LAW ENFORCEMENT AND EMERGENCY MANAGEMENT COMMITTEE

AGENDA

Jefferson County Courthouse, Room 112
311 S. Center Ave.
Jefferson, WI 53549
December 28, 2018 @ 8:30 a.m.

DWAYNE MORRIS; KIRK LUND; GREG DAVID; BRANDON WHITE; JAMES BRAUGHLER

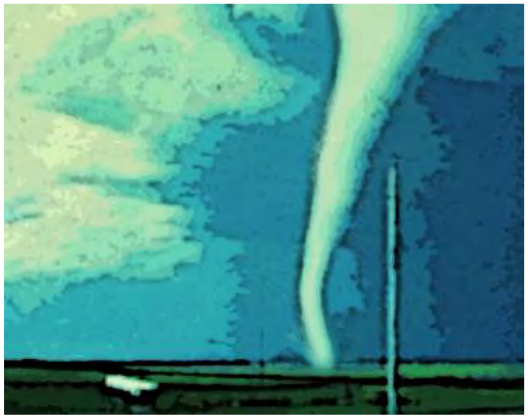
1. Call to order
2. Roll call
3. Certification of compliance with open meetings law
4. Approval of the agenda
5. Public comment – (Members of the public who wish to address the committee on specific agenda items must register their request at this time)
6. Approval of the November 30, 2018 meeting minutes
7. Discussion and possible action on Emergency Management Natural Hazard Mitigation Plan – Donna Haugom
8. Communications
9. Grants – Update of ongoing or new grants
10. Report from the Sheriff
11. Review monthly bills and financial items (November) and Report on the budget
12. Review monthly jail and patrol activity reports
13. Discussion and possible action on approving jail assessment fund purchases
14. Discussion on potential items for the January 25, 2019 meeting agenda
15. Next meeting date is January 25, 2019 (Emergency Management)
16. Adjourn

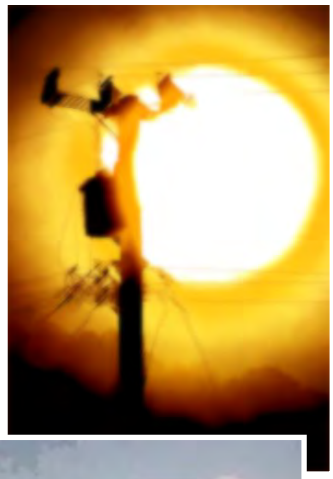
A quorum of any Jefferson County Committee, Board, Commission or other body, including the Jefferson County Board of Supervisors, may be present at this meeting.

Individuals requiring special accommodations for attendance at the meeting should contact the County Administrator 24 hours prior to the meeting at 920-674-7101 so appropriate arrangements can be made.

NATURAL HAZARDS MITIGATION PLAN: 2019-2023

JEFFERSON COUNTY, WISCONSIN





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CONSULTING LLC

FORWARD

The *Jefferson County Hazard Mitigation Plan: 2019-2023* consists of six chapters and a map series. The first chapter provides an overview of the project. The second chapter presents background information about Jefferson County including its setting, demographic and economic characteristics, climate, natural resources, land use, and development trends. Chapter 3 presents background information related to special needs populations and groups in the county. Chapter 4 contains a complete inventory of critical facilities in the county. Natural hazards are reviewed in chapter 5 along with estimated losses to buildings, infrastructure, and critical facilities. In chapter 6, goals, objectives, and policies are identified that will help to craft appropriate solutions to the identified problems. A range of activities are also presented to help foster hazard mitigation efforts. Various funding sources are reviewed with an eye towards identifying options for funding identified projects. Most of the maps in the plan are included in the final section of the plan.

Jefferson County adopted a multi-jurisdictional plan in 2008, which was approved by the Federal Emergency Management Agency (FEMA) on July 25, 2008. This plan was prepared to cover all of the municipalities in the county. As part of the five-year update begun in 2012, this plan was substantially updated and revised to meet new state and federal guidelines. The plan as revised was approved by FEMA on October 18, 2013 and by Wisconsin Emergency Management on October 28, 2013.

This most recent version is intended to guide mitigation planning efforts in Jefferson County during the five-year period from 2019 through 2023.

ACKNOWLEDGEMENTS

County Board of Supervisors by District

1. Richard Jones
2. Mike Kelly
3. Greg David
4. Augie Tietz
5. James Braughler
6. Dan Herbst
7. Dwayne Morris
8. Michael Wineke
9. Amy Rinard
10. Lloyd Zastrow
11. Donald Reese
12. Peter A. Hartz
13. Ed Morse
14. Kirk Lund
15. Steven J. Nass
16. Laura Payne
17. Russell Kutz
18. Brandon White
19. Jim Schroeder
20. Jim Mode
21. John Kannard
22. Blane Poulson
23. George Jaeckel
24. Roger Lindl
25. Matthew Foelker
26. Gregg Patrick
27. Conor Nelan
28. Dick Schultz
29. Mark K. Roberts
30. Walt Christensen

Law Enforcement/Emergency Management Committee

- Jim Braughler
- Greg David
- Kirk Lund
- Dwayne Morris
- Brandon White

2017 Plan Update Steering Committee

- Kyle L. Ellefson, Village Administrator – Village of Johnson Creek
- Bill Ingersoll, Town Chair – Town of Concord
- Ted Kumbier, Village Trustee – Village of Cambridge
- Hope Oostdik, Town Chair – Town of Lake Mills
- Robert L. Peter – Town of Waterloo
- Robert Preuss, Town Supervisor – Town of Watertown
- Daryl Rausch, Fire Chief – City of Fort Atkinson
- Glendon Rewoldt, Town Clerk – Town of Sumner
- James Small, Fire Chief – Village of Palmyra
- Todd Yandre, Deputy Fire Chief – City of Lake Mills
- Nancy J. Zastrow, Clerk/Treasurer – Town of Ixonia

2012 Plan Update Steering Group

- Andy Erdman, Director – Land Information Office
- Paul Hable, Safety Director – Fort Health Care
- Donna Haugom, Emergency Management Director
- Rusty Kapela, National Weather Service, Meteorologist
- Bill Kern, Highway Department Commissioner
- Paul Milbrath, Jefferson County Sheriff
- Joe Nehmer, Director – Parks Department
- Gail M. Scott, Director – Health Department
- Mark Watkins, Director – Land & Water Conservation Department
- Stewart E. Calkins, Town Chairman – Town of Palmyra
- Mike Ciardo, Sergeant and EM Coordinator – City of Whitewater
- Mike Drew, Captain – City of Jefferson

- Dale Falk, Town Supervisor – Town of Oakland
- James Frohmader, Supervisor – Town of Aztalan
- Matthew Foelker, Town Supervisor – Town of Hebron
- Larry Kreger, Fire Chief – Village of Palmyra
- Richard Gimler, Chairman – Town of Watertown
- Greg Michalek, Fire Chief – City of Watertown
- Todd Nieting, Supervisor – Town of Waterloo
- Hope Oostdik, Chair – Town of Lake Mills
- David F. Peterson, Fire Chief – Village of Johnson Creek
- Glendan Rewoldt, Deputy Clerk – Town of Sumner
- Timothy Thomas, Police Chief – City of Waterloo

2008 Plan Working Group

- Andy Erdman, Director – Land Information Office
- Paul Hable, Safety Director – Fort Health Care
- Donna Haugom, Emergency Management Director
- Bruce Haukom, Director – Zoning Department
- Rusty Kapela, National Weather Service, Meteorologist
- Bill Kern, Highway Department Commissioner
- Paul Milbrath, Jefferson County Sheriff
- Joe Nehmer, Director – Parks Department
- Gail M. Scott, Director – Health Department
- Mark Watkins, Director – Land & Water Conservation Department

Project Supervision
Donna Haugom, Emergency Management Director, served as project supervisor for Jefferson County.

Funding
Partial funding for the preparation of this plan was provided by Wisconsin Emergency Management through a grant from the Pre-Disaster Mitigation Program.

Consultant
Civi Tek Consulting prepared this plan under the supervision of Tim Schwecke, AICP.

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INTRODUCTION

1. CHAPTER OVERVIEW

This chapter introduces the need for this plan by making the case that natural disasters have historically caused substantial damage to people and property in Jefferson County and that while it is not possible to prevent natural disasters from occurring, it is possible to better position a community to mitigate the effects of natural disasters. The purpose and scope of this plan are described so that it is clear what this document is intended to do and how it relates to other previous planning efforts and ongoing emergency management activities. The ways in which the general public and local units of government were involved in the preparation, review, and adoption of this plan are documented. A procedure for keeping this document current is described. In the final section, those governmental units adopting this plan are listed.

Chapter Contents

1. Chapter Overview
2. Purpose
3. Scope
4. Relationship of Mitigation Planning to Other Emergency Management Activities
5. Relationship to Other Plans
6. Plan Preparation, Review, and Adoption
7. Interagency Coordination
8. Plan Maintenance and Amendment
9. Incorporating this Plan into Other Planning Efforts
10. Governmental Units Adopting this Plan

2. PURPOSE

It's fair to say that most people do not think about natural disasters until they are personally affected in some way. When a significant event does strike, the general public most often looks to government at all levels and non-governmental organizations, like the American Red Cross, for assistance. Likewise, local units of government look to state agencies and the federal government for financial help and assistance. Depending on the scale of the natural disaster, assistance can be short-term or on-going over an extended period of time.

Throughout the United States, government's response, and associated costs, has grown significantly. At the federal level, the average annual loss from natural disasters was $3.3 billion between 1989 and 1993. Between 1994 and 1998, that figure rose to $13 billion.

In an effort to curb rising costs, the federal government adopted the Disaster Mitigation Act of 2000 (DMA 2000). It amended the Robert T. Stafford Disaster Relief and Emergency Act, which is the primary law at the federal level dealing with disaster planning, mitigation, response, and recovery.

DMA 2000 reinforced the importance of hazard mitigation planning to proactively devised strategies intended to avoid and reduce the negative effects of natural disasters. If a community wants to apply for grant funding from the Pre-Disaster Mitigation (PDM) Program or the Hazard Mitigation Grant Program (HMGP), it must have an approved hazard mitigation plan. If a disaster strikes a community that does not have an approved plan, it can only receive funding through HMGP if it agrees to prepare a plan within one year.

Jefferson County and participating municipalities have prepared this plan to meet this new requirement, and in so doing, help its citizens mitigate the effects of natural disasters.

3. SCOPE

The scope of this plan is limited to natural hazards. It does not address threats of terrorism or man-made hazards. Hazardous materials (HAZMAT) are addressed in this plan when the production and storage are vulnerable to natural hazards such as flooding. Plans and programs are in place at the county and state levels to address HAZMAT incidents and accidents.

4. RELATIONSHIP OF MITIGATION PLANNING TO OTHER EMERGENCY MANAGEMENT ACTIVITIES

Mitigation planning is one prong of a multi-faceted approach to emergency management (Exhibit 1-1). Each of these are briefly described to help provide context for this plan.

MITIGATION

Mitigation is any activity that is proactively done to reduce a community's vulnerability of damage from future disasters. Mitigation is the focus of this plan.

PREPAREDNESS

Emergency preparedness focuses exclusively on creating effective strategies and procedures to respond to an emergency. It includes creating the institutional framework for response and protocol for decision making, conducting training of emergency response personnel, ensuring equipment is available and operational, and developing and maintaining an appropriate communications network.

Jefferson County has a well-established and tested emergency operations plan. It identifies a decision making structure and areas of responsibility depending on the nature of the emergency.

RESPONSE

Response includes any action taken immediately before, during, and after an event to save lives and minimize property damage.

RECOVERY

Although the extent and type of recovery efforts will vary with the nature and extent of the event, they focus on restoring support services and infrastructure and helping those affected to regain a sense of normalcy.

It is important to recognize that each of these areas focuses on different aspects of emergency management, but that the effectiveness of each depends on an integrated systems approach.

Key Terms in This Chapter

Disaster Mitigation Act of 2000 (DMA 2000) – A federal law (P.L. 106-390) amending the Robert T. Stafford Disaster Relief and Emergency Act. The act authorizes the president to establish (1) a program of technical and financial assistance to the states and local governments to assist in the implementation of pre-disaster hazard mitigation measures; (2) the National Predisaster Mitigation Fund; and (3) an interagency task force. It requires state, local, or tribal governments to develop predisaster hazard mitigation plans as a precondition of receiving certain federal funds and controls and streamlines the cost of disaster assistance.

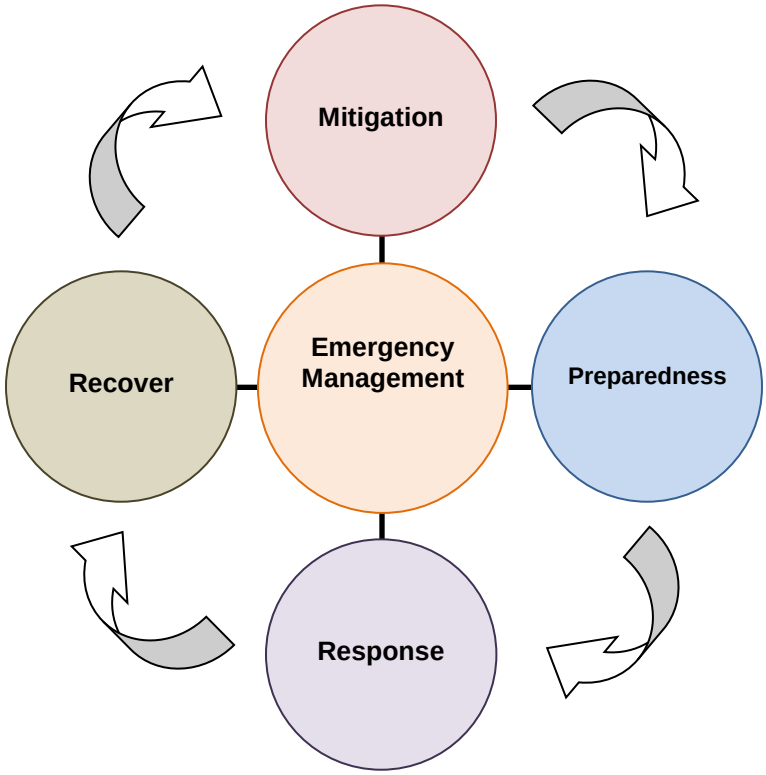
Federal Emergency Management Agency (FEMA) – A federal agency created in 1979 with a mission to reduce loss of life and property and protect our nation's critical infrastructure from all types of hazards through a comprehensive, risk-based emergency management program of mitigation, preparedness, response, and recovery. In March 2003, it was placed under the Department of Homeland Security.

Hazard mitigation plan – A plan prepared at the state or local level that systematically evaluates policies, actions, and tools, and sets goals for implementation over the long term that will result in a reduction in risk and minimize future losses in a community.

Hazard Mitigation Grant Program (HMGP) – A federal program administered by the Federal Emergency Management Agency intended to prevent future losses of lives and property due to disasters; to implement state or local hazard mitigation plans; to enable mitigation measures to be implemented during immediate recovery from a disaster; and to provide funding for previously identified mitigation measures to benefit the disaster area. It was authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act.

Wisconsin Emergency Management (WEM) – A state agency that specializes in hazard mitigation, warning and communications, emergency police services, disaster response and recovery, hazardous materials & EPCRA, radiological emergency preparedness, and exercise and training.

Exhibit 1-1. Emergency Management



5. Relationship to Other Plans

The following plans, studies, and reports were reviewed in preparing this plan:

- **Comprehensive Plans** Jefferson County and many of the cities and villages have adopted comprehensive plans consistent with state requirements. At a minimum, a comprehensive plan needs to address the following nine elements:
  - Issues and opportunities
  - Housing
  - Transportation
  - Utilities and Community Facilities
  - Agriculture, Natural and Cultural Resources
  - Economic Development
  - Intergovernmental Cooperation
  - Land Use
  - Plan Implementation

  Land use policies established in a community's comprehensive plan have a significant relationship to this plan especially in the area of floodplain management. For example, what kind of development will a community allow in the floodplain? This is a significant public policy questions that should be addressed in a comprehensive plan.

- **Jefferson County Hazards Analysis** This document identifies those hazards that have or could occur in the county. It also describes each

hazard, its frequency of occurrence, and actions being taken to mitigate the hazard. It was last updated March 2012.

- **Jefferson County Flood Mitigation Plan** In 1999, Jefferson County adopted a flood mitigation plan for the unincorporated area of the county and updated it in 2001. The goal of the plan is to reduce the economic and personal costs of flood damages and is intended to:
  - Document the extent of existing flooding
  - Document the potential economic impacts of major flooding
  - Identify properties at greatest risk of damage
  - Document properties with repetitive flood damages
  - Identify feasible management alternatives to reduce flood risks
  - Identify potential funding sources for flood mitigation implementation
  - Develop a proactive implementation strategy to reduce flood risks
  - Identify strategies to ensure the community's preparedness in case of a flood disaster
  - Make Jefferson County and its residents eligible for federal financial assistance from the Flood Mitigation Assistance program administered by FEMA.

- **Jefferson County Hazardous Materials Response Plan** Jefferson County has a hazardous materials response plan which identifies the policies and procedures for responding to hazardous materials incidents/accidents. It was adopted in compliance with the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) and state law codified in Section 166.20, Wis. Stats. It was last updated March, 2011.

- **Jefferson County Emergency Operations Plan** The Jefferson County Office of Emergency Management maintains an emergency operations plan that identifies the procedures for responding to emergency events in the county.

- **Jefferson County Land and Water Resources Management Plan** Jefferson County Land and Water Resources Management Plan 2006-2010 was developed by the Jefferson County Land and Water Conservation Department to guide land and water resource protection in the county. The plan addresses the protection of lakes, stream, wetlands, and soil. Like the county land use plan, this plan further protects environmentally sensitive areas and natural flood storage in the county. Implementation of the plan's recommendations will assist in the prevention of flood damage in Jefferson County.

- **State Hazard Mitigation Plan** This plan was prepared by Wisconsin Emergency Management (WEM) and complies with the requirements of the Disaster Mitigation Act of 2000 at the state level.

- **Emergency Action Plan Lower Watertown Dam** This plan was prepared by the Rock River Power and Light Corporation for the hydroelectric plant on the Rock River in the city of Watertown.

- **Emergency Action Plan Upper Watertown Dam** This plan was prepared by the Rock River Power and Light Corporation for the hydroelectric plant on the Rock River in the city of Watertown.

- **Jefferson County Business Flood Assessment** This report was prepared to assess the knowledge, experiences, and impact the flooding had on the business owners of Jefferson County, who own or operate businesses along the Rock and Crawfish Rivers in the communities of Fort Atkinson, Jefferson, Jonson Creek, Lake Mills, Palmyra, Waterloo, and Watertown, Wisconsin.

- **Flood of June 2008 in Southern Wisconsin** This report was prepared by the U.S. Geological Service (USGS) in cooperation with the Federal Emergency Management Agency (FEMA). Flood peak inundation maps and water surface profiles were generated for the communities of Reedsburg, Rock Springs, LaFarge, Gays Mills, Milford, Jefferson, Fort Atkinson, Janesville, and Beloit in a geographic information system by combining flood high-water marks with available 1-10 meter resolution digital-elevation-model data. The high-water marks used in the maps were a combination of those surveyed during the June 2008 flood by communities, counties, and federal agencies and hundreds of additional marks surveyed in August 2008 by the USGS. The flood maps and profiles outline the extent and depth of flooding through the communities and were used in flood response and recovery efforts by local, county, state and federal agencies. (Scientific investigations Report 2008-5235, U.S. Geological Survey)

When any of these local plans are updated, they should incorporate provisions, as may be appropriate, that support this plan.

6. PLAN PREPARATION, REVIEW, AND ADOPTION

2008 PLAN

The Jefferson County Board adopted a public participation plan on July 11, 2006 that describes the ways in which the public and local units of government would be involved in the preparation, review, and approval of the plan. Key elements include: a project website, publication of all meetings, submittal of press releases, and public presentations.

An ad hoc working group was established and given the responsibility of developing the first draft of the plan. It consisted of ten members, including staff from various county departments and a representative from Forth Health Care and from the National Weather Service. Work on this plan began with the first meeting on June 29, 2006. In all, the working group met four times to work on the plan and review various drafts.

Local jurisdictions were involved in a number of ways and were kept abreast of the plan's progress. Initially, letters were sent to each local unit of government inviting them to designate an individual who would serve as a point of contact and a liaison. The local contact was given a listing of critical facilities in his/her jurisdiction for review and comment. A member of the consulting team attended a meeting of the Jefferson County Towns Association and presented the project to the attendees and answered questions.

After the working group finished its work, it submitted a draft plan to the Jefferson County Law Enforcement/Emergency Management (LE/EM) Committee, a committee of the County Board. The LE/EM Committee reviewed the draft plan and made revisions. At this point, public presentations were held for local officials and the public at five locations throughout the county. Following

those meetings, the LE/EM Committee made revisions to the draft plan and on January 22, 2008 recommended the draft plan to the full County Board for its review and action.

On February 12, 2008 the County Board adopted this plan by resolution, which is included as Appendix B. A number of local jurisdictions also adopted this plan by resolution also included in Appendix B.

In a letter dated July 25, 2008, Wisconsin Emergency Management and the Federal Emergency Management Agency certified that this plan meets federal requirements (Appendix C).

2012 5-YEAR PLAN UPDATE

In 2011, the Jefferson County Emergency Management office applied for and received a grant to prepare a five-year update to the plan. The county contracted with Civi Tek Consulting for this project.

The Jefferson County Board of Supervisors adopted a public participation plan on April 17, 2012, that describes the ways in which the public and local units of government would be involved in the preparation, review, and approval of the plan update. A copy of the public participation plan is included as Appendix A. Key elements include: a project website, establishment of a steering committee, publication of all meetings, submittal of press releases, and numerous opportunities for submitting written comments and suggestions.

No comments were received from residents, property owners, or other interested parties during the process.

Municipalities in the county were involved in a number of ways and were kept abreast of the plan's progress. Initially, letters were sent to each municipality inviting them to approve a memorandum of understanding (MOU) and to designate an individual who would serve as a point of contact and a liaison. A sample of the MOU and of the appointment form is included in Appendix A. All of the municipalities approved the MOU. The local point of contact was given a listing of critical facilities in his/her jurisdiction for review and comment (Appendix A). Corrections were made to the list of critical facilities based on the input received.

A steering committee was established and given the responsibility of reviewing the draft of the plan update. Members are listed in the acknowledgements to this plan. The committee met on July 9, 2012 to review the proposed changes to the plan. The meeting was publicly noticed and the agenda from the meeting and a listing of those in attendance is included in Appendix A. Members of the public in attendance were given an opportunity to provide input (see agenda).

After the steering committee finished its work, another draft (2.0) was prepared, which was sent to Wisconsin Emergency Management (WEM) for tentative review. A third draft of the plan was prepared to address WEM's initial comments.

Table 1-1. Summary of Village and City Involvement

Municipality	Description
City of Fort Atkinson	Appointed a point of contact for the project; city representative on steering committee; provided information relating to critical facilities; returned review acknowledgement form and approved as drafted
City of Jefferson	Appointed a point of contact for the project; city representative on steering committee; provided information relating to critical facilities; returned review acknowledgement form and approved as drafted
City of Lake Mills	Appointed a point of contact for the project; provided information relating to critical facilities; returned review acknowledgement form and requested revisions
City of Waterloo	Appointed a point of contact for the project; provided information relating to critical facilities; returned review acknowledgement form and requested revisions
City of Watertown	Appointed a point of contact for the project; city representative on steering committee; provided information relating to critical facilities; returned review acknowledgement form and requested revisions
City of Whitewater	Appointed a point of contact for the project; city representative on steering committee; provided information relating to critical facilities; returned review acknowledgement form and approved as drafted
Village of Cambridge	Appointed a point of contact for the project; provided information relating to critical facilities; returned review acknowledgement form and approved as drafted
Village of Johnson Creek	Appointed a point of contact for the project; village representative on steering committee; provided information relating to critical facilities; returned review acknowledgement form and approved as drafted
Village of Lac La Belle	No involvement
Village of Palmyra	Appointed a point of contact for the project; village representative on steering committee; provided information relating to critical facilities; returned review acknowledgement form and requested revisions
Village of Sullivan	Appointed a point of contact for the project; provided information relating to critical facilities; returned review acknowledgement form and requested revisions

A copy of this draft was then sent to each of the cities and villages in the county, the adjoining counties, and the local chapter of the American Red Cross for review and comment.[1] An executive summary was sent to each of the towns for review and comment. A copy of these cover letters are included in Appendix A. All of the municipalities responded (Table 1-1). Revisions as requested were incorporated into the plan document.

A fourth draft of the plan was prepared based on the local government input that was received. It was then sent to the Federal Emergency Management Agency for preliminary approval. A letter dated June 3, 2013, indicated such approval. The Law Enforcement/Emergency Management Committee of the County Board reviewed this draft on June 28, 2013, and recommended the draft plan to the full County Board for its review and action.

On July 9, 2013 the County Board of Supervisors adopted the plan update. The Federal Emergency Management Agency and Wisconsin Emergency Management certified that this plan update meets federal requirements on October 18, 2013 and October 28, 2013 respectively.

Table 1-2 summarizes the changes made to each section of the plan as part of the update.

[1] Note: Jefferson County is not located within the jurisdiction of a regional plan commission.

Table 1-2. Summary of Changes Made in the 2012 Plan Update

Plan Section	Summary of Changes
Chapter 1	This chapter was reviewed and updated as needed. Specifically, a narrative describing the process used in developing the update was included. The procedure for plan maintenance was reviewed and updated. A section titled "Incorporating this Plan into Other Planning Efforts" was added.
Chapter 2	This chapter was updated using data the best available data.
Chapter 3	This chapter was updated including data from the 2010 Census of population and housing.
Chapter 4	This chapter was updated.
Chapter 5	Natural hazard profiles, occurrences, and probabilities were reviewed and updated as necessary. In addition, the risk assessments were updated.
Chapter 6	This chapter was updated. The steering committee focused in on the goals, objectives, policies, and activities. Revisions were made and new ones were added.
Map Series	All of the maps were updated.
Appendix A	Public participation documentation for the 2013-2017 plan is included.
Appendix B	Resolutions adopting the 2013-2017 plan update are included.
Appendix C	Certification letters from WEM and FEMA for the 2013-2017 plan are included.
Appendix D	This appendix was updated to list all of the municipalities adopting the plan.
Appendix E	The listing represents an up-to-date inventory of critical facilities in the county sorted by type of facility.
Appendix F	The listing represents an up-to-date inventory of critical facilities in the county sorted by jurisdiction.
Appendix G	The history of storm events was updated using data provided by the National Weather Service.
Appendix H	No change
Appendix I	No change

2018 5-Year Plan Update (2019-2023)

The Jefferson County Emergency Management office applied for and received a grant in 2016 to prepare a five-year update to the plan (2019-2023). The county contracted with Civi Tek Consulting for this project.

