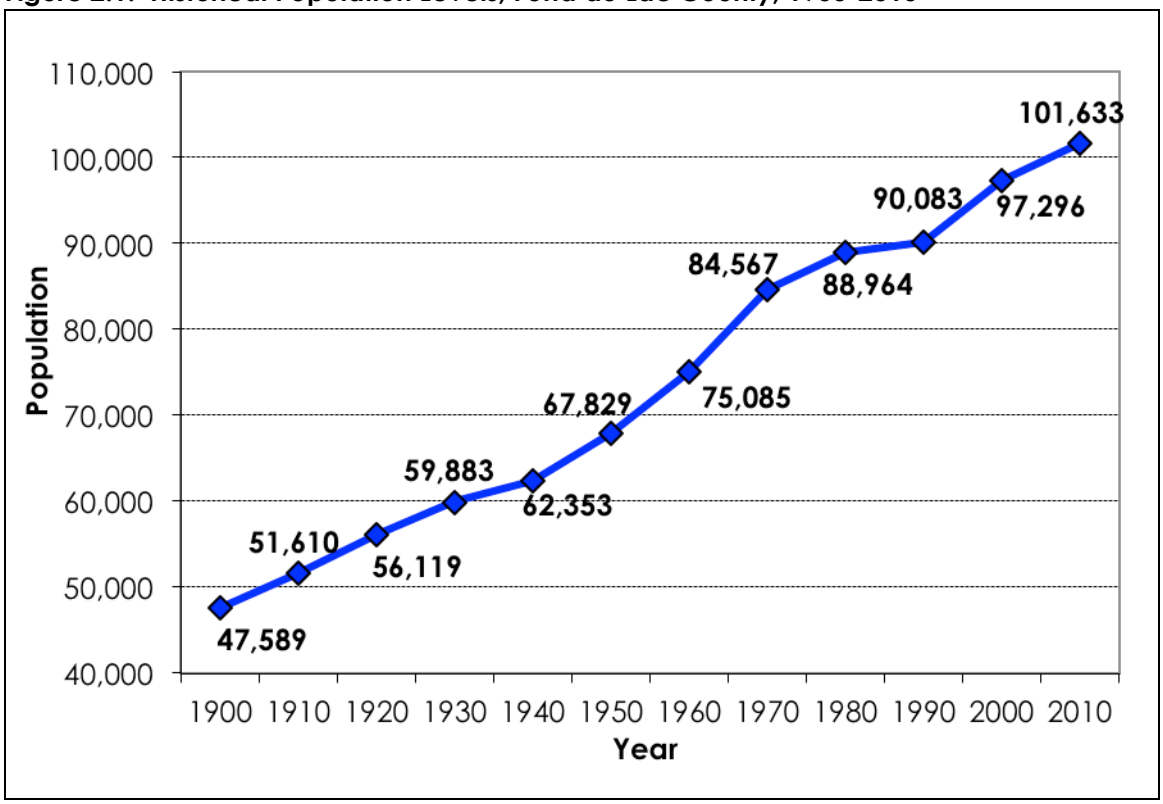
DEMOGRAPHIC TRENDS

In order to plan for hazards that may occur within Fond du Lac County, it is important to gain an understanding of the current and projected future population and housing characteristics for each community within the county. U.S. Census of Population and projections provided by the Wisconsin Department of Administration provide an indication of anticipated population increases for the county. Increases in population will drive the need for new homes (single and multi-family) and the services needed to meet the needs of those new residents. The following information summarizes population and housing data for Fond du Lac County.

Population Trends

During the past 110 years, Fond du Lac County's population has steadily grown over the decades, with an overall increase of 114 percent or 54,044 persons. Figure 2.1 illustrates Fond du Lac County's population change from the years of 1900 to 2010.

Figure 2.1: Historical Population Levels, Fond du Lac County, 1900-2010



Source: U.S. Census Bureau, 1900 - 2010 Censuses; and Community Assistance Planning, LLC; 2014.

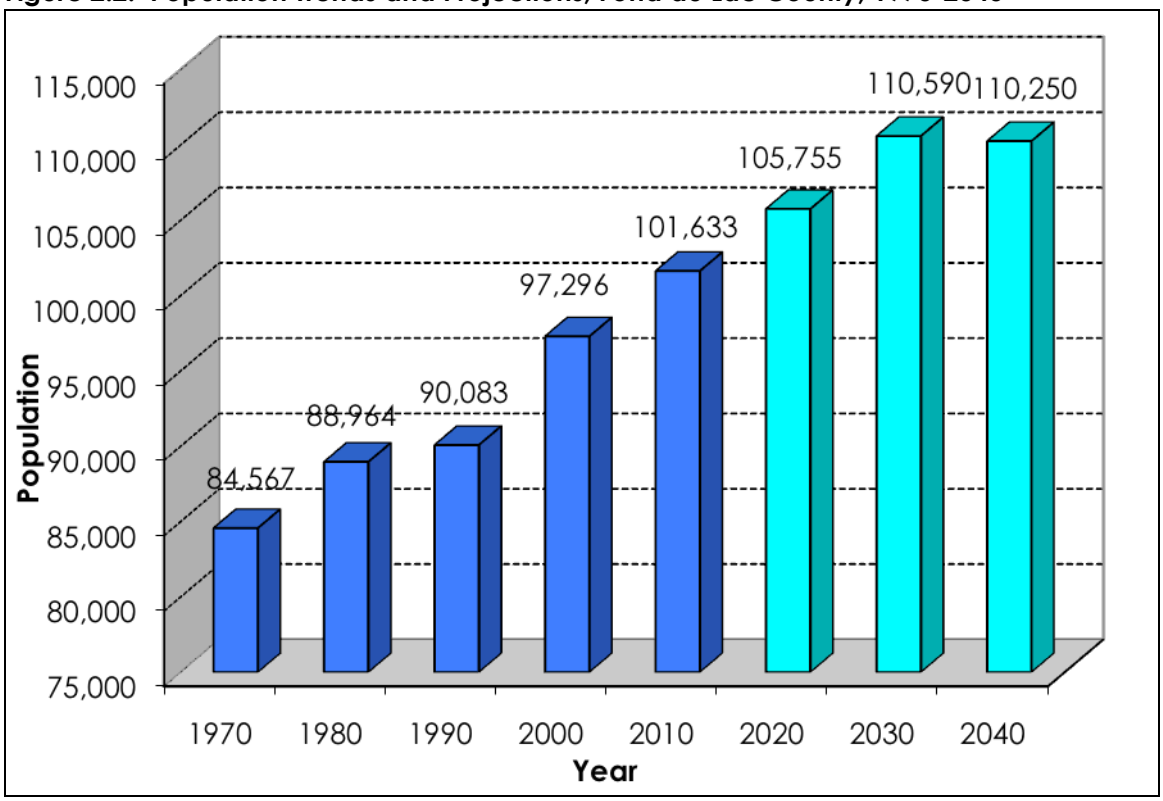
Fond du Lac County's population is projected to continue growing steadily from 2010 to 2040 with a slight dip in population from 2030 to 2040. Overall the county is projected to have a population of 110,250 by 2040, according to the WDOA projection calculations. This represents an increase of 8,617 persons, or 8.5 percent, from the 2010 Census count of 101,633 persons (Table 2-2 and Figure 2.2).

Table 2-2: Population and Projections, Fond du Lac County and State of Wisconsin, 2010-2040

Geographic Location	Census 2010	Population Projections 2020	2030	2040	# Change 2010-2040	% Change 2010-2040
Fond du Lac County	101,633	105,755	110,590	110,250	8,617	8.5
Wisconsin	5,686,986	6,005,080	6,375,910	6,491,635	804,649	14.1

Source: U.S. Census Bureau, 2010 Census; Wisconsin Department of Administration, Population Projections, 2013; and Community Assistance Planning, LLC; 2014.

Figure 2.2: Population Trends and Projections, Fond du Lac County, 1970-2040



Source: U.S. Census Bureau, 2010 Census; Wisconsin Department of Administration, Population Projections, 2013; and Community Assistance Planning, LLC; 2014.

Housing Trends

Fond du Lac County has experienced steady housing growth over the last 40 years. From 1970 to 2010, the county gained 18,029 housing units (69.7 percent) (Table 2-3).

Table 2-3: Housing Units, Fond du Lac County, 1970-2010

Geographic Location	Year					Percent Change
	1970	1980	1990	2000	2010	1970-2010
Fond du Lac County	25,881	31,739	34,548	39,271	43,910	69.7
Wisconsin	1,472,466	1,863,897	2,055,774	2,321,144	5,686,986	286.2

Source: U.S. Census Bureau, 1970 - 2010 Censuses; Community Assistance Planning, LLC; 2014.

Employment Characteristics

The labor force is comprised of employed persons and those seeking employment, and excludes persons in the armed forces and those under age 16 years old. Variations in the number of persons in the labor force are the result of many factors. Shifts in the age and gender 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.

Over the last decade, Fond du Lac County has employed a labor force of approximately 55,000 to 56,000 civilian persons over the age of 16 years old. The average unemployment rate over the last decade has been 5.6.

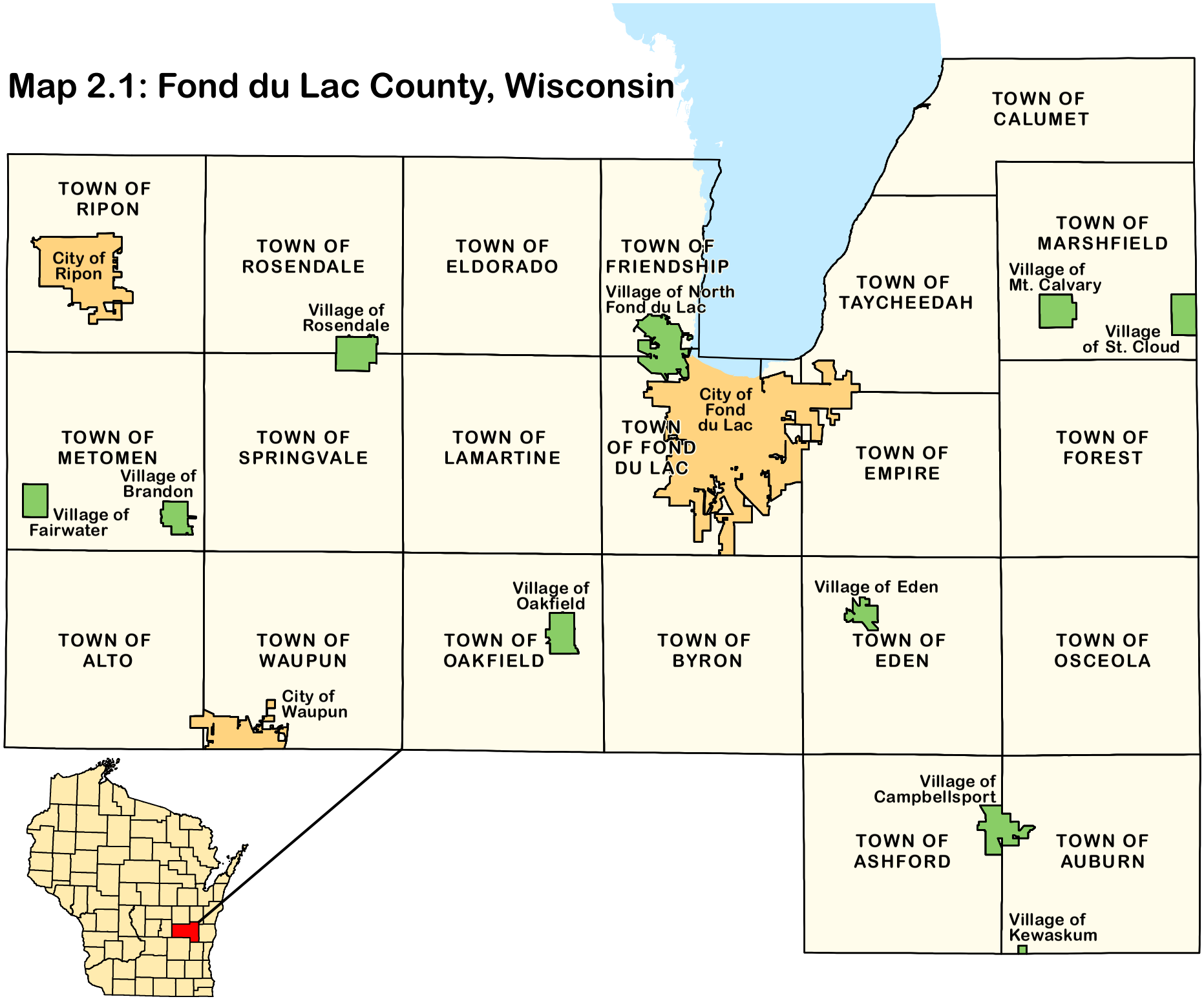
As a result of the 2009 "Great Recession" that affected the entire country, there was a significant jump in the number of unemployed in the county during that time. The unemployment rate reached its highest level on record at 9.2 during this period. Recovery since 2009 has been slow but steady (Table 2-4).

Table 2-4: Labor Force Estimates, 2000-2013, Fond du Lac County

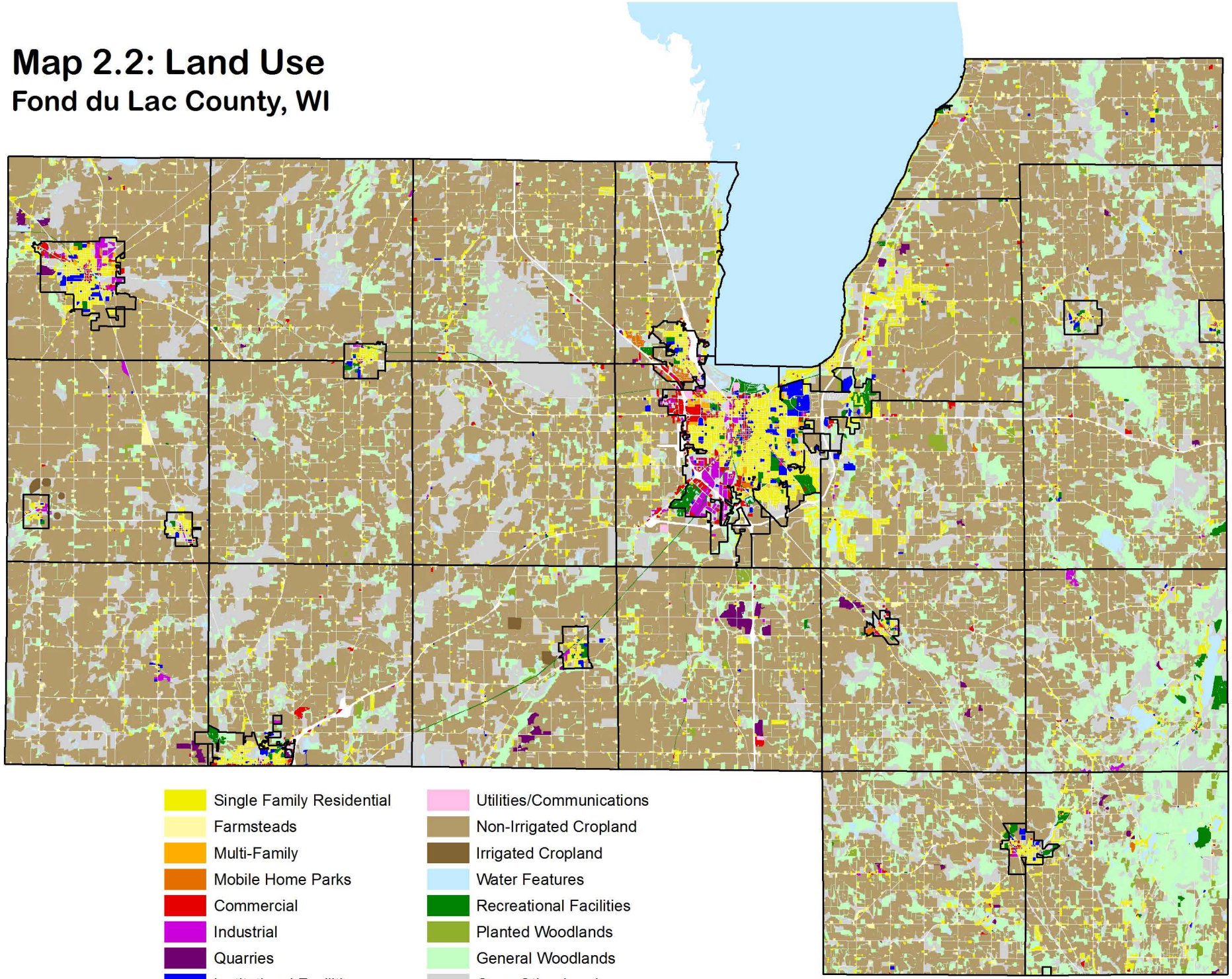
Year	Labor Force	Employed	Unemployed	Unemployment Rate
2000	55,970	54,293	1,677	3.0
2001	56,621	54,325	2,296	4.1
2002	56,943	54,152	2,791	4.9
2003	56,650	53,624	3,026	5.3
2004	56,247	53,591	2,656	4.7
2005	56,138	53,523	2,615	4.7
2006	56,796	54,135	2,661	4.7
2007	57,052	54,420	2,632	4.6
2008	56,912	54,214	2,698	4.7
2009	56,553	51,367	5,186	9.2
2010	55,857	51,159	4,698	8.4
2011	55,148	51,151	3,997	7.2
2012	55,129	51,528	3,601	6.5
2013	56,126	52,581	3,545	6.3

Note: Not Seasonally Adjusted
Source: Wisconsin Department of Workforce Development, Local Area Unemployment Statistics; 2014.