The Jefferson County Board of Supervisors adopted a public participation plan on July 11, 2017, that describes the ways in which the public and local units of government would be involved in the preparation, review, and approval of the plan update. A copy of the public participation plan is included as Appendix A.

No comments were received from residents, property owners, or other interested parties during the process.

Municipalities in the county were involved in a number of ways and were kept abreast of the plan's progress. Initially, letters were sent to each municipality inviting them to approve a memorandum of understanding (MOU) and to designate an individual who would serve as a point of contact and a liaison.

A steering committee was established and given the responsibility of reviewing the draft of the plan update. Members are listed in the acknowledgements to this plan. The committee met to review the proposed changes to the plan. The meeting was publicly noticed and the agenda from the meeting and a listing of those in attendance is included in Appendix A. Members of the public in attendance were given an opportunity to provide input (see agenda).

Table 1-3. Summary of Village and City Involvement

Municipality	Description
City of Fort Atkinson	Appointed a point of contact for the project; city representative on steering committee
City of Jefferson	Appointed a point of contact for the project
City of Lake Mills	Appointed a point of contact for the project; city representative on steering committee
City of Waterloo	Appointed a point of contact for the project
City of Watertown	Appointed a point of contact for the project
City of Whitewater	Appointed a point of contact for the project
Village of Cambridge	Appointed a point of contact for the project; village representative on steering committee
Village of Johnson Creek	Appointed a point of contact for the project; village representative on steering committee
Village of Lac La Belle	No involvement
Village of Palmyra	Appointed a point of contact for the project; village representative on steering committee
Village of Sullivan	Appointed a point of contact for the project

A copy of this draft was then sent to each of the cities and villages in the county, the adjoining counties, and the local chapter of the American Red Cross for review and comment.[2] An executive summary was sent to each of the towns for review and comment. A copy of these cover letters are included in Appendix A. All of the municipalities responded (Table 1-1). Revisions as requested were incorporated into the plan document.

A draft of the plan was prepared based on the local government input that was received. It was then sent to the Federal Emergency Management Agency for preliminary approval. The Law Enforcement/Emergency Management Committee of the County Board reviewed this draft on December 28, 2018, and recommended the draft plan to the full County Board for its review and action.

On January 8, 2019 the County Board of Supervisors adopted this plan. A copy of the agenda is included in Appendix A. The county adoption resolution and those of the cities and villages is included in Appendix B.

The Federal Emergency Management Agency and Wisconsin Emergency Management certified that this plan update meets federal requirements on ____, 2019 and ____, 2019 respectively (Appendix C).

Every effort has been made to use the best available data for the update. Data from the 2010 census of population and housing and the 2015 American Community Survey was used to update the demographic information contained in this plan.

Table 1-4 summarizes the changes made to each section of the plan as part of the 2018 update.

[2] Note: Jefferson County is not located within the jurisdiction of a regional plan commission.

Table 1-4. Summary of Changes Made in the 2012 Plan Update

Plan Section	Summary of Changes
Chapter 1	This chapter was reviewed and updated as needed.
Chapter 2	This chapter was updated using data the best available data.
Chapter 3	This chapter was updated including data from the 2010 Census of population and housing and the 2015 American Community Survey
Chapter 4	This chapter was updated.
Chapter 5	Natural hazard profiles, occurrences, and probabilities were reviewed and updated as necessary. In addition, the risk assessments were updated.
Chapter 6	This chapter was updated. The steering committee focused in on the goals, objectives, policies, and activities. Revisions were made and new ones were added.
Map Series	Maps were updated as needed.
Appendix A	Public participation documentation for the 2019-2023 plan is included.
Appendix B	Resolutions adopting the 2019-2023 plan update are included.
Appendix C	Certification letters from WEM and FEMA for the 2019-2023 plan are included.
Appendix D	This appendix was updated to list all of the municipalities adopting the plan.
Appendix E	The listing represents an up-to-date inventory of critical facilities in the county sorted by type of facility.
Appendix F	The listing represents an up-to-date inventory of critical facilities in the county sorted by jurisdiction.
Appendix G	The history of storm events was updated using data provided by the National Weather Service.
Appendix H	No change
Appendix I	No change

7. Interagency Coordination

A copy of the draft plan that the LE/EM Committee recommended to the County Board was sent to the American Red Cross and each of the adjoining counties for review and comment. A copy of the letter is included in Appendix A. Comments were received from the American Red Cross and incorporated into this plan. Jefferson County is not served by a regional plan commission.

8. Plan Maintenance and Amendment

DMA 2000 requires that an adopted plan be reviewed and updated at least once every five years. However, to ensure that the plan remains a viable planning tool, it should be reviewed each year and following a natural disaster. The Federal Emergency Management Agency and Wisconsin Emergency Management will be notified of amendments to this plan.

Without periodic review and assessment, this plan has the potential to lose its relevance as conditions change, specific projects are implemented, and new priorities emerge.

Annual Review

Each November, the Emergency Management Director should review and monitor this plan and suggest amendments to the LE/EM Committee. As part of this review, the Emergency Management Director should contact each of the participating jurisdictions to give them the opportunity to suggest changes. During this annual review, most of the focus should be on Chapter 6, which lists the goals, objectives, polices, and activities.

To determine whether amendments are needed, the following considerations should be reviewed:

- Review of general development trends
- Review of hazard risk
- Review of hazard mitigation goals and objectives
- Review of completed mitigation activities and their effectiveness
- Review of recommended strategies
- Review of available resources for future projects
- Public input
- Input from WEM and FEMA

FOLLOWING A NATURAL DISASTER

In addition, to a yearly review cycle, this plan should be updated following a significant natural disaster. Ideally, the update would be completed within six months of the event.

The public will be formally notified of meetings scheduled for the purpose of plan review. Other mechanisms that will be used to maintain public involvement include making available a copy of the plan at local public libraries, issuance of periodic press releases to the media describing the status of plan implementation and the use of the county's website as a medium to keep residents informed of the plan's status and implementation activities.

HISTORY OF ADOPTION AND AMENDMENT

A history of adoption and amendment is included in Appendix D. It lists when this plan was first adopted and the various amendments which have taken place since then.

9. INCORPORATING THIS PLAN INTO OTHER PLANNING EFFORTS

The state-mandated comprehensive plan and floodplain regulations will be the primary means of reducing the effects of hazards on people and property in Jefferson County. Mitigation strategies can be incorporated into these plans when they are updated. Each jurisdiction should incorporate goals, objectives, and policies into their comprehensive plans that are consistent with this plan. The Jefferson County Emergency Management Director should send a letter to the Plan Commission of each city and village in 2013 encouraging them to cross reference their plan revisions with this plan. Likewise, amendments to this plan should be made consistent with comprehensive plans so long as such action would reduce the impact of hazards on people and property.

In addition to long-range planning, this plan will also be utilized when reviewing land development projects. It will be useful to consult this plan to determine where hazards are located, primarily 100-year floodplains. The plan will also be consulted as necessary when capital improvement plans are being prepared. Again, the intent of these cross-cutting planning efforts is to reduce the effects of hazards on people and property.

To underscore the importance of incorporating this plan into other planning efforts, Jefferson County Emergency Management sent a letter to the County Planning Director encouraging the use of this plan (Appendix A).

10. Governmental Units Adopting This Plan

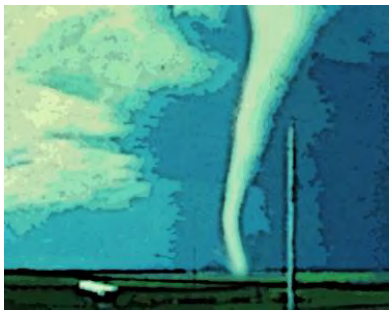
In addition to Jefferson County, 6 cities and 4 villages have adopted this plan (Table 1-5). The cities of Watertown and Whitewater and the villages of Cambridge and Lac La Belle are situated in Jefferson County and an adjoining county. As such, these municipalities would need to adopt a hazard mitigation plan for their entire jurisdiction before they would be eligible to apply for mitigation grants from the federal government. Those jurisdictions that have not done so, can at any time in the future adopt this plan provided they involve the public in the adoption process.

Table 1-5. Municipalities Adopting Plan Update (to be verified)

Cities	Villages
Fort Atkinson	Cambridge [1]
Jefferson	Johnson Creek
Lake Mills	Palmyra
Waterloo	Sullivan
Watertown [1]	
Whitewater [1]	

Notes: 1. Municipality located in Jefferson County and another county

PLANNING AREA PROFILE



1. CHAPTER OVERVIEW

This chapter is intended to give an overview of Jefferson County to help describe the setting and provide the general context for mitigation planning.

Chapter Contents

1. Chapter Overview
2. Regional Context
3. Units of Government
4. Population
5. Housing
6. Transportation
7. Land Use and Development Trends
8. General Climate
9. Soil
10. Topography
11. Surface Water Resources
12. Wetlands

2. REGIONAL CONTEXT

Jefferson County is located midway between the Milwaukee and Madison metropolitan areas. It is bordered by Waukesha County on the east, Dodge County on the north, Dane County on the west, and Walworth and Rock counties on the south (Exhibit 2-1). It encompasses 564 square miles and is located in the Eastern Ridges and Lowlands portion of southeastern Wisconsin which is densely populated with a high concentration of industry and farms.

The Rock River, which travels north to south in the central to western half of the Jefferson County, is a Mississippi River tributary that flows through northern Illinois. It drains most of Jefferson County. The major feeder streams are the Crawfish, Bark, Scuppernong, and Oconomowoc rivers and the Whitewater, Koshkonong, and Deer creeks. Lake Koshkonong is the largest lake, located in the southwest portion of the county. Other smaller lakes are Rock Lake, Lake Ripley, Hahn's Lake, Red Cedar Lake, Goose Lake, Golden Lake, Mill Pond, Green Isle Lake, Upper and Lower Spring Lake, and Blue Spring Lake.

Land use percentages of assessed totals are estimated as 67 percent for agricultural with residential and commercial uses at 9 percent each. Approximately 5 percent of the county's surface is covered with water (i.e., lakes, rivers, streams, etc.) and the remaining balance is non-assessed properties such as government, religious, non-profit, and other uses.

Industry is the largest employment sector at 46 percent. There are approximately 1,420 farms with the average size being 174 acres.

Exhibit 2-1. General Location

3. UNITS OF GOVERNMENT

Civil divisions in Jefferson County consist of 16 towns, 5 villages, and 6 cities (Table 2-1). The city of Watertown is located in Jefferson and Dodge counties. The village of Cambridge is located in Jefferson and Dane counties. The majority of Lac La Belle is located in Waukesha County. The city of Whitewater is located in Jefferson and Walworth counties. The city of Jefferson is the county seat.

Table 2-1. Civil Divisions; Jefferson County

Towns	Cities	Villages
Aztalan	Fort Atkinson	Cambridge [1]
Cold Spring	Jefferson	Johnson Creek
Concord	Lake Mills	Lac La Belle [1]
Farmington	Waterloo	Palmyra
Hebron	Watertown [1]	Sullivan
Ixonia	Whitewater [1]	
Jefferson		
Koshkonong		
Lake Mills		
Milford		
Oakland		
Palmyra		
Sullivan		
Sumner		
Waterloo		
Watertown		

Notes: 1. Municipality located in Jefferson County and another county

4. POPULATION

According to the U.S. Census Bureau there were 84,345 county residents in 2015 (Table 2-2). With 4,457 residents, the town of Ixonia is the most populous of the 16 towns in the county. The village of Johnson Creek is the most populous village and Watertown is the most populous city. As seen in Table 2-2, the county has enjoyed steady growth since 1980.

At 6.1 percent, towns as a group posted the smallest change in population from 2000 to 2010 when compared to cities as a group (11.6%) and villages (28.5%) also as a group. With the exception of two towns, the population in towns posted modest population gains. The town of Ixonia experienced the highest rate of change (51.1%) and the largest numerical gain (1,483 residents). With a change in population of 9.3 percent, the town of Waterloo posted the second highest rate of change, although it only added 77 residents.

Except for a small corner of the village, Lac La Belle is located in Waukesha County and has only 2 residents in Jefferson County. Of the villages, Johnson Creek experienced the largest change from 2000 to 2010 (73.2%) and also the largest numerical increase (1,157 residents). Seven of the twenty-seven municipalities experienced a decrease in their populations.

That portion of the city of Watertown in Jefferson County has a current population of 15,720 residents. With 12,447 residents, Fort Atkinson is the second most populous city in the county. Between 2000 and 2010, each of the six cities saw their population increase from between 2.8 to 24.1 percent.

Table 2-2. Population; Jefferson County and Civil Divisions: 1980, 1990, 2000, 2010, and 2015

	1980 Census	1990 Census	2000 Census	2010 Census	Percent Change 2000-10	2015 Estimate (ACS)
Town						
Aztalan	1,752	1,476	1,447	1,457	0.7	1,377
Cold Spring	684	683	766	727	-5.1	830
Concord	1,805	1,884	2,023	2,072	2.4	2,269
Farmington	1,528	1,404	1,498	1,380	-7.9	1,447
Hebron	1,104	975	1,135	1,094	-3.6	1,089
Ixonia	2,905	2,789	2,902	4,385	51.1	4,457
Jefferson	2,891	2,687	2,457	2,178	-11.4	2,054
Koshkonong	2,979	2,984	3,395	3,692	8.7	3,694
Lake Mills	1,515	1,584	1,936	2,070	6.9	2,022
Milford	1,066	1,007	1,055	1,099	4.2	1,106
Oakland	2,240	2,526	3,135	3,100	-1.1	3,134
Palmyra	1,069	1,176	1,145	1,186	3.6	1,317
Sullivan	1,646	1,924	2,124	2,208	4.0	2,297
Sumner	973	822	904	832	-8.0	760
Waterloo	811	694	832	909	9.3	896
Watertown	1,921	1,840	1,876	1,975	5.3	2,080
Total	26,889	26,455	28,630	30,364	6.1	30,829
Village						
Cambridge [1]	59	80	87	109	25.3	110
Johnson Creek	1,136	1,259	1,581	2,738	73.2	2,855
Lac La Belle [1]	-	-	0	1	100	0
Palmyra	1,515	1,540	1,766	1,781	0.9	1,317
Sullivan	434	449	688	669	-2.8	693
Total	1,949	3,328	4,122	5,298	28.5	4,975
City						
Fort Atkinson	9,785	10,213	11,621	12,368	6.4	12,447
Jefferson	5,647	6,078	7,146	7,973	11.8	7,965
Lake Mills	3,670	4,143	4,843	5,708	17.9	5,708
Waterloo	2,393	2,712	3,259	3,333	2.8	3,345
Watertown [1]	12,202	12,388	13,535	15,402	13.8	15,720
Whitewater [1]	2,422	2,466	2,611	3,240	24.1	3,395
Total	36,119	38,000	43,015	48,024	11.6	48,580
Jefferson County	**66,152**	**67,783**	**75,767**	**83,686**	**10.5**	**84,345**

Source: US Census Bureau including American Community Survey (ACS)

Notes: 1. Municipality located in Jefferson County and another county

5. HOUSING

According to the 2015 American Community Survey of population and housing (ACS), there were over 35,000 dwelling units in the county (Table 2-3). About 70 percent were single family residences. Structures with 3 or 4 units represent the second most common housing type. Dwellings of 5 to 9 units are the third most common type of housing. Over one-fourth of the county's housing stock was built more than 70 years ago (Table 2-4).

Table 2-3. Housing Types; Jefferson County: 2015

Units in Structure	Number	Percent
1-unit, detached	24,645	69.9
1-unit, attached	1,575	4.5
2 units	1,719	4.9
3 or 4 units	1,949	5.5
5 to 9 units	1,876	5.3
10 to 19 units	873	2.5
20 or more units	1,180	3.3
Mobile home	1,447	4.1
Boat, RV, van, etc.	0	0
Total	35,264	100

Source: US Census Bureau, American Community Survey (2015)

Table 2-4. Age of Housing Stock; Jefferson County: 2015

Year Structure Built	Number	Percent
2014 or later	32	0.1
2010 to 2013	289	0.8
2000 to 2009	4,890	13.9
1990 to 1999	5,455	15.5
1980 to 1989	2,280	6.5
1970 to 1979	4,905	13.9
1960 to 1969	3,314	9.4
1950 to 1959	3,301	9.4
1940 to 1949	1,317	3.7
1939 or earlier	9,481	26.9
Total	35,264	100

Source: US Census Bureau; American Community Survey (2015)

6. TRANSPORTATION

SURFACE TRANSPORTATION

The county contains approximately 1,374 miles of roadways (Table 2-5). Nearly two-thirds of which are classified as a local road. Interstate 94 travels east and west in the northern part of the county (Map 1). Interchanges are located at the city of Lake Mills (STH 89), the village of Johnson Creek (STH 26), and at Concord (CTH F).

The other key regional highways include STH 26, STH 12, STH 18, and STH 16. Each of these highways connects one or more of the incorporated municipalities in Jefferson to the Interstate highway system and provides access to nearby metropolitan areas. Extremely hazardous substances may be transported over any local, state, or federal highway, without restriction provided weight limits are met.

Table 2-5. Roadway by Type: Jefferson County

Type of Roadway	Miles	Percent of Total
Interstate Highway	24.56	1.8
State Highway	151.74	11.0
County Highway	259.77	18.9
Local Roads	919.41	66.9
Other	18.58	1.4
Total	1374.06	100

Source: Jefferson County

AIR TRANSPORTATION

Public-use airports are located in the city of Watertown, city of Fort Atkinson, and village of Palmyra.

- Watertown Municipal Airport is classified as transport/corporate based airport[1]. Forecasts prepared for the Wisconsin Bureau of Aeronautics indicate that use will increase to 7,530 operations by 2030, a 1 percent decrease since 2010 (58,000).

[1] A transport/corporate airport is intended to serve corporate jets, small passenger and cargo jet aircraft used in regional service and small aircraft (piston and turboprop) used in commuter air service.

- Fort Atkinson Municipal Airport is classified as a general utility airport[2]. Total operations are forecasted to grow at a rate of 2% from 10,900 in 2010 to 11,880 in 2030.
- Palmyra Municipal Airport is classified as a basic utility airport[3]. It is estimated that use will decrease slowly by 1% from 15,650 in 2010 to 15,470 operations by 2030.

In addition to these public-use airports, there are a number of private-use airports, including McDermott Airpark. Private-use airports are not considered critical infrastructure for the purposes of this plan.

RAIL TRANSPORTATION

As shown on Map 6, there are three railroads that serve Jefferson County: Wisconsin Southern, Union Pacific, and Canadian Pacific.

7. LAND USE AND DEVELOPMENT TRENDS

The unincorporated area of Jefferson County is predominated by rural land uses, principally agriculture (Map 2). The Jefferson County Comprehensive Plan and Land Use Map summarize the most recent land use totals by acreage. In the unincorporated area, agriculture and other open lands account for nearly three-quarters of the land area. With 15.6 percent of the land area, wetlands constitute the second largest land use type.

As envisioned in the county's recently adopted farmland preservation plan, most of the future growth is expected to take place in planned urban service areas located in or adjacent to the existing urban municipalities. Most rural areas of the county are zoned as agricultural preservation areas and environmental corridor, which limit urban development. Urban development is anticipated to increase proportional to the population growth, and will likely be limited to approximately 800 to 900 acres of new urban development in the unincorporated areas of the county.

8. GENERAL CLIMATE

Wisconsin's climate is typically classified as continental. About two-thirds of the annual precipitation falls during the growing season (freeze-free period). It is normally adequate for vegetation, although drought is occasionally reported. This climate is most favorable for dairy farming; the primary crops are corn, small grains, hay, and vegetables. The rapid succession of storms moving from west to east or southwest to northeast account for the stimulating climate.

Table 2-6 charts conditions in the city of Lake Mills which is representative of the entire county.

[2] A general utility airport is intended to serve virtually all small general aviation single and twin-engine aircraft, both piston and turboprop, with a maximum takeoff weight of 12,500 pounds or less.

[3] A basic utility airport is intended to serve all small single-engine piston aircraft and many smaller twin-engine aircraft with a maximum takeoff weight of 12,500 pounds or less.

Table 2-6. Climate; City of Lake Mills

Climate Normals	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Ave Daily High (F°)	26.6	32	43.7	59	71.7	80	85	82.1	74.3	62	46.2	31.4
Ave Daily Low (F°)	7.9	11.9	23.6	36	46.5	56	61	58.5	50.8	41	28.8	14.7
Growing Degree Days	0	2	37	161	359	535	675	610	413	202	40	3
Heating Degree Days	1479	1207	970	525	227	38	0	18	103	431	825	1302
Cooling Degree Days	0	0	0	0	44	131	246	182	31	10	0	0
Ave Precipitation (")	1.29	1.13	2.3	3.1	3.17	3.5	3.9	4.05	3.89	2.4	2.28	1.87
Ave Snowfall (")	9.6	7	6.4	1.4	0.1	0	0	0	0	0.1	2.3	10.7

Source: National Weather Service

The lakes and rivers of Jefferson County often are ice covered from late December to late March. Snow covers the ground 50 to 75 percent of winter days. Flooding is most frequent and most serious during March and April, and sometimes in February, due to the melting of snow and spring rains. During this period, flood conditions are often aggravated by ice jams that clog flowing floodwaters. Excessive rains from thunderstorms sometimes produce tributary flooding or flash flooding along the smaller streams and creeks.

9. SOIL

The most common soil associations occurring in the upland areas of Jefferson County are the Fox, Kidder, Keowns, Mayville, Rotamer, and Sebwa silt loams. These soils are made up of loam and silt loam soils that have subsoils of silty clay loam over clay loam and underlain by calcareous loam glacial till. The soils of these associations are well drained and facilitate good infiltration of runoff. These soils fall mainly into the hydrologic soil group B[4].

Adrian and Houghton muck soils dominate the lowlands in the county. Adrian and Houghton muck soils are very poorly drained organic soil that consists of decomposed residue from wetland plants such as reeds, sedges, and forbs. Houghton muck occurs in old glacial lakebeds and wetlands. The lowland soils fall into hydrologic soil groups A/D, B/D and D, indicating limited infiltration capacity.

10. TOPOGRAPHY

Jefferson County is located in a glaciated area, dominated by rolling hills and wide valleys. The topography of the area is the result of 4 major glacial advances, the last of which occurred about 12,000 years ago. Two lobes of the huge glacier sheet, known as the Green Bay and Lake Michigan lobes, interacted over southeast Wisconsin, including Jefferson County, with ice thicknesses ranging from 1/4 mile to 1 mile. As the glaciers advanced and retreated across the county, they deposited large amounts of rock debris known as drift. As the glaciers retreated, outpourings of sand and gravel were added to the drift. The two glacier lobes pushed up against each other over the southeast corner of Jefferson County, leaving behind rock debris that formed the Kettle Moraine ridge located in that part of the county.

[4] Soils are classified into four HSGs (A, B, C, and D) according to their minimum infiltration rate. The soils range from Group A, which has high permeability in well-drained soil with less runoff [produced], to Group D which has low permeability and more anticipated runoff.

The glacier left behind many ground moraines, which provide many hills located in the county. Among the moraines, large outwash plains formed as melt waters deposited fine sands and gravel. Most of the wide floodplain areas of the county are in these outwash plains. The large floodplains south of the city of Watertown, at Lake Koshkonong, and west of the city of Jefferson, are examples of large outwash plains.

11. SURFACE WATER RESOURCES

Jefferson County has a total of 40 lakes, 27 of these are named and 13 are unnamed (Table 2-7). Lake Koshkonong is the largest lake in the county followed by Rock Lake.

Table 2-7. Named Lakes; Jefferson County

Lake (listed by size)	Acres
Lake Koshkonong [1]	10,460
Rock Lake	1,371
Rome Millpond	477
Lake Ripley	418
Red Cedar Lake	359
Golden Lake [2]	250
Goose Lake	144
Hope Lake	142
Blue Spring Lake	136
Mud Lake [3]	120
Lower Spring Lake	104
Mud Lake [3]	93
Watertown Millpond	84
Hahns Lake	82
Maunesha Flowage (Willow Pond)	81
Cushman Pond	48
Bean Lake	33
Mud Lake [3]	33
Slabtown Pond	32
Mud Lake [3]	30
Green Isle Lake (Hebron)	28
Upper Spring Lake	17
Firemen Park Pond	8
Rose Lake	8
Perch Lake	6
Round Lake	3
Kurtz Pond	1

Notes:
1. Located in Dane County and Jefferson County
2. Located in Jefferson County and Waukesha County
3. One of four lakes in the county with the same name

The Rock River and its tributaries drain Jefferson County. Upstream of the outlet of the Rock River at Lake Koshkonong, the river drains over 2,500 square miles and includes portions of Columbia, Dane, Dodge, Fond du Lac, Jefferson, Washington, and Waukesha counties.

The drainage basin of Rock River is divided into the Upper Rock River Basin and Lower Rock River Basin by the Wisconsin Department of Natural Resources for water quality planning purposes. Descriptions for each of the watersheds follow in the following sections.

UPPER ROCK RIVER BASIN

The northern and central portions of Jefferson County are drained by the Upper Rock River Basin. This basin includes all surface waters draining to the Rock River above the Bark River. More than 1,920 square miles are drained by the Upper Rock River, including all of Dodge County and parts of Columbia, Dane, Fond du Lac, Jefferson, Washington and Waukesha counties. The basin is divided into 13 watersheds. Seven of the 13 watersheds in the Upper Rock River Basin drain the northern and central parts of Jefferson County.

Middle Rock River Watershed (UR 01) The Middle Rock River watershed is approximately 132 square miles, including parts of Dodge and Jefferson counties. It extends from the north edge of Fort Atkinson upstream to the dam at Watertown. Totaling 55 stream miles, the major streams within the watershed are Deer Creek, Rock River, and nine unnamed creeks. Agriculture is the dominant land use in this watershed; however, urbanization is occurring on the north side of Fort Atkinson and on the southwest side of Watertown. There are three municipal wastewater treatment plant dischargers in this watershed (Watertown, Johnson Creek, and Jefferson) and four industrial dischargers.