Map 2.1: Fond du Lac County, Wisconsin



Map 2.2: Land Use
Fond du Lac County, WI



Source: East Central Wisconsin Regional Planning Commission
Existing Land Use 2007

CHAPTER 3 - RISK ASSESSMENT

A risk assessment has been prepared for Fond du Lac County in order to more effectively evaluate potential hazard mitigation measures and develop useful strategies to address the risks associated with the identified natural hazards. The risk assessment identifies the natural hazards determined 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.

HAZARD IDENTIFICATION

Although the county could potentially be at risk from several distinct hazards, this plan focuses on addressing the natural hazards that pose the greatest risk to people and property in the county. Identification of the natural hazards to be addressed was based on a query of the natural hazards that have impacted the county in the past, as determined from historical hazard occurrences data from the National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center (NCDC).

Hazard Risk Assessment Ranking

To develop a hazard risk assessment ranking, the steering committee participated in a consensus-based prioritization exercise. The steering committee ranked the hazards based on the number and frequency of occurrences, the injury and deaths, and the estimated damage costs from the NCDC data. Table 3-1 shows the hazard risk assessment ranking for the plan.

Table 3-1: Risk Assessment Ranking

Natural Hazard	2015 Ranking
Winter Storm	1
Tornado and Strong Wind	2
Flooding	3
Drought	4
Extreme Heat	5
Extreme Cold	6
Hail	7
Lightning	8
Dense Fog	9
Wildland Fire	10

Source: Fond du Lac County Hazard Mitigation Plan Steering Committee, 2014.

Natural Hazard Events Historical Summary

The 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

available from January 1, 2000 through January 31, 2014. The query for that time period resulted in 389 events recorded (Table 3-2).

The data from the NCDC shows that of the 389 events, the natural hazards occurring most frequently in Fond du Lac County from 2000 to 2014 include: tornado and strong wind (119 events), winter storm (95 events), dense fog (53 events), and hail (41 events). Other hazard events in the county since 2000 include drought (19 events), extreme heat (19 events), extreme cold (16 events), lightning (14 events), and flooding (13 events).

Some of the recorded hazard events may not have been specific to Fond du Lac County, as they may have been recorded for a larger regional area, or statewide. Additionally, some of the common hazard events, such as lightning may only get reported to the NCDC if they are extreme events that cause property damage, injury, or death.

There have been no deaths in the last 14 years, but there have been 60 injuries. The 60 injuries were not specific to Fond du Lac County, but occurred across the region during one winter storm event in January 2009 from freezing rain, which caused hazardous driving conditions.

By far, the most costly hazard event in terms of property damage (includes crop damage) since 2000 has been flooding ($98,154,400). The single most costly flooding event occurred in June 2004 and caused $67.4 million in damages. However, the damage totals included a zone extending beyond the county.

Table 3-2: Natural Hazard Occurrences Data, Fond du Lac County 2000-2014

Natural Hazard (Listed in Ranked Order)	# of Events[1]	Average #/Year	Risk[2]	Deaths	Injuries	Property Damage[3,4]
Winter Storm	95	7	High	0	60	$10,000
Tornado and Strong Wind	119	8	High	0	0	$11,260,020
Flooding	13	1	Low	0	0	$98,154,400
Drought	19	1	Low	0	0	$200,000
Extreme Heat	19	1	Low	0	0	$0
Extreme Cold	16	1	Low	0	0	$2,000
Hail	41	3	Medium	0	0	$53,000
Lightning	14	1	Low	0	0	$491,100
Dense Fog	53	4	Medium	0	0	$0
Wildland Fire	No data	--	Low	--	--	--
Total Events	389	--	--	0	60	$110,160,520

1. January 1, 2000 to January 31, 2014 (14 years, 1 month)
2. Risk based on occurrences per year: High >5; Medium 3-5; and Low<3
3. Includes Crop Damages.
4. Does not factor in private losses for most occurrences.

Source: NOAA NCDC Storms Database, 2000-2014; and Community Assistance Planning, LLC; 2014.

Natural Hazards Prioritization

The plan steering committee identified the following ranked natural hazards to be the focus of the plan assessment and mitigation strategies. Ranking the potential risks associated with each natural hazard helped the steering committee prioritize the

mitigation strategies that were addressed later in the process. 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.

- Winter Storm (includes heavy snow, winter weather, blizzard, and ice storm)
- Tornado and Strong Wind (includes tornado, thunderstorm wind, funnel cloud, strong wind, and high wind)
- Flooding (includes flash flood and heavy rain)[2]
- Drought
- Extreme Heat (includes heat and excessive heat)
- Extreme Cold (includes cold/wind chill and extreme cold/wind chill)
- Hail
- Lightning
- Dense Fog
- Wildland Fire (i.e. brush fires)

Disaster Declaration History

There have been 15 declarations issued for Wisconsin since 2000. Fond du Lac County was included in two disaster declarations and one emergency declaration. A major disaster declaration was issued for Fond du Lac County, along with other counties, in 2004 (FEMA-1526-DR) and 2008 (FEMA-1768-DR) for severe storms, flooding and tornadoes. An emergency declaration (FEMA-3249-EM) was issued for all Wisconsin counties as part of the nationwide evacuation response for Hurricane Katrina.

Natural Hazards Determined Not to Pose a Significant Risk

Earthquakes have been determined to have a minimal likelihood of occurring in Fond du Lac County. A full risk assessment for earthquakes has been excluded, but is briefly described here.

Earthquakes

According to the U.S. Geological Survey (USGS), there have been 19 earthquake events in Wisconsin. Fond du Lac County has experienced one earthquake in 1922, which had a magnitude of 4.2 on the Richter scale. All recorded readings on Wisconsin earthquakes have been relatively small, most being 3.0 to 4.2 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.[3]

[2] Includes dam failure flooding.
[3] Dutch, Steve; University of Wisconsin – Green Bay; https://www.uwgb.edu/dutchs/GeologyWisconsin/wieqks.htm; 1999.

The nearest active earthquake fault outside of Wisconsin is the New Madrid Fault, which stretches from northeast Arkansas to southern Illinois. Fond du Lac 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, Fond du Lac 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.

Critical Facilities

Although the risk assessment focuses 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, childcare, and manufactured housing communities).

There are 456 critical facilities in Fond du Lac County. Table 3-3 lists the types and number of critical facilities within the county. Table 3-4 lists the number of critical facilities in each municipality. Critical facilities in the planning area have been identified and mapped, and are illustrated in Map 3.3. Appendix C lists the critical facilities by community.

Table 3-3: Number of Critical Facilities by Type, Fond du Lac County

Critical Facility Type	Total
Bridge	130
Utilities	103
School	63
Health Care Facility	59
Municipal Facility	38
Fire Department	19
Manufactured Housing Community	13
Law Enforcement	12
Communication Tower	9
Dam	9
Airport	1
Total	456

Source: Steering Committee; Fond du Lac County; Community Assistance Planning, LLC; 2015.

Table 3-4: Number of Critical Facilities by Municipality, Fond du Lac County

Municipality	# of Critical Facilities
City of Fond du Lac	121
City of Ripon	35
City of Waupun	14
Village of Brandon	12
Village of Campbellsport	14
Village of Eden	4
Village of Fairwater	6
Village of Mt Calvary	7
Village of North Fond du Lac	16
Village of Oakfield	10
Village of Rosendale	9
Village of St. Cloud	5
Town of Alto	5
Town of Ashford	7
Town of Auburn	9
Town of Byron	9
Town of Calumet	8
Town of Eden	6
Town of Eldorado	7
Town of Empire	8
Town of Fond du Lac	49
Town of Forest	6
Town of Friendship	13
Town of Lamartine	10
Town of Marshfield	14
Town of Metomen	3
Town of Oakfield	7
Town of Osceola	9
Town of Ripon	3
Town of Rosendale	3
Town of Springvale	5
Town of Taycheedah	6
Town of Waupun	16
Total	456

Source: Steering Committee; Fond du Lac County; Community Assistance Planning, LLC; 2015.

HAZARD PROFILES

Hazard profiles are intended to describe the frequency, severity, and probability of future natural hazards that could impact Fond du Lac County. These hazard profiles

describe the cause and characteristics of past natural hazards, 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 five times per year; medium probability hazards are those that occur an average of three to five times per year; and low probability hazards occur less frequently than three times per year.

Winter Storm

Description of Hazard

Winter storms can vary in size and strength, and can include heavy snow storms, blizzards, freezing rain, sleet, and ice storms. Extremely cold temperatures accompanied by strong winds can result in wind chills that cause bodily injury such as frostbite and hypothermia. 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 when followed by freezing rain and subsequent 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 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.

Winter storms in Wisconsin are typically caused by Canadian and Arctic cold fronts that push snow and ice deep into the interior of the United States. 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 about 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 snowstorms when gusty winds cause severe blowing and drifting of snow.

Both ice storms and sleet can occur at any time throughout the winter season from October into April. Early- and late-season ice storms and sleet are generally limited to northern Wisconsin. Otherwise, the majority of these storms occur in southern Wisconsin.

Previous Significant Hazard Occurrences

According to the NCDC, Fond du Lac County has experienced 95 significant winter storm events in the last 14 years from January 1, 2000 to January 31, 2014 (including blizzards, winter weather, heavy snow, and ice storms). Many of these hazard events may not have been specific to Fond du Lac County, and may have been recorded for a larger regional area.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, Fond du Lac County experiences approximately seven significant winter storm events per year.

Probability of Hazards Occurring in the Future

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

Winter storms tend to be a regional phenomenon in that they affect much of east central Wisconsin on nearly all of the occasions in which they affect Fond du Lac 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, but 60 injuries have been reported from significant winter storm events for Fond du Lac County over the last 14 years from January 1, 2000 to January 31, 2014 according to NCDC data.

The 60 injuries were not specific to Fond du Lac County, but occurred across the region during one winter storm event in January 2009 from freezing rain, which caused hazardous driving conditions.

Structures at Risk

Occasionally, heavy snow or accumulated ice will cause structural collapse of older buildings (particularly roofs), but most buildings are 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

Critical facilities are not greatly impacted by winter storms; however, personnel associated with the critical facilities face greater workload burdens. 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 may see increased patient loads for frostbite, pedestrian and vehicular accident injuries, and heart conditions resulting from the shoveling of heavy snow during and following winter storms. Sometimes, hospitals and clinics have difficulty getting their own staff to report to work because of the storm, which increases the workload for present staff (double shifts, etc.).

Police personnel respond to more accidents during winter storms. Utility and telephone companies 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 persons during winter storms. Airports face flight delays.

Economic Impacts

Loss of power often means that businesses and manufacturing facilities 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.

Additional economic costs of winter storms include snow removal (exceeds $2 billion/yr for U.S.), road closures that cause lost retail trade, wages, and tax revenue (exceeds $10 billion/day for closures in eastern U.S.), flight delays ($3.2 billion annually for U.S. carriers), damage to utilities (up to $2 billion per event), flooding from snowmelt ($4.3 billion for 1997 floods), and cost to agriculture and timber from frost and ice (up to $1.6 billion per ice storm).[4]

Property Damage

The NCDC reports $10,000 in reported property damages from winter storm events for Fond du Lac County over the last 14 years from January 1, 2000 to January 31, 2014 according to NCDC data.

[4] Adams, R., Houston, L., Weiher, R., *The Value of Snow and Snow Information Services*, Report prepared for NOAA's National Operational Hydrological Remote Sensing Center, August, 2004

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 14 years.

Tornado and Strong Wind

Description of Hazard

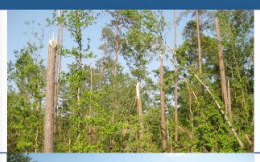
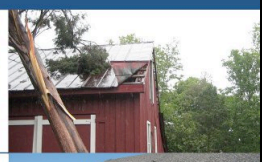
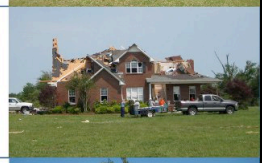
A tornado is a relatively short-lived storm comprised of an intense rotating column of air, extending from a thunderstorm cloud system. Tornadoes come in many shapes and sizes, but they are typically in the form of a visible condensation funnel, whose narrow end touches the earth and is often encircled by a cloud of debris and dust. Most tornadoes have wind speeds less than 110 miles per hour, are about 250 feet across, and travel a few miles before dissipating. The most extreme tornadoes can attain wind speeds of more than 300 miles per hour, stretch more than two miles across, and stay on the ground for dozens of miles.

The destructive power of the tornado results primarily from strong wind velocities and sudden changes in pressure. Wind and pressure differentials probably account for most of the damage caused by tornadoes. Since tornadoes are generally associated with severe storm systems, hail, torrential rain, and intense lightning usually accompany them. Depending on their intensity, tornadoes can uproot trees, down power lines and destroy buildings. Flying debris can cause serious injury and death. Table 3-5 shows the Enhanced Fujita Scale (EF Scale), which is recognized as the acceptable tornado magnitude measurement rating.

The United States has been divided into four zones that geographically reflect the number and strength of extreme wind. Wisconsin lies along the northern edge of Zone IV, the nation's maximum frequency zone for tornadoes (commonly known as "tornado alley"), which extends northeastward from Oklahoma into Iowa and then across to Michigan and Ohio. Zone IV includes most of the southern two-thirds of Wisconsin and has experienced 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 Fond du Lac County.

Wisconsin's tornado season runs from the beginning of April through September, but tornadoes have occurred in Wisconsin in every month except February. The most severe tornadoes statewide typically occur during the months of April, May, and June. Personal property damage, deaths, and injuries have and will continue to occur due to tornado events in Wisconsin.

Table 3-5: Tornado Magnitude Measurement, EF Scale

EF Rating	Wind Speeds	Expected Damage		
EF-0	65-85 mph	'Minor' damage: shingles blown off or parts of a roof peeled off, damage to gutters/siding, branches broken off trees, shallow rooted trees toppled.		
EF-1	86-110 mph	'Moderate' damage: more significant roof damage, windows broken, exterior doors damaged or lost, mobile homes overturned or badly damaged.		
EF-2	111-135 mph	'Considerable' damage: roofs torn off well constructed homes, homes shifted off their foundation, mobile homes completely destroyed, large trees snapped or uprooted, cars can be tossed.		
EF-3	136-165 mph	'Severe' damage: entire stories of well constructed homes destroyed, significant damage done to large buildings, homes with weak foundations can be blown away, trees begin to lose their bark.		
EF-4	166-200 mph	'Extreme' damage: Well constructed homes are leveled, cars are thrown significant distances, top story exterior walls of masonry buildings would likely collapse.		
EF-5	> 200 mph	'Massive/incredible' damage: Well constructed homes are swept away, steel-reinforced concrete structures are critically damaged, high-rise buildings sustain severe structural damage, trees are usually completely debarked, stripped of branches and snapped.		

Source: NOAA National Weather Service, 2011.

Strong winds, including thunderstorm winds and high winds can often be just as damaging as a tornado. Strong winds 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.

Strong 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 remain nearly straight line and are not the rotating column of air that is characteristic of a tornado.

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 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 the NCDC, Fond du Lac County has experienced 119 significant tornado and strong wind events (including thunderstorm wind, funnel cloud, and high wind) in the last 14 years from January 1, 2000 to January 31, 2014.

A couple tornado events were particularly damaging for the county. The first was an F1 tornado that occurred in Eden on September 2, 2002 causing $750,000 in damages. The second was an F3 tornado that occurred from Alto to Waupun on June 23, 2004 causing $8.6 million in damages.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, Fond du Lac County experiences approximately eight significant tornado and strong wind events per year.

Probability of Hazard Occurring in the Future

Based on the hazard frequency, Fond du Lac County is considered to have a **high** probability of experiencing a tornado and strong wind 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, manufactured home residents are often most vulnerable to death, injury, and property damage from tornadoes as these homes often lack foundations, tie-downs, and/or basements. Therefore, manufactured housing communities in the county are the areas of greatest risk from this hazard.

Impacts from Hazard

Death and Injury

No deaths or injuries have been reported from tornado and strong wind events for Fond du Lac County over the last 14 years from January 1, 2000 to January 31, 2014, 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 sustain damage. These structure types include manufactured homes, homes on crawlspaces (because they are more susceptible to lift), and buildings with large spans (such as airplane hangars, gymnasiums, warehouses, 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 cleanup. Downed

trees caused by tornadoes can be problematic in terms of impacting infrastructure (transportation, sewer, water, etc.) 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. Power lines and communication towers are at risk of being blown down.

Any critical facility in the planning area is capable of being impacted by a tornado. However, schools are a main concern for three reasons: (1) they have large numbers of people present, either during school or as a storm shelter; (2) they have large span areas, such as gyms and theaters; and (3) they house a vulnerable population during the day time for most of the year.

Economic Impacts

A tornado can have a significant economic impact to a local economy due to irrecoverable businesses and infrastructure damages. A heavily damaged business often never reopens after the hazard event.

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 greatest public expenditures for a community result from repairs to public facilities, and cleanup and disposal of debris. Most public facilities are insured, so the economic impact on the local treasury is likely to be small. Cleanup and disposal can be a larger problem, especially if there is limited landfill capacity near the damage site.

Property Damage

Reported property damage from significant tornadoes and strong winds for Fond du Lac County has totaled approximately $11.3 million in public property and crop damages over the last 14 years from January 1, 2000 to January 31, 2014 according to the NCDC.

Estimate of Potential Dollar Losses

Since manufactured homes are especially vulnerable to tornadoes, a "worst case scenario" for this hazard would involve the total destruction of all manufactured homes in the county. In such a "worst case scenario," the total destruction of all buildings and facilities in the 13 manufactured housing communities in the County would result in estimated dollar losses of approximately $12.9 million plus an additional estimated value of building contents of $6.5 million (calculated as 50 percent of the building value), for total estimate of potential dollar losses of $19.4 million.

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.

Stormwater Flooding

Flooding often occurs in urban areas due to stormwater management issues. Stormwater drainage systems have been designed to manage most storms. However, larger storms that occur in a short time period are of such intensity that the drains cannot handle all the stormwater and flooding results. Localized stormwater flooding can also occur if storm drains in the area are blocked. It is important to keep the drainage system clear of litter and debris.

Newly built property developments incorporate stormwater management measures such as stormwater detention and retention basins that provide greater flood protection. Detention basins slow the flow of stormwater being carried in the drainage system by storing it for a time, while retention basins (i.e. ponds) hold water during most of the year. Detention basins often double as parks and playing fields.

Dam Failure Flooding

Flooding can result from a dam failure. 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.

As identified by the Wisconsin Department of Natural Resources (WDNR), there are a total of 46 dams in Fond du Lac County. Of these, nine are classified as large dams. A large dam has 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. The rest of the dams located in the county are regarded as small dams.[5] Map 3.5 displays the 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. The hazard rating is not based on the physical attributes, quality, or strength of the dam itself, but rather the

[5] Wisconsin Department of Natural Resources; http://dnr.wi.gov/topic/dams/damfacts.html; Retrieved 2014.

potential for loss of life or property damage should the dam fail. A high hazard rating indicates that a failure would put lives at risk. 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 Fond du Lac County there is one large dam with a high hazard rating (Schley's Ledgeview Acres Dam), and two large dams with a significant hazard rating (Gothic Mill Pond Dam and Long Lake Dam).

The areas of greatest risk from dam failure are those areas within the hydraulic shadow of the dam of the three high and significant risk 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).

Previous Significant Hazard Occurrences

According to the NCDC, Fond du Lac County has experienced 13 significant flooding events (including flood, flash flood, heavy rain, dam failure flooding, and stormwater flooding) in the last 14 years from January 1, 2000 to January 31, 2014. Some of these reported occurrences may not have been specific to Fond du Lac County, and may have been recorded for a larger regional area.

In June 2008, Wisconsin and other Midwest states saw an unprecedented amount of rainfall across the region. A series of storms from June 5th through the 12th caused widespread flooding that resulted in damage to thousands of homes, businesses, and public infrastructure. Many local climate records were broken with up to 17 inches of rain in some parts of Wisconsin. Thirty counties were declared a "state of emergency" by Governor Doyle and received federal disaster declarations.

Appendix D provides maps of the extent of flooding throughout Fond du Lac County and the City of Fond du Lac in 2008.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, Fond du Lac County experiences approximately one significant flooding event every year.

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, Fond du Lac County is considered to have a **low** 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 Fond du Lac 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 3.2.

Impacts from Hazard

Death and Injury

No death or injuries from flooding has been reported for Fond du Lac County over the last 14 years from January 1, 2000 to January 31, 2014, according to the NCDC.

Structures at Risk

Analysis of the data used to produce Map 3.2 indicates that 11,630 structures could potentially be impacted by the base flood in the planning area.

A review of FEMA flood insurance claims from January 1, 1978 through August 31, 2014, indicates that there were 319 paid claims in Fond du Lac County in the amount of $4.9 million.[6]

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 seven repetitive loss properties in Fond du Lac County. All seven are residential structures.

Critical Facilities

Analysis of the GIS data used to produce Map 3.4**,** indicates that there are 153 critical facilities potentially located within 100-year floodplains in Fond du Lac County. However, 72 of these critical facilities are near-water dependent facilities (i.e. bridges and dams), so 81 critical facilities may be unnecessarily located in the floodplain. Table 3-6 lists the critical facility types of those facilities potentially within the 100-year floodplains.

[6] FEMA NFIP Flood Loss Statistics (WR2C1040); http://bsa.nfipstat.fema.gov/reports/1040.htm; 2014.

Table 3-6: Critical Facility Types within the 100-Year Floodplains

Critical Facilities Type	Total
Bridge	64
Utilities	33
School	18
Health Care Facility	12
Dam	8
Municipal Facility	7
Fire Department	4
Manufactured Housing Community	4
Airport	1
Communication Tower	1
Law Enforcement	1
Total	153

Source: Fond du Lac County, 2015.

Economic Impacts

Flooding can have significant economic impact to a local economy from businesses and infrastructure damages. During floods, property and belongings are destroyed and people become homeless. Public expenditures will include police, fire, and emergency management personnel and shelters, and may also include search and rescue. Great public expenditures result from repairs to public facilities and cleanup. It often takes years for affected communities and businesses to rebuild and return to normalcy.

Property Damage

Reported significant public property and crop damage from flooding in Fond du Lac County has totaled $98.2 million over the last 14 years from January 1, 2000 to January 31, 2014 according to NCDC data.

Most of the damage occurred from the following three flooding events.

- A flooding event occurring from June 9-12, 2004 was caused by heavy rain across east central and southeast Wisconsin. Fond du Lac County had at least 3,869 houses report basement flooding, minor damage occurred to 1,040 homes, and major damage to 31 homes ($4.2 million in private property damage); minor damage occurred to eight businesses, and major damage to one business ($231,000 in business property damage); damage occurred to public infrastructure ($363,000 in damages); and crop losses were estimated at $63 million.
- A flooding event occurring from June 7-9, 2008 caused by heavy rain across east central and southeast Wisconsin. A number of areas across Fond du Lac County were affected; however, only the City of Ripon had reported damages including $4.6 in property damage and $9 million in crop damage.
- A flash flooding event occurred on June 12, 2008 caused by heavy rain across east central and southeast Wisconsin. Much of western Fond du Lac County was impacted. Water depths on road surfaces reached three feet or more and there

were gravel washouts. Manhole covers pushed up in Ripon. Some farm fields remained flooded into early July. The breakdown for private property damages included 1,000 minimally affected homes, 500 homes with minor damage, 25 homes with major damage, and five homes destroyed ($1 million in private property damages). 15 businesses sustained minor damage ($50,000 in business property damage). Crop losses were estimated at $17 million. Public sector damage was about $1.3 million from several roads and bridges that sustained damage.

Value of Structures at Risk

The value of all at-risk structures is estimated at $889.8 million. This information was obtained from Fond du Lac 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 a flood washes out roads, bridges, or railroads, 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 indicates that there are 64 bridges that could potentially be underwater during a base flood. There may be a number of additional bridges 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

Vulnerable structures are structures located in the 100-year flood hazard area identified in Map 3.1. Since there is no 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.

It is estimated that over $889.8 million 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 all buildings in the county flood zones.

This information was obtained from a Fond du Lac 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

Through zoning, development in floodplains, wetlands, and environmentally sensitive areas are kept to a minimum. Fond du Lac County has shoreland and floodplain

zoning. This ordinance is a useful tool in keeping inappropriate development out of flood hazard zones in the county.

NFIP Participation

Fond du Lac County has participated in the FEMA National Floodplain Insurance Program (NFIP) since July 1982 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.

Additionally, all incorporated communities in the county participate in the NFIP. The following provides the date that each incorporated community joined the NFIP:

- City of Fond du Lac since January 1979
- City of Ripon since August 1980
- City of Waupun since August 1984
- Village of Brandon since September 1988
- Village of Campbellsport since May 1978
- Village of Eden since August 2012
- Village of Fairwater since September 1985
- Village of Mount Calvary since September 1976
- Village of North Fond Du Lac since December 1979
- Village of Oakfield since September 1988
- Village of Rosendale since September 1989
- Village of St. Cloud since July 1987

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 people and crops.

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 the NCDC, Fond du Lac County has experienced 19 significant drought events in the last 14 years from January 1, 2000 to January 31, 2014.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, Fond du Lac County experiences approximately one significant drought 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 it affects much of eastern Wisconsin on nearly all of the occasions in which it affects Fond du Lac County. However, based strictly on the hazard frequency, Fond du Lac County is considered to have a **low** probability of experiencing a 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. According to the 2012 USDA Census of Agriculture, Fond du Lac County contains 315,553 acres of agricultural lands.

Impacts from Hazard

Death and Injury

No deaths or injuries have been reported from significant drought events for Fond du Lac County over the last 14 years from January 1, 2000 to January 31, 2014, according to NCDC data.

Structures at Risk

There are no direct impacts to structures 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 often 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 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 sun 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 tourism dependent economies will be impacted by a decrease in tourists traveling to their area in times of drought. Industries that utilize large amounts of water in processing materials may also be subject to these limitations, which could potentially reduce their production capabilities.

Property Damage

Reported property damage from significant drought events for Fond du Lac County has totaled approximately $200,000 in crop damages over the last 14 years from January 1, 2000 to January 31, 2014 according to the NCDC.

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 315,553 acres of agricultural lands in the county. Based on the 2012 Census of Agriculture, the average value per acre of agricultural land in Fond du Lac County is $5,001 (USDA, 2014). The USDA Census of Agriculture is conducted every 5 years and the valuation data is based on a sample of farms to estimate the market value of agricultural land and buildings.

It can be estimated that if a "worst case scenario" were to occur, the total destruction of all agricultural land in Fond du Lac County would cause a loss of over $1.6 billion.

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. The elderly, disabled, and other vulnerable populations are especially susceptible to extreme heat.

Previous Significant Hazard Occurrences

According to the NCDC, Fond du Lac County has experienced 19 significant extreme heat events in the last 14 years from January 1, 2000 to January 31, 2014.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, Fond du Lac County experiences approximately one significant extreme heat event every year.

Probability of Hazard Occurring in the Future

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

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

No deaths or injuries have been reported from significant extreme heat events for Fond du Lac County over the last 14 years from January 1, 2000 to January 31, 2014 according to NCDC data.

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. Broken water mains can result from temperature changes of the pipes and shifting of the clay soils. 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 event. Hospitals and clinics will likely experience an increased demand due to heat related illnesses during an extreme heat event. 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 event, 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, with some emergency shelters being set up specifically in response. Finally, there is likely to be increased water demand during the extreme heat, both for consumption as well as for lawn watering in the event that the extreme heat includes a drought.

Economic Impacts

Economic impacts of an extreme heat event may 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 during extreme heat, 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.

Water utilities will incur the expenses involved with additional demand for water during extreme heat, 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 extreme heat event is over, negatively impacting the local economy. Extreme heat can negatively impact agriculture in the surrounding area when combined with drought.

Property Damage

No significant public property damages have been reported from extreme heat events for Fond du Lac County over the last 14 years from January 1, 2000 to January 31, 2014 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, there have been no property damages from extreme heat over the past 14 years.

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 could 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 the NCDC, Fond du Lac County has experienced 16 significant extreme cold events in the last 14 years from January 1, 2000 to January 31, 2014.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, Fond du Lac County experiences approximately one significant extreme cold event every year.

Probability of Hazard Occurring in the Future

Based on the hazard frequency, Fond du Lac County is considered to have a **low** probability of experiencing an 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

No deaths or injuries have been reported from significant extreme cold events for Fond du Lac County over the last 14 years from January 1, 2000 to January 31, 2014 according to NCDC data.