Lower Crawfish River Watershed (UR 02) The Lower Crawfish River watershed is 178 square miles including parts of Dane, Dodge, and Jefferson counties. Totaling 90.4 stream miles, the major streams in the watershed are the Crawfish River, Mud Creek, Nolan Creek, Rock Creek, and 7 unnamed creeks. This watershed includes the Crawfish River and all its tributaries from the dam at Columbus downstream to its confluence with the Rock River at Jefferson. The land use in this watershed is primarily agricultural. There are two municipal wastewater treatment plants (Columbus and Lake Mills) and five industrial plants discharging into this watershed.

Maunesha River Watershed (UR 05) This watershed is 126 square miles and includes parts of Dane, Dodge, and Jefferson counties. Totaling 98 stream

miles, the major streams in the watershed are Maunesha River, Schumacher Creek, Spring Creek, Stony Brook, Stransky Creek, and 19 unnamed streams. Agriculture is the predominant land use in this watershed. The watershed has two state wildlife areas. There are two municipal wastewater dischargers into the watershed (Marshall and Waterloo) and two industrial dischargers.

Johnson Creek Watershed (UR 07) The Johnson Creek watershed is 45 square miles in Jefferson County. Totaling 37.5 stream miles, the major streams in the watershed are Johnson Creek and seven unnamed creeks. The predominant land use in this small watershed is agriculture, although there has been increasing urbanization.

Sinissippi Lake Watershed (UR 08) The Sinissippi Lake watershed is 237 square miles including parts of Dodge and Jefferson counties. It includes the mainstream of the Rock River from the dam at Horicon downstream to the Watertown dam and all the streams which flow into the Rock River in this area. Totaling 160 stream miles, the major streams in the watershed are Baker Creek, Oyman Creek, Dead Creek, Lentz Creek, Neda Creek, Oliver Creek, Rock River, Silver Creek, Wildcat Creek, Woodland Creek, and 20 unnamed streams. The land use in this watershed is primarily agricultural. There are eight communities which have municipal wastewater facilities that discharge into this watershed.

Oconomowoc River Watershed (UR 09) The Oconomowoc River watershed is 129 square miles including parts of Jefferson, Washington, and Waukesha counties. Totaling 88.8 stream miles, the major streams in the watershed are Battle Creek, Coney Creek, Flynn Creek, Little Oconomowoc River, Mason Creek, Oconomowoc River, Rosenow Creek, and 11 unnamed creeks. From its source, the Oconomowoc River flows in a southwesterly direction through six major lakes for approximately 49 miles before entering the Rock River in the Town of Ixonia. Urbanization is continuing, especially next to or near lakes. The City of Oconomowoc is the only municipality in the watershed with a wastewater discharge to surface water. There are approximately 1,100 acres of publicly-owned recreation lands and three large county-owned parks in this watershed.

Ashippun River Watershed (UR 10) The Ashippun River watershed is 69 square miles including parts of Dodge, Washington, and Waukesha counties and a small part of Jefferson County. Totaling 63 stream miles, the major streams in the watershed are Ashippun River, Davey Creek, Dawson Creek, Mud Run Creek, and nine unnamed creeks. The predominant land use is agricultural. The only municipal wastewater discharger in the watershed is the Town of Ashippun.

LOWER ROCK RIVER BASIN

The Lower Rock River Basin drains the southern, eastern, and western portions of Jefferson County. The Lower Rock River Basin drains an area of approximately 1,307 square miles including parts of Columbia, Dane, Jefferson, Rock, Walworth, and Waukesha counties. There are 15 watersheds in the Lower Rock River Basin, five of which drain the southern, eastern, and western portions of Jefferson County.

Lower Koshkonong Creek Watershed (LR 11) The Lower Koshkonong Creek watershed is approximately 219 square miles and includes parts of Dane, Jefferson, and Rock counties. Totaling 104 stream miles, the major streams in this watershed are Allen Creek, Koshkonong Creek, Otter Creek, Sounders Creek, and 15 unnamed streams. While the majority of wetlands in the watershed have been drained for agricultural purposes, many significant

wetland areas remain. Agriculture is the predominant land use. There are significant soil losses in this watershed. Soil loss, coupled with wetland drainage and stream channel drainage, indicates significant sediment likely reaches the watershed's surface water, adversely affecting habitat, and water quality. Fort Atkinson, Cambridge, Rockdale, and Edgerton are each a municipal point discharger in the watershed.

Upper Koshkonong Creek Watershed (LR 12) The Upper Koshkonong Creek watershed is 107 square miles including parts of Dane and Jefferson counties. Totaling 73 miles, the major streams in the watershed are Koshkonong Creek, Mud Creek, and 35 unnamed streams. The land use is primarily agriculture. Large portions of the wetlands were drained for this purpose. This wetland loss, coupled with stream ditching and widespread use of field tiles, allows a significant amount of sediment and nutrients to reach surface waters in the watershed and, thus, downstream watersheds.

Bark River Watershed (LR 13) The Bark River watershed is approximately 189 square miles and includes parts of Jefferson, Waukesha, and Washington counties. Totaling 171.5 stream miles, the major streams in this watershed are the Bark River, Deer Creek, Duck Creek, Meadow Brook, Scuppernong Creek, Wales Creek, and 36 unnamed streams. Agriculture is the predominant land use in the Bark River Watershed. This watershed has many large lakes which continue to have development around them. Though some of the wetlands have been drained, significant amounts of wetlands remain in this watershed. There is significant development in the Waukesha County portion of the watershed. This is the greatest threat to increased flood flows in this basin.

Whitewater Creek Watershed (LR 14) The Whitewater Creek watershed is 71 square miles including parts of Jefferson, Walworth, and Rock counties. Totaling 60 stream miles, the major streams in this watershed are Bluff Creek, Galloway Creek, Spring Brook, Whitewater Creek, and 17 unnamed streams. Land use in this watershed is predominantly agriculture. A portion of the Kettle Moraine State Forest runs along the southeast edge of the watershed. The Whitewater Municipal Treatment Plant discharges into this watershed.

Scuppernong River Watershed (LR 15) The Scuppernong River watershed is 86.5 square miles including parts of Jefferson, Walworth, and Waukesha counties. Totaling 835 stream miles, the major streams in the watershed are Funk Creek, Mud Creek, Paradise Springs Creek, Scuppernong River, Spring Creek, Steel Brook, and 28 unnamed streams. Agriculture is the predominant land use in this watershed. The Kettle Moraine State Forest and two state wildlife areas with large forested tracts and wetland areas are within this watershed. Other wetlands have been drained for agricultural purposes. The only urban area in this watershed is the Village of Palmyra.

12. WETLANDS

Within the unincorporated areas of Jefferson County, there are 55,097 acres of wetlands. These wetlands make up 15.5 percent of the land area. The majority of wetlands are associated with the floodplains of local rivers and creeks.

SPECIAL NEEDS POPULATIONS AND GROUPS

1. CHAPTER OVERVIEW

During a natural disaster the potential exists for certain populations and groups of people to be disproportionately affected when compared to the general population. This section looks at those groups including the elderly, people with disabilities, homeless individuals, populations with language barriers, and people in mobile home parks, campgrounds, and group quarters. Strategies and actions are included in Chapter 5 in order to address the particular needs of the groups.

Chapter Contents

1. Chapter Overview
2. Elderly
3. People with Disabilities
4. Homeless Individuals
5. Populations with Language Barriers
6. People Living in Manufactured and Mobile Homes
7. People in Campgrounds
8. Residents in Group Quarters

2. ELDERLY

As a group, the elderly are especially vulnerable to natural hazards. This is especially true when an elderly person lives by him or herself or with an elderly spouse and do not have family or friends to help them prepare for natural hazards or react to and recover from an event.

The aging of the population is occurring throughout the nation and is also evident in Jefferson County. As seen in Table 3-1, the number of people between the ages of 5 and 34 decreased between 2010 and 2015, while the number of people 45 and older increased. As the population continues to get proportionately older, it will become increasingly important to address the needs of the elderly with respect to natural hazards planning.

Table 3-1. Age of Population; Jefferson County: 1990, 2000, 2010, and 2015

	Percent of Total			Percent Change	2015 Estimate
Age Group	**1990**	**2000**	**2010**	**1990-10**	**(ACS)**
Under 5 years	6.9	6.3	6.3	-8.7	5.6
5 to 9	7.5	6.8	6.7	-10.7	6.0
10 to 14	7.3	7.5	6.6	-9.6	7.0
15 to 19	8.9	7.3	7.9	-11.2	7.8
20 to 24	7.2	5.8	6.5	-9.7	6.5
25 to 34	15.8	13.6	12.0	-24.1	11.8
35 to 44	14.7	16.8	13.2	-10.2	12.6
45 to 54	14.5	14.1	15.3	5.5	14.9
55 to 64	4.2	9.1	12.4	195.2	13.6
65 to 74	7.2	6.4	7.3	1.4	8.2
75 to 84	4.5	4.5	4.1	-8.9	4.3
85 and older	1.3	1.7	1.8	38.5	1.9

Source: 2010 Census of Population and Housing, 2015 American Community Survey, US Census Bureau

3. People with Disabilities

Like the elderly, people with disabilities have increased exposure to some types of natural hazards. As indicated in Table 3-2, 9.6 percent of the population in Wisconsin self-reported a disability in 2015. This compares to 9.0 percent of the people in Jefferson County.

Table 3-2. People with Disabilities: 2010 and 2015

Subject	Percent Estimate	
	Wisconsin	Jefferson County
2015 Population*		
18 to 64 years	9.6	9.0
2010 Population		
With a hearing difficulty	1.9	1.6
With a vision difficulty	1.2	0.5
With a cognitive difficulty	3.7	3.7
With an ambulatory difficulty	4.2	2.8
With a self-care difficulty	1.5	0.8
With an independent living difficulty	2.8	2.9

Source: 2010 US Census.

*Estimates based on the 2015 American Community Survey (ACS).

4. Homeless Individuals

Homeless individuals are disproportionately affected by many types of natural disasters. Excessive heat and cold are especially hard on the elderly homeless. There is no accurate number of homeless individuals in Jefferson County. Local relief organizations provide assistance.

5. Populations with Language Barriers

Most people in Jefferson County are able to communicate effectively in English. However, a small group of residents, most likely recent immigrants, have not learned to speak English or have not become proficient. Recognizing this fact is important in devising strategies to help residents prepare themselves for an impending disaster and recover from the aftermath of the event.

According to the 2010 census, three percent of Wisconsin residents described their use of English as less than proficient. The proportion of residents in Jefferson County was somewhat less. However, when compared to the statewide figure, the rates in the cities of Fort Atkinson, Jefferson, Watertown and Whitewater were slightly higher. Most notably, Fort Atkinson was more than a full point higher than the statewide figure.

Although the number of residents who do not speak proficient English is comparatively small, it is anticipated that the number will continue to rise barring a significant shift in public policy in immigration.

Table 3-3. People with Language Barriers: 2010

Jurisdiction	Percent of Total Population
Wisconsin	3.0
Jefferson County	2.5
Jefferson, city	3.2
Johnson Creek, village	2.3
Fort Atkinson, city	4.1
Lake Mills, city	1.6
Palmyra, village	1.7
Sullivan, village	2.1
Waterloo, city	2.1
Watertown, city [1]	3.2
Whitewater, city [1]	3.4

Source: 2010 Census of Population and Housing, US Census Bureau

Notes: 1. Data is for the entire municipality

6. People Living in Manufactured and Mobile Homes

Manufactured housing and mobile homes are especially susceptible to damage from wind and other storms. As a result, people living in this type of housing are more vulnerable to injury and death when compared to those living in dwellings built with conventional framed construction.

In 2018, there were 23 mobile home parks in Jefferson County (Table 3-4). Most of these were located in a city or village. As a proportion of the total housing stock, the city of Lake Mills had the highest proportion of mobile homes when compared to other municipalities in Jefferson County.

None of the mobile parks have a storm shelter where people could go during wind-related storm events.

Table 3-4. Mobile Home Parks: 2018

Name	Jurisdiction	Address	Number of Sites	On-Site Shelter
Back Acres Mobile Home Park	Johnson Creek, village	105 Aztalan Street	45	No
Breezy Knoll	Oakland, town	CTH A	50	No
Country Acres Mobile Home Park	Lake Mills, town	N6789 CTH A	53	No
Hickory Hill Park	Watertown, town	3266 East Gate Drive	22	No
Hidden Meadows Mobile Home Park	Lebanon, town	Route 2	6	NK
Lakeland Mobile Home Community	Lake Mills, city	855 E Lake Street	84	No
Lakeland Trails	Lake Mills, city	865 E Lake Street	38	NK
Maple Grove Mobile Home Park	Jefferson, city	Main Street	179	No
Oak Ridge Mobile Community	Fort Atkinson, city	N3525 Trieloff Road	175	No
Pal Park	Palmyra, village	Beach Street	39	No
Quiet Creek LLC	Lake Mills, city	657 East Lake Street	35	No
Ripview Court	Oakland, town	W9202 A Ripley Road	65	NK
Rock River Mobile Home Park	Johnson Creek, village	W5370 Urban Drive	24	NK
Sandy Beach Mobile Home Park	Lake Mills, city	Sandy Beach Road	120	No
Spacious Acres Mobile Home Community	Concord, town	W1211 Sunnyside Drive	182	No
Topel's Mobile Home Park	Lake Mills, city	Topel Street	144	No
Tremaine Mobile Home Park	Sullivan, town	N2639 CTH Z	196	No
Twin Oaks Park	Whitewater, city	CTH N	230	No
Village Terrace	Johnson Creek, village	STH 26 & CTH Y	119	No
Webers Maple Grove Mobile Park	Jefferson, city	714 N Watertown Ave	2	NK
Wil-Park	Waterloo, city	300 Hendricks St	18	NK
Wolfs	Whitewater, city	N. 431 Twinkling Star Rd	14	NK
Woodland Beach Resort	Lake Mills, city	Woodland Drive	40	No

Source: Various sources including field verification

Notes: NK = not known

7. People in Campgrounds

People staying in campgrounds are even more vulnerable to wind storm events than those living in mobile home and manufactured homes. Although a significant number of campers stay in hard-sided campers or RVs, many stay in soft-sided tents. During a wind storm or tornado, they have little protection from flying debris and falling branches and trees.

In 2018, there were 11 campgrounds in Jefferson County (Table 3-5). With the exception of two campgrounds, they were all privately operated. In addition to the two traditional campgrounds, the Wisconsin Department of Natural Resources operates a number of primitive backpack camping sites along the Ice Age National Scenic Trail. One of these is located in Jefferson County. Backpack sites are remote sites, separate from other forest facilities and require a hike of 1/2 mile to 10 miles depending on the parking location selected by the camper. A roofed trail shelter, fire ring, and pit toilet are provided at each site. These sites are not accessible by vehicle, but most have parking areas within a mile of the site. All equipment must be backpacked to the site and all refuse must be packed out.

Table 3-5. Campgrounds: 2018

Name	Jurisdiction	Address	Number of Sites
Bark River Campground & Resort	Sullivan, town	W2340 Hanson Road	321
Circle K Campground	Palmyra, town	W1316 Island Road	80
Dorothy Carnes Park (Jefferson County Parks)	Jefferson, town	W6509 Jones Road	2
Hebron Campground	Hebron, town	N2316 Museum Road	48
Hoard & Curtis Scout Camp	Oakland, town	N4189 Island Lane	NK
Horserider's Campground (Wis. DNR)	Palmyra, town	W830 Little Prairie Road	56
Jellystone Park of Fort Atkinson	Koshkonong, town	N551 Wishing Well Lane	569
Natures Villa Inc	Sullivan, town	N2899 Roger Road	NK
Pilgrim's Campground	Koshkonong, town	W7271 County Road C	89
River Bend RV Resort	Milford, town	W6940 Rubidell Road	NK
Rome Riverside Campground	Sullivan, town	N3780 Water Street	134
Sandhill Station State Campground (Wis. DNR)	Lake Mills, town	N5595 Mud Lake Road	15

Source: Various sources including field verification

Notes: NK = not known

8. Residents in Group Quarters

While the majority of people in Jefferson County live in a single-family dwelling or in a multifamily building, a sizable segment of the population live in what are referred to as group quarters. If residents live in a controlled environment, the group quarters are referred to as institutional and those living in a group setting are referred to as noninstitutional population. In 2010, there were more than 500 institutionalized residents and more than 3,100 non-institutionalized residents (Table 3-6).

Table 3-6. Residents in Group Quarters; Wisconsin, Jefferson County, and Selected Municipalities: 2010 and 2015

	Wisconsin	Jefferson County	Fort Atkinson	Jefferson	Lake Mills	Waterloo	Watertown [1]
Group quarters population (2015)*	148,804*	3,782*	314*	415*	86*	22*	1,159*
Institutionalized population	71,235*	539	80	259	79	0	368
Correctional facilities for adults	38,102	149	0	149	0	0	0
Juvenile facilities	1,743	0	0	0	0	0	0
Nursing facilities/Skilled-nursing facilities	33,808	390	80	110	79	0	368
Other institutional facilities	642	0	0	0	0	0	0
Noninstitutionalized population	77,569*	3,139	174	119	6	19	883
College/University student housing	56,773	2,338	0	0	0	0	502
Military quarters	132	0	0	0	0	0	0
Other noninstitutional facilities	19,014	801	174	119	6	19	381

Source: 2010 Census of Population and Housing, US Census Bureau
Notes:
1. Data is for the entire municipality
2. Populations marked with an asterisk (*) are 2015 estimates from the American Community Survey

CRITICAL FACILITIES

1. CHAPTER OVERVIEW

This chapter focuses on those critical facilities in Jefferson County that need to be evaluated in terms of natural hazards mitigation planning. For the purpose of this plan, critical facilities are categorized into the following classification scheme:

- Type I — A facility that provides a public service, which if damaged would significantly impair a local governmental response
- Type II — A facility that provides a public service, but which if damaged would not significantly impair a local governmental response
- Type III — A facility that can cause greater damage to the surrounding area if damaged by a natural hazard
- Type IV — A facility that primarily housing special populations such as the infirm, children, elderly, or people with development disabilities

In all, there were 615 critical facilities in the county (Table 4-1). There were 173 Type I facilities, 134 Type II, 65 Type III, and 243 Type IV facilities. Appendix E lists all of the critical facilities sorted by type and Appendix F provides a list sorted by jurisdiction.

As part of this project, the consultant created an Access™ data base to manage basic information for critical facilities identified in this plan. Each facility is assigned to one or more parcels using the county PIN number to facilitate use in the county's geographic information system.

2. BRIDGES

The road network in the county consists of local, county, sate, and federal roads. There are 51 locations where a federal, state, or county roadway crosses a waterbody. These range in size from a single culvert to a multi-span bridge. These locations have been identified because flooding may overtop the roadway or backup floodwaters. The locations are shown on Map 5. Bridges that cross another roadway or railroad tracks are not considered a critical facility from the perspective of natural hazards.

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1. Chapter Overview
2. Bridges
3. Dams
4. Public-Use Airports
5. Communication Towers
6. Telephone Facilities
7. Electric Facilities
8. Natural Gas Facilities
9. Petroleum Pipeline Facilities
10. Public Water Facilities
11. Wastewater Facilities
12. Fire and Police Services
13. National Guard Facilities
14. Government Facilities
15. Schools
16. Special Care Facilities-Residential
17. Special Care Facilities-Nonresidential
18. Health Care Facilities
19. Facilities with Hazardous Materials
20. Vulnerable Housing
21. American Red Cross Shelters

In 2018, there were ___ critical facilities in Jefferson County.

Table 4-1. Critical Facilities by Type: 2018

Facility Type	Type I	Type II	Type III	Type IV
Facility with Hazardous Materials	-	-	37	-
Infrastructure				
Bridge	-	51	-	-
Dam (large & small)	-	-	24	-
Communication Tower	-	54	-	-
Electric Facility – Power Plant	4	-	-	-
Electric Facility – Substation	18	-	-	-
Natural Gas Facility	-	-	2	-
Natural Gas Pipeline	-	-	1	-
Petroleum Pipeline	-	-	1	-
Public-Use Airport	-	4	-	-
Telephone Facility	4	-	-	-
Utility Offices/Yard	6	-	-	-
Water Facility [1]	37	-	-	-
Wastewater Facility	11	-	-	-
Government Facility				
Community Center	-	5	-	-
Library	-	7	-	-
Municipal Garage	20	-	-	-
Municipal Office and Other	29	-	-	-
Post Office	-	10	-	-
Senior Center	-	3	-	-
Health Care Facility				
Health Care Clinic	15	-	-	-
Hospital	1	-	-	-
Public Safety Facility				
EMS Facility	5	-	-	-
Fire Station	11	-	-	-
National Guard Facility	2	-	-	-
Police Station	10	-	-	-
School				
K-12	-	-	-	50
Secondary	-	-	-	3
Special Care Facility - Residential				
Adult Family Home	-	-	-	71
Community Based Residential Facility	-	-	-	62
Nursing Home	-	-	-	3
Residential Care Apartment Complex	-	-	-	3
Special Care Facility - Nonresidential				
Adult Day Care	-	-	-	5
Group Day Care	-	-	-	31
Vulnerable Housing				
Mobile Home Park	-	-	-	16
Campground	-	-	-	11
Total	___	___	___	___

Notes: 1. Types of facilities included in this category include wells, towers, and treatment plants.

Key Terms in This Chapter

Adult day care – A place where adults receive care for less than 24 hours.

Adult family home (AFH) – A place where three or four adults who are not related to the operator reside and receive care, treatment, or services that are above the level of room and board and that may include up to seven hours per week of nursing care per resident.

Community based residential facility (CBRF) – A place where five or more adults reside who are not related to the operator, who do not require care above intermediate level nursing care, and who receive care, treatment, or services that are above the level of room and board, but includes no more than three hours of nursing care per week per resident.

Group day care – A place where a person for less than 24 hours a day provides care and supervision for 9 or more children who are not related to the provider.

Nursing home – A place where unrelated individuals live, who because of their mental or physical condition, are given 24-hour personal care and nursing care, but who do not require hospitalization.

Large dam – A dam that either (1) has a structural height of over 6 feet and impounds 50 acre-feet or more, or (2) has a height of 25 feet or more and impounds more than 15 acre-feet.

Power plant – A facility containing prime movers, electric generators, and auxiliary equipment for converting mechanical, chemical, and/or fission energy into electric energy.

Public-use airport – An airport open for public use without prior permission, and without restrictions within the physical capacities of available facilities. A public-use airport may or may not be publicly owned.

Residential care apartment complex (RACA) – A multi-family building where five or more adults reside in independent dwelling units and also receive not more than 28 hours per week of supportive services, personal assistance, and nursing assistance.

Small dam – A dam not classified as a large dam.

Substation – An auxiliary power station where electrical current is converted, as from DC to AC, or where voltage is stepped up or down.

3. Dams

According to a statewide inventory maintained by the DNR, there are 24 regulated dams in the county. Over the years, seven dams have been decommissioned (Table 4-2). The Rock River and its tributaries has the highest number of dams followed by the Scuppernong River and its tributaries (Table 4-3). Map 5 shows the location of dams (large and small) within the county.

For the purposes of this plan, dams are classified as a Type III critical facility in that a dam failure would cause additional impacts primarily to downstream properties.

Dam in the City of Watertown

4. Public-Use Airports

There are four airports open for public use. The locations of the four public-use airports are shown on Map 6.

Table 4-2. Abandoned Dams: 2018

Name	Year	Jurisdiction
Ball Park Dam	2004	Waterloo, city
Golden Dam		Concord, town
Hebron	1996	Hebron, town
Hoopers Dam	2012	Milford, town
Slabtown	1992	Hebron, town
Oakland	1991	Oakland, town
Upper Waterloo	1995	Waterloo, city

Source: Wisconsin Department of Natural Resources

5. Communication Towers

Map 7 shows the location of 54 communication towers located in the county.

6. Telephone Facilities

Four telephone facilities are maintained by telephone service providers (Map 7). They are located in the cities of Jefferson, Lake Mills, and Watertown and the village of Palmyra.

7. Electric Facilities

There are four electric power plants in the county (Map 8). One is located southeast of the city of Watertown in the town of Watertown. The other is located in the city of Whitewater. Two hydroelectric power plants are located in the city of Watertown. Eighteen substations are located throughout the county primarily in or near urban areas (Map 8).

Table 4-3. Regulated Dams by Waterbody: 2018

Waterbody	Number
Ashipun River	0
Bark River	2
Crawfish River	0
Maunesha River	0
Rock River	7
Scuppernong River	4
Other	11
Total	24

8. Natural Gas Facilities

Guardian Pipeline operates a high-pressure natural gas pipeline in the eastern part of the county (Map 8). There are two above-ground metering stations associated with the pipeline in the town of Ixonia.

9. Petroleum Pipeline Facilities

Enbridge Energy operates a pipeline for transporting petroleum crude oil through the county. It is located to the south and west of the cities of Lake Mills and Fort Atkinson (Map 8). It carries oil from Superior to Chicago where it is processed. Gate valves are located along the pipeline in three locations. Because of concerns about security, the exact location of the pipeline and gate valves are not mapped in this plan.

Substation in the Town of Ixonia

10. Public Water Facilities

Public water facilities inventoried for this plan include water wells, towers, reservoirs, and treatment plants. A total of 37 facilities have been identified and are shown on Map 9.

Communication Tower in the Town of Waterloo

11. Wastewater Facilities

Wastewater treatment plants are located in each of the urban areas and in the more developed areas of the towns of Ixonia and Sullivan (Map 9).

12. Fire and Police Facilities

Within Jefferson County, there are 15 fire districts as depicted on Map 10. There are 10 police stations and 11 fire stations. Generally, EMS services are housed with a fire station or police station. In two instances though, EMS services are housed in a stand-alone building.

13. National Guard Facilities

There are two National Guard facilities. One is in the city of Fort Atkinson and the other is in the city of Watertown (Map 10).

Water Tower in the City of Jefferson

14. Government Facilities

Government facilities included in the inventory of critical facilities include a wide array of facilities including community centers, public libraries, municipal garages, municipal offices, post offices, and senior centers. Map 11 shows the location of the 74 government facilities.