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 electric and natural gas utilities. 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. Water utilities 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 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

Reported property damage from significant extreme cold events for Fond du Lac County has totaled approximately $2,000 in public property and crop damages over the last 14 years from January 1, 2000 to January 31, 2014 according to the NCDC.

In addition to the property damages information from the NCDC, the Fond du Lac County Communications and Emergency Management Department has recorded $460,885 in damages (plus $14,467 in protective measures) as a result of failures in public sector water mains for municipalities throughout Fond du Lac County from

extreme cold causing frost levels to exceed system depths during the winter of 2013/2014.

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 14 years.

Hail

Description of Hazard

A severe thunderstorm can produce frozen precipitation, or hail. 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 they develop sufficient weight and fall as precipitation. The size of hailstones is a direct function of the severity and size of the storm. Significant damage typically does not result until the hailstones reach 1.5 inches in diameter, which occurs in less than half of all hailstorms. Hail in Wisconsin ranges from pea-sized to golf ball-sized. Area coverage of individual hailstorms is highly variable and spotty because of the unstable nature of cumulonimbus clouds.

Previous Significant Hazard Occurrences

According to the NCDC, Fond du Lac County has experienced 41 significant hail events in the last 14 years from January 1, 2000 to January 31, 2014. Some of these reported occurrences may not have been specific to Fond du Lac County, and may have been recorded for a larger area.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, Fond du Lac County experiences approximately three significant hail events per year.

Probability of Hazard Occurring in the Future

Based on the hazard frequency, Fond du Lac County is considered to have a **medium** probability of experiencing a significant hail event in any given year.

Areas at Greatest Risk

Hail 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 death or injuries have been reported from hail events in Fond du Lac County over the last 14 years from January 1, 2000 to January 31, 2014, according to NCDC data.

Structures at Risk

Hail can inflict severe damage to roofs, windows, and siding, depending on hailstone size and winds.

Critical Facilities

Hail can inflict severe damage to roofs, windows, and siding of critical facilities, depending on hailstone size and winds.

Economic Impacts

Hail can damage or destroy crops. Taller crops, such as corn are particularly vulnerable to hail. Costly damage can occur to roofs, windows, siding, and trees, as well as automobiles, RVs, and boats.

Property Damage

Reported property damage from significant hail events for Fond du Lac County has totaled $53,000 in public property and crop damages over the last 14 years from January 1, 2000 to January 31, 2014 according to NCDC data.

Estimate of Potential Dollar Losses

An estimate of potential dollar losses cannot be calculated for hail events, since no vulnerable structures have been identified.

Lightning

Description of Hazard

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 that produces thunder.

Lightning primarily occurs when warm air is mixed with colder air masses resulting in atmospheric disturbances necessary for polarizing the atmosphere. However, it can also occur during dust storms, forest fires, tornadoes, volcanic eruptions, and even in the cold of winter, where the lightning is known as thundersnow.

Previous Significant Hazard Occurrences

According to the NCDC, Fond du Lac County has experienced 14 significant lightning events in the last 14 years from January 1, 2000 to January 31, 2014.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, Fond du Lac County experiences approximately one significant lightning event every year.

Probability of Hazard Occurring in the Future

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

Areas at Greatest Risk

Based on review of the historic patterns of lightning event occurrences, there are no specific areas that are a higher than average risk. The events are relatively uniform throughout Fond du Lac County.

Impacts from Hazard

Death and Injury

No deaths or injuries from lightning storms or thunderstorms have been reported for Fond du Lac County over the last 14 years from January 1, 2000 to January 31, 2014, according to NCDC data.

Structures at Risk

Lightning can cause direct damage to structures, especially those without lightning protection systems. Buildings or tall structures hit by lightning may be damaged as the lightning seeks unintended paths to ground. By safely conducting a lightning strike to ground, a lightning protection system can greatly reduce the probability of severe property damage. Lightning strikes can result in fires that damage structures, property, and land.

Critical Facilities

Hospitals can see increases in patient load with sufficiently severe lightning events. Schools can sustain damage. Police and fire departments often see an increased workload during and after lightning events. Emergency operations can be disrupted as lightning events affect radio and cellular communications, as antennas are often struck by lightning.

Economic Impacts

Nationwide, lightning causes $4 to 5 billion in losses each year[7] and about $2 billion annually in airline operating costs and passenger delays.[8]

Property Damage

Reported property damage from significant lightning for Fond du Lac County has totaled $491,100 over the last 14 years from January 1, 2000 to January 31, 2014 according to NCDC data.

The most costly lightning event occurred on October 2, 2006 in Ladoga in the amount of $200,000. The resultant fire burned the shed to the ground, and the contents were a total loss.

Estimate of Potential Dollar Losses

An estimate of potential dollar losses cannot be calculated for lightning 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 14 years.

Dense 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

[7] Kithil, R., *21st Century Lightning Safety for Facilities & Structures*, 2002.
[8] *Northeast States Emergency Consortium*, Wakefield, Mass., 2002

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, shipwrecks, 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 visibility to only a short distance. In response to this problem, automobiles are often equipped with specially designed fog lights that illuminate a usually dry (and therefore clear) area just above the roadway surface.

Previous Significant Hazard Occurrences

According to the NCDC, Fond du Lac County has experienced 53 significant dense fog events in the last 14 years from January 1, 2000 to January 31, 2014.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, Fond du Lac County experiences approximately four significant dense fog event every year.

Probability of Hazard Occurring in the Future

Based on the hazard frequency, Fond du Lac County is considered to have a **medium** probability of experiencing a significant dense 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 eastern Wisconsin on many of the occasions in which they affect Fond du Lac County, especially near Lake Michigan.

Impacts from Hazard

Death and Injury

No deaths or injuries have been reported from significant fog events for Fond du Lac County over the last 14 years from January 1, 2000 to January 31, 2014, 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, cleanup 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 may need to respond to an increased number of accidents during many fog events. 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. Municipal public works and county highway departments may need to perform emergency repairs to signs or roadway structures caused by damage during 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.

Property Damage

No significant public property damages have been reported from dense fog events for Fond du Lac County over the last 14 years from January 1, 2000 to January 31, 2014 according to NCDC data.

Estimate of Potential Dollar Losses

An estimate of potential dollar losses cannot be calculated for dense fog events, since no vulnerable structures have been identified. Based on previous damages reported by the NCDC, there have been no property damages from fog over the past 14 years.

Wildland Fire

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. According to the current land use for the county (Table 2-1), 13 percent of the county is woodlands and 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 the 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

There have been no significant wildland fires in Fond du Lac County since 2000.

Hazard Frequency

No adequate records are available at this time in order to determine a hazard frequency.

Probability of Hazard Occurring in the Future

According to the U.S. Forest Service Wildland Fire Assessment System, Fond du Lac County regularly falls within a low to moderate fire danger class. A low rating indicates that fuels do not ignite readily from small firebrands, while a moderate rating means that fires will likely start from most accidental causes with the exception of lightning fires in some areas, the number of starts is generally low. Additionally, because Fond du Lac County is not extensively forested and does not contain the hazards and risks necessary to warrant intensive or extensive fire protection, it is designated as a Cooperative Fire Protection Area. Therefore, no Wisconsin DNR ranger stations or suppression resources are located within the county. Additionally, the Forestry Division of the Wisconsin DNR has determines that there are no "Communities-at-Risk" and no "Communities-of-Concern" within Fond du Lac County.

The likelihood that any wildland fire in Fond du Lac County would be catastrophic is **low** as most susceptible areas lack enough acreage to allow for continuous burning.

Areas at Greatest Risk

Fond du Lac County contains approximately 59,000 acres of woodlands (based on current land use). Of these, few contain timbers that are very susceptible to burning. Therefore, lands covered in grass fuels pose the highest risk for the planning area. Furthermore, grasslands that abut heavy residential development present an even greater danger, especially when residents practice unapproved outdoor burning of leaves, garbage, and other items that they wish to dispose of by incineration.

The Kettle Moraine State Forest, in the southeastern corner of the county, is the largest area of contiguous woodlands in the county and likely poses the greatest risk for wildland fire.

Impacts from Hazard

Death and Injury

No data on deaths or injuries is available for significant wildland fire events for Fond du Lac County over the last 14 years from January 1, 2000 to January 31, 2014.

Structures at Risk

Homes and other structures located in or near woodlands (i.e. wildland urban interface or WUI) are at greatest risk of 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.

Critical Facilities

Fire, emergency response, and police personnel are most affected by wildland fires due to the dangers of helping to save people and extinguish fires, and the increased workloads during and after occurrences. Hospitals can see increases in patient load resulting from burn related injuries and individuals suffering from the effects of smoke inhalation. 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 to extinguish the fire, to salvage and remove damaged debris, restore 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 for some time.

Property Damage

No property damage data is available for wildland fire events for Fond du Lac County over the last 14 years from January 1, 2000 to January 31, 2014.

Estimate of Potential Dollar Losses

An estimate of potential dollar losses from wildland fire hazard cannot be calculated as specific vulnerable structures or geographic areas have not been identified.

NATURAL HAZARDS AND CLIMATE CHANGE

Hazard profiles provide information and predictions based on past hazard occurrence data. Climate change may make past trends unreliable sources for predicting future impacts, frequency, probability, and vulnerabilities. Climate change has and will continue to impact average annual temperatures causing increased frequency in heat waves; increased frequency and intensity of severe rainstorms; shorter, warmer winters with decreased lake ice cover; increased drought frequency, and other impacts. In general, Fond du Lac County, along with most of Wisconsin, will continue growing warmer and drier during this century, especially in the summer; and rainfall amount and

intensity will continue to increase. It is projected that over the next 30-50 years, Fond du Lac's climate will resemble that of current Toledo, Ohio.[9]

Analysis of historical data, combined with climate model downscaling, suggest that the southern Wisconsin precipitation events of 2008 are part of a trend toward wetter conditions and more intense rainfall. Climate models also suggest that increased winter snow pack, and late winter rainfall, may result in high regional groundwater tables and lake levels, and saturated soil conditions.[10]

Vulnerabilities

Local and state government and private sector developers make significant investments in long-lived infrastructure that controls or is affected by stormwater runoff from large rainfalls. Likewise, municipal wastewater treatment plant operators make substantial long-term investments in their system capacity that anticipates development, but not increased stormwater inflow and groundwater infiltration. This infrastructure is designed using standards based on rainfall data from the latter half of the 20th century. By having assumed "stationarity" of climate in the design of our infrastructure, Fond du Lac County is now vulnerable to the potential impacts from more intense rainfall events and elevated groundwater.

In summary, our previous investment in public safety and environmental protection risks being overwhelmed by precipitation impacts that are beyond those anticipated by past infrastructure designers and water resource managers.[11]

Potential Impacts

The WICCI working groups have investigated how potential changes in Wisconsin's climate might impact natural and human systems around the state. Some potential impacts of concern for Fond du Lac County with regard to stormwater management and large rainfalls include:

- Conveyance systems filled beyond capacity cause flooded homes and urban streets;
- Roadways and bridges are washed-out or become impassable;
- Groundwater flooding of property and cropland increases;
- Rural residential wellheads are contaminated by flood waters and high groundwater;
- Impoundments and stormwater detention ponds fail more frequently;
- Raingardens and other biofiltration best management practices (BMPs) fail due to saturated soil conditions;
- Increased erosion of slopes by intense rainfall events leads to high sediment and phosphorus loading to surface waters;

[9] Wisconsin Initiative on Climate Change Impacts, Interactive Mapping Tool, http://www.wicci.wisc.edu/climate-map.php.
[10] Wisconsin Initiative on Climate Change Impacts, Stormwater Working Group, http://www.wicci.wisc.edu/stormwater-working-group.php#2.
[11] Ibid.

- Runoff of manure from fields, and accompanying fish kills, are more frequent;
- Stormwater inflow and groundwater infiltration to sanitary sewers, results in untreated municipal wastewater flowing into to lakes and streams.

Other potential impacts of concern for Fond du Lac County include:

- Warmer nighttime temperatures might lead to more extreme heat waves, increasing the risk for heat stroke in some populations. At the same time, observed and projected trends show fewer cold temperature extremes, which may mean reduced health risks due to exposure in the winters.
- Air pollution, increasing temperatures, changing circulation patterns, and other processes combine to increase ground-level ozone, which affects respiratory health.
- Heavy rains and flooding can overwhelm sewer and stormwater systems, leading to a rise in water pollution and the risk of waterborne diseases such as cryptosporidium and giardia.
- Changes in temperatures and precipitation could result in an increase in disease-carrying insects, including ticks and mosquitoes. This means people may be at a greater risk for contracting vector-borne diseases, such as Lyme disease and West Nile encephalitis.
- Changes in temperature and precipitation could affect growing seasons, crop yields, weed and pest infestations, and dairy productivity.

Solutions/Adaptations

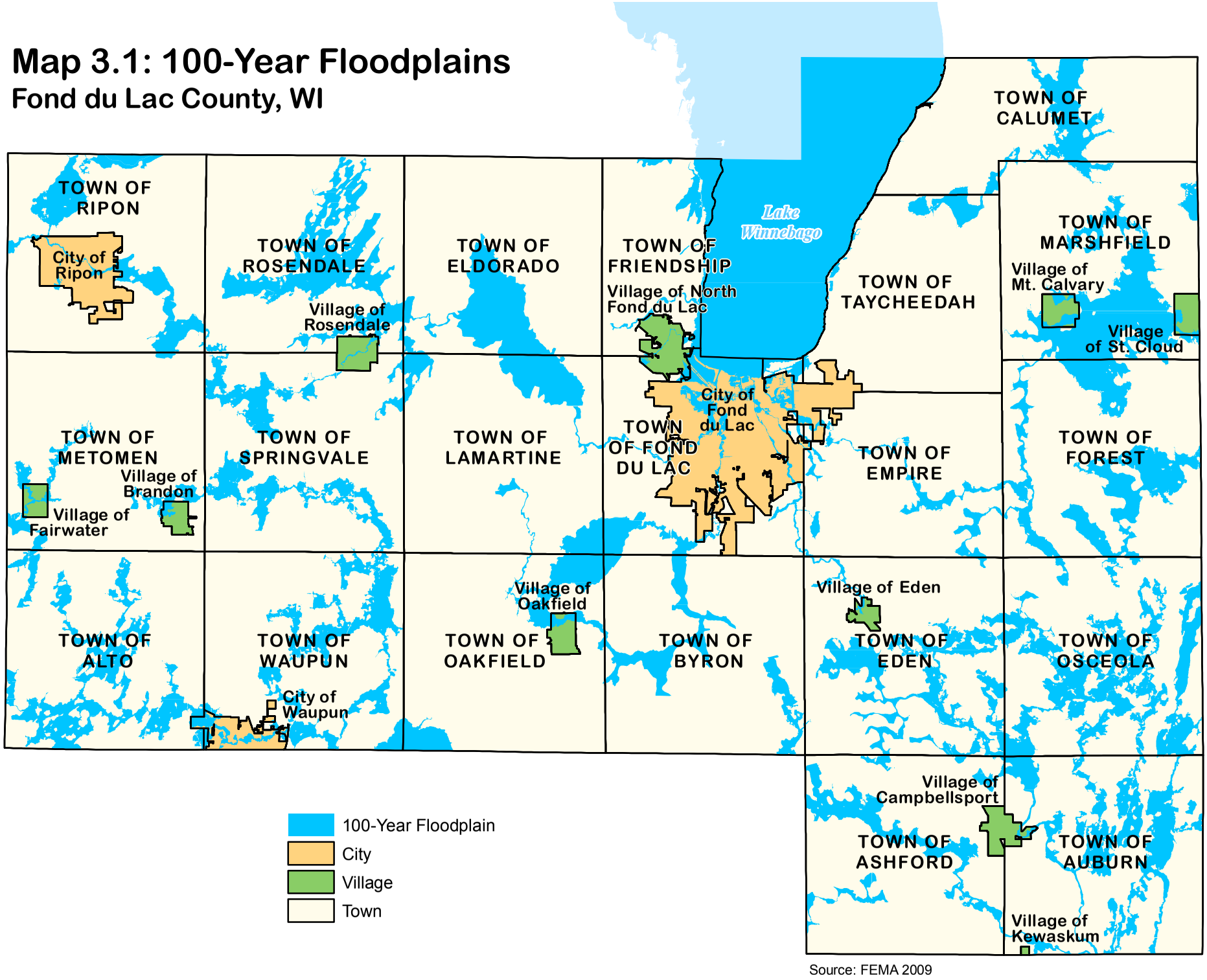
Although the impacts of climate change are already being seen in Wisconsin, there are things Fond du Lac County policymakers, business leaders, and residents can do to help reduce potential impacts from climate change. The development of climate change mitigation programs can help decrease the impacts from climate change while advancing other community priorities. Examples include implementing cost-effective clean energy policies and programs, and reducing carbon emissions. Climate change and clean energy policies and programs can reduce greenhouse gas emissions, lower energy costs, improve air quality and public health, and help achieve economic development goals. The following are some solutions or adaptations to climate change impacts that could be employed in Fond du Lac County. Many of the identified solutions/ adaptations were developed by the WICCI working groups.