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Table 4-4. Government Facilities: 2018

	Community Center	Public Library	Municipal Garage	Municipal Office and Other	Post Office	Senior Center
Town						
Aztalan	-	-	1	1	-	-
Cold Spring	-	-	-	1	-	-
Concord	1	-	2	1	-	-
Farmington	-	-	1	1	-	-
Hebron	-	-	-	1	-	-
Ixonia	-	-	2	1	1	-
Jefferson	-	-	-	1	1	-
Koshkonong	-	-	-	2	-	-
Lake Mills	-	-	-	-	-	-
Milford	-	-	1	1	-	-
Oakland	-	-	1	1	-	-
Palmyra	-	-	-	1	-	-
Sullivan	-	-	1	1	-	-
Sumner	-	-	-	1	-	-
Waterloo	-	-	-	-	-	-
Watertown	-	-	-	1	-	-
Village						
Cambridge [1]	-	-	-	-	-	-
Johnson Creek	1	1	2	1	1	-
Lac La Belle [1]	-	-	-	-	-	-
Palmyra	1	1	1	1	1	-
Sullivan	-	-	-	1	1	-
City						
Fort Atkinson	-	1	1	1	1	1
Jefferson	-	1	3	4	1	1
Lake Mills	1	1	1	2	1	-
Waterloo	1	1	2	1	1	-
Watertown [1]	-	1	1	2	1	1
Whitewater [1]	-	-	-	-	-	-
Jefferson County	5	7	20	29	10	3

Notes: 1. Municipality located in Jefferson County and another county

15. SCHOOLS

Within Jefferson County, there is a total of 50 schools serving kindergarten through high school. There are three colleges. Maranatha Baptist Bible College is located in the city of Watertown, Madison Area Technical College–Fort Atkinson is in the city of Fort Atkinson, and UW–Whitewater is in Whitewater. School locations are shown on Map 12.

Fort Atkinson High School

16. SPECIAL CARE FACILITIES - RESIDENTIAL

The term special care facility is a broad term for a type of housing arrangement where residents receive care or supervision from trained personnel. Special care facilities include nursing homes, residential care apartment complexes (RCACs), community based residential facilities (CBRFs), and adult family homes (AFHs) (Map 13).

There are five nursing homes in the county with a capacity of 299 beds (Table 4-5).

Countryside Nursing Home in City of Jefferson

In a RACA, people live in independent dwelling units complete with a kitchen, a bathroom, and sleeping and living areas. The management team provides supportive services such as general housekeeping and transportation to access community services and recreational activities. Personal services are also provided and may include help with daily activities such as dressing, eating, bathing, and grooming. Finally nursing services are available to help with health monitoring, medication administration, and medication management. There are two RACAs in Jefferson County. One is in the city of Watertown and the other in the city of Waterloo.

CBRFs and AFHs are similar in terms of the level of care provided. One significant difference between them is the number of residents served in the facility. An AFH can serve up to four adults. A CBRF serves five or more adults. There are 69 AFHs in the county and 41 CBRFs (Table 4-5).

17. SPECIAL CARE FACILITIES – NONRESIDENTIAL

Nonresidential special care facilities include group day care centers and adult day care centers (Map 14). Group day care centers provide child care for nine or more children. Adult day care centers provide care to older adults who may live at home but need care during the day because the spouse or other primary care giver is not able to provide care. There are 28 group day care centers located throughout the county primarily in more urban areas and 6 adult day care center (Table 4-5).

Table 4-5. Special Care Facilities: 2018

	Nursing Home	Residential Care Apartment Complex (RACA)	Community Based Residential Facility (CBRF)	Adult Family Home (AFH)	Group Day Care	Adult Day Care
Town						
Aztalan	-	-	-	-	-	-
Cold Spring	-	-	1	2	-	-
Concord	-	-	-	2	-	-
Farmington	-	-	1	-	-	-
Hebron	-	-	2	0	1	1
Ixonia	-	-	1	2	-	-
Jefferson	-	-	2	3	-	1
Koshkonong	-	-	2	7	-	-
Lake Mills	-	-	2	-	-	-
Milford	-	-	-	-	-	-
Oakland	-	-	1	1	-	-
Palmyra	-	-	-	-	1	-
Sullivan	-	-	-	-	-	-
Sumner	-	-	-	1	-	-
Waterloo	-	-	-	-	-	-
Watertown	-	-	1	-	-	-
Village						
Cambridge [1]	-	-	-	-	-	-
Johnson Creek	-	-	3	2	-	-
Lac La Belle [1]	-	-	-	-	-	--
Palmyra	-	-	-	-	1	-
Sullivan	-	-	-	-	1	-
City						
Fort Atkinson	1	1	15	34	7	3
Jefferson	1	-	15	8	6	2
Lake Mills	1	-	1	1	3	-
Waterloo	-	1	2	-	2	-
Watertown [1]	-	1	4	6	6	-
Whitewater [1]	-	-	-	-	-	-
Jefferson County	3	3	62	71	31	5

Source: Wisconsin Department of Health and Family Services

Notes: 1. Municipality located in Jefferson County and another county

18. HEALTH CARE FACILITIES

For the purpose of this plan, health care facilities are divided into two types: hospitals and health care centers. Health care centers provide subacute medical and include ambulatory surgery centers and health care clinics operated by a number of medical practioners.

Fort Memorial Hospital in the city of Fort Atkinson is the only hospital in Jefferson County. Watertown Memorial Hospital is in the city of Watertown, but is located in Dodge County. It serves an area with 60,000 residents. In Jefferson County, it operates health care clinics in the city of Lake Mills and village of Johnson Creek.

A total of 15 health care centers were identified as part of this plan. Map 15 shows the location of health care facilities along with the service areas for the 12 emergency medical service providers serving Jefferson County.

Fort Memorial Hospital

19. Facilities with Hazardous Materials

There are 37 locations in the county where hazardous materials are stored, used, or manufactured. These are shown on Map 16. For the purposes of this plan, a facility with hazardous materials is classified as a Type III critical facility because there could be damage to surrounding properties if a natural hazard damaged a facility with hazardous materials.

20. Vulnerable Housing

Vulnerable housing, including campgrounds and mobile home parks, is described in Chapter 3.

21. American Red Cross Shelters

Jefferson County is served by the American Red Cross in Southeastern Wisconsin and the Badger and South Central Wisconsin Region. Table 4-6 lists designated shelters available during an emergency. With the exception of the Jefferson County Fair Park, all are considered critical facilities.

Table 4-6. American Red Cross Shelters: 2018

Facility Name	Address	Jurisdiction	Sleeping Capacity	Meal Preparation Capacity	Meal Serving Capacity	Back-up Generator
Barrie Elementary School	1000 Harriette Street	Fort Atkinson, city	200	Unknown	150	Yes
Bethany Lutheran Church	404 Roosevelt Street	Fort Atkinson, city	50	Unknown	200	No
Fort Atkinson High School	925 Lexington Boulevard	Fort Atkinson, city	242	Unknown	400	Yes
Fort Atkinson Middle School	301 4th Street East	Fort Atkinson, city	50	Unknown	225	Yes
Purdy Elementary School	719 S Main Street	Fort Atkinson, city	200	Unknown	275	Yes
Rockwell Elementary School	821 Monroe Street	Fort Atkinson, city	200	Unknown	200	Yes
St. Peter's Episcopal Church	302 Merchants Avenue	Fort Atkinson, city	38	Unknown	125	No
Ixonia Elementary School	N8425 North Street	Ixonia, town	87	Unknown	140	No
Ixonia Town Hall	W1195 Marietta Avenue	Ixonia, town	110	Unknown	32	No
Jefferson County Fair Park	503 N Jackson Avenue	Jefferson, city	300	Unknown	800	No
Jefferson Senior High School	700 W Milwaukee Street	Jefferson, city	105	Unknown	96	No
St. John the Baptist Catholic School	333 E Church Street	Jefferson, city	56	Unknown	250	No
Johnson Creek Junior/Senior High	111 South Street	Johnson Creek, village	147	Unknown	240	No
Johnson Creek Elementary School	111 South Street	Johnson Creek, village	80	Unknown	250	No
Lake Mills Middle School	318 College Street	Lake Mills, city	300	Unknown	180	Yes
Prospect Elementary School	135 E Prospect Street	Lake Mills, city	100	Unknown	80	Yes

continued on next page

Table 4-6. American Red Cross Shelters: 2018 - continued

Facility Name	Address	Jurisdiction	Sleeping Capacity	Meal Preparation Capacity	Meal Serving Capacity	Back-up Generator
Lake Mills High School	615 Catlin Drive	Lake Mills, city	450	Unknown	300	Yes
St. Paul Evangelical Lutheran Church & School	1530 S Main Street	Lake Mills, city	100	Unknown	200	No
Lakeside Lutheran High School	231 Woodland Beach Road	Lake Mills, city	180	Unknown	180	No
St. Mary Catholic Church	919 W Main Street	Palmyra, village	72	Unknown	125	No
Palmyra-Eagle Middle/High School	123 Burr Oak Street	Palmyra, village	410	Unknown	130	No
St. Mary Help of Christians Catholic Church	W856 Hwy 18	Sullivan, village	85	Unknown	160	No
Sullivan Elementary School	618 Bakertown Road	Sullivan, village	81	Unknown	100	No
St. John's Evangelical Lutheran Church & School	413 E Madison Street	Waterloo, city	80	Unknown	200	No
Waterloo Middle/High School	865 N Monroe Street	Waterloo, city	150	Unknown	400	Yes

Source: Jefferson County Emergency Management

NATURAL HAZARDS ASSESSMENT

1. CHAPTER OVERVIEW

This chapter evaluates the natural hazards that have or could occur in the county. Initially, 15 hazards were identified. They were prioritized and two of the hazards were dropped from future consideration. The remaining 13 hazards are described in detail. After describing the nature of the hazard, the frequency of occurrence is documented along with its effect on critical facilities, various population groups, and economic sectors. Estimates of economic loss are included when there is enough empirical data to do so.

Chapter Contents

1. Chapter Overview
2. Hazard Identification
3. History of Weather-Related Events
4. Presidential Declarations
5. Dam Failure
6. Flooding
7. Ice Shoves
8. Fog
9. Tornado / High Winds
10. Hailstorms
11. Thunderstorms
12. Winter Storms
13. Extreme Temperature
14. Drought
15. Wildland Fire
16. Summary of Risk by Jurisdiction
17. Summary of Damage Estimates

2. HAZARD IDENTIFICATION

As part of an initial screening process, the working group used the methodology developed by Wisconsin Emergency Management[1] to evaluate natural hazards in Jefferson County to determine which warrant the most attention. For each hazard, the members used a group consensus process to assign a numeric value to the 10 factors listed in Table 5-1.

Table 5-1. Natural Hazard Assessment Criteria

Factor	Description
Historical Hazard Frequency	Frequency of past occurrences
Anticipated Hazard Probability	Probability of the hazard occurring again
Historical Health and Public Safety	Degree of past hazard events causing injuries, sickness, and/or deaths
Residential Damage	Degree of past hazard events causing damages to homes
Business Damage	Degree of past hazard events causing damages to businesses
Public Costs	Amount of local, state, and federal funds expended on past hazard recovery activities
Magnitude of Population at Risk	Amount of the area's population still vulnerable to injury, sickness, and/or death
Magnitude of Homes at Risk	Amount of homes still vulnerable to damage
Magnitude of Businesses at Risk	Amount of businesses still vulnerable to damage or interruption of business trade
Magnitude of Public Infrastructure at Risk	Amount of infrastructure that is susceptible to damages

Source: *Resource Guide to All Hazards Mitigation Planning In Wisconsin*, 2003. Wisconsin Emergency Management

Table 5-2 shows the results of that exercise. The three highest ranked natural hazards are riverine flooding, tornadoes, and thunderstorms. Given the distance to a known fault line, earthquakes were judged to be of little concern. In addition, given the topography and soils in the county, land failures, including subsidence and mass movement, were judged to be of little concern. Both of these were removed from further consideration in this plan.

[1] *Resource Guide to All Hazards Mitigation Planning In Wisconsin*, 2003. Wisconsin Emergency Management

Table 5-2. Comparative Analysis of Natural Hazards; Jefferson County: 2017

Natural Hazard	1 Historical Hazard Frequency (1,2,3)	2 Anticipated Hazard Probability (1,2,3)	3 Historical Health and Public Safety (1,2,3)	4 Residential Damage (1,2,3)	5 Business Damage (1,2,3)	6 Public Costs (1,2,3)	7 Magnitude Of Population At Risk (1,2,3)	8 Magnitude Of Homes At Risk (1,2,3)	9 Magnitude Of Businesses At Risk (1,2,3)	10 Magnitude Of Public Infrastructure At Risk (1,2,3)	11 Rating Total
Flooding – riverine	3	3	3	3	2	3	1	2	2	2	24
Tornado / high winds	2	2	2	3	3	2	2	2	2	2	22
Storms - thunderstorm	3	3	1	2	2	2	2	2	2	1	20
Storms – snow **	3	3	3	1	1	2	3	1	2	1	20
Extreme temperature **	2	2	3	1	1	1	2	2	1	1	16
Storms – hail **	2	2	1	2	2	2	1	1	1	1	15
Drought	1	1	1	1	2	2	1	1	2	1	13
Fog	2	2	1	1	1	1	1	1	1	1	12
Wildland fire	1	1	1	1	1	2	1	1	1	2	12
Ice shoves	2	1	1	1	1	1	1	1	1	1	11
Dam failure	1	1	1	1	1	1	1	1	1	1	10
Flooding – storm water	1	1	1	1	1	1	1	1	1	1	10
Land failure	1	1	1	1	1	1	1	1	1	1	10
Earthquake**	1	1	1	1	1	1	1	1	1	1	10

Notes: This matrix is based on a qualitative assessment and is intended to identify those hazards posing the greatest concern.

A low, medium, or high numerical rating of 1, 2, or 3, respectively, is assigned to each criterion and then the ratings for each hazard are totaled.

** The ratings for these hazards are based on occurrences in the surrounding subregion.

Column 1 refers to the frequency of past occurrences.
Column 2 refers to the probability of the hazard occurring again.
Column 3 refers to the degree of past hazard events causing injuries, sickness, and/or deaths.
Column 4 refers to the degree of past hazard events causing damages to homes.
Column 5 refers to the degree of past hazard events causing damages to businesses.
Column 6 refers to the amount of local, state, and federal funds expended on past hazard recovery activities.
Column 7 refers to the amount of the area's population still vulnerable to injury, sickness, and/or death.
Column 8 refers to the amount of homes still vulnerable to damage.
Column 9 refers to the amount of businesses still vulnerable to damage or interruption of business trade.
Column 10 refers to the amount of infrastructure that is susceptible to damages.
Column 11 is the raw score for the hazard.

In reviewing these natural hazards, it became evident that they are quite variable (Table 5-3). Some of the hazards are characteristically localized occurrences, while others could potentially cover all of Jefferson County and the surrounding region. Further, some hazards occur with little advance warning and others can be forecasted with some degree of accuracy. Some hazards have the potential to occur often, while others occur infrequently.

Table 5-3. Nature of Natural Hazards; Jefferson County

Natural Hazard	Extent	Amount of Advance Warning	Recurrence Interval
Dam Failure	Localized	None to weeks	[1]
Flooding – Riverine	Localized	One day	100 [2]
Flooding – Stormwater	Localized	One day	100 [2]
Ice Shoves	Localized	One day	5
Fog	Localized to countywide	One day	0.5
Tornado/High Wind	Localized	Hours	1
Hail Storms	Localized	Hours	1
Thunderstorm	Localized	One day	0.5
Snow Storms	Countywide	Several days	1
Extreme Temperature - heat	Countywide	Several days	10
Extreme Temperature – cold	Countywide	Several days	3
Drought - short-lived	Countywide	Several months	10
Drought - long-lived	Countywide	Year	75
Wildland fire - 25 acres or more	Localized	None	100
Wildland fire - less than 25 acres	Localized	None	10

Notes: 1. It is not possible to define a recurrence interval for this type of hazard
2. Based on a 100-year flood

Table 5-4 lists each of the hazards and identifies whether they will have an impact on the critical facilities identified in this plan, noncritical buildings and structures, special populations, the general population, and broadly defined economic sectors.

Table 5-4. General Effects of Natural Hazards on Facilities, Population Groups, and Economic Sectors; Jefferson County: 2017

Critical Facility		Dam Failure	Flooding - Riverine	Flooding - Stormwater	Ice Shoves	Fog	Tornado/ High Wind	Hail Storms	Thunderstorm	Snow Storms	Extreme Temperature	Drought	Wildland Fire
Facility with Hazardous Materials		-	D	-	-	-	D	-	-	-	-	-	-
Infrastructure	Bridge	D	D	-	-	-	-	-	-	-	-	-	-
	Dam	D	D	-	-	-	-	-	-	-	-	-	-
	Communication Tower	-	-	-	-	-	D	-	-	-	-	-	-
	Electric Facility – Power Plant	-	-	-	-	-	D	-	-	-	-	-	-
	Electric Facility – Substation	-	-	-	-	-	D	-	-	-	-	-	-
	Natural Gas Facility	-	-	-	-	-	D	-	-	-	-	-	-
	Petroleum Pipeline	-	-	-	-	-	-	-	-	-	-	-	-
	Public-Use Airport	-	-	-	-	I	D	I	I	I	-	-	-
	Telephone Facility	-	-	-	-	-	D	-	-	-	-	-	-
	Utility Offices/Yard	-	-	-	-	-	D	-	-	-	-	-	-
	Water Facility [1]	-	-	-	-	-	D	-	-	-	-	I	-
	Wastewater Facility	-	-	-	-	-	D	-	-	-	-	-	-
Government Facility	Community Center	-	-	-	-	-	D	D	-	-	-	-	-
	Library	-	-	-	-	-	D	D	-	-	-	-	-
	Municipal Garage	-	-	-	-	-	D	D	-	-	-	-	-
	Municipal Office and Other	-	-	-	-	-	D	D	-	-	-	-	-
	Post Office	-	-	-	-	-	D	D	-	-	-	-	-
	Senior Center	-	-	-	-	-	D	D	-	-	-	-	-
Health Care Facility	Health Care Clinic	-	-	-	-	-	D	D	-	-	-	-	-
	Hospital	-	-	-	-	-	D	D	-	-	-	-	-
Public Safety Facility	EMS Facility	-	-	-	-	-	D	D	-	-	-	-	-
	Fire Station	-	-	-	-	-	D	D	-	-	-	-	-
	National Guard Facility	-	-	-	-	-	D	D	-	-	-	-	-
	Police Station	-	-	-	-	-	D	D	-	-	-	-	-
School	K-12	-	-	-	-	-	D	D	-	-	-	-	-
	Secondary	-	-	-	-	-	D	D	-	-	-	-	-
Special Care Facility - Residential	Adult Family Home	-	-	-	-	-	D	D	-	-	-	-	-
	Community Based Residential Facility	-	-	-	-	-	D	D	-	-	-	-	-
	Nursing Home	-	-	-	-	-	D	D	-	-	-	-	-
	Residential Care Apartment Complex	-	-	-	-	-	D	D	-	-	-	-	-
Special Care Facility - Nonresidential	Adult Day Care	-	-	-	-	-	D	D	-	-	-	-	-
	Group Day Care	-	-	-	-	-	D	D	-	-	-	-	-
Vulnerable Housing	Mobile Home Park	-	-	-	-	-	D	D	-	-	-	-	-
	Campground	-	-	-	-	-	D	D	-	-	-	-	-
Noncritical Buildings/Structures		-	-	-	-	-	D	D	-	-	-	-	-
Population Groups													
General Public		-	-	-	-	-	I	-	-	-	I	I	-
Elderly and People with Disabilities		-	-	-	-	-	-	-	-	-	I	-	-
Homeless		-	-	-	-	-	-	-	D	D	D	-	-
Economic Sector													
Agriculture		-	D	D	-	-	-	D	I	-	I	D	-
Commercial		-	-	-	-	-	-	-	-	-	-	I	-
Industrial		-	-	-	-	-	-	-	-	-	-	-	-
Transportation		-	-	-	I	-	-	-	-	-	-	-	-

Notes: 1. Types of facilities included in this category include wells, towers, and treatment plants

Key: - No or minimal effect; I – Indirect Effect; D – Direct Effect

3. History of Weather-Related Events

Table 5-5 presents a summary of documented weather-related events that have affected Jefferson County since 1950 (See Appendix G for a list of all events). Strong winds associated with a thunderstorm occur with the highest frequency—on average 3.6 times a year. At about 1.8 times a year, hail is the second most common weather-related event. Winter storms are the third most common weather-related event. Flooding has a recurrence interval of 0.5 per year.

Out of all of the weather-related events, tornadoes have caused the highest number of deaths and injuries. Extreme cold caused one death. Lightening caused 7 injuries and 1 death. High winds caused 2 injuries, and thunderstorm winds caused 9 injuries. Floods and winter storms each caused one injury.

Flooding over the years has caused by far the most damage to property and crops ($173.2 million). At $13.53 million, hail caused the second highest amount of economic impact.

Table 5-5. Summary of Weather-Related Events Affecting Jefferson County: 1950–2018

Type of Event	Number of Events	Direct Deaths	Direct Injuries	Property Damage ($)	Crop Damage ($)
Drought	18	0	0	0	300K
Dust Devil	1	0	0	0	0
Extreme Heat	4	0	0	0	0
Cold/Wind Chill	25	1	0	2K	0
Extreme Cold/Wind Chill	2	0	0	0	0
Flood	18	0	0	$3.587M	$28.512M
Flood – Flash	15	0	1	104.38M	36.775M
Fog	72	0	0	10K	0
Funnel Cloud	12	0	0	0	0
Hail	135	0	0	13.53M	200K
Heavy Rain	11	0	0	3K	0
High Wind	13	0	2	1.098M	200K
Lightning	23	1	7	0.971	0
Strong Wind	34	0	0	135K	0
Thunderstorm Winds	265	0	9	4.239M	352K
Tornado	33	3	36	10.748M	21K
Winter Storms	41	0	0	10K	0
Winter Weather	96	0	0	50K	0
Winter – Blizzard	6	0	0	0	0
Winter – Heavy Snow	5	0	0	0	0
Winter – Ice Storm	3	0	0	30K	0
Total	786	6	65	138.781M	66.36M

Source: National Climatic Data Center database accessed on December 10, 2018
http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms

4. PRESIDENTIAL DECLARATIONS

Since 1965, there have been 38 major disaster declarations issued for Wisconsin, 6 emergency declarations, and one fire management assistance declaration. Jefferson County was included in seven disaster declarations and three emergency declarations.

Major Disaster Declaration A major disaster declaration was issued for Jefferson County in 1973, 1976, 1991, 1993, 2004, 2007, 2008 (Table 5-6). Most recently, Jefferson County was one of 30 counties under a disaster declaration (FEMA-1768-DR) for severe storms, tornadoes, and flooding. In that instance, both individual assistance and public assistance grants were made to help local communities respond to severe storms and flooding. Disaster declarations were issued in 2004 and 2007 for severe storms and flooding. In 1993, Jefferson County received $1,453,507 in state and federal aid. However, the total flood damage suffered is believed to exceed several million dollars.

Emergency Declaration There have been three emergency declarations. In 2008, Jefferson County was one of 11 counties affected by a significant snow event. In 2005, an emergency declaration was issued for all 72 counties in the state as part of the nationwide response to Hurricane Katrina. In 1976, Jefferson County was one of 66 counties covered by an emergency declaration for drought.

Fire Management Assistance Declaration No fire management assistance declarations have been issued for Jefferson County (and it is unlikely that one would be issued given the nature of that category of declaration).

Table 5-6. Presidential Disaster Declarations, Jefferson County: 1965–2018

			Number of Counties By Type of Assistance	
Major Disaster	**Year**	**Description**	**Public**	**Individual**
FEMA-376-DR	1973	Severe storms, flooding	35	35
FEMA-496-DR	1976	Severe storms, icing, wind, flooding	22	22
FEMA-912-DR	1991	Hail, severe storms	5	0
FEMA-994-DR	1993	Flooding, severe storm, tornado	40	47
FEMA-1526-DR	2004	Severe storms and flooding	12	12
FEMA-1719-DR	2007	Severe storms and flooding	-	14
FEMA-1768-DR	2008	Severe storms, tornadoes, and flooding	30	30
Emergency				
FEMA-3014-EM	1976	Drought	66	66
FEMA-3249-EM	2005	Hurricane Katrina evacuation	72	0
FEMA-3285-EM	2008	Snow	11	0
Fire Management Assistance				
None	-	-	-	-

Source: Federal Emergency Management Agency (http://www.fema.gov/news/disasters_state.feam?id=55) and Wisconsin Emergency Management

Denied Applications for Presidential Disaster Declaration On three occasions, the county's application for a presidential disaster declaration has been denied (Table 5-7).

Table 5-7. Denied Applications for Presidential Disaster Declarations, Jefferson County: 1965–2018

Year	Number of Counties Included	Description
1977	6	Tornado
1996	15	Flooding
1998	16	High winds, severe storms
2000	11	Snow

Source: Wisconsin Emergency Management and Jefferson County Emergency Management

5. DAM FAILURE

PROFILE

A dam failure involves the uncontrolled release of impounded water when the structure fails. A dam can fail because of excessive rainfall or melting snow, poor construction or maintenance, flood damage, earthquake activity, weakening caused by burrowing animals, vegetation, surface erosion, vandalism, or a combination of factors. When a dam does fail, the impounded water flows unimpeded and, depending on what development is located downstream, can potentially cause significant property damage and loss of life.

HISTORY OF PAST OCCURRENCES

According to the Wisconsin Department of Natural Resources, there are about 3,700 dams in the state. Between 1990 and 1995, 75 dam failures were documented, many of which resulting from the flooding that occurred statewide in 1993. In Jefferson County, there are no documented dam failures.

VULNERABILITY ASSESSMENT

There were 26 dams in the county according to the Department of Natural Resources (DNR) (Table 5-8). Fourteen are classified as small and 12 as large. A failure of a small dam would likely not cause damage. Given the amount of water impounded behind a large dam, dam failure is a concern in varying degrees.