- Strengthen public health response and warning systems.
- Increase energy efficiency.
- Switch to renewable energy sources such as wind, solar, geothermal, and biomass.
- Increase vehicle fuel economy.
- Invest in clean transportation choices.
- Encourage bicycle and pedestrian transportation and expand availability options.

- Implement beach improvement projects that reduce stormwater runoff to beaches and nearshore waters and integrate natural infiltration features such as vegetated swales.
- Improve or restore natural shore protection features.
- Protect floodplains, wetlands, and other natural "green infrastructure" features that can hold flood waters and enable water infiltration.
- Implement development setbacks based on defensible scientific data.
- Relocate structures that are threatened by flooding or erosion.
- Provide education for developers, bankers, and insurance agents.
- Ongoing comprehensive planning and improved implementation of existing plans.
- Use best management practices for site design to control stormwater runoff.
- Develop plans for bluff stability enhancement, e.g. slow erosion by planting vegetation on bluffs.
- Design port and harbor infrastructure that can accommodate increased variability in lake levels, e.g. harbor slips that float.
- Use a risk/consequence approach to evaluating and modifying existing infrastructure to accommodate observed and predicted changes in climate.
- Develop and evaluate alternative tools and strategies for the design of stormwater-related infrastructure, using a collaborative process that includes climate scientists, water resource managers, design engineers, and regulators, and members of relevant business communities.