Dams are also classified based on the threat to downstream property if a dam failed. A dam rated as a high hazard indicates that a failure would most probably result in the loss of life. A significant hazard indicates that a dam failure could result in appreciable property damage. A low hazard rating is assigned to dams where a dam failure would result in only minimal property damage and where loss of life is unlikely. Of the 16 large dams, 7 are classified as high and one is classified as significant (Table 5-8). The remaining dams are either unclassified or classified as low.

Section NR 335.07 of the Wisconsin Administrative Code mandates that owners of a large dam or a dam that poses a threat to life or property must prepare an emergency action plan (EAP). An EAP is a document that identifies potential emergency conditions at a dam and procedures to be followed to eliminate the loss of life and minimize downstream property damage. When drafting an EAP,

the dam operator must consult with the local units of government that lie downstream of the dam as well as the county emergency management department. According to the DNR inventory, an EAP has not been prepared for 3 of the 12 large dams (Table 5-8).

Based on historical data and the lack of multiple large, high-risk dams in the county, it is unlikely that a catastrophic dam failure, resulting in the loss of life and property, will occur in Jefferson County in the future.

Table 5-8. Large Dams: 2018

Large Dams	DNR ID	Jurisdiction	Ownership	Stream Name	Date of Last Inspection	Hazard Rating Code [1]	Status of Emergency Action Plan
Watertown Dam, Lower	141	Watertown, city	Private	Rock River	July 2017	High	June 2008
Watertown Dam, Upper	142	Watertown, city	Private	Rock River	Nov 2011	Low	Feb 2016
Spring Lake Dam	144	Palmyra, village	Municipality	Scuppernong River	Oct 2014	High	Mar 2012
Blue Springs Lake	145	Palmyra, town	Lake District	Spring Creek	Nov 2015	High	Feb 2015
Rome Dam	**259**	Sullivan, town	Municipality	Bark River	Sep 2016	High	Nov 2014
Carlin	260		Private	Scuppernong River	2010	Low	Not known
Jefferson Dam	**588**	Jefferson, city	Private	Rock River	Oct 2013	Low	Not done
Princes Point WLA Dam No. 1	1009	Hebron, town	DNR	Trib. Of Scuppernong River	May 1994	None	No data
Princes Point WLA Dam No. 2	1010	Hebron, town	DNR	Trib. Of Scuppernong River	April 2015	None	No data
Lake Mills Dam	1245	Lake Mills, city	Private	Rock Creek	Jan 2017	High	April 2012
Jefferson Marsh WRP – North	5735	Hebron, town	DNR	Unknown	Dec 2010	Low	Nov 2016
Jefferson Marsh WRP – South	6066	Hebron, town	DNR	Deer Creek	2010	Low	Nov 2016

Source: Wisconsin Department of Natural Resources
Key: 1. High - loss of life likely should dam fail; Significant - significant property damage is likely; Low - neither loss of life or property will occur

Effects on Facilities – Because a dam break analysis has not been conducted on any of the dams in Jefferson County, it is not possible to determine what effects would occur. It is believed that much of the released waters would be contained within the 100-year floodplain below the dam failure. Except for wastewater facilities, there are no critical facilities in the 100-year floodplain.

Effects on Population Groups – A dam failure would not disproportionately affect the elderly, people with disabilities, or the homeless.

Effects on Economic Sectors – Although a dam failure could damage individual structures, it likely would not affect the overall economy of the area or any particular economic sector.

6. FLOODING

PROFILE

Riverine flooding occurs when a stream, lake, or other body of water overflows its banks onto normally dry land. Stormwater flooding occurs when stormwater pools in normally dry depressions in the land. Flooding can develop slowly over

Aerial view of flooding in 2004

a period of days, but can also occur within a few hours in some watersheds with narrow stream channels.

HISTORY OF PAST OCCURRENCES

Jefferson County has experienced several major floods in the last century. Documentation of historic flooding is available from the following sources:

- presidential disaster declarations
- insurance claim records from the Federal Flood Insurance Program
- records from U. S. Geological Survey stream gage stations
- damage assessment for 2004 flood
- anecdotal information from local community leaders

Presidential Disaster Declarations – Since 1965, there have been six presidential declarations in Jefferson County, five of which were flood related. Presidential disaster declarations were issued in Jefferson County for flooding in 1973, 1976, 1993, and 2004. On July 2, 1993 a declaration was issued for the June 1993 floods. As part of the declaration, federal and state grant dollars, $1,235,097.96 and $218,409.11, respectively, were awarded to local units of government to assist with the flood recovery through the Disaster Recover Aids Program.

Historical National Flood Insurance Program Claims In 1968, Congress adopted the National Flood Insurance Act, which among other things created the National Flood Insurance Program (NFIP). This Federal program allows property owners to purchase flood insurance if their community participates in the program. In fact, certain homeowners must purchase flood insurance when their property is located in the regulatory floodplain. All county residents are eligible to purchase flood insurance because all of the jurisdictions participate in the program.

Paid claims for flood damage under the NFIP are good indicators of the number of properties that are located in floodplains. From 1978 through 2006, 221 insurance claims were paid in Jefferson County for a total of $1.37 million for building and content loss. Table 5-9 summarizes the number and type of claims made by year.

Table 5-9. National Flood Insurance Program Paid Claims by Year; Jefferson County: 1978 through May 2006

Year	Number of Claims	Building Loss	Content Loss	Total Loss
1978	1	$861	$0	$861
1979	91	$378,483	$95,429	$473,912
1982	9	$7,078	$2,491	$9,578
1985	1	$721	$0	$721
1986	28	$43,823	$1,603	$45,426
1993	52	$485,473	$96,755	$582,228
1996	8	$23,392	$2,585	$25,977
2000	6	$38,393	$4,647	$43,040
2004	25	181,546	$6,987	$188,533
Total	**221**	**$1,159,770.00**	**$210,497.00**	**$1,370,276**

Source: National Flood Insurance Program, Federal Emergency Management Agency

The majority of claims were filed for the floods of 1979, 1986, 1993, and 2004. Building damage accounted for more than 84 percent of the total loss. It should be noted that the figures for content claims may not represent the true level of damage to building contents, because it is an optional policy and many people elect to not take content loss as part of their policy.

Table 5-10 summarizes the number and type of claims made by jurisdiction. In unincorporated Jefferson County, payments to policyholders exceeded $7.3 million. Policyholders in Fort Atkinson received more than $1.2 million.

Table 5-10. National Flood Insurance Program Claims by Jurisdiction; 1978 through September 2018

Jurisdiction	Total Losses [2]	Closed Losses [3]	Open Losses [4]	Unpaid Losses [5]	Total Payments [6]
Cambridge, village [1]	1	0	0	1	0
Fort Atkinson, city	61	53	0	6	$1,223,875
Jefferson, city	35	30	0	5	$1,926,664
Jefferson County, unincorporated	427	359	0	68	$7,386,721
Johnson Creek, village	0	0	0	0	0
Lac La Belle, village [1]	1	0	0	1	0
Lake Mills, city	0	0	0	0	0
Palmyra, village	0	0	0	0	0
Sullivan, village	1	1	0	0	$215
Waterloo, city	3	3	0	0	$22,707
Watertown, city [1]	12	10	0	2	$31,875
Whitewater, city [1]	0	0	0	0	0
Total	301	245	0	56	$1,429,418

Source: National Flood Insurance Program, Federal Emergency Management Agency (http://bsa.nfipstat.com/reports/1040_200611.htm) (https://bsa.nfipstat.fema.gov/reports/1040.htm#55)

Notes:
1. Municipality located in Jefferson County and another county
2. All losses submitted regardless of status
3. Losses that have been paid
4. Losses that have not been paid in full
5. Losses that have been closed without payment
6. Total amount paid on losses

Without appropriate mitigation measures, the damage caused by a 100-year flood would dramatically exceed the damage caused by past floods.

Repetitive Loss Properties A property for which two or more National Flood Insurance Program losses of at least $1,000 each have been paid within any 10-year rolling period since 1978 is referred to as a repetitive loss property. According to the National Flood Insurance Program, there were 28 repetitive loss properties in Jefferson County in 2018; 26 were residential and 2 were nonresidential.

Requirements of the program stipulate that individual policy information may not be disclosed, including addresses of such properties.

Records from U. S. Geological Survey Stream Gage Stations – A summary of the annual mean stream flow, highest daily mean, instantaneous peak, percent of exceedance, and predicted flood flows for each gaging station is presented in Table 5-11. According to the flood frequencies estimated by the US Geological Service (Report 91-4128), the 1959 flood may have exceeded a 100-year event on the Crawfish River at Milford. The Rock River in 1979 was approximately a 50-year event at Watertown and Indianford. The largest event on the Bark River at Rome was between a 10- and 50-year flood. While

Jefferson County has experienced several major floods—based on stream gage records—only one has been a 100-year flood event, and only on one river. Based on the available information, if a 100-year flood would occur in the county, potential damages could dramatically exceed those of past floods without appropriate mitigation measures.

Table 5-11. Measured and Predicted Stream Flows at USGS Stream Gaging Stations, Jefferson County and Vicinity

	Rock River at Watertown	Crawfish River at Milford	Bark River at Rome	Rock River at Indianford	Rock River at Fort Atkinson
Gage Number	0542550	05426000	05426250	05427570	05427085
Time Period	1931-2005	1931–2005	1972–2005	1975–2005	1999-2005
Drainage Area (square miles)	969	762	122	2,630	2,240
Annual Mean Flow (cfs)	503	418	88.9	1,807	1,479
10% Exceeds (cfs)	1,330	1,090	158	3,820	3,180
50% Exceeds (cfs)	262	194	76	1,320	960
90% Exceeds (cfs)	39	39	32	369	306
Highest Daily Mean (cfs) (year)	1,186 (1993)	6,130 (1959)	476 (1993)	11,700 (1979)	2,294 (2004)
Instantaneous Peak Flow (cfs) (year)	5,080 (1979)	6,140 (1959)	467 (1993)	11,900 (1979)	-
Predicted 10-Year Flow (cfs)	4,100[1] 3,620[2]	4,200[1] 3,970[2]	425[2]	9,170[2]	-
Predicted 50-Year Flow (cfs)	6,100[1] 5,010[2]	5,700[1] 5,230[2]	545[2]	12,200[2]	-
Predicted 100-Year Flow (cfs)	7,100[1] 5,590[2]	9,500[1] 5,720[2]	590[2]	13,400[2]	-
Predicted 500-Year Flow (cfs)	10,000[1] 6,930[2]	10,000[1] 6,730[2]	695[2]	16,300[2]	-

Source: U. S. Geological Survey Water Resources of Wisconsin Water Year 1999 (WDR-WI-05-1)

[1] Source: Flood Insurance Study for Jefferson County, FEMA 2005

[2] Source: USGS Water Resource Report 91-4128 "Flood Frequency Characteristics of Wisconsin Streams

2004 Flood Damage Assessment – During the flooding of 2004, staff with Jefferson County completed a damage report following FEMA guidelines using the Residential Substantial Damage Estimator (RSDE). Table 5-12 shows the results. Of the 40 residential structures with some damage, 7 experienced damage in excess of 50 percent or substantial damage.

Seven in 10 of the damaged residential structures are located in the town of Sumner. The town of Koshkonong had the second highest number of damaged structures.

Table 5-12. Flood Damages from the 2004 Flood; Unincorporated Jefferson County

Jurisdiction	Percent Damage
Sumner, Town	1167.2
Sumner, Town	1042.0
Watertown, Town	240.9
Ixonia, Town	106.3
Sumner, Town	101.7
Sumner, Town	71.4
Sumner, Town	53.7
Watertown, Town	47.2
Koshkonong, Town	46.6
Sumner, Town	46.1
Sumner, Town	45.2
Sumner, Town	44.9

Continued

Major Floods – Severe flooding has occurred in 1929, 1959, 1973, 1976, 1979, 1982, 1986, 1993, 1994, 1996, 1997, 2000, 2004, 2006, 2007, 2008, and 2010. The worst recorded flood was in 1929. At the Fort Atkinson stream gage, the peak level in 1929 was measured at 784.3, which is approximately 6 feet above flood stage. During this time, there were fewer residential properties in the unincorporated sections along the river. The majority of the structures on Blackhawk Island and the North Shore were constructed in the late 1940s and early 1950s. In 1959 and 1979, the flood waters were approximately 4 to 5 feet above the river bank and all residents along the river were evacuated.

Typically the Rock River experiences high water during the spring as a result of winter melt. In 1986, the highest level recorded was in October, measuring about one foot below the 1959 spring flood. Some degree of high water is evident nearly every year along the Rock River at Blackhawk Island.

1993 Flood – In 1993, floodwater was within 10 inches of the all-time watermark set in 1929 at Blackhawk Island. All of the residents were evacuated for seven or more weeks beginning in the spring. Residents were encouraged to drink bottled water because many of the private wells were submerged and a number of local roadways were damaged because they remained under water for an extended period of time. A restaurant and a boat marina were damaged. The north shore area was also flooded, although resulting damage was not severe.

The Rock River in Fort Atkinson rose to its highest July level since records were first kept in 1933. According to the Director of Public Works, additional water inflow and infiltration caused the community's wastewater treatment plant to operate above hydraulic capacity. Many storm sewer inlets were damaged and needed to be repaired.

In July, the Department of Natural Resources observed more that a dozen sites underwater and inaccessible at the River Bend Resort/Campground.

Most of the development along the Rock River in the city of Jefferson is located outside of the 100-year floodplain. Most of the damage associated with the flooding was related to stormwater backups. The Dairy Queen, one block away from the river, was flooded by storm water, while properties closer to the river had no damage. Many residential structures experienced basement flooding. A warehouse and distribution operation, known at that time as Doskocil Foods, was effectively protected by sandbags and remained open.

According to Capt. Dick Gallop of the Watertown Fire Department, that community experienced a number of flooded basements, but no significant damage to first floor living spaces in residential neighborhoods.

2007 Flood – Heavy rains, beginning on August 18 and lasting for seven days, caused significant property damage in 2007. On August 26, 2007, Jefferson County was added to a disaster declaration that was ultimately issued for 14 counties in southern Wisconsin. On September 17, a Mobile Disaster Recovery Center was set up at the Jefferson County fairgrounds. Federal, state, and local officials conducted a Preliminary Damage Assessment of those applying for individual assistance. As of October 11, 2007, 104 applications were received from residents. A total of $115,442.42 was awarded for housing assistance and

Table 5-12. (Continued) Flood Damages from the 2004 Flood; Unincorporated Jefferson County

Jurisdiction	Percent Damage
Koshkonong, Town	44.4
Sumner, Town	42.4
Sumner, Town	40.2
Sumner, Town	36.4
Sumner, Town	36.4
Sumner, Town	33.9
Sumner, Town	33.4
Sumner, Town	29.2
Sumner, Town	28.5
Koshkonong, Town	27.5
Sumner, Town	26.4
Watertown, Town	24.8
Sumner, Town	24.1
Koshkonong, Town	23.9
Sumner, Town	23.1
Koshkonong, Town	21.4
Sumner, Town	18.5
Sumner, Town	15.6
Sumner, Town	12.6
Sumner, Town	12.6
Sumner, Town	11.2
Sumner, Town	11.1
Sumner, Town	10.2
Sumner, Town	8.4
Koshkonong, Town	7.8
Sumner, Town	5.2
Jefferson, Town	5.1
Ixonia, Town	1.8

Source: Jefferson County

$3,021.32 for other needs assistance. Most of the damage resulted from sewer backups and stormwater in basements. In a few instances, basement walls were damaged from the saturated soils. The Lake Mills area suffered the most damage as reported to Jefferson County Emergency Management (Table 5-13).

2008 Flood – In June 2008, heavy rain caused severe flooding across southern Wisconsin, including portions of Jefferson County. The U.S. Geological Survey conducted a research study to generate flood-peak inundation maps and water surface profiles for nine communities in the study area, three of which are located in Jefferson County.[2] These include the Rock River at the city of Jefferson (Exhibit 5-1); Crawfish River at Milford, an unincorporated community (Exhibit 5-2); and Rock River at the city of Fort Atkinson (Exhibit 5-3).

Flooding on Blackhawk Island, 2004

Table 5-13. Damage Reports for Flooding, August 2007

	Damage Reports
Town	
Aztalan	2
Cold Spring	0
Concord	0
Farmington	0
Hebron	1
Ixonia	0
Jefferson	2
Koshkonong	0
Lake Mills	23
Milford	4
Oakland	1
Palmyra	0
Sullivan	1
Sumner	0
Waterloo	1
Watertown	1
Village	
Cambridge [1]	0
Johnson Creek	0
Lac La Belle [1]	0
Palmyra	0
Sullivan	0
City	
Fort Atkinson	1
Jefferson	18
Lake Mills	26
Waterloo	0
Watertown [1]	8
Whitewater [1]	0
Jefferson County	53

Source: Jefferson County Emergency Management

[2] *Flood of June 2008 in Southern Wisconsin*, 2008, Faith A. Fitzpatrick, et al; U.S. Geological Survey, U.S. Department of the Interior; Scientific Investigations Report 2008-5235

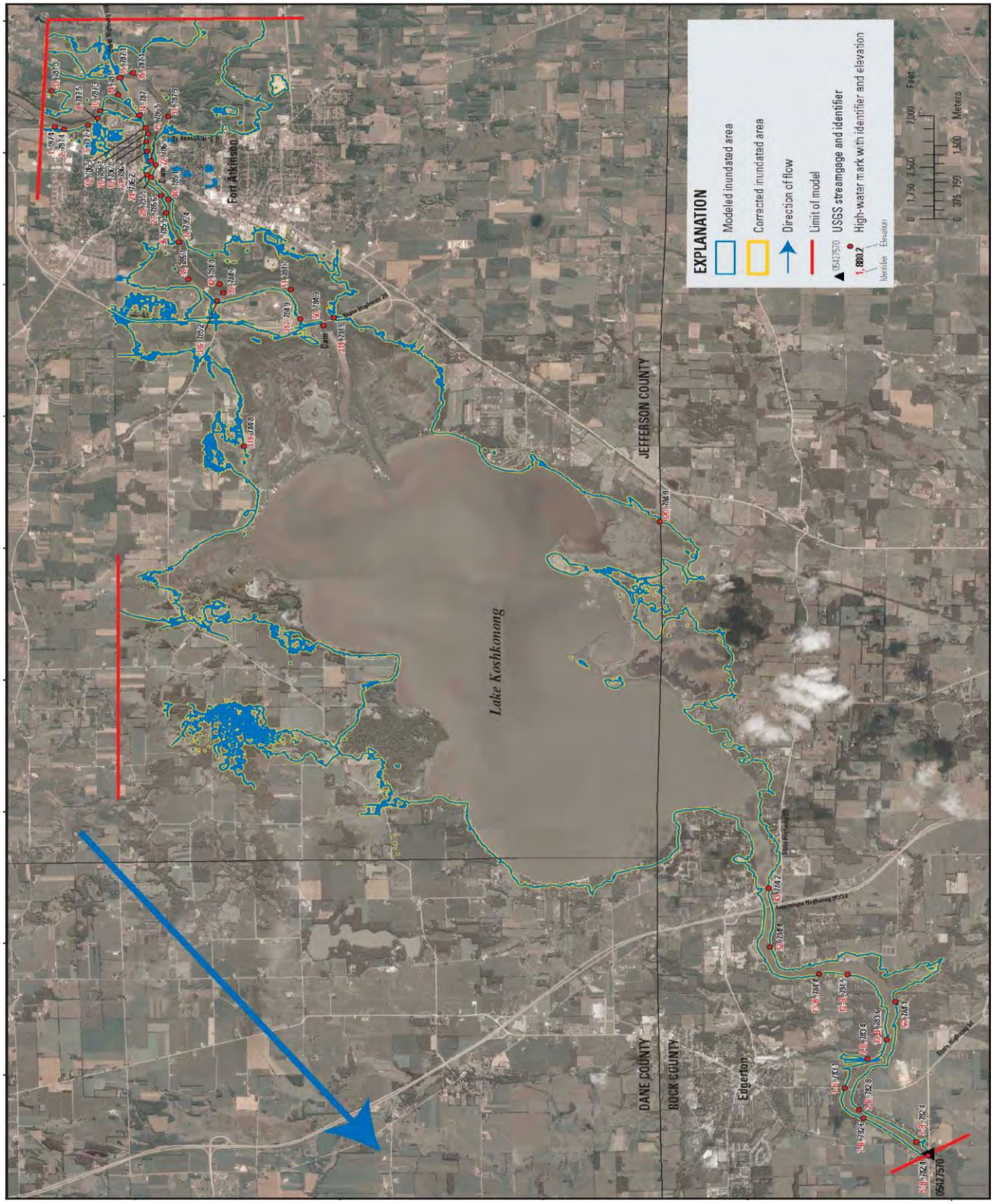
Exhibit 5-1. 2008 Flood Inundation Map; City of Jefferson, Wisconsin

Source: *Flood of June 2008 in Southern Wisconsin*, 2008, Faith A. Fitzpatrick, et al; U.S. Geological Survey, U.S. Department of the Interior; Scientific Investigations Report 2008-5235

Exhibit 5-2. 2008 Flood Inundation Map; Milford (Unincorporated), Wisconsin

Source: *Flood of June 2008 in Southern Wisconsin*, 2008, Faith A. Fitzpatrick, et al; U.S. Geological Survey, U.S. Department of the Interior; Scientific Investigations Report 2008-5235

Exhibit 5-3. 2008 Flood Inundation Map; City of Fort Atkinson), Wisconsin



Source: *Flood of June 2008 in Southern Wisconsin*, 2008, Faith A. Fitzpatrick, et al; U.S. Geological Survey, U.S. Department of the Interior; Scientific Investigations Report 2008-5235

Throughout the region, there were evacuations and road closures and prolonged, extensive damage and looses associated with agriculture, businesses, housing, public health and human needs, and infrastructure, and transportation.

To further document some of these impacts, the Jefferson County Economic Development Consortium conducted a survey of those in the business community.[3] Over 200 employees were laid off according to the survey; with a significant number of individuals not returning to their jobs. The survey estimated a loss of $4.7 million dollars related to physical damage, production and order loss, and infrastructure.

This flood event caused the first full activation of the Jefferson County emergency Operations Center (EOC) on June 12, 2008 with partial activation on June 23, 2008. There were 21 full road closures, 18 partial closures (including 5 bridges), and partial closure of I-94 due to concerns about the stability of the bridge over the Rock and Crawfish rivers. Multiple families were evacuated throughout the county.

Presidential Disaster Declaration (FEMA-1768-DR) was granted for individual and public assistance. Over $4 million in SBA loans were received in Jefferson County, over $3 million were received for Individual and household programs, over $3 million were received for housing assistance, and over $400,000 for other needs. In total, more than $10 million was received.

VULNERABILITY ASSESSMENT – 2006

Effects on Facilities – The consultant team identified 843 buildings (in 2006) within the 100-year floodplain (Table 5-14). Using the methodology described in Appendix H, it is estimated that if all waterbodies in the county experienced 100-year flood levels during the same time period, flood damage to buildings could potentially exceed $13.3 million. It should be noted however, that flood magnitudes are generally not uniform across different watersheds and that it would be a rare occurrence for all water bodies in the county to experience a 100-year flood from the same event. The town of Sumner is anticipated to experience the highest amount of building damage followed by the town of Oakland[4]. Five municipalities do not have a building in the 100-year floodplain.

A countywide 100-year flood could potentially cause more than $13.3 million in damage to buildings.

With the exception of wastewater treatment facilities, there are no critical facilities in the 100-year floodplain.

[3] Source: *Jefferson County 2008 Business Flood Assessment*, Dennis L. Hartwig, Jefferson County Economic Development Consortium.

[4] Note: The floodplain maps contained apparent errors, especially around Lake Ripley.

Table 5-14. Buildings in 100-Year Floodplain and Estimated Damage: 2006

	Number of Buildings by Percent Damaged			Total Number of Buildings	Market Value of Structures ($ millions)	100-Year Flood Damage (S thousands)
	<10%	10-20%	>20%			
Town						
Aztalan	2	4	1	7	0.4	57.0
Cold Spring	2	3	1	6	0.5	83.7
Concord	2	0	0	2	0.3	23.6
Farmington	1	4	0	5	0.5	61.3
Hebron	5	7	4	16	1.5	297.2
Ixonia	1	0	0	1	0.03	0.001
Jefferson	4	9	0	13	1.3	135.1
Koshkonong	47	57	40	144	7,0	992.3
Lake Mills	4	2	0	6	0.6	63.1
Milford	6	9	3	18	1.2	215.2
Oakland	59	77	66	202	29.3	5,517.9
Palmyra	14	17	0	31	4.3	461.5
Sullivan	8	9	6	23	1.8	243.6
Sumner	132	54	17	203	10.0	1,095.4
Waterloo	0	1	0	1	0.1	14.8
Watertown	9	10	1	20	1.5	148.5
Village						
Cambridge [1]	0	0	0	0	0	0
Johnson Creek	1	0	0	1	0.2	12.6
Lac La Belle [1]	0	0	0	0	0	0
Palmyra	0	0	0	0	0	0
Sullivan	0	0	0	0	0	0
City						
Fort Atkinson	8	12	0	20	5.0	597.0
Jefferson	30	23	5	58	9.2	1,542.0
Lake Mills	10	15	13	38	5.7	970.6
Waterloo	9	8	9	26	4.6	728.2
Watertown [1]	2	2	0	4	0.2	26.0
Whitewater [1]	0	0	0	0	0	0
Jefferson County	356	323	166	845	85.23	13,286.601

Source: Civi Tek Consulting and Planning and Design Institute
Notes: 1. Municipality located in Jefferson County and another county

A number of areas have concentrations of buildings as generally described below.

1. **Blackhawk Island and Veterans Lane** – This area is located just upstream of Lake Koshkonong and southwest of the city of Fort Atkinson and has experienced significant flooding in the past. The area has been a targeted area for past county-sponsored removal of flood prone homes.

From 1996 through 1998, 38 structures were removed from the Blackhawk Island area as part of the County's flood mitigation program.

2. **North Shore** - This area is on the north shore of Lake Koshkonong and includes both seasonal and permanent homes.
3. **Rock River Mobile Home Court** - This is a small subdivision of approximately 20 mobile homes located along the Rock River south of the village of Johnson Creek. There are also other permanent residential structures in the immediate area.
4. **Rock River Road** - This residential area is west of Fort Atkinson along the Rock River and has a number of year-round residences.
5. **Rock River Paradise Subdivision** - This small residential development is east of the city of Watertown along the Rock River.
6. **Pottawatomi Trail** - This residential development is located on the south side of Lake Koshkonong.
7. **River Bend Resort/Campground** – This is a condominium campground located along the Crawfish River in the town of Milford. It contains approximately 300 campsites, which are individually owned. The recreation buildings, miniature golf, parking lot, and piers are owned jointly.

Countywide, damage to public facilities included erosion of recreational trails, damage to community and county parks, local and county road washouts, and damage to culverts and bridges. These infrastructure damages resulted in serious health and safety concerns as they impeded police, fire, and rescue personnel from getting to the scene of emergency situations.

Effects on Population Groups – There are no population groups that are especially vulnerable to flooding except to the extent older homes, which were built prior to floodplain regulations, are occupied by lower income residents.

Effects on Economic Sectors – While flooding can impact a number of economic sectors, the agricultural sector is the most vulnerable. Aside from damaging farm buildings, flooding can destroy crops and reduce crop yields for surviving crops. Table 5-15 summarizes the agricultural losses due to flooding from 1986 through 2006. In addition, harvesting crops on wet soils causes soil compaction that reduces crop yields in subsequent years. Heavy rains, which are often associated with flooding, cause a considerable amount of soil erosion on unprotected soils.

Table 5-15. Agricultural Losses Due to Flooding: Jefferson County: 1986 through 2000

Year	Soybean ($ millions)	Corn ($ millions)
1986	0.7	3.9
1993	2.1	6.4
1996	2.5	6.4
1997	1.5	3.2
2000	1.0	2.1

Source: Farm Services Agency

Damages sustained by businesses in the county are primarily a direct reflection of the agricultural production losses. The effects of the agricultural base extend throughout the county. Farming supports a variety of farm- (e.g., implement dealers, feed stores, granaries) and non-farm related (e.g., grocery stores, hardware stores) businesses. Most notably, the 1993 flooding affected a number of business sectors that support farmers.

Other Effects – During periods of flooding, no-wake boating restrictions are imposed which limit recreational uses, but are needed to protect shorelines from erosion.

VULNERABILITY ASSESSMENT – 2007

Flood analysis for Jefferson County was performed using HAZUS-MH released in July 2007. The bundled aggregated general building stock was updated to Dun & Bradstreet 2006. Building valuations were updated to R.S. Means 2006. Building counts based on census housing unit counts are available for RES1

(single-family dwellings) and RES2 (manufactured housing) instead of calculated building counts.

The site-specific inventory (specifically schools, hospitals, emergency operation centers, fire stations and police stations) was updated using the best available statewide information.

HAZUS-MH was used to generate the flood depth grid for a 100-year return period calculated by clipping the USGS 30m DEM to the DFIRM boundary. Exhibit 5-4 depicts the flood boundary from the HAZUS-MH analysis.

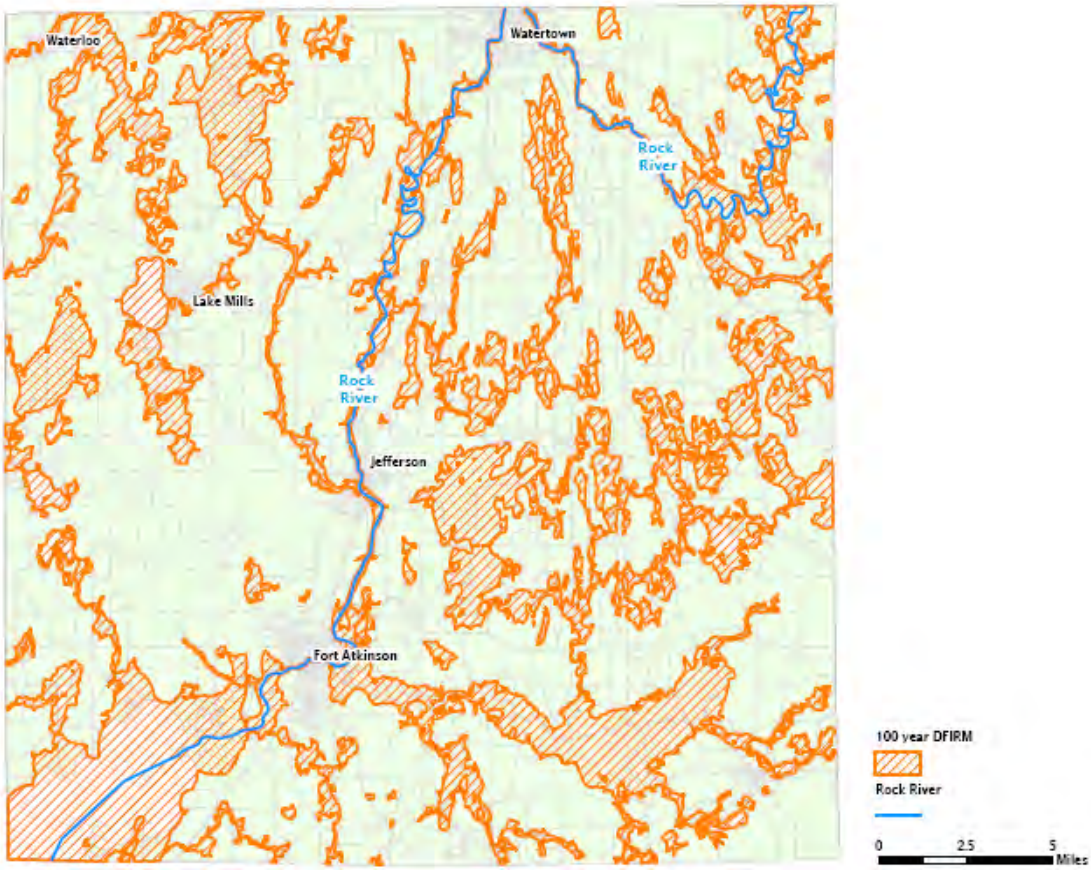


Exhibit 5-4. HAZUS-MH Analysis (100-Year Flood): 2007

Aggregate Loss Analysis – HAZUS-MH was used to estimate the damages for a 100-year flood event in Jefferson County. An estimated 129 buildings will be damaged totaling $58 million in building losses and $151 million in total economic losses. The total estimated number of damaged buildings, total building losses, and estimated total economic losses are shown in Table 5-16.

HAZUS-MH estimates 26 census blocks with losses exceeding $1 million. The distribution of losses is shown in Exhibit 5-5.

HAZUS-MH aggregate loss analysis is evenly distributed across a census block. Census blocks of concern should be reviewed in more detail to determine the actual percentage of facilities that fall within the flood hazard areas. The aggregate losses reported in this study may be overstated.

Table 5-16. Economic Loss for a 100-Year Flood: 2007

General Occupancy	Estimated Total Buildings	Total Damaged Buildings	Total Building Exposure X 1000	Total Economic Loss X 1000	Building Loss X 1000
Agricultural	1	0	$80,731	$4,479	$962
Commercial	192	1	$948,602	$29,472	$6,758
Education	5	0	$121,088	$537	$74
Government	13	0	$42,507	$1,495	$154
Industrial	74	3	$696,703	$46,500	$9,732
Religious/Non-Profit	13	0	$98,065	$3,531	$460
Residential	24,675	125	$4,488,760	$64,473	$39,486
Total	24,973	129	$6,476,456	$150,487	$57,626

The reported building counts should be interpreted as degrees of loss rather than as exact numbers of buildings exposed to flooding. These numbers were derived from aggregate building inventories which are assumed to be dispersed evenly across census blocks. HAZUS-MH requires that a predetermined amount of square footage of a typical building sustain damage in order to produce a damaged building count. If only a minimal amount of damage to buildings is predicted, it is possible to see zero damaged building counts while also seeing economic losses.

Exhibit 5-5. Economic Loss for a 100-Year Flood by Census District: 2007

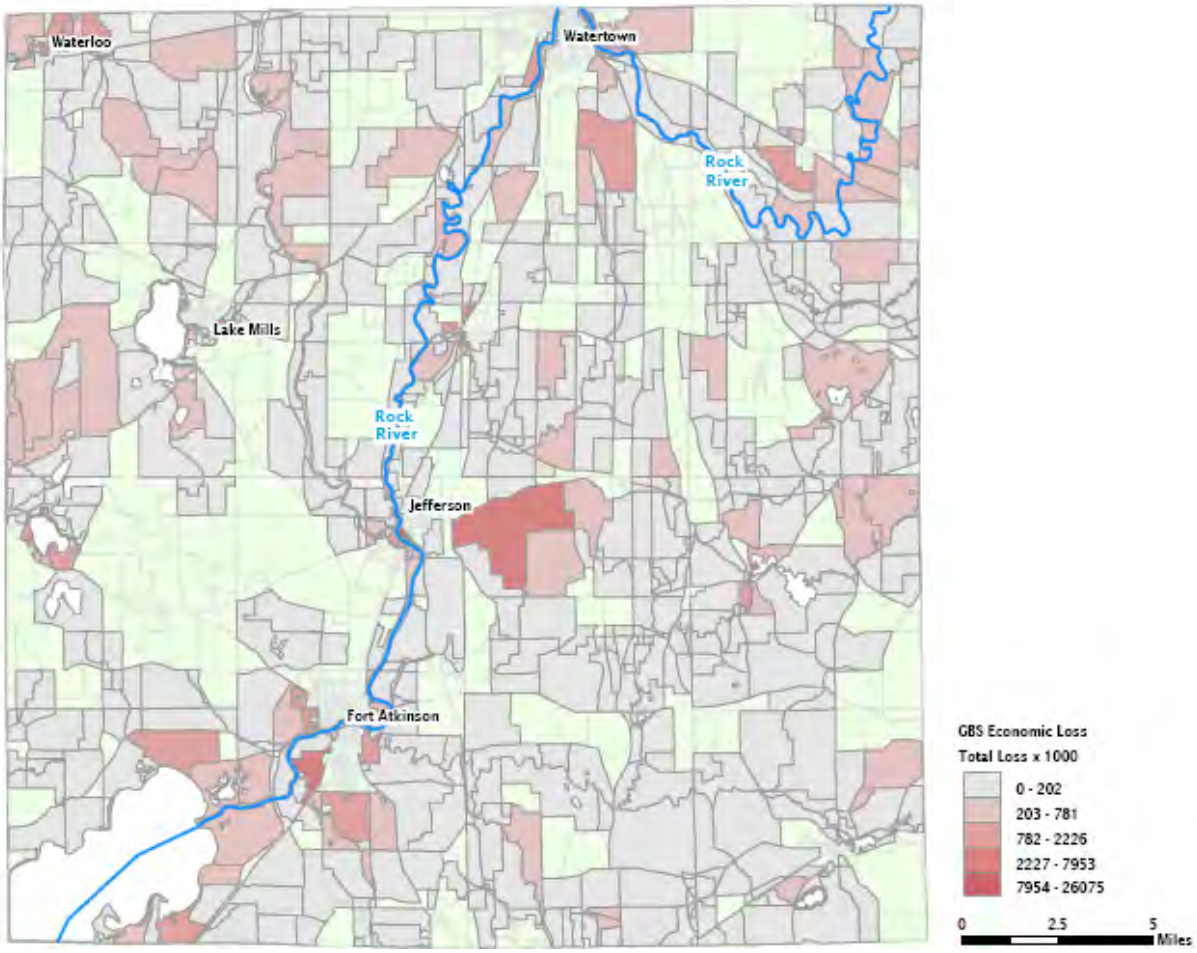


Exhibit 5-6 shows census blocks overlaid with the flood boundary and orthophoto of Jefferson. Census block 550559909002011 has an estimated building loss of $866,000 with a combined replacement cost of $3 million. HAZUS-MH estimates that 36 buildings are within the calculated flood boundary for this block. Although the orthophoto shows significant flooding in this census block, very few buildings appear to be at risk.

Exhibit 5-6. Flood Damage Exposure in Jefferson: 2007

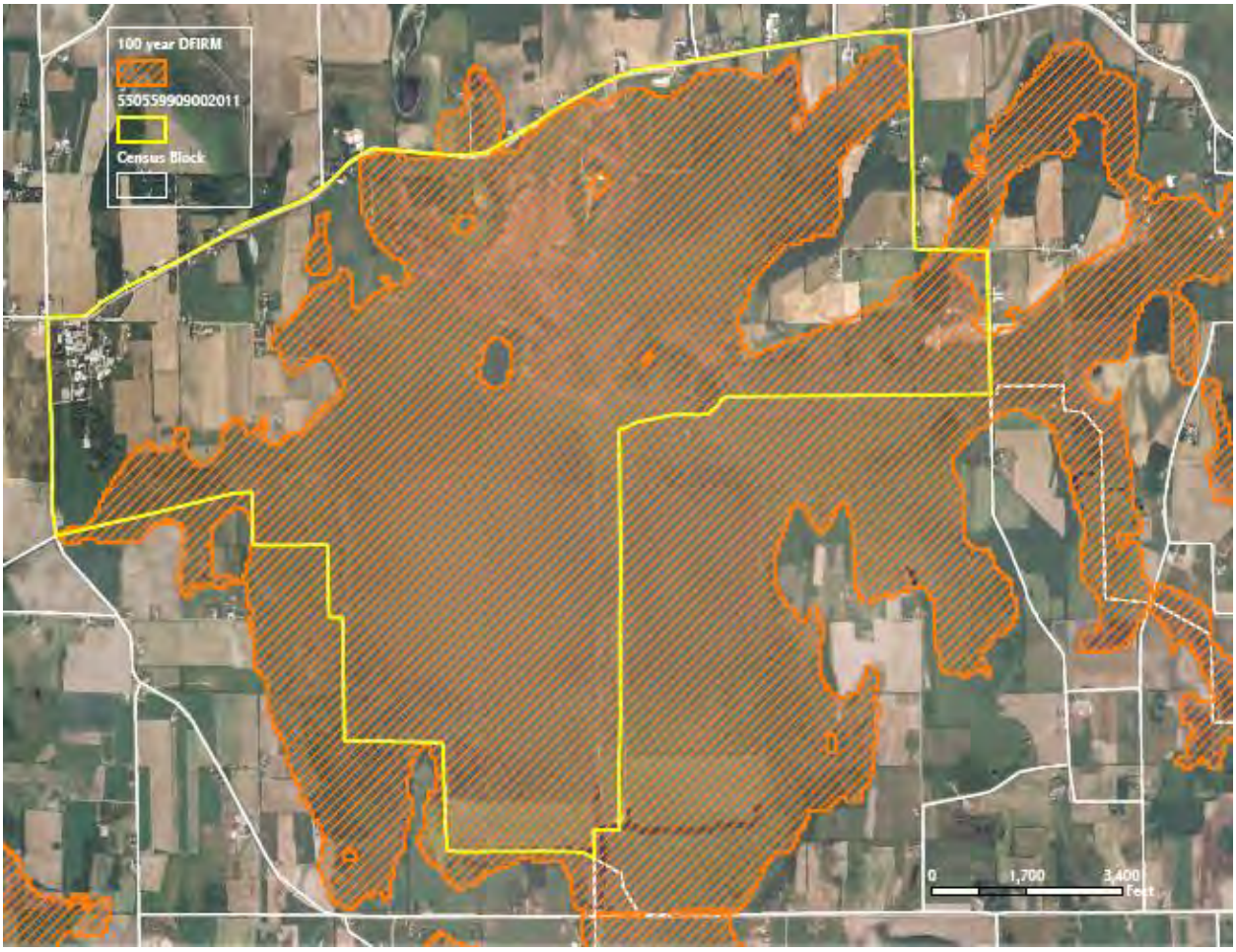
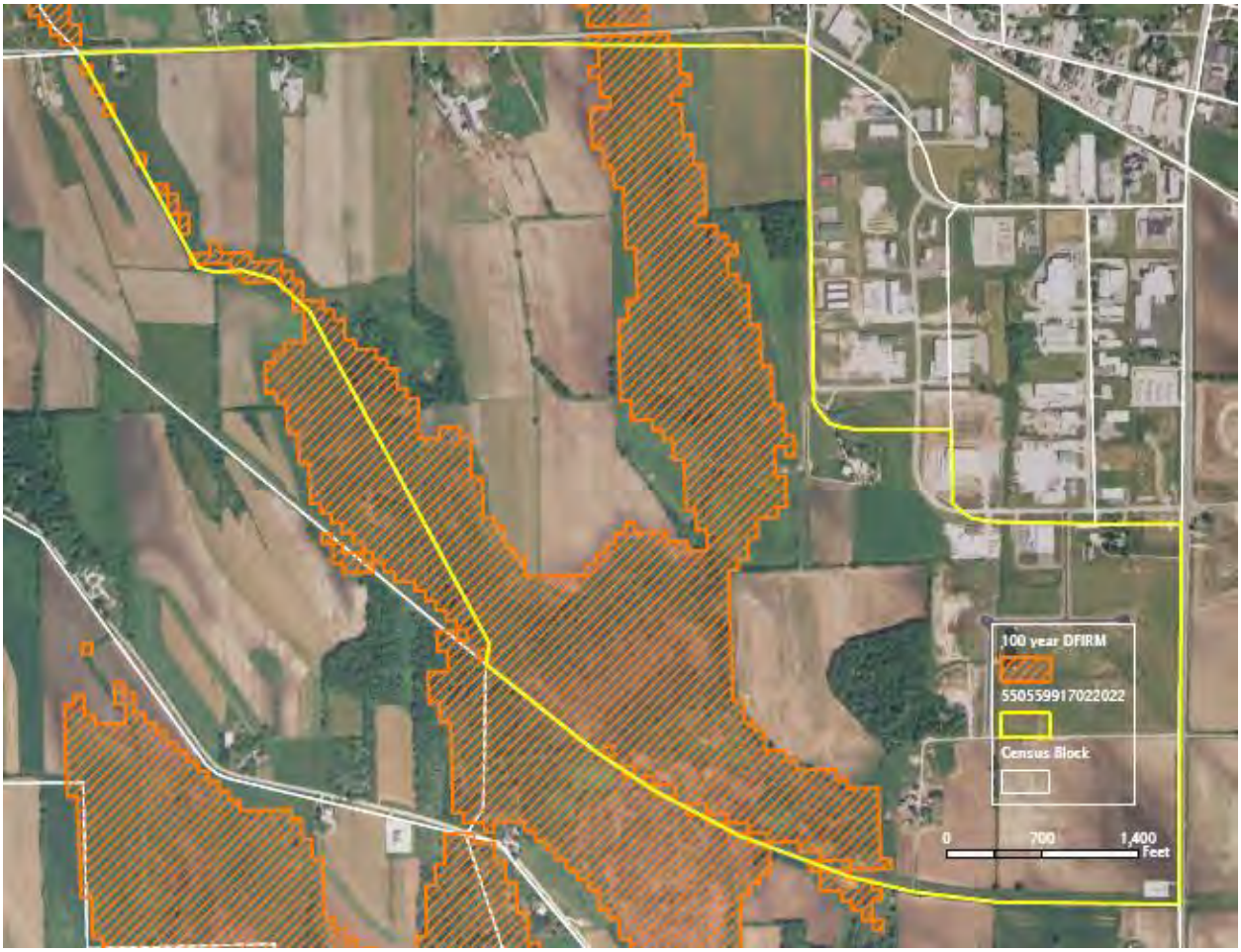


Exhibit 5-7 shows census blocks overlaid with the flood boundary and orthophoto of Ixonia. Census block 550559917022022 has an estimated building loss of $225,000 with a combined replacement cost of $930,000. HAZUS-MH estimates that 11 buildings are within the calculated flood boundary for this block. However, the orthophoto shows this area to be predominately forest.

Exhibit 5-7. Flood Damage Exposure in Ixonia: 2007



Essential Facility Loss Analysis – An essential facility would encounter many of the same impacts as any other building within the flood boundary. These impacts include: structural failure, extensive water damage to the facility, and loss of facility functionality (i.e. a damaged police station will no longer be able to serve the community).

The HAZUS-MH analysis identified that no essential facilities are subject to flooding. A list of the essential facilities within Jefferson County is included in Table 5-17.

Table 5-17: Essential Facility Loss for a 100-Year Flood: 2007

Class	Building Count	At Least Moderate Damage	At Least Substantial Damage	Loss of Use
Care Facilities	4	0	0	0
Fire Stations	11	0	0	0
Police Stations	13	0	0	0
Schools	55	0	0	0
EOC	0	0	0	0
Total	**83**	**0**	**0**	**0**

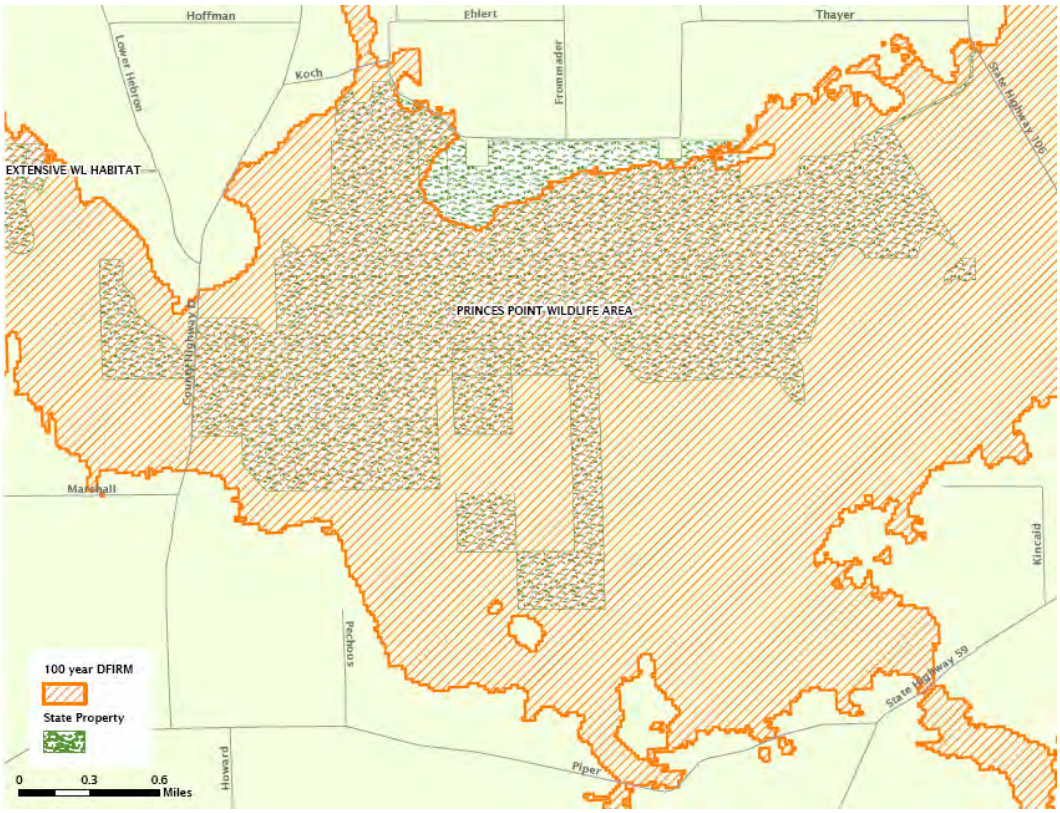
Shelter Requirement Analysis - HAZUS-MH estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. HAZUS-MH also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 1,921 households will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these 2,528 people (out of a total population of 74,021) will seek temporary shelter in public shelters.

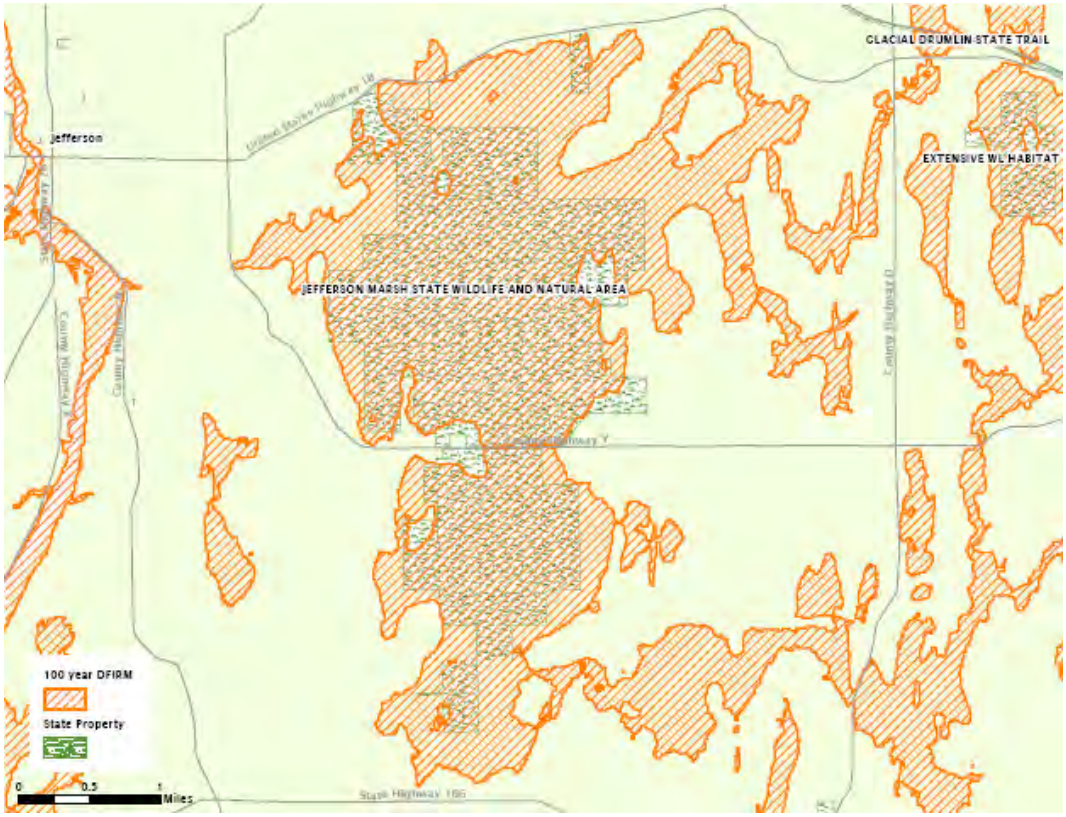
State Property Loss Analysis – The flood boundaries were overlaid with the State of Wisconsin property boundaries as provided by the Department of Natural Resources. Table 5-18 provides a list of state properties impacted by the flood boundary. Exhibit 5-8 shows two examples of inundated areas.