Map 3.1: 100-Year Floodplains

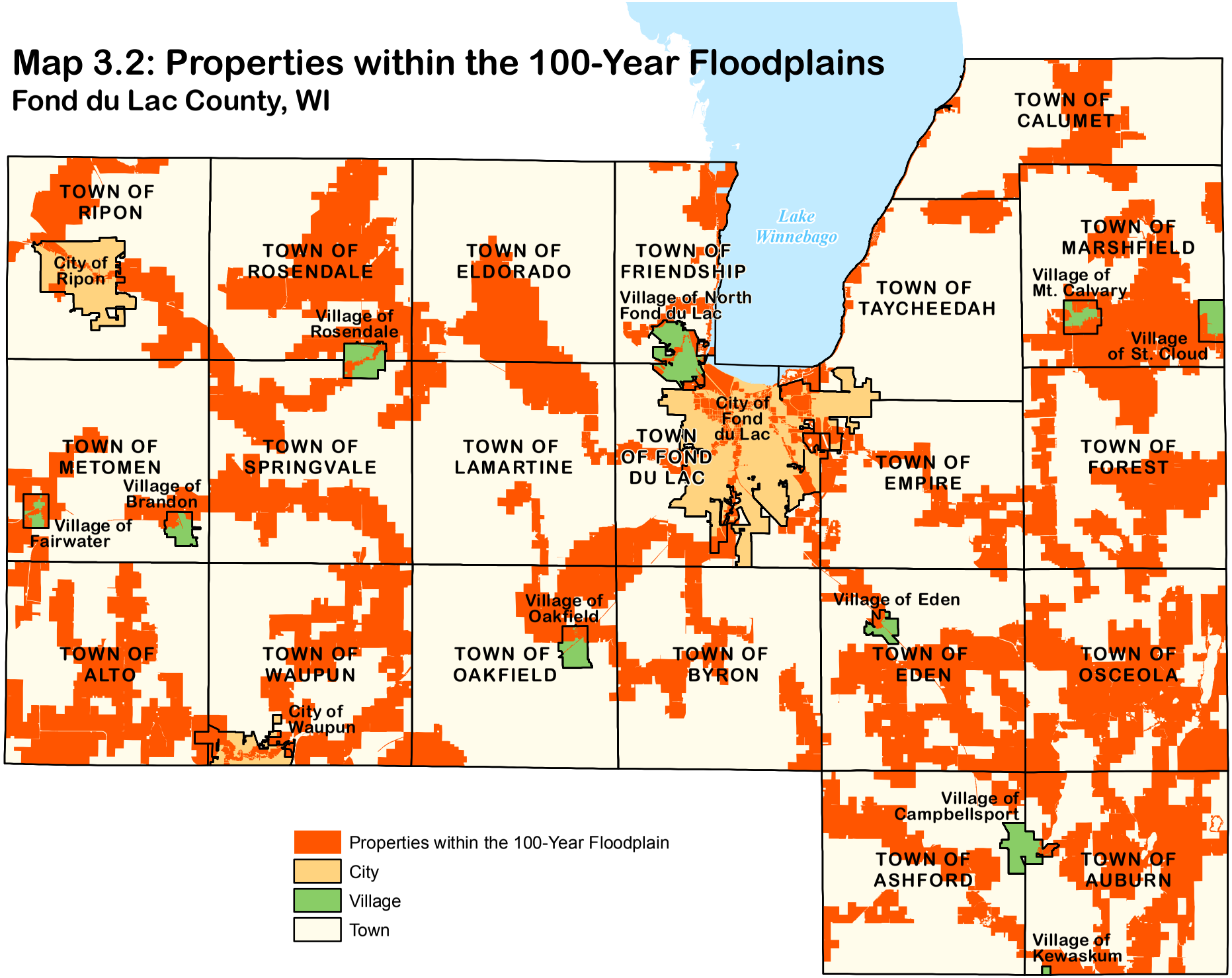
Fond du Lac County, WI



Source: FEMA 2009

Map 3.2: Properties within the 100-Year Floodplains

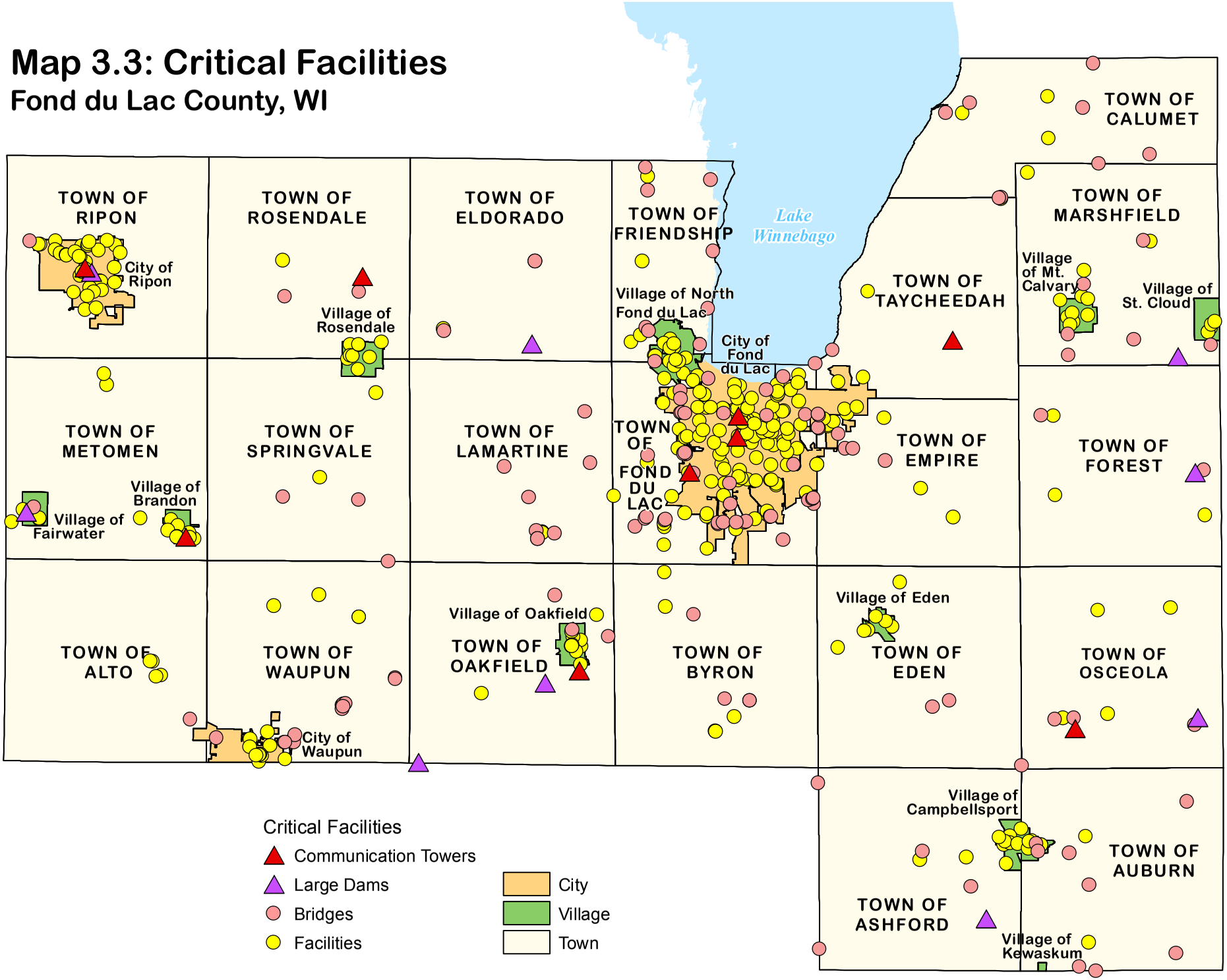
Fond du Lac County, WI



Source: FEMA 2009 & Fond du Lac County Parcels 12/31/2013

Map 3.3: Critical Facilities

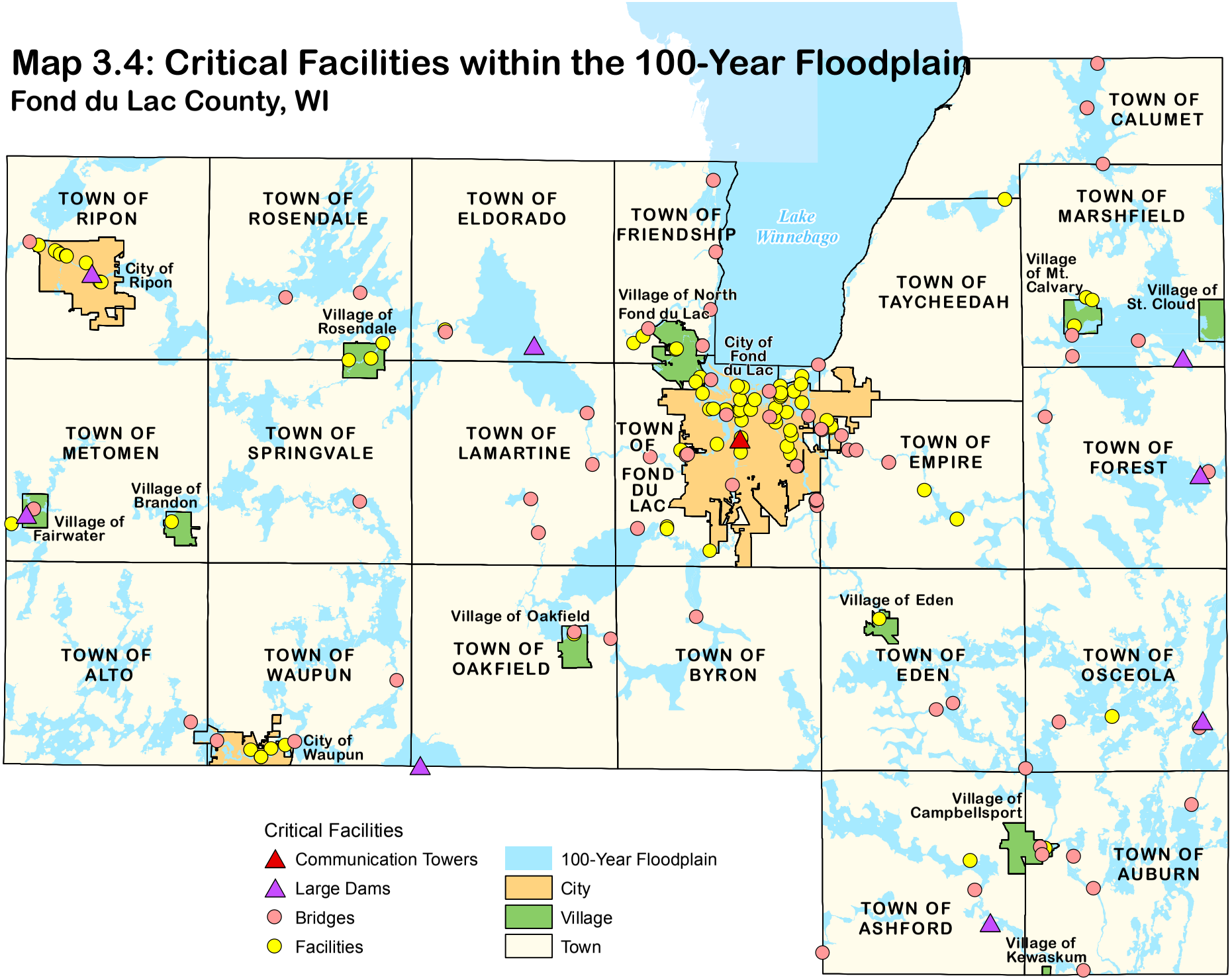
Fond du Lac County, WI



Source: Wisconsin DNR

Map 3.4: Critical Facilities within the 100-Year Floodplain

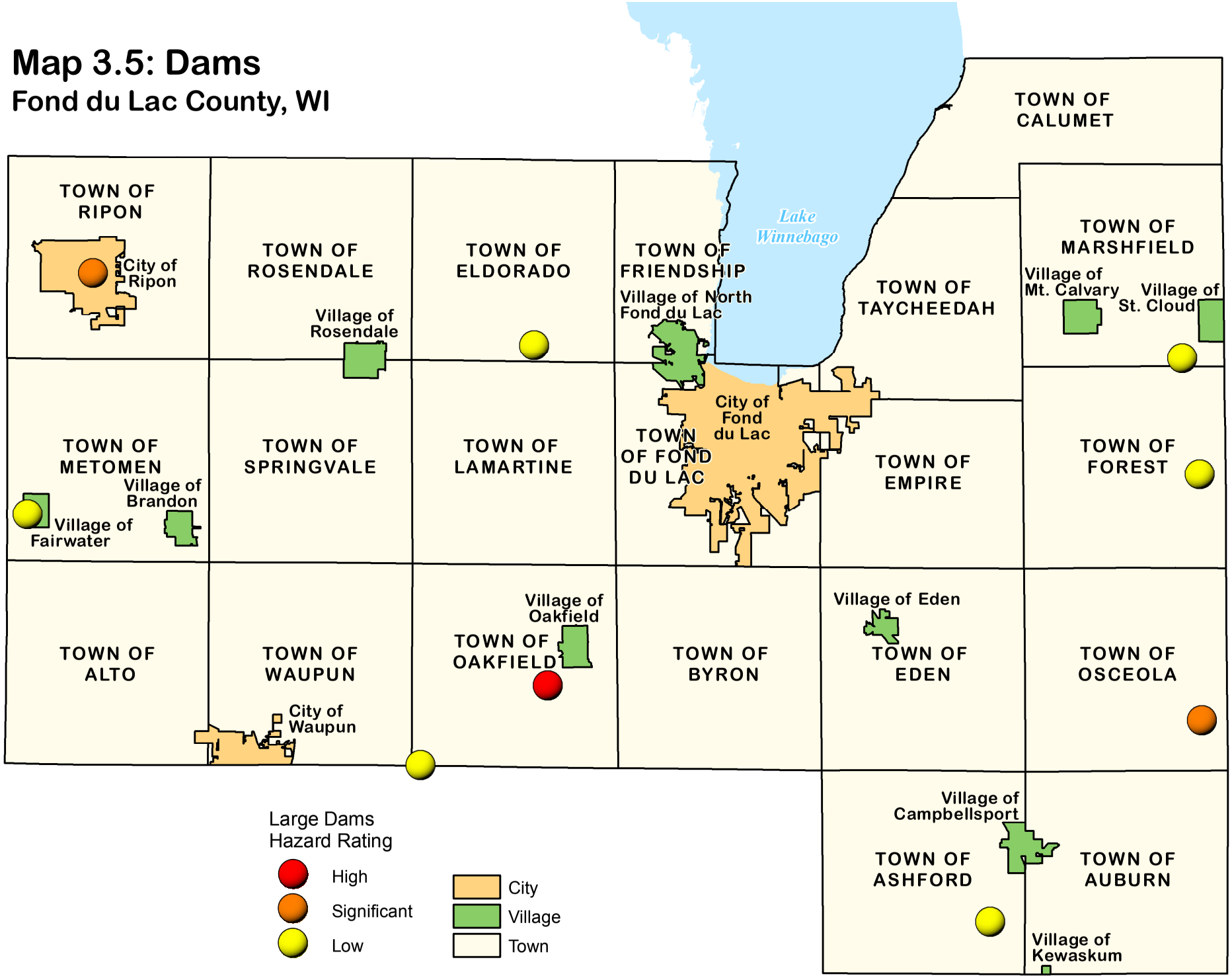
Fond du Lac County, WI



Source: Wisconsin DNR, FEMA 2009

Map 3.5: Dams

Fond du Lac County, WI



Source: Wisconsin DNR

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 Fond du Lac 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 are intended to be used by public officials and emergency response personnel as general guidelines to mitigate the hazards identified in Chapter 3. These goals are broad in order to apply to all of the hazards addressed in the plan.

Goal 1: Protect the public health, safety, and welfare of people and property during hazard events.

Goal 2: Lessen the impact of storm events to the extent feasible and speed recovery following an event.

Goal 3: Provide the public with the information they need to adequately prepare for and respond to natural hazards.

Goal 4: Utilize an early warning system to provide the affected public with as much advance warning as possible.

HAZARD MITIGATION STRATEGIES

The hazard mitigation strategies form the core of the hazard mitigation plan. Table 4-1 lists the mitigation strategies developed for Fond du Lac County. The table lists the hazard type, associated mitigation actions/strategies, the estimated costs of each project (where known), potential funding sources, project priorities, the project timetable, and responsible entities for each mitigation action identified. The identified

actions and projects aim to reduce the effects of hazards on the population, services, and existing and new buildings and infrastructure.

The County Communications and 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 the 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 prioritized. The prioritization process included assigning a rank of "high," "medium" or "low" to each strategy 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 cost-benefit calculations were not prepared for each strategy item included in the plan. A detailed cost-benefit analysis for a strategy will be undertaken during the project development process when implementation is being pursued.

COMPLETED MITIGATION ACTIONS

Several mitigation actions have been completed since the preparation of the previous hazard mitigation plan for Fond du Lac County. The following is a list of those strategies that have been completed.

- Create displays for use at public events such as the county fair and wellness fairs.
- Explore alternatives to increase public warning options (e.g., sirens, mass notification system).
- Evaluate the support for and the feasibility of becoming part of the Community Rating System (CRS) to lower flood insurance premiums for property owners.
- Develop a directory of public buildings that would be open to the public during extended heat waves.
- Call a meeting of public and nonprofit organizations that may be able to mobilize a volunteer corps of individuals willing to assist vulnerable people during periods of extreme heat.
- Call a meeting of public and nonprofit organizations that may be able to mobilize a volunteer corps of individuals willing to assist vulnerable people during periods of extreme cold.

Table 4-1: County Mitigation Strategies

Item	Mitigation Actions/Strategies	Cost Estimate	Priority	Timeline	Responsible Entities
ALL HAZARDS					
1	Host severe weather classes for spotters and maintain a network of spotters in the county.	Covered within budget	High	On-going	Fond du Lac County Communications/ Emergency Management
2	Update and maintain the database of critical facilities.	Included within budget	Medium	2015-2020	Fond du Lac County Communications/ Emergency Management
3	Identify and pursue funding opportunities to develop and implement local and county mitigation activities.	Covered within existing budgets and grants	Medium	2015-2020	Fond du Lac County Communications/ Emergency Management; and local government
4	Make available plans for public and private schools within the county to promote hazard mitigation awareness and to develop hazard mitigation plans.	Covered within budgets and grants	Medium	On-going	Fond du Lac County Communications/ Emergency Management
5	Promote informational and preparedness campaigns for all hazards.	Covered within budgets	Medium	On-going	Fond du Lac County Communications/ Emergency Management
6	Provide hazard-related information and materials to non-English speaking, and hearing impaired communities.	Covered within budgets	Medium	On-going	Fond du Lac County Communications/ Emergency Management
7	Create and maintain public relation displays on Hazard Mitigation for special events and meetings.	Covered with in budget	Medium	On-going	Fond du Lac County Communications/ Emergency Management
8	Maintain a list and update shelter evaluation assessment	Covered with in budget	Medium	On-going	American Red Cross
9	Post and maintain current Hazard Mitigation Plan on the County Web Site and maintain useful links on the web page.	Included within budget	Low	On-going	Fond du Lac County Communications/ Emergency Management
WINTER STORM					
10	Ensure the sufficient plow and sanding equipment and supplies are available and operational.	Covered by existing budgets	Medium	On-going	Fond du Lac County Highway and Public Works Department
TORNADO AND STRONG WIND					
11	Install storm shelters near or in existing manufactured housing communities and high occupancy campgrounds.	Covered by grants or park owners	Medium	2015-2020	Manufactured housing communities and campground managers

Table 4 1: County Mitigation Strategies (cont'd)

Item	Mitigation Actions/Strategies	Cost Estimate	Priority	Timeline	Responsible Entities
FLOODING					
12	Evaluate the support for and the feasibility of becoming part of the Community Rating System (CRS) to lower flood insurance premiums for property owners.	Covered by existing budgets	High	2015-2020	Fond du Lac County Planning and Development Department; and local government
13	Revise local floodplain regulations to ensure they comply with the most recent model floodplain regulations developed by the Wisconsin DNR.	Covered by existing budgets	High	On-going	Fond du Lac County Code Enforcement; Fond du Lac County Planning and Development Department; and local government
14	Study problem areas to determine feasible and cost-effective solutions to minimize flooding along the local waterways.	Covered by existing budgets	High	On-going	Fond du Lac County Code Enforcement; Fond du Lac County Planning and Development Department; and local government
15	Design and construct stormwater management facilities consistent with adopted stormwater management plans that have been or will be prepared/amended.	Covered by existing budgets	High	On-going	Fond du Lac County Code Enforcement; Fond du Lac County Planning and Development Department; and local government
16	Identify and analyze feasible mitigation options for those properties which are designated as a repetitive loss property.	Covered by existing budgets	Medium	On-going	Fond du Lac County Code Enforcement; Fond du Lac County Planning and Development Department; and local government
17	Apply for funding through the federal Hazard Mitigation Grant program, Flood Mitigation Assistance Program, and the Pre-Disaster Mitigation Program as well as any other resources that may be available to help floodproof repetitive loss sites or remove them through voluntary acquisition with demolition or relocation.	Covered by existing budgets	Medium	On-going	Fond du Lac County Communications/ Emergency Management; Fond du Lac County Code Enforcement; Fond du Lac County Planning and Development Department; and local government
18	Maintain the database of bridges/culverts on a county or state road.	Covered by existing budgets	Medium	On-going	Fond du Lac County Highway and Public Works Department

Table 4 1: County Mitigation Strategies (cont'd)

Item	Mitigation Actions/Strategies	Cost Estimate	Priority	Timeline	Responsible Entities
FLOODING (CONT'D.)					
19	Identify those culverts and bridges that are undersized or are otherwise unable to handle expected flood flows.	Covered by existing budgets	Medium	On-going	Fond du Lac County Highway and Public Works Department; and local government
20	Prepare a strategy to prioritize stormwater improvements for public roadways that are susceptible to flooding.	Covered by existing budgets	Medium	On-going	Fond du Lac County Highway and Public Works Department; and local government
21	Re-evaluate and update the stormwater and erosion control ordinances as may be required.	Covered by existing budgets	Medium	On-going	Fond du Lac County Planning and Development Department
22	Distribute National Flood Insurance Program information.	Covered by existing budgets	Medium	On-going	Fond du Lac County Communications/ Emergency Management; Fond du Lac County Planning and Development Department; and local government
23	Work with the owners in manufactured housing communities that are located in the 100-year floodplain to reduce the density of units and to ensure the remaining units are tied down.	Covered by existing budgets	Medium	On-going	Local government and private owners
24	Initiate a study to update hydrology data of problem areas.	Costs will vary	Low	On-going	Fond du Lac County Planning and Development Department
DROUGHT					
25	Adopt local regulations to control the use of water during drought conditions.	Covered by existing budgets	Medium	2015-2020	Local government and water utilities
26	Develop a set of procedures for water distribution during drought to those in need.	Covered by existing budgets	Medium	2015-2020	EOC/Unified Command and local government
EXTREME HEAT					
27	Continue to promote informational campaigns about severe weather, such as Heat Awareness Day in June.	Covered by existing budgets	Medium	On-going	Fond du Lac County Health Department

Table 4 1: County Mitigation Strategies (cont'd)

Item	Mitigation Actions/Strategies	Cost Estimate	Priority	Timeline	Responsible Entities
EXTREME HEAT (CONT'D)					
28	Amend the Fond du Lac County's emergency operations plan to address extreme heat.	Covered by existing budgets	Medium	On-going	Fond du Lac County Health Department, and local media
EXTREME COLD					
29	Amend the Fond du Lac County's emergency operations plan to address extreme cold.	Covered by existing budgets	Medium	On-going	Fond du Lac County Health Department, and local media
HAIL					
30	Continue to educate producers on risk management strategies that minimize the economic impact of extreme weather events for crops.	Covered by existing budgets	Medium	On-going	Fond du Lac County UW-Extension
LIGHTNING					
31	Provide the public with information about proven lightning safety guidelines to reduce the risk of lightning hazards.	Covered by existing budgets	Medium	On-going	Local media, Fond du Lac County Communications/ Emergency Management, and Fire services
DENSE FOG					
32	Dissemination of fog advisories.	Covered by existing budgets	Medium	On-going	National Weather Service; and local media
WILDLAND FIRE					
33	Investigate the adoption of an ordinance to ensure that those parties conducting controlled burns are present and have the wherewithal to control and extinguish the fire if required.	Covered by existing budgets	High	2015-2020	Local government
34	Apply for federal and state grants to enhance the capability of local fire departments.	Covered by existing budgets	Medium	On-going	Local fire departments

Table 4-2: Municipal Mitigation Strategies

Hazard Type	Mitigation Measures	Costs of Project	Responsible Parties	Project Timetable	Priority
City of Fond du Lac					
Winter Storm	Implement brine dispersal system for ice prevention on roads.	$25,000	City	2015	Medium
All Hazards	Install emergency generators for four storm pump stations.	$1.214 million	City	2015-2018	High
All Hazards	Replace nine emergency sirens city-wide.	$188,000	City	2015-2019	Medium
City of Ripon					
Flooding	Evaluate removal vs. reconstruction of Mill Pond dam.	TBD	City	2015-2018	Medium
City of Waupun					
All Hazards	Evaluate the need for a portable communications antenna to support local radio traffic in the event that severe weather disables existing communication tower.	Covered by existing local budgets	County Communications	2015-2020	Medium
Village of Brandon					
All Hazards	Acquire portable emergency backup generator to set up emergency shelter.	$15,000	Village Emergency Management and Brandon Fairwater Fire Department	2020	Medium
Village of Campbellsport					
Winter Storm	Purchase two new snowplows (one additional and one replacement).	$170,000	Village Public Works Department	2015	Medium
Village of Eden					
All Hazards	Develop awareness efforts of chemical storage at Helena Chemical Co. for the community and the fire department.	Covered by existing local budgets	Village and Fire Department	2015-2020	Low
Village of Fairwater					
Tornado and Strong Wind	Place NOAA radios in all homes and businesses to warn of tornadoes in the event of siren failures.	$3,000 (for 100 units)	Village Board and Village Emergency Government	2016	Medium
Village of Mount Calvary					
All Hazards	Acquire a dump truck.	$50,000 - $60,000	Village	2015-2020	Medium

Table 4-2: Municipal Mitigation Strategies (cont'd)

Hazard Type	Mitigation Measures	Costs of Project	Responsible Parties	Project Timetable	Priority
Village of North Fond du Lac					
All Hazards	Evaluate risk and relocation of Village police, fire, EMS, administration offices, and the DPW garage associated with an incident involving the chemicals carried on the railroad.	$30,000	Village	2015-2020	High
Village of Oakfield					
All Hazards	Enhance the capability of the village fire department.	Federal and State Grants	Fire Department	On-going	Medium
Village of Rosendale					
Flooding	Remove fallen trees in creek bed (Hill Road to Mascoutin Valley State Trail) to reduce debris during flooding conditions.	$4,000	Village	2015	Medium
Tornado and Strong Wind	Investigate adding an additional siren on the west side of the village to increase coverage.	$20,000	Village	2016	Medium
Village of St. Cloud					
All Hazards	Establish a plan to prepare the village for potential effects from a disaster that impacts the 30" natural gas pipeline located partially in the village (1/4 mile into village), but primarily in Sheboygan County.	Covered by existing local budgets	Village	2015-2020	Low

Policies, Programs, and Resources for Mitigation

Fond du Lac County has a number of authorities that enforce policies, 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 strategy (Table 4-1), and include the following:

Fond du Lac County Land and Water Conservation Department

Relevant policies and programs include enforcement of county erosion control, stormwater management, and floodplain management regulations.

Fond du Lac County Planning and Development Department

Relevant policies and programs include protecting the natural resources of the county through good land use planning practices including urban stormwater management.

Fond du Lac County Communications and Emergency Management Department

Relevant policies and programs include coordinating effective disaster response and recovery efforts in the county through response, recovery, planning, training, exercises, and mitigation.

Fire Departments and Emergency Medical Services

Relevant policies and programs include coordinating emergency preparedness, mitigation, response, and recovery efforts.

Law Enforcement

Relevant policies and programs include coordinating emergency preparedness, mitigation, response, and recovery efforts.

Fond du Lac County Communications Center

Relevant policies and programs include coordinating emergency response and recovery efforts with regard to communication between the public and police, fire, and EMS.

Fond du Lac County Highway and Public Works Department

Relevant policies and programs include road maintenance, stormwater management, and management of salt storage for winter storms.

Fond du Lac 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.

University of Wisconsin – Extension

Relevant policies and programs include providing information and sharing educational resources to citizens before, during and after disasters to reduce the impacts from natural and man-made disasters.

Power Utilities (Alliant Energies, Wisconsin Public Service, WE Energies, Waupun Utilities, and Plymouth Utilities)

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 (Milwaukee Regional Office)

Relevant policies and programs include publicizing information, and providing outreach and education about hazardous weather.

These authorities have the ability to expand or modify their programs when needed to improve existing tools to address mitigation. Fond du Lac County has taxing authority through property taxes to raise funds for the purpose of 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 Fond du Lac County (or other entities seeking to carry out hazard mitigation actions) for 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 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 with implementing 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 to moderate-income individuals.

CHAPTER 5 - PLAN ADOPTION AND MAINTENANCE

PLAN ADOPTION PROCESS

The Fond du Lac County Hazard Mitigation Plan development process was guided by a Steering Committee over a 16-month timeframe, with professional planning assistance contracted from Community Assistance Planning, LLC, and oversight from the Fond du Lac County Communications and Emergency Management Department. A list of Steering Committee members is located in Chapter 1 - Introduction of this document.

Both WEM and FEMA reviewed a final draft of the County's hazard mitigation plan prior to adoption by the Fond du Lac 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 Fond du Lac County Board on _____, 2015. The resolution adopting the plan can be found on page iii, just before the Table of Contents. After the Fond du Lac County Board adopted the plan, it was approved by WEM and FEMA. Approval letters from WEM and FEMA can be found on page v.

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 Fond du Lac County Hazard Mitigation Plan is an update to the 2009 plan, and will continue to be monitored, evaluated, and updated by Fond du Lac County. Every five years, the plan will be comprehensively reviewed, and fully updated. The 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 Fond du Lac County Communications and Emergency Management Director, and approved by the County Board. 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. All municipalities will be encouraged to participate in the process and adopt the plan update.

Additional Plan Review

Within three to six months following a significant natural hazard event (as determined by the Fond du Lac County Communications and Emergency Management Director), a special post-disaster review will occur. The Fond Du Lac County Communications and Emergency Management Director shall collect information concerning the disaster. Information will be gathered 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 review.

At a public meeting, the Steering Committee will analyze the contributing factors to the impact(s) of the hazard event, the likelihood of the event recurring, and any strategies that should be implemented to mitigate the impact(s) in the future. The County Communications and 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, 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 Fond du Lac County Board for its action and consideration.

PLAN COORDINATION

The identified mitigation strategies (provided in Chapter 4) are tied 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 opportunities to mitigate future losses from hazards.

Housing Element – An inventory of the properties within floodplain boundaries, the location of manufactured 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 vulnerable during hazards events such as flooding.

Agricultural, and Natural and Cultural Resources Element – Identify floodplains and agricultural areas that are vulnerable during hazard events. Incorporate recommendations on how to mitigate future losses to these areas.

Economic Development Element – Describe the impacts of hazards on area businesses and commerce.

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 – Include recommended actions from this plan in the implementation element of comprehensive plans of jurisdictions within the planning area.

To maximize coordination with other related plans for Fond du Lac 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 Fond du Lac 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 inventory data (2007, East Central Wisconsin Regional Planning Commission);

Resource Guide to All Hazards Mitigation Planning in Wisconsin (AWRPC, 2003);

Local Hazard Mitigation Plan Review Crosswalk, Completed for Fond du Lac County in April 2009 was used to complete the updated Crosswalk;

State of Wisconsin Hazard Mitigation Enhanced Plan (2009) 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 (January 2000 – February 2014);

U.S. Geological Survey maps on earthquakes were used to describe the hazard;

FEMA Flood Insurance Studies and FEMA Flood Insurance Rate Maps (FIRMs) were used to map floodplain areas;

Parcel data from Fond du Lac County was used to determine impacts of hazards with defined areas;

Assessed valuation data from Fond du Lac County was used to derive estimates of potential dollar losses;

Local municipal comprehensive plans 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.

APPENDIX A - STEERING COMMITTEE SIGN-IN SHEETS

In order to assist in plan development, Fond du Lac County established a Hazard Mitigation Plan Steering Committee. A table listing all members of the Committee can be found in Chapter 1 - Introduction. The steering committee held five meetings to update the plan: August 28, 2014; September 30, 2014; October 23, 2014; November 18, 2014; and January 14, 2014. This Appendix contains the sign-in sheets from each of these meetings to verify attendance and participation by Committee members.

Fond du Lac County Emergency Management
Natural Hazards Mitigation Plan Review/Up-Date Meeting

Date 8-28-2014 **Location** EOC **Time- Start** 6:30

Meeting Purpose: ___Kick-Off Meeting ___County Board Public Participation Plan adoption ___Municipal Meeting with Consultant

X Steering Committee Meeting ___Municipal Meeting to Review Draft Plan ___Municipal meeting to adopt plan

___County Board Meeting to Adopt Plan ___Meeting with Emergency Management Staff ___Other _____

Important: This sign-in sheet will be used as the In-Kind Cost portion of the Federal Grant acquired to do the review and up-date of the current Natural Hazard Mitigation Plan. Please be sure that this completed document is forwarded to Tony Zelhofer from the Fond du Lac County Office of Communications/Emergency Management

Name	Organization	Salary per hour	Mileage- to and from meeting	Sub-total expense per line
CRAIG MOLITOR	FOND DU LAC CONSERVATION BOARD			
RUSS RAUBE	FOND DU LAC COUNTY	35.00	8 miles	
TERRY DIETZEL	FOND du LAC County	40.00	20 MILES	
Dana Tscheschlok	UW-Extension		6 miles	
Lori Rich	City of Ripon		20 miles	
Marty Schroeder	FDL County Board	250.00/month	10	
Chuck Brown	Village of North Fond du Lac		6 miles	
Steve Weston	ALLIANT ENERGY		5 miles	
DICK FLYNN	CITY OF WAUPUN	40.00	80 miles	
Rick Olig	FOND DU LAC COUNTY SHERIFF	54.00	4.5 mile	
James McNabb	Emergency Management			
Robert J Gleso	Town of Fond du Lac	-	6 miles	
Tony Zelhofer	FDL County EM			
Angie Kowalzek-Adams	Community Assistance Planning	—	—	

Fond du Lac County Emergency Management
Natural Hazards Mitigation Plan Review/Up-Date Meeting

Date Sept 30, 2014 **Location** County EOC **Time- Start** 2:00 PM **End-Time** 4:00PM

Meeting Purpose: ___Kick-Off Meeting ___County Board Public Participation Plan adoption ___Municipal Meeting with Consultant

X Steering Committee Meeting ___Municipal Meeting to Review Draft Plan ___Municipal meeting to adopt plan

___County Board Meeting to Adopt Plan ___Meeting with Emergency Management Staff ___Other _____

Important: This sign-in sheet will be used as the In-Kind Cost portion of the Federal Grant acquired to do the review and up-date of the current Natural Hazard Mitigation Plan. Please be sure that this completed document is forwarded to Tony Zelhofer from the Fond du Lac County Office of Communications/Emergency Management

Name	Organization	Mileage- to and from meeting
Tony Zelhofer	FDL County Comm/EM	—
Richard W [illegible]	City of Waupun	40
Angela Kowalzeka-Adrians	Community Assistance Planning	—
Rick Olin	FDL Co Sheriff	—
Shelley Braun Grebel	EM	
JORDAN SKIFF	CITY OF FDL, PUBLIC WORKS	—
Chuck Hornung	Village of NFDL	—
Darrin Parsons	Village of NFDL	
RUSS RAUBE	FOND DU LAC LAND INFO	
TERRY DIETZEL	LAND INFO C.	—
Lori Rich	City of Ripon	48

Name	Organization/Title	Mileage- to and from meeting
Robert J Riesp	Chair Town of Fdl	10 mi
Marty Schroeder	City Bd	8 mi
Tom JANKE	COUNTY HIGHWAY	1 mi
Diana Tscheschlok	UW Extension	3 miles
Lisa Stanchfield	ARC	2 miles
CRAIG MOLITOR	FDL VISITORS + CONVENTION BUREAU	
STEVE WESTON	ALLIANT ENERGY	
BOBBI HICKEN	FDL COMM/EM	—

Fond du Lac County Emergency Management
Natural Hazards Mitigation Plan Review/Up-Date Meeting

Date October 23, 2014 **Location** County EOC **Time- Start** 2:00 PM **End-Time** 3:35 PM

Meeting Purpose: ___Kick-Off Meeting ___County Board Public Participation Plan adoption ___Municipal Meeting with Consultant

_X_ Steering Committee Meeting ___Municipal Meeting to Review Draft Plan ___Municipal meeting to adopt plan

___County Board Meeting to Adopt Plan ___Meeting with Emergency Management Staff ___Other _____

Important: This sign-in sheet will be used as the In-Kind Cost portion of the Federal Grant acquired to do the review and up-date of the current Natural Hazard Mitigation Plan. Please be sure that this completed document is forwarded to Tony Zelhofer from the Fond du Lac County Office of Communications/Emergency Management

Name	Organization	Mileage- to and from meeting
Tony L. Zelhofer	Fond du Lac County Comm/Em	—
Beth Eidman	WDNR	60
Robert J Miesbauer	Town of Fdl.	10 -
Angela Kowalzek-Adrians	Community Assistance Planning	—
Russ Raube	FDL Co. Land Info	—
Chuck Hornung	Village of NFDL	—
Rick Olig	Fond Du Lac SO	—
Tom Miller	FDCMUBAS President	20
Lori Rich	City of Ripon	45
Marty Schroeder	FDL Cty. BD	10
Tom Janke	FDL County Highway	1
Jordan Skiff	City FdL - Public Works	ϕ

Fond du Lac County Emergency Management
Natural Hazards Mitigation Plan Review/Up-Date Meeting

Date Nov. 18, 2014 **Location** FDL County EOC **Time- Start** 2:00 PM **End-Time** 2:45 PM

Meeting Purpose: ___Kick-Off Meeting ___County Board Public Participation Plan adoption ___Municipal Meeting with Consultant

X Steering Committee Meeting ___Municipal Meeting to Review Draft Plan ___Municipal meeting to adopt plan

___County Board Meeting to Adopt Plan ___Meeting with Emergency Management Staff ___Other _____

Important: This sign-in sheet will be used as the In-Kind Cost portion of the Federal Grant acquired to do the review and up-date of the current Natural Hazard Mitigation Plan. Please be sure that this completed document is forwarded to Tony Zelhofer from the Fond du Lac County Office of Communications/Emergency Management

Name	Organization	Mileage- to and from meeting
Tony L. Zelhofer	Fond du Lac County EM	—
Angela Kowalzek-Adriant	Community Assistance Planning	—
[illegible]	Town of FDL.	5
[illegible]	OEM	
Bobbi Hicken	EM	
TERRY DIETZEL	LAKE IVF.	
RUSS RAUBE	LAND INFO.	
Marty Schroeder	FDL County Board	10
[illegible]	City of Ripon	47
Steve Weston	Alliant Energy	10
[illegible]	Village of North FDL	

Fond du Lac County Emergency Management
Natural Hazards Mitigation Plan Review/Up-Date Meeting

Date 1-14-2015 **Location** County EOC **Time- Start** 2:00 PM **End-Time** _____

Meeting Purpose: ___Kick-Off Meeting ___County Board Public Participation Plan adoption ___Municipal Meeting with Consultant

X Steering Committee Meeting ___Municipal Meeting to Review Draft Plan ___Municipal meeting to adopt plan

___County Board Meeting to Adopt Plan ___Meeting with Emergency Management Staff ___Other _____

Important: This sign-in sheet will be used as the In-Kind Cost portion of the Federal Grant acquired to do the review and up-date of the current Natural Hazard Mitigation Plan. Please be sure that this completed document is forwarded to Tony Zelhofer from the Fond du Lac County Office of Communications/Emergency Management

Name	Organization	Mileage- to and from meeting
Tony Zelhofer	Fond du Lac County Comm/Em	—
Dick FLYNN	CITY OF WAUPUN	40
Beth Erdman	WDNR	66
Chuck Hornung	Village of NFDL	
Marty Schroeder	FDL City Board	10
Stark Weston	Alliant Energy	10
Angela Kowalzek-Adkins	Community Assistance Planning LLC	—
Lori Rich	City of Ripon	47
RUSS RAUBE	FDC CO CANID INFO	
TERRY DIETZEL	FDL Co LAND INFO	—
JORDAN SKIFF	CITY - FDL	—
Bob Giese	Town of Fond du Lac	

S:\Temporary\2015-2020 Natural Hazards Mitigation Plan\reporting documents\Sign in sheet.docx

APPENDIX B - MULTI-JURISDICTIONAL COOPERATION EXERCISE

As a way to ensure accurate data and multi-jurisdictional cooperation in the update of the county's hazard mitigation plan, the steering committee and Community Assistance Planning, LLC engaged the local communities in a mutli-jurisdictional cooperation exercise to review and provide input on plan materials.

Communities were provided a listing of their critical facilities, the plan goals, and the identified mitigation strategies, and were asked to review and comment on the materials. Additionally, they were asked to identify mitigation actions specific to their community. The following is the letter that was sent to the municipalities in Fond du Lac County and Table B-1 below displays the communities that returned the reviewed materials.

Fond du Lac County

OFFICE OF COMMUNICATIONS/EMERGENCY MANAGEMENT

December 9, 2014

RE: Request for Review of Hazard Mitigation Materials

Dear ,

Fond du Lac County Emergency Management and Community Assistance Planning have been working with a steering committee to update the Hazard Mitigation Plan for Fond du Lac County and the municipalities within the county.

The Disaster Mitigation Act of 2000 established a **requirement for local governments** to prepare a Hazard Mitigation Plan in order to be eligible for funding from the Federal Emergency Management Agency (FEMA) through; the Pre-Disaster Mitigation Grant Program, the Flood Mitigation Assistance Program, the Hazard Mitigation Grant Program, and disaster assistance.