Table 5-18. State Property Flood Inundation: 2007

State Property	Percent Inundated	Acres
Jefferson Marsh State Wildlife and Natural Area	93	3060
Lake Mills Wildlife Area	90	2472
Princes Point Wildlife Area	94	2019
Waterloo Wildlife Area	35	1496
Extensive Wildlife Habitat	11	1282
Rome Pond Wildlife Area	52	1188
Koshkonong Wildlife Area	86	726
Scattered Wildlife	3	349
Kettle Moraine State Forest-Southern Unit	1	251
Glacial Drumlin State Trail	9	61
Kanow Park Fishery Area	100	47
Lake Mills Hatchery	35	28
Aztalan State Park	14	27
Statewide Natural Area	0	25
Statewide Public Access	1	15
Rem-Golden Lake	32	11
Red Cedar Lake Natural Area	6	4
Lima Marsh Wildlife Area	0	0

Exhibit 5- 8: Select State of Wisconsin Properties Boundary with 100-Year Flood Boundary: 2007





7. ICE SHOVES

PROFILE

An ice shove, also referred to as an ice flow, is a large accumulation of broken ice blocks and sheets which have been piled up by the wind along the shoreline of a lake. Ice shoves are characteristically found on large lakes in the spring during and immediately after ice breakup. The size of the ice shove is related to the amount of ice on the lake when breakup occurs and the strength and duration of the winds at breakup.

HISTORY OF PAST OCCURRENCES

Ice shoves occur on a fairly frequent basis on the north and northeast shore of Lake Koshkonong. Rock Lake in the northwest quadrant of the county is the second largest lake in the county and has experienced ice shoves, but to a lesser degree than Lake Koshkonong. No other lakes in the county are large enough to generate ice shoves of any consequence.

VULNERABILITY ASSESSMENT

Although ice shoves occur on a fairly frequent basis, most do not cause damage to man-made structures such as buildings, piers, boat landings, and roads. On a few occasions though, ice shoves have become rather large and damaged man-made structures. Damage estimates are not available for ice shoves.

Effects on Facilities – Ice shoves most directly affect buildings and structures near the lakeshore. Ice may pile on top of a road if not removed as it moves on shore.

Effects on Population Groups – Ice shoves do not negatively affect any population group in particular.

Effects on Economic Sectors – Ice shoves do not negatively affect any economic sector in particular.

8. FOG

PROFILE

Fog is a visible concentration of small water droplets suspended in the air at the earth's surface that obscures visibility to less than one kilometer. It forms when air temperature falls to its dew point, which is the temperature at which air is holding as much moisture as it can. When air reaches its dew point, it condenses into very small water droplets.

HISTORY OF PAST OCCURRENCES

Fog can form throughout the year, but is most common from September through April. As shown in Appendix G, there have been 72 reported occurrences of fog in Jefferson County since 1950. In Jefferson County fog tends to cover large areas.

VULNERABILITY ASSESSMENT

Effects on Facilities – Fog does not damage or impair the operation of facilities.

Effects on Population Groups – Fog does not negatively affect any population group.

Effects on Economic Sectors – Fog impairs visibility and can hamper ground and air transportation. When visibility is decreased, the potential for motor vehicle crashes increase as does the possibility of an airplane accident on landing or take off.

9. TORNADO / HIGH WINDS

PROFILE

A tornado is a violently rotating column of air extending from the ground to the base of a convective cloud. The tornado may or may not have a visible condensation funnel (commonly referred to as a "funnel cloud"), which may or may not extend from the cloud base all the way to the ground. In the absence of a visible condensation funnel, a severe weather spotter can determine they are looking at a tornado if they observe cloud-base rotation superimposed over rotating dirt and debris at ground level. Wind speeds in a tornado typically range from 80 mph to 150 mph, but on occasions reach speeds in excess of 200 mph. There have been documented tornado winds exceeding 300 mph outside of Wisconsin. The majority of damage resulting from a tornado occurs within one-eight mile of the tornado's path, which characteristically does not exceed 16 miles. In fact, the average path length of tornadoes in Wisconsin for the period of 1950-2005 was 5.8 miles with a duration of about 10 minutes. Tornadoes with track lengths greater than 150 miles have been reported in Wisconsin, although they are quite rare.

Tornadoes are visible because low atmospheric pressure in the vortex leads to cooling of the air by expansion with condensation and formation of water droplets. They are also visible as a result of the airborne debris and dust associated with the vortex. The destructive power of the tornado lies primarily in its high horizontal winds, a built-in upward-lifting force, and airborne debris impacting structures (collectively resulting in about 95 percent of the damage). To a much lesser degree, air pressure differences associated with a tornado result in additional damage. Years ago, it was assumed that air pressure differences accounted for a large portion of the damage, however, it is now realized that most buildings have enough air leakage or infiltration so that most of the air pressure differences between the inside and outside of a structure are minimized as the tornado approaches. Since tornadoes are usually associated with organized storm systems that consist of several thunderstorm cells of varying intensity, large hail, torrential rain, and intense lightning usually accompany the storm that spins-up a tornado.

Although a tornado can form at any time during the year, the peak tornado season is May through July. They can also occur at any time of the day. The peak hour for tornado initiation is between 6 and 7 pm and the peak hours of occurrence are between 2 and 10 pm.

Prior to 2007, the Fujita Tornado Scale was used to estimate the wind speed of a tornado based on damage to structures (Table 5-18). Though the Fujita Scale has 13 ratings (F0-F12), tornadoes never exceed an F5 (261 to 318 MPH). Beginning in 2007, tornadoes will be rated using the Enhanced Fujita Tornado Scale, which is essentially the same as the former scale except for the wind speed (Table 5-19).

Table 5-18. Fujita Tornado Scale

Fujita Rating	Wind Speed	Characteristic Damage
F0	40 to 72 mph	Some damage to chimneys, TV antennas, roof shingles, trees, and windows
F1	73 to 112 mph	Automobiles overturned, carports destroyed, and trees uprooted
F2	113 to 157 mph	Roofs blown of homes, sheds and outbuildings demolished, mobile homes overturned
F3	158 to 207 mph	Exterior walls and roofs blown off homes; metal buildings collapsed or are severely damaged; forests and farmland flattened
F4	208 to 260 mph	Few walls, if any, standing in well-built homes; large steel and concrete missiles thrown far distances
F5	261 to 318 mph	Homes leveled with all debris removed; schools, motels, and other larger structures have considerable damage with exterior walls and roofs gone; top stories demolished

Table 5-19. Enhanced Fujita Tornado Scale

Fujita Rating	Wind Speed	Characteristic Damage
EF0	65 to 86 mph	Some damage to chimneys, TV antennas, roof shingles, trees, and windows
EF1	86 to 110 mph	Automobiles overturned, carports destroyed, and trees uprooted
EF2	111 to 135 mph	Roofs blown of homes, sheds and outbuildings demolished, mobile homes overturned
EF3	136 to 165 mph	Exterior walls and roofs blown off homes; metal buildings collapsed or are severely damaged; forests and farmland flattened
EF4	166 to 200 mph	Few walls, if any, standing in well-built homes; large steel and concrete missiles thrown far distances
EF5	>200 mph	Homes leveled with all debris removed; schools, motels, and other larger structures have considerable damage with exterior walls and roofs gone; top stories demolished

Table 5-20. Tornado Frequency: Jefferson County

Fujita Rating [1]	Number of Occurrences [2]	Probability of Occurrence
F0	12	36%
F1	13	39%
F2	6	18%
F3	1	3%
F4	0	0
F5	0	0

History of Past Occurrences

Wisconsin lies along the northern edge of the nation's tornado belt that extends northeastward from Oklahoma into Iowa. Winter, spring, and fall tornadoes are more likely to occur in southern Wisconsin than in northern counties. Yet, tornadoes have occurred in Wisconsin during every month except February.

Wisconsin's tornado season runs from the beginning of April through September. The most severe tornadoes typically occur during April, May, and June. Many tornadoes strike in late afternoon or early evening. However, tornadoes have occurred at other times. Personal property damage, deaths, and injuries have and will continue to occur in Wisconsin. On average, one person dies from tornado-related injuries each year.

In 2005, Wisconsin had a record of 62 verified tornadoes, including 27 that occurred on August 18, 2005. Seven of the 27 tornadoes on that day visited Jefferson County.

In Jefferson County, there have been 33 verified tornadoes from 1950 through 2018 (Appendix G). The vast majority of them were F0 or F1 (Table 5-20). Prior to 1950, there were four verified tornadoes: 1851, 1878, 1883, and 1931. Prior to 1982 when the National Weather Service began classifying tornadoes, ratings are at best broad estimates, with an accuracy of plus/minus 1.

A presidential disaster declaration was issued for tornado damage in 1991 and 1993.

Vulnerability Assessment

Effects on Facilities – Because tornadoes apparently occur randomly across the landscape, all areas of the county are equally as likely to experience a tornado. Therefore, all of the critical facilities which have been identified are at risk.

Effects on Population Groups – Even though all areas of the county are equally likely to experience a tornado, those living in mobile homes or staying in a campground are more vulnerable than those people living in a residence with a basement. In 2018, there were more than 20 mobile home parks and campgrounds, none of which had a storm shelter where people could go during a wind-related storm event.

Effects on Economic Sectors – While individual businesses may be damaged, the overall economy generally experiences short-term effects of a tornado, if at all.

Notes: 1. Refer to Table 5-14 for a description of the Fujita ratings
2. Based on data collected by the National Weather Service

Table 5-21. Documented Tornadoes; Jefferson County: 1851 through 2018

Year	Month	Number
1851	May	**1**
1878	May	**1**
1883	July	1
1931	September	1
1965	April	2
1967	June	1
1971	June	2
1972	July	2
1974	June	1
1979	August	1
1980	June	2
1981	June	1
1986	July	1
1986	September	1
1988	May	1
1991	March	1
1997	September	1
1999	June	1
2002	August	1
2004	June	1
2004	July	1
2005	August	7
2008	June	1
2010	July	4

Source: National Weather Service

Table 5-22. Estimated Tornado Damage: Jefferson County

Based on historical occurrences and documented damage estimates, a tornado would be expected to cause about $375,000 on average. The range however, is quite wide depending on where the tornado occurs and its magnitude (Table 5-22).

Fujita Rating [1]	Damage Estimate
F0	0 to $250,000
F1	$25,000 to $250,000
F2	$25,000 to $2,500,000
F3	$250,000 to $3,000,000
F4	$500,000 to $3,000,000
F5	$750,000 to $3,000,000

Notes: 1. Refer to Table 5-13 for a description of the Fujita ratings

10. HAILSTORMS

PROFILE

A hailstorm is a weather event where water particles in the upper atmosphere form into round or irregular masses of ice that fall to earth. Hail stones form when sub-freezing temperatures in the upper atmosphere cause water in thunderstorm clouds to accumulate in layers around an icy core. When strong underlying winds no longer can support their weight, the hailstones fall to Earth. The size of hail typically ranges from ¼" up to three inches in diameter. In a rather rare occurrence, a 2006-hail storm in Lake Mills created hail stones with a diameter of 4.25 inches.

Hail tends to fall in swaths that may be 20-115 miles long and 5-30 miles wide. The swath is not normally an even bombardment of hail, but generally consists of a series of hail strikes that are produced by individual thunderstorm clouds traversing the same general area. Hail strikes are typically one-half mile wide and up to five miles long. They may partially overlap, but often leave completely undamaged gaps between them.

Hailstorms tend to occur in conjunction with severe thunderstorms

HISTORY OF PAST OCCURRENCES

From 1950 through 2018, there have been 135 documented hailstorm events in the county (Table 5-5).

VULNERABILITY ASSESSMENT

Effects on Facilities – The threat of hail damage increases as the size of the hailstones increase. Hail can break windows, damage roofs and siding, and dent motor vehicles.

Effects on Population Groups – All population segments are equally susceptible to hail storms. Hail storms while resulting in property and crop damage, rarely causes serious injury or loss of life.

Effects on Economic Sectors – Of all the economic sectors, agriculture is the most susceptible to hail damage. When hailstones approach golf ball size, crops are damaged and are not able to recover, resulting in a total loss.

ESTIMATED DAMAGE

Based on historical data, hailstorms, while quite numerous, do not cause widespread or significant damage. There is however, one exceptional event. In April 2006, a hailstorm caused $4.4 million in property damage. This single event accounts for nearly 92 percent of all the documented damage that occurred since 1950.

For the purposes of this plan, it is estimated that a hailstorm would cause about $5,000 in property damage per event.

11. THUNDERSTORMS

PROFILE

Thunderstorms are severe and violent forms of convection produced when warm moist air is overlaid by dry cool air. As the warm air rises, thunderheads (cumulonimbus clouds) form and cause the strong winds, lightening, hail, and rain characteristically associated with these storms. Thunderheads may be a towering mass 6 miles or more across and 40,000 to 50,000 feet high. As much as 1.5 million tons of water may be held in a thunderhead.

A storm event arising for a single thunderhead typically lasts less than 30 minutes in a given location. However, strong frontal systems may spawn more than one squall line composed of many individual thunderheads.

As defined by the National Weather Service, a severe thunderstorm is a thunderstorm event that produces one or more of the following: downbursts with winds of 58 mile per hour or greater, hail ¾ of an inch in diameter, or a tornado.

HISTORY OF PAST OCCURRENCES

Out of all the weather-related events in Jefferson County, powerful thunderstorms are the most common. They account for more than one-third (37%) of all weather-related events documented since 1950. On average county residents can expect slightly more than three significant thunderstorm events each year.

Although thunderstorms can occur throughout the year, they are most common from May through September. Typically, they occur after noon until 10:00 pm.

The most devastating thunderstorm to hit Jefferson County occurred May 31, 1998. Straight-line winds with peak gusts of 100 to 128 mph hit 12 counties in south central and southeast Wisconsin, while another 8 counties had peak gusts of 60 to 80 mph. It is believed that this event was the most damaging, widespread, straight-line thunderstorm wind event to hit southern Wisconsin in more than 100 years. Roofs were torn off of barns, homes, and other buildings. Thousands of trees were uprooted or significantly damaged. Hundreds of motor vehicles were either damaged or totaled by falling trees and branches or collapsed garages. At one point, about 60,000 customers were without electricity in south central Wisconsin and about 170,000 in southeast Wisconsin. Some areas were without power for as much as 5 or 6 days. Property damage for all 20 counties totaled more than $55.85 million and $1.48 million in crop losses. In Jefferson County, there were 8 reported injuries, $2.7 million in property damage, and $200,000 in crop losses.

VULNERABILITY ASSESSMENT

Effects on Facilities – Aside from hail, straight line winds from a thunderstorm can damage property and to a less extent crops. Overhead utility lines are quite susceptible to downed trees and tree branches. Entire neighborhoods and even larger areas can lose power because of a thunderstorm. All areas of the county are equally susceptible to thunderstorms, meaning that all critical facilities are at risk.

Effects on Population Groups – Wind associated with severe thunderstorms can cause injury or loss of life. With the exception of those living in mobile home parks or staying in campgrounds, no population group is uniquely susceptible to

a thunderstorm event. Those in mobile homes and campgrounds are at risk from falling trees and branches, and damage to their residence or camper.

Effects on Economic Sectors – Thunderstorms do not affect any economic sector disproportionately more than others.

Based on historical data, a thunderstorm is expected to cause less than $20,000 in property damage and less than $2,000 in crop damage.

12. WINTER STORMS

PROFILE

Winter storms include a wide range of weather-related events including snowstorms, blizzards, freezing rain, sleet, and ice storms. Typical snow events produce totals of between one and three inches. On a statewide basis, heavy snowfalls happen on average only five times per winter. Total snow accumulations in southern Wisconsin average about 40-50 inches. While blizzard conditions can occur in southern Wisconsin, it is rare. Both ice and sleet storms can occur at any time from October into April. They are more common in southern Wisconsin than in the northern part of the state. Statewide, there are 3 to 5 freezing rain events.

Terms Related to Winter Storms

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

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

Ice storm - An occurrence where rain falls from warmer upper layers of the atmosphere to the colder ground, freezing upon contact with the ground and exposed objects near the ground forming an accumulation of at least 1/4" in 12 hours or less.

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.

HISTORY OF PAST OCCURRENCES

For the period of 1982 through 2006, there have been 60 winter storm events in Jefferson County consisting of either blizzard conditions, heavy snow, ice, or sleet -- about 2.5 per winter season.

VULNERABILITY ASSESSMENT

Effects on Facilities – Heavy snow can cause the structural collapse of buildings with flat roofs. In recent memory there have been a few winter seasons where snow events taxed the ability of local governments to pay for the removal of snow from roads and keep them clear of snow.

Effects on Population Groups – Winter storms affect all population groups equally. People who commute a comparatively long distance are disproportionately affected.

Effects on Economic Sectors – A prolonged winter storm event with a large accumulation of snow can have a short-term effect on the local economy in terms of lost productivity. Transportation-related businesses are often negatively affected when winter weather hits.

The cost of snow removal is incorporated into local government budgets so there is no direct financial impact arising from a winter storm.

13. EXTREME TEMPERATURE

PROFILE

Periods of excessive heat, often referred to as heat waves, are quite common in Wisconsin during the summer months. When high temperatures do occur, they cover large areas of the country.

Exhibit 5-9. Heat Disorders and Symptoms

Heat Disorder	Symptoms
Sunburn	Redness and pain; in severe cases swelling of skin, blisters, fever, headaches
Heat Cramps	Painful spasms usually in muscles of legs and abdomen possible; heavy sweating
Heat Exhaustion	Heavy sweating, weakness, skin cold, pale and clammy; pulse thready; normal temperature possible; fainting and vomiting
Heat Stroke	High body temperature (106 or higher); hot dry skin; rapid and strong pulse; possible unconsciousness

Source: National Weather Service, National Oceanic and Atmospheric Administration

The National Weather Service (NWS) devised the Heat Index[5] as a way to measure the combined effects of temperature and relative humidity. The Heat Index chart (Exhibit 5-10) also shows when certain physiological responses are commonly seen with prolonged exposure and/or physical activity. As the relative humidity increases, even modest temperatures can cause heat stroke and other less serious heat disorders.

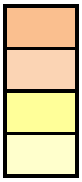
Exhibit 5-10. Heat Index (Apparent Temperature)

Air	Relative Humidity (%)												
Temp. ºF	40	45	50	55	60	65	70	75	80	85	90	95	100
110	136												
108	130	137											
106	124	130	137										
104	119	124	131	137									
102	114	119	124	130	137								
100	109	114	118	124	129	136							
98	105	109	113	117	123	128	134						
96	101	104	108	112	116	121	126	132					
94	97	100	103	106	110	114	119	124	129	135			
92	94	96	99	101	105	108	112	116	121	126	131		
90	91	93	95	97	100	103	106	109	113	117	122	127	132
88	88	89	91	93	95	98	100	103	106	110	113	117	121
86	85	87	88	89	91	93	95	97	100	102	105	108	112
84	83	84	85	86	88	89	90	92	94	96	98	100	103
82	81	82	83	84	84	85	86	88	89	90	91	93	95
80	80	80	81	81	82	82	83	84	84	85	86	86	87

[5] The Heat Index is sometimes referred to as the apparent temperature.

Source: National Weather Service, National Oceanic and Atmospheric Administration

With Prolonged Exposure and/or Physical Activity



Extreme Danger – Heat stroke or sunstroke highly likely

Danger – Sunstroke, muscle cramps, and/or heat exhaustion likely

Extreme Caution – Sunstroke, muscle cramps, and/or heat exhaustion likely

Caution – Fatigue possible

HISTORY OF PAST OCCURRENCES

From 1986 to 2006, there were 10 years in which at least one or more persons in Wisconsin died from the direct or indirect effects of excessive heat (Table 5-23).

Out of all of the natural hazards in Wisconsin, excessive heat is the leading cause of fatalities.

VULNERABILITY ASSESSMENT

In those 10 years, a total of 115 people died. None of the deaths occurred in Jefferson County. However, some Jefferson County residents most likely received medical treatment for heat-related symptoms.

During that 20-year period, 1995 was the deadliest year when a total of 82 deaths were reported. Two heat waves gripped much of the state. The first occurred in mid-June and the second in mid-July. In the second heat wave, temperatures rose to between 100ºF and 108ºF with heat indices of 120ºF to 130ºF.

Table 5-24. Heat-Related Fatalities; United States: 1995

Age	Number	Percent
0 – 19	14	1.4
20 – 29	5	0.5
30 – 39	34	3.3
40 – 49	79	7.7
50 – 59	95	9.3
60 – 69	179	17.5
70 – 79	253	24.8
80 – 89	241	23.6
90 and older	61	6.0
Unknown age	60	6.0
Total	1,021	100

Source: National Weather Service

According to the National Weather Service, the mortality rate from excessive heat in Wisconsin is the highest of all natural disasters – more than four times greater than the second highest cause of death, tornadoes.

Intensely urbanized areas feel the effects of heat waves more than rural areas in that the temperature in urban areas is often elevated because radiant energy is stored in pavement and the exterior building surfaces and is released slowly over a period of time. Even during a heat wave, nighttime temperatures typically drop, but less so in urban areas because these heat reservoirs dissipate the radiant heat collected during the day time. This phenomenon is often referred to as the heat island effect.

Not only are urban areas heat islands, pollutants often build up in the lower atmosphere during periods of excessive heat, causing respiratory problems, especially for the young, the elderly, and those with respiratory ailments such as asthma.

Although the more urban areas of the county experience the heat island effect, the change in the ambient temperature is modest. This is because the urban areas of the county are relatively small and street trees help to deflect solar radiation back into the atmosphere.

Effects on Facilities – Excessive heat does not directly impact critical facilities.

Effects on Population Groups – The elderly are disproportionately affected by heat. For example, during the heat waves of 1995, three-quarters of the fatalities were 60 years of age or older (Table 5-24).

Effects on Economic Sectors – Excessive heat can accompany drought causing a loss of crops. Additionally, some businesses may close or reduce

production to minimize heat effects on employees.

Table 5-23. Heat-Related Fatalities; Wisconsin: 1986 - 2006

Year	Direct Deaths	Indirect Deaths
1986	1	**0**
1988	1	**0**
1993	2	**0**
1995	82	72
1997	1	0
1999	12	8
2001	10	5
2002	3	5
2003	0	4
2006	3	1
Total	115	95

Source: National Weather Service, Milwaukee - Sullivan Office

14. DROUGHT

PROFILE

A drought is an extended period of time when rainfall is significantly below normal amounts. Unlike other natural disasters, it is not known until much later in time, when a drought begins. A drought could last for months, several years, and in extreme conditions, much longer. Droughts are typically accompanied by higher-than-normal temperatures and lower-than-normal relative humidity levels. Some droughts cover entire regions of a continent or can affect a sub-region as small as several counties.

A number of methodologies have been developed to measure droughts from a purely meteorological standpoint. Droughts can also be defined based on the consequences which result. For the purposes of this plan, two types of drought are considered: agricultural and hydrologic. An agricultural drought causes a noticeable drop in crop yields and a hydrological drought causes a drop in lake and stream levels and lowers the height of the ground water table.

Although these two types of droughts can occur at the same time, the negative effects of a drought are first seen on crop production. Hydrologic droughts characteristically lag behind an agricultural drought because it takes time for the lack of precipitation to lower surface and ground water levels. As a result, it is possible for an area to experience a hydrologic drought long after the end of an agricultural drought.

HISTORY OF PAST OCCURRENCES

Agricultural and hydrologic droughts occur in Wisconsin on a regular basis. Since the Dust Bowl, short-lived droughts have occurred on an interval of about once in every ten years. Long-term droughts are more infrequent. Since the Dust Bowl, there have been four significant droughts in the state: 1987-1988, 1976-1977, 1955-1959, and 1948-1950.

VULNERABILITY ASSESSMENT

Given the nature of droughts, it is difficult to quantify the impacts on Jefferson County.

By most accounts, the 1987-1988 drought in Wisconsin was the most severe and is estimated to have a recurrence interval of about 75 years. All Wisconsin counties were eligible for drought assistance. Agricultural losses throughout the state totaled $1.3 billion. More than half of the farms in the state suffered crop
losses of 50 percent or more, with 14 percent experiencing a crop loss of 70 percent or more.

Table 5-25. Source of Drinking Water; Jefferson County: 2016

	Number of Residents	Percent of Total
Public well	35,058	41.6
Private well	49,204	58.4
Total	84,262	100

Source: Estimated from population estimates prepared by Wisconsin Department of Administration, Demographic Service Center

POTENTIAL FOR FUTURE LOSSES

Effects on Facilities and Population Groups – Unlike many of the other natural disasters addressed in this plan, drought conditions do not cause physical harm to people or destroy buildings and other structures.

Effects on Economic Sectors -- The two main concerns with drought relate to economic losses to agricultural crops and livestock and effects on ground water supplies available to both private and public water wells.

According to the Jefferson County Agricultural Preservation and Land Use Plan, roughly half of the unincorporated area of the county is in agricultural production. Droughts would therefore affect a significant portion of the county and a significant economic sector. During extended droughts, municipalities often see an increased water usage due primarily to increased use for lawns and gardens. It is important that municipal wells are properly sized for the number of residents they are intended to serve. At times it may be necessary to impose water restrictions when there is concern that the available water supply may not be sufficient to meet basic needs.

Because municipal wells are generally concentrated in a relatively small area, extended droughts can affect the level of the water table. With decreased rainfall, the water table will naturally drop. Most public water wells draw from the deep aquifers and typically are not negatively affected. However, those wells serving an individual household are comparatively shallow and are more susceptible to a dropping water table, especially when located near a municipal well. Nearly two-fifths of county residents receive their drinking water from a municipal system and the remaining three-fifths from a private well (Table 5-25).

15. WILDLAND FIRE

PROFILE

A wildland fire is an uncontrolled fire burning natural vegetation and potentially buildings and other structures. A wildland fire can occur in a large forested area, woodlot, grassland, roadside ditch, or marsh.

Wildland fires can be ignited by lightening, human carelessness, and arson. In Wisconsin, human carelessness is the leading ignition source.

HISTORY OF PAST OCCURRENCES

Because the majority of Jefferson County is in some form of agriculture, there have been few instances of wildland fires. Those wildland fires that have started are relatively small and contained comparatively quickly. Larger fires that do occur, often occur in marsh areas.

VULNERABILITY ASSESSMENT

Effects on Facilities – With the exception of some utility infrastructure, no critical facilities are vulnerable to a wildland fire.

Effects on Population Groups – wildland fires do not negatively affect any population group.