Hazard mitigation planning is being conducted at the county level, with local municipalities participating in the plan and providing valuable input. Once completed, the plan must be adopted locally and by the county board before receiving plan approval from FEMA. **Your community's participation in the development and adoption of this plan is necessary in order for your community to be fully eligible for future assistance from FEMA.**

The enclosed attachments will assist you with your participation of the development of this plan. **Please forward these attachments to your Plan Commission if you have one, or review with your City Council or Village Board.**

Thank you for time and consideration concerning this request and we hope to hear from you in the near future. Should you have any questions please do not hesitate to contact myself or our consultant:

Angela Kowalzek-Adrians
Community Assistance
Planning,(920) 412-0075
angela.cap.planner@gmail.com>

Sincerely,

James P. Mc Nabb
Director

Fond du Lac County-- Hazard Mitigation Plan 2015//Supporting Material

The following materials have been enclosed to assist with the facilitation of your participation in the development of this plan update:

160 South Macy + Fond du Lac + WI 54935 + Tel. 920-929-3288 + Fax 920-929-2912

EXERCISE 1: Review the inventory of the critical facilities found in your community. A list of the critical facility types/categories to include is enclosed. Please review your critical facilities inventory for accuracy. Write in edits on the sheet.

- Ensure that there is an address or lat/long coordinates provided for each critical facility.

EXERCISE 2: Review the goals for the plan. **Please review, comment, and sign-off on your approval**.

EXERCISE 3: Review hazards to be addressed in the plan. They are listed in prioritized order based on impact and frequency. **Please review, comment, and sign-off on your approval**.

EXERCISE 4: Review the mitigation actions identified by the steering committee. **Please review, comment, and sign-off on your approval** and **ADD AT LEAST ONE MITIGATION ACTION SPECIFIC TO YOUR COMMUNITY** that you plan to implement or would like to implement if grant funding were available.

*If you have any questions or need any additional information please contact our consultant Angela Kowalzek-Adrians with Community Assistance Planning at angela.cap.planner@gmail.com or (920) 412-0075. Please return your information **no later than January 5, 2014** to Community Assistance Planning, PO Box 28092, Green Bay, WI 54324-0092.*

PLEASE NOTE THAT THIS IS THE ONLY REQUEST THAT WILL BE MADE FOR THIS INFORMATION. IF YOUR MATERIALS ARE NOT RECEIVED, YOU WILL NOT BE A PART OF THE PLAN. Not participating in this plan will require your community to develop its own plan if you wish to be eligible for future FEMA funding – including disaster assistance. Thank you for your participation in reviewing the enclosed materials.

Enclosures (4):

1) Listing of Critical Facilities;
2) Critical Facility Categories;
3) Plan Goals;
4) Hazards Addressed
5) Mitigation Actions

160 S. Macy Street / Fond du Lac / WI / 54935 / 920-929-3288 / 920-929-3390 / Fax 920-906-4651

Table B-1: Returned Hazard Mitigation Plan Update Review Materials

	Community Representative		
Municipality	Name	Title	Date Signed
City of Fond du Lac	Jordan Skiff	Director of Public Works	1/20/15
City of Ripon	Gary Will	Mayor	1/5/15
City of Waupun	Dick Flynn	Director of Public Works	1/15/15
Village of Brandon	Vance B Henning	Director of Public Works	12/30/14
Village of Campbellsport	Patrick D Twohig	Village President	12/17/14
Village of Eden	Timothy R Engel	Fire Chief	12/22/14
Village of Fairwater	Larry Beuthin	Emergency Government Co-Director	1/8/15
Village of Mount Calvary	Mary Merten	Clerk	1/8/15
Village of North Fond du Lac	Chuck Hornung	Village Administrator	1/22/15
Village of Oakfield	Tim Stoppleworth	Village Trustee	1/5/15
Village of Rosendale	Duane Ciske	Village President	1/5/15
Village of St. Cloud	Carol Limberg	Village President	1/6/15

Source: Community Assistance Planning, LLC; 2015.

APPENDIX C - CRITICAL FACILITIES BY COMMUNITY

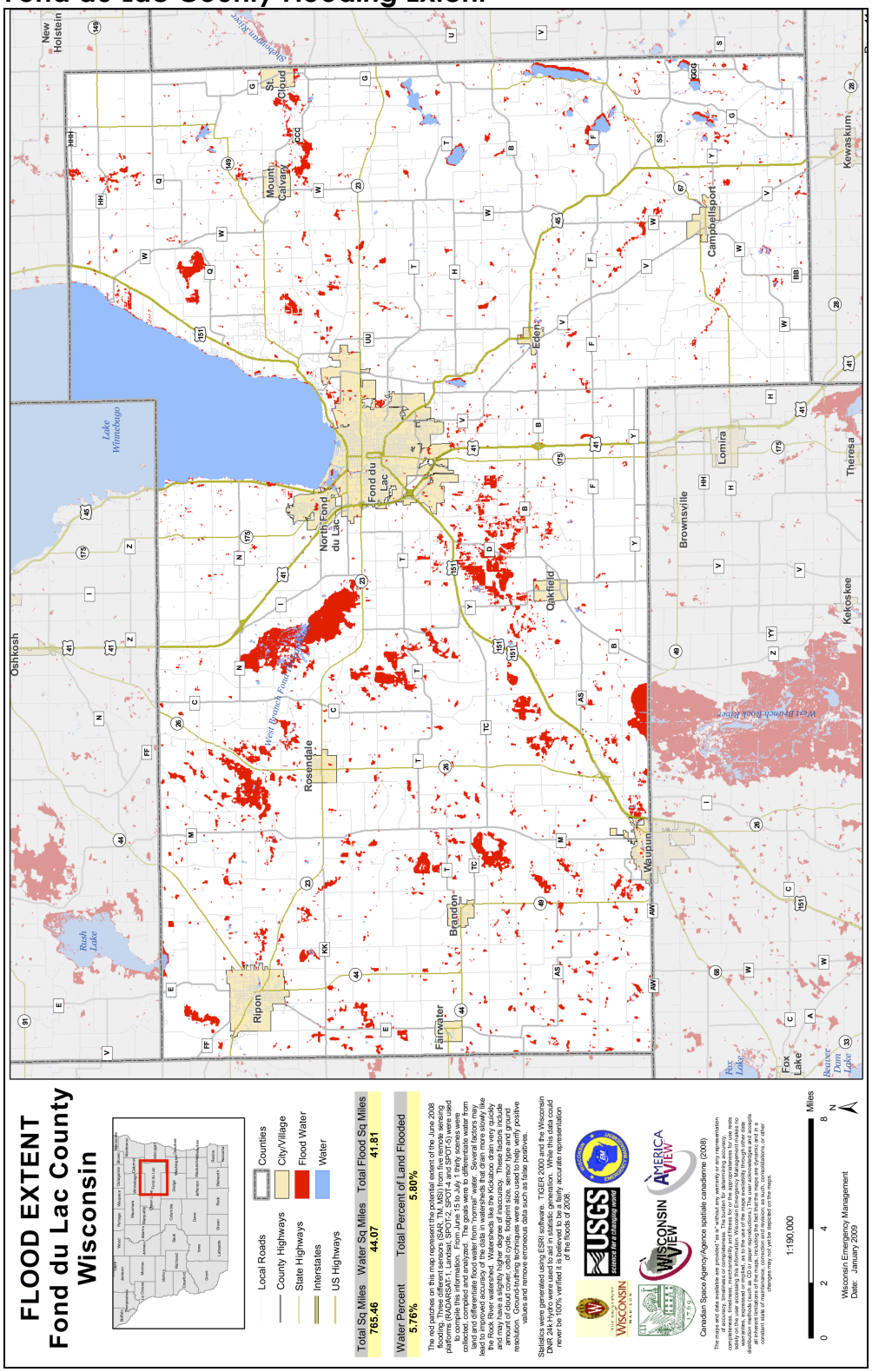
The Fond du Lac County Hazard Mitigation Plan Steering Committee and community representatives identified critical infrastructure assets for all the communities in the county. Table C-1 below summarizes the critical facilities by municipality for Fond du Lac County.

Table C-1: Critical Facilities by Municipality, Fond du Lac County

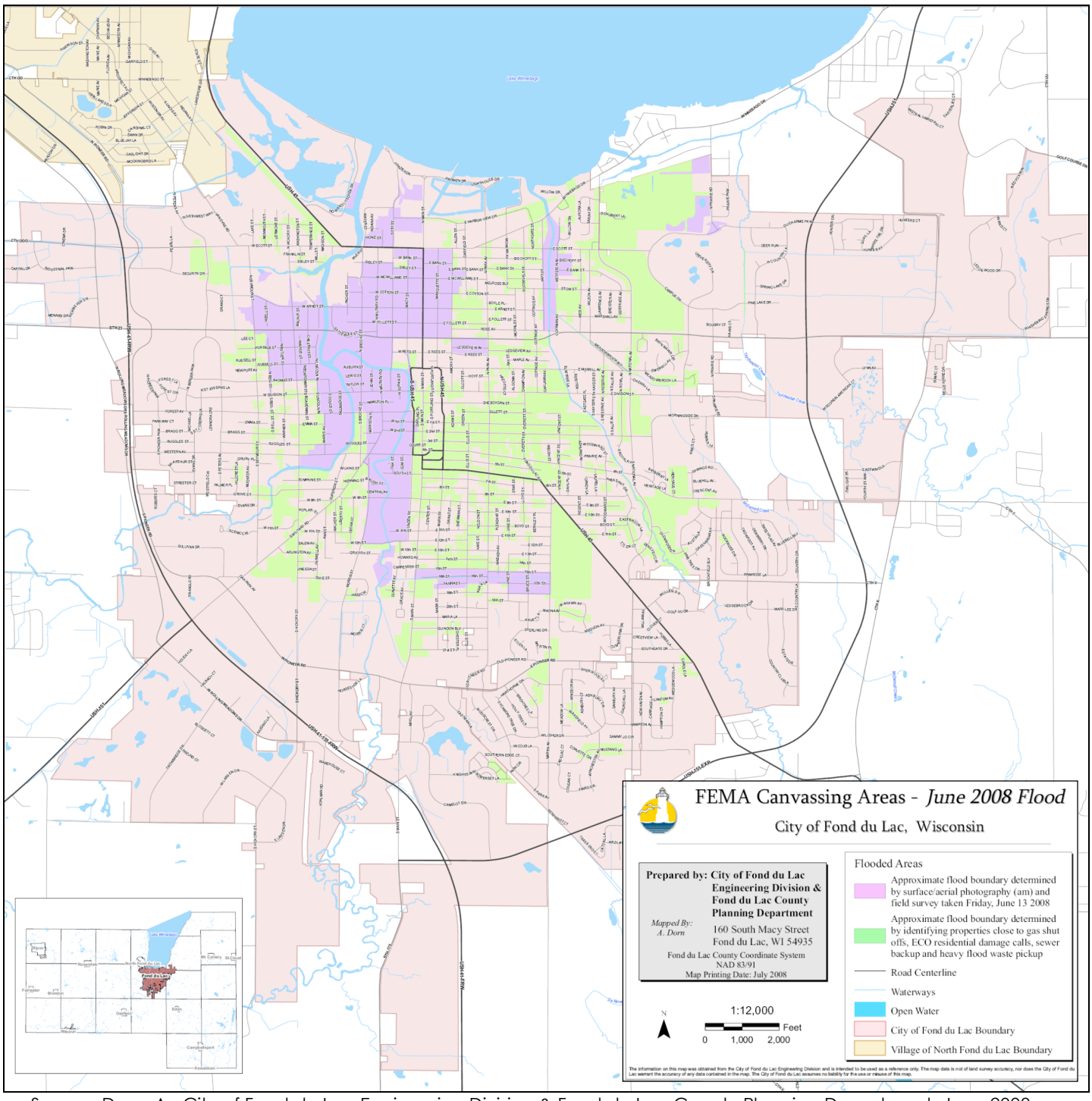
Municipality	Airport	Bridge	Communication Tower	Dam	Fire Department	Health Care Facility	Law Enforcement	Manufactured Housing Community	Municipal Facility	School	Utilities	Total
City of FDL		12	3		3	32	4	3	8	31	25	121
City of Ripon			1	1	1	12	1	1	1	7	10	35
City of Waupun						1	1		1	1	10	14
Village of Brandon			1		1	3	1		1	1	4	12
Village of Campbellsport		1			1	1	1	2	2	3	3	14
Village of Eden					1			1		1	1	4
Village of Fairwater		1		1	1						3	6
Village of Mt Calvary					1	1			1	1	3	7
Village of North FDL						3	1	2	1	4	5	16
Village of Oakfield		1			1		1		2	3	2	10
Village of Rosendale					1	1	1		1	3	2	9
Village of St. Cloud					1				1	1	2	5
Town of Alto		1			1				1	1	1	5
Town of Ashford		4		1				1	1			7
Town of Auburn		7							1		1	9
Town of Byron		4							1		4	9
Town of Calumet		5			1				1		1	8
Town of Eden		3				1					2	6
Town of Eldorado		3	1	1	1				1			7
Town of Empire		4							1		3	8
Town of FDL	1	32			2	1		1	1	1	10	49
Town of Forest		2		1					1	1	1	6
Town of Friendship		9			1			2	1			13
Town of Lamartine		8			1				1			10
Town of Marshfield		7		1		3			1		2	14
Town of Metomen									1		2	3
Town of Oakfield		2	1	2					1		1	7
Town of Osceola		3	1	1					1	2	1	9
Town of Ripon		1					1				1	3
Town of Rosendale		2							1			3
Town of Springvale		3							1		1	5
Town of Taycheedah		3	1						1	1		6
Town of Waupun		12							1	1	2	16
Total	**1**	**130**	**9**	**9**	**19**	**59**	**12**	**13**	**38**	**63**	**103**	**456**

Source: Fond du Lac County, and Community Assistance Planning, LLC; 2015.

Fond du Lac County Flooding Extent



City of Fond du Lac Flooding Extent



Source: Dorn, A.; City of Fond du Lac Engineering Division & Fond du Lac County Planning Department; June 2008.

APPENDIX E - PUBLIC MEETING NOTICE AND SIGN-IN SHEET

NOTICE OF PUBLIC INFORMATIONAL MEETING

Media Contact: James Mc Nabb, Tel: (920) 906-4646

For Immediate Release

January 5, 2015

Fond du Lac County Undertaking Hazard Mitigation Planning – Public Informational Meeting Scheduled and Draft Plan Available for Public Review

Emergency management, response, and planning personnel from the private and public sectors in Fond du Lac County have been working together to update the County's Hazard Mitigation Plan. The plan is being developed with funding assistance from the Federal Emergency Management Agency (FEMA).

With this plan, the County has identified mitigation actions aimed at minimizing or eliminating long-term risk to people and property from natural hazards. With the rising costs associated with hazard recovery activities, it is much more cost effective to address hazards before they occur. Additionally, a current plan qualifies the County to apply for FEMA funding to undertake pre-disaster mitigation activities.

Public input is requested on the draft plan. A public informational meeting to present the draft plan, maps, and materials will be held **Friday, January 23, 2015 from 6:00-7:00 PM** at the Fond du Lac City/County Government Center on the first floor in Meeting Room H at 160 South Macy Street in Fond du Lac.

Alternatively, the draft plan can be viewed, and comments submitted online at http://tinyurl.com/FDLCoHazPlan. Online comments are being accepted now through February 1, 2015.

# # #

Fond du Lac County Hazard Mitigation Plan

Public Information Meeting Sign-In

January 23, 2015

Name	Affiliation or Address
Angela Kowalzak-Adrians	Community Assistance Planning, LLC
Bobbi Hicken	Fond du Lac County EM

APPENDIX F - RESOLUTIONS OF ADOPTIONS FROM INCORPORATED COMMUNITIES