Effects on Economic Sectors – Wildland fires do not negatively affect any of the economic sectors in Jefferson County.

It is estimated that direct costs for fighting a five-acre grass fire is in the range of $1,500 to $4,500. Costs related to a fire exceeding 25 acres would be in the range of $10,000 to $25,000.

SUMMARY OF RISK BY JURISDICTION

Table 5-26 presents a summary of risk for each jurisdiction in Jefferson County.

Table 5-26. Summary of Risk by Jurisdiction: 2018

	Dam Failure	Flooding [2]	Dense Fog	Tornado	Hail-storm	Thunder-storm	Winter Storms	Temp. Extremes	Drought	Wildland Fire
Town										
Aztalan	Low	Medium	Low	Medium	Medium	Medium	Medium	Medium	Low	Low
Cold Spring	Low	Medium	Low	Medium	Medium	Medium	Medium	Medium	Low	Low
Concord	Low	Medium	Low	Medium	Medium	Medium	Medium	Medium	Low	Low
Farmington	Low	Medium	Low	Medium	Medium	Medium	Medium	Medium	Low	Low
Hebron	Low	Medium	Low	Medium	Medium	Medium	Medium	Medium	Low	Low
Ixonia	Low	Medium	Low	Medium	Medium	Medium	Medium	Medium	Low	Low
Jefferson	Medium	Medium	Low	Medium	Medium	Medium	Medium	Medium	Low	Low
Koshkonong	Medium	Medium	Low	Medium	Medium	Medium	Medium	Medium	Low	Low
Lake Mills	Medium	Medium	Low	Medium	Medium	Medium	Medium	Medium	Low	Low
Milford	Low	Medium	Low	Medium	Medium	Medium	Medium	Medium	Low	Low
Oakland	Low	Medium	Low	Medium	Medium	Medium	Medium	Medium	Low	Low
Palmyra	Medium	Medium	Low	Medium	Medium	Medium	Medium	Medium	Low	Low
Sullivan	Low	Medium	Low	Medium	Medium	Medium	Medium	Medium	Low	Low
Sumner	Low	Medium	Low	Medium	Medium	Medium	Medium	Medium	Low	Low
Waterloo	Low	Medium	Low	Medium	Medium	Medium	Medium	Medium	Low	Low
Watertown	Medium	High	Low	Medium	Medium	Medium	Medium	Medium	Low	Low
Village										
Cambridge [1]	Low	Medium	Low	Medium	Medium	Medium	Medium	Medium	Low	Low
Johnson Creek	Low	Medium	Low	Medium	Medium	Medium	Medium	Medium	Low	Low
Lac La Belle [1]	Low	Medium	Low	Medium	Medium	Medium	Medium	Medium	Low	Low
Palmyra	Low	Medium	Low	Medium	Medium	Medium	Medium	Medium	Low	Low
Sullivan	Low	Medium	Low	Medium	Medium	Medium	Medium	Medium	Low	Low
City										
Fort Atkinson	Low	High	Low	Medium	Medium	Medium	Medium	Medium	Low	Low
Jefferson	Low	High	Low	Medium	Medium	Medium	Medium	Medium	Low	Low
Lake Mills	Low	Medium	Low	Medium	Medium	Medium	Medium	Medium	Low	Low
Waterloo	Low	High	Low	Medium	Medium	Medium	Medium	Medium	Low	Low
Watertown [1]	Medium	High	Low	Medium	Medium	Medium	Medium	Medium	Low	Low
Whitewater [1]	Low	Medium	Low	Medium	Medium	Medium	Medium	Medium	Low	Low

Notes:
1. Municipality located in Jefferson County and another county
2. See Section 6 of this chapter for a detailed loss estimates.

16. SUMMARY OF DAMAGE ESTIMATES

Table 5-27 lists damage estimates for the various natural hazards reviewed in this chapter.

Table 5-27. Damage Estimates for Natural Hazards; Jefferson County

Natural Hazard	Damage Estimate
Dam Failure	Unknown
Flooding [1]	$13.3 million (maximum)
Ice Shoves	$1,000
Fog [2]	0
Tornado/High Wind	$375,000
Hail Storms [2]	$5,000
Thunderstorm [2]	$20,000 property; $2,000 crop
Winter Storms [2] [3]	0
Extreme Temperature – heat	0
Extreme Temperature – cold	0
Drought - short-lived	0
Drought - long-lived	0 property; $100,000-$200,000 crop
Wildland fire - 25 acres or more	$10,000-$20,000
Wildland fire - less than 25 acres	$1,500-$4,500

Notes: 1. Based on a 100-year flood
2. Estimates do not include damage to motor vehicle or other accident-related costs
3. Estimate does not include snow removal costs. These are included in local government budgets.

MITIGATION STRATEGY

1. CHAPTER OVERVIEW

This chapter is intended to identify common mitigation strategies for each of the natural hazards reviewed in this plan and potential funding sources for carrying out mitigation activities. The bulk of the chapter is devoted to listing goals, objectives, and policies along with activities that apply broadly to the county and civil divisions. Where warranted, special programs or projects or activities that apply to a single jurisdiction are also listed.

Chapter Contents

1. Chapter Overview
2. Types of Potential Mitigation Strategies
3. Existing Mitigation Strategies
4. Funding Sources
5. Review of Capabilities
6. Goals, Objectives, Policies, and Activities

2. TYPES OF POTENTIAL MITIGATION STRATEGIES

Mitigation strategies can be grouped into six broad categories:

- Prevention
- Property protection
- Public education and awareness
- Natural resource protection
- Emergency services
- Structural projects

Examples are listed below for each of the natural hazards addressed in this plan.

Dam Failure

- Remove dams that don't serve a useful purpose
- Require the preparation of emergency action plans
- Ensure that emergency action plans are current
- Ensure that dam inspections are conducted as required by state law
- Include a dam failure in emergency planning exercises
- Minimize the level of development in a dam's hydraulic shadow in an effort to minimize damage resulting from a dam failure

Key Terms in This Chapter

Community Rating System (CRS) – A voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum National Flood Insurance Programs requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from qualified community actions.

Goal – A statement that describes a desired condition to be achieved sometime in the future. A goal is often broad in scope, not easily measurable, and long-term in nature.

Objective – A specific and usually measurable intermediate end that is achievable and make progress toward a goal.

National Flood Insurance Program – A Federal program created in 1968 under which flood-prone areas are identified and flood insurance is made available to the owners of the property in participating communities.

Policy – *A predetermined course of action or specific rule that an organization adopts and uses in decision-making and which when applied will help to achieve one or more of its goals or objectives.*

Repetitive loss community – *A community with one or more repetitive loss properties.*

Repetitive loss property (RLP) – *For purposes of the Community Rating System, a property for which two or more National Flood Insurance Program losses of at least $1,000 each have been paid within any 10-year rolling period since 1978.*

Severe residential loss (SRL) property – *A residential property (1) that has at least four NFIP claim payments over $5,000 each, when at least two such claims have occurred within any ten-year period, and the cumulative amount of such claims payments exceeds $20,000; or (2) or which at least two separate claims payments have been made with the cumulative amount of the building portion of such claims exceeding the value of the property, when two such claims have occurred within any 10-year period.*

Safe room – An above ground room within a building (most often homes) that is specifically designed to withstand high winds and provides occupants a safe refuge from tornadoes, hurricanes, or other high-wind events.

Strategy – *An action or a group of actions intended to achieve a goal or objective.*

Flooding

- Continue to enforce floodplain regulation and strengthen requirements when appropriate
- Limit development in the floodplain through local floodplain regulations or zoning
- Provide dryland access through flood-prone areas
- Retrofit legal nonconforming buildings that do not meet floodplain regulations (e.g., elevating, floodproofing)
- Purchase repetitive loss properties and other flood-prone properties and remove structures (i.e., demolition or relocation)
- Raise the surface of local roads above 50-year flood elevations and arterials above 100-year flood elevations
- Enlarge the cross-section of culverts and bridges when they do not adequately carry anticipated flood flows
- Prohibit basements in new subdivisions where flooding from stormwater could be problematic
- Clean drainageways to allow a free flow of water
- Minimize the amount of impervious surfaces in a watershed so that stormwater can soak into the ground rather than contributing to flood water
- Maintain appropriate water rescue equipment
- Develop and implement appropriate evacuation procedures in flood-prone area
- Install gaging stations to better understand surface water flow regimes
- Construct stormwater facilities (e.g., detention and retention basins) to help manage stormwater
- Take steps to upgrade the National Flood Insurance Program requirements

Ice Shoves

- Limit development along lakeshores prone to ice shoves

Fog

- Identify those roadways where fog is localized and install appropriate signage
- Install automated visibility warning systems to detect reduced visibility conditions

Tornado / High Winds

- Construct storm shelters in campgrounds and mobile home parks
- Bury electrical and telephone lines and other utility cables
- Continue to enforce building codes and strengthen requirements when appropriate
- Include safety strategies for severe weather events in driver education classes

Severe Storms/Hail

- Encourage property owners to use building products (e.g., roofing, siding) resistant to hail damage

Snow Storms

- Bury electrical and telephone lines and other utility cables
- Install temporary snow fences along road ways that have experienced blowing and drifting snow

- Continue to enforce building codes and strengthen requirements when appropriate
- State and local governments can produce and distribute information to motorists relating to severe winter weather hazards
- Include safety strategies for severe weather events in driver education classes

Extreme Temperature

- Establish heating and cooling centers for vulnerable populations including the elderly and homeless
- Encourage local residents to contact friends, neighbors, and other family members during periods of extreme temperature

Drought

- Adopt local ordinances for prioritizing water usage during drought emergencies
- Develop public wells in deep aquifers
- Maintain enough water storage capacity in public water systems
- Protect wetlands from development
- Encourage the use of water-saving devices in homes and other places where water is used
- Encourage farmers to take out crop insurance
- Protect important aquifer recharge areas from inappropriate development

Wildland Fire

- Maintain appropriate fire fighting equipment to effectively respond to wildland fires
- Ensure that new homes are well protected from wildland fires and have multiple routes of ingress and egress
- Provide homeowners with information on how to create a defensible space around structures
- Bury electrical and telephone lines and other utility cables
- Institute measures to reduce soil erosion following a wildland fire event
- Local governments in rural areas can require the issuance of burn permits
- Encourage property owners to conduct controlled burns as a means of controlling fuel buildup

3. EXISTING MITIGATION STRATEGIES

NATIONAL FLOOD INSURANCE PROGRAM

In 1968, Congress created the National Flood Insurance Program (NFIP)[1] to identify and map flood-prone communities and provide flood insurance to those property owners within a community that has adopted floodplain management regulations that meet minimum requirements. The Federal Insurance and Mitigation Administration, a division of the Federal Emergency Management Agency (FEMA), administers this Federal program. Over 21,000 communities across the United States and its territories now participate in the NFIP.

Jefferson County participates in the NFIP along with each of the cities and villages (Table 6-1). In 1971, the city of Fort Atkinson became the first jurisdiction in the county to participate. In a number of instances, revised flood

[1] The National Flood Insurance Program was created with the passage of the National Flood Insurance Act of 1968.

insurance rate maps (FIRMs) have been adopted as more accurate information became available.

Beginning in 2006, the Federal Emergency Management Agency, in collaboration with the Wisconsin Department of Natural Resources, initiated a multi-year effort to create and adopt digital FIRMs for the entire county. Those FIRMs became effective June 2, 2009.

Table 6-1. Participating Jurisdictions in the National Flood Insurance Program: 2018

Jurisdiction	Number	Initial FIRM Adopted	Current FIRM Effective Date
Cambridge, village [1]	550080	6/4/1980	6/02/2009
Fort Atkinson, city	555554	8/6/1971	6/02/2009
Jefferson, city	555561	5/26/1972	6/02/2009
Jefferson County, unincorporated	55055	9/29/1978	6/02/2009
Johnson Creek, village	550194	9/30/1982	6/02/2009
Lac La Belle, village [1]	550565	1/18/1983	6/02/2009
Lake Mills, city	550195	7/2/1987	6/02/2009
Palmyra, village	550196	5/3/1990	6/02/2009
Sullivan, village	550197	9/18/1985	6/02/2009
Waterloo, city	550198	9/18/1985	6/02/2009
Watertown, city [1]	550107	4/1/1981	6/02/2009
Whitewater, city [1]	550200	6/1/1982	6/02/2009

Source: Federal Emergency Management Agency (http://www.fema.gov/fema/csb.shtm)

Notes: 1. Municipality located in Jefferson County and another county

Participation in the NFIP is based on an agreement between local communities and the federal government that states, if a community will adopt and enforce a floodplain management ordinance to reduce future flood risks to new construction in Special Flood Hazard Areas, the federal government will make flood insurance available within the community as a financial protection against flood losses.

The Jefferson County floodplain ordinance, adopted in August of 1978, is based on a model established by the Wisconsin Department of Natural Resources. Recently, the DNR drafted a new model ordinance. All existing floodplain ordinances need to meet the requirements of the new model.

Because Jefferson County and each of the cities and villages participate in the NFIP, property owners are able to purchase flood insurance, including those not located within a mapped floodplain area. Flood insurance pays even when no state or federal disaster is declared. Historically, federal disaster declarations have been issued in less than 50 percent of the flooding incidents.

There are two types of flood insurance. The first is a policy that insures the physical structure and the second is a policy that covers the content of the building. The standard flood insurance policy provides coverage for one building per policy. The only exception is 10 percent coverage for a detached garage. However, the total payment for flood damage to the detached garage and the house together cannot exceed the building policy limit. For coverage to apply, the garage can only be used for parking and storage. All other buildings on the

premises need separate coverage. The maximum allowable limits are $250,000 for residential properties and $500,000 for commercial properties.

Contents are not automatically included. If contents coverage is desired, a specific amount must be named and a separate premium charged. Contents coverage limits are $100,000 for residential policies and $500,000 for commercial policies.

Federal disaster declarations are issued in less than 50% of the flooding incidents.

Building property coverage includes:

- The insured building and its foundation
- The electrical and plumbing systems
- Central air conditioning equipment, furnaces, and water heaters
- Refrigerators, cooking stoves, and built-in appliances such as dishwashers
- Permanently installed carpeting over an unfinished floor
- Permanently installed paneling, wallboard, bookcases, and cabinets.
- Window blinds
- Detached garages (up to 10 percent of building property coverage)
- Debris removal

Personal property coverage includes:

- Personal belongings such as clothing, furniture, and electronic equipment
- Curtains
- Portable and window air conditioners
- Portable microwave ovens and portable dishwashers
- Carpets not included in building coverage (see above)
- Clothes washers and dryers
- Food freezers and the food in them
- Certain valuable items such as original artwork and furs (up to $2,500)

The cost of an annual regular flood insurance policy varies depending on the site location, age of the building, design of the building, and elevation of the building if located in a flood hazard area

Sanitary sewer backups are not covered. However, many homeowners policies do have riders to cover sewer back-ups. Sewer back-up riders can cost as little as $30 per year.

While flood insurance coverage can significantly reduce the potential economic loss to a landowner in case of a flood disaster, flood insurance also helps reduce the cost of disaster aid to the general public. It has been shown that every $3 paid in flood insurance claims saves $1 in disaster assistance payments.

In 2017, there were more 345 insurance policies in Jefferson County with coverage of more than $63.2 million (Table 6-2). Premiums totaled $298,150 for those policies.

Table 6-2. Flood Insurance Policies: 2017 (June)

Jurisdiction	Policies	Total Coverage	Total Premiums
Cambridge, village [1]	-	-	-
Fort Atkinson, city	45	$8,157,400	$61,974
Jefferson, city	34	$5,477,100	$31.687
Jefferson County, unincorporated	174	$31,739,700	$190,791
Johnson Creek, village	2	$700,000	$830
Lac La Belle, village [1]	0	0	0
Lake Mills, city	1	$105,000	$288
Palmyra, village	1	$350,000	$415
Sullivan, village	0	0	0
Waterloo, city	10	$1,407,900	$7,263
Watertown, city [1]	-	-	-
Whitewater, city [1]	14	$3,721,300	$8,616

Source: Federal Emergency Management Agency (https://bsa.nfipstat.fema.gov/reports/1011.htm#WIT)

Notes: 1. Municipality located in Jefferson County and another county

Table 6-3. Insurance Premium Reductions for Communities in the Community Rating System

CRS Rating	Special Flood Hazard Area	Non-Special Flood Hazard Area
1	45%	10%
2	40%	10%
3	35%	10%
4	30%	10%
5	25%	10%
6	20%	10%
7	15%	5%
8	10%	5%
9	5%	5%
10	0	0

COMMUNITY RATING SYSTEM

The Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum requirements of the National Flood Insurance Program (NFIP). Because flood risk has been reduced, policy holders in participating communities enjoy lower flood insurance premiums than those located in a community that is not part of CRS. Flood insurance premium rates are discounted as shown in Table 6-3 based on a community's rating. A Class 1 community receives a 45 percent premium discount, while a Class 9 community receives a 5 percent discount. A Class 10 community is not participating in CRS and receives no discount. The CRS classes for local communities are based on 18 activities, organized under four categories: (1) public information, (2) mapping and regulations, (3) flood damage reduction, and (4) flood preparedness. Nationwide, 1,049 communities are part of CRS, or roughly 5 percent of those who are eligible.

In Jefferson County, the city of Watertown is the only jurisdiction that is part of CRS (Table 6-4). All of the other communities have a CRS rating of 10.

Table 6-4. CRS Rating for Communities in Jefferson County: 2018

Jurisdiction	CRS Rating
Jefferson County	10
City of Fort Atkinson	10
City of Jefferson	10
City of Lake Mills	10
City of Waterloo	10
City of Watertown [1] [2]	7
City of Whitewater [1]	10
Village of Cambridge [1]	10
Village of Johnson Creek	10
Village of Lac La Belle [1]	10
Village of Palmyra	10
Village of Sullivan	10

Notes: 1. Municipality located in Jefferson County and another county
2. Watertown enrolled in the CRS in October 1991 and has maintained its current rating since October 2001.

PROPERTY ACQUISITION AND STRUCTURE REMOVAL

Given the large number of buildings located in the 100-year floodplain, Jefferson County began a program in 1988 to acquire flood-prone properties with the intent of removing the buildings either through demolition or relocation. Since then, Jefferson County has acquired and demolished over 100 residential structures located in flood-prone areas (Table 6-5).

Table 6-5. Flood-Prone Properties Acquired by Jefferson County: 1988–2018

Municipality / Tax Key Number	Location	Acres	Date Acquired
Town of Aztalan			
002-0714-2341-001	Marobehl Lane	0.300	12-18-2009
Town of Ixonia			
012-0816-3422-004	CTH F	0.490	10-04-2010
Town of Koshkonong			
016-0513-1333-000	-	1.750	10-26-1995
016-0513-1333-001	-	0.250	10-26-1995
016-0513-1444-001	-	0.250	10-05-1988
016-0513-3413-023	N355 Oxbow Bend	-	-
016-0513-3413-028	N327 Oxbow Bend	-	-
016-0514-0541-003	STH 106	2.730	05-20-2010
016-0514-0821-001	N2098 Vets Lane	-	-
016-0514-0821-004	Vets Lane	0.250	07-15-2010
016-0514-1811-003	Blackhawk Island Road	0.250	08-31-2006
016-0514-1811-006	-	0.280	01-21-1997
016-0514-1811-008	Blackhawk Island Road	0.280	07-30-2010
016-0514-1811-015	-	0.200	04-18-1996
016-0514-1813-000	Blackhawk Island Road	0.444	05-20-2010
016-0514-1813-003	-	0.970	01-21-1997
016-0514-1813-007	Blackhawk Island Road	0.310	01-13-2010
016-0514-1813-020	Blackhawk Island Road	0.189	08-03-2004
016-0514-1813-021	W7085 Blackhawk Island Road	-	-
016-0514-1813-022	-	0.440	08-20-1998
016-0514-1823-006	W7253 Blackhawk Island Road	-	-
016-0514-1823-008	-	0.650	10-26-1995
016-0514-1823-010	-	0.250	09-12-1997
016-0514-1823-012	-	0.256	09-12-1997
016-0514-1824-000	-	0.230	11-28-2005
016-0514-1824-001	-	0.273	03-26-1999
016-0514-1824-002	Blackhawk Island Road	0.574	12-26-2009
016-0514-1824-004	-	0.296	04-05-1999
016-0514-1824-006	Blackhawk Island Road	0.740	07-30-2010
016-0514-1824-008	-	0.330	09-18-1995
016-0514-1824-009	Blackhawk Island Road	0.290	10-04-2010
Town of Oakland			
022-0613-0742-053	Sleepy Hollow Road	0.210	04-28-2010
028-0513-1141-004	North Shore Road	0.920	12-18-2009
028-0513-1141-007	North Shore Road	0.331	01-20-2010
028-0513-1141-013	N1852 North Shore Road	-	-
028-0513-1141-021	Lamp Road	1.260	03-19-2010
028-0513-1141-023	LAMP RD	0.540	05-21-2010
028-0513-1141-032	W7772 Lamp Road	-	-
028-0513-1141-035	W7764 Lamp Road	-	-
028-0513-1142-030	WILLOW RD	0.200	12-19-2009
028-0513-1142-051	WILLOW RD	0.055	07-15-2010
028-0513-1142-052	W7836 Willow Road	-	-
028-0513-1144-015	W7738 Lamp Road	-	-
028-0513-1144-020	W7724 Lamp Road	-	-
028-0513-1144-024	-	0.130	07-15-2010

Continued

Table 6-5. Flood-Prone Properties Acquired by Jefferson County: 1988–2018

Municipality / Tax Key Number	Location	Acres	Date Acquired
Town of Oakland - continued			
028-0513-1144-025	W7710 Lamp Road.	-	-
028-0513-1144-027	W7706 Lamp Road.	-	-
028-0513-1233-001	Lamp Road	0.107	07-15-2010
028-0513-1233-007	Lamp Road	0.220	03-10-2008
028-0513-1233-010	Lamp Road	0.240	10-02-2003
028-0513-1233-014	Lamp Road	0.220	09-09-2010
028-0513-1233-014	W7668 Lamp Road	-	-
028-0513-1233-017	W7674 Lamp Road	-	-
028-0513-1314-001	-	0.370	06-07-1999
028-0513-1314-002	-	0.150	06-07-1999
028-0513-1314-004	-	0.440	12-23-1996
028-0513-1314-005	-	0.360	06-10-1996
028-0513-1314-009	-	0.440	01-10-1997
028-0513-1314-010	-	0.440	09-08-1998
028-0513-1314-013	-	0.500	03-31-1997
028-0513-1314-014	-	0.310	09-18-1995
028-0513-1314-015	-	0.310	12-16-1996
028-0513-1314-017	-	0.070	09-12-1997
028-0513-1314-018	-	0.070	09-12-1997
028-0513-1314-020	-	0.270	03-31-1997
028-0513-1314-021	-	0.100	06-10-1996
028-0513-1331-002	-	3.920	02-27-1996
028-0513-1331-009	-	0.330	10-28-1996
028-0513-1331-011	W7604 Blackhawk Island Road	-	-
028-0513-1331-013	-	0.275	02-12-1999
028-0513-1331-014	-	0.275	12-01-1997
028-0513-1331-015	-	0.331	02-27-1996
028-0513-1331-016	W7632 Blackhawk Island Road	-	-
028-0513-1331-018	Blackhawk Island Road	0.448	07-30-2010
028-0513-1331-019	-	0.122	06-26-1997
028-0513-1332-002	-	0.600	12-17-1997
028-0513-1332-003	-	0.590	04-03-1997
028-0513-1333-002	-	0.450	11-16-1995
028-0513-1333-003	-	0.430	06-30-1997
028-0513-1333-007	W7706 Blackhawk Island Road	-	-
028-0513-1333-009	W7714 Blackhawk Island Road	-	-
028-0513-1333-013	-	0.350	09-18-1995
028-0513-1333-014	W7734 Blackhawk Island Road	-	-
028-0513-1333-015	W7740 Blackhawk Island Road	-	-
028-0513-1342-009	Blackhawk Island Road	0.240	11-24-2003
028-0513-1342-010	-	0.230	09-18-1995
Town of Watertown			
032-0815-1723-012	River View Road	0.330	12-15-2009
032-0815-2411-013	N2527 Rock River Paradise	-	-
032-0815-2411-016	W2545 Rock River Paradise	-	-
032-0815-2421-004	-	0.526	07-30-2010
032-0815-2421-005	Rock River Paradise	0.321	07-30-2010

Source: Jefferson County Emergency Management

STORMREADY

StormReady is a national voluntary program, administered through local National Weather Service offices that encourages communities to take a proactive approach in developing plans to improve local hazardous weather operations and public awareness for all types of local severe weather threats[2]. It is intended to give communities the skills and education needed to cope with and manage potential weather-related disasters, before and during the event. By participating in StormReady, local agencies can earn recognition for their jurisdiction by meeting criteria established by the National Weather Service in partnership with federal, state, and local emergency management professionals.

The program does not replace any of the various federally or state-funded hazard mitigation programs, rather, it compliments them. The entire community - from the mayor, emergency managers, to business leaders and civic groups - can take the lead on becoming StormReady. Education and communication are a key part of the StormReady program. The Wisconsin StormReady Advisory Board, comprised of National Weather Service personnel and state, regional, and county emergency managers, reviews applications and visits the jurisdictions to verify the steps made in the process to become StormReady. The designation is only valid for two years.

The city of Lake Mills was initially certified in 2001, the first community in Wisconsin to receive the StormReady designation. The city of Whitewater, is the only other jurisdiction in the county to be certified (Table 6-6).

Table 6-6. StormReady Jurisdictions; Wisconsin 2017 (June)

Jurisdiction	
Counties	
Calumet	date not known
Fond du Lac	date not known
Lincoln	date not known
Oneida	date not known
Racine	12/08/2005
St. Croix	date not known
Communities	
Bayside	date not known
Belleville	7/13/2004
Cedarburg	9/10/2001
Dousman	1/13/2005
Elm Grove	date not known
Hillsboro	6/24/2008
Lake Delton	date not known
Lake Mills	5/14/2001
New Berlin	date not known
Viroqua	9/28/2004
Waupaca	date not known
Whitewater	8/22/2001
Gov't/Military Sites	
Fort McCoy	date not known
WI Emergency Management	date not known
Universities	
UW-Madison	date not known
UW-Milwaukee	date not known

Source: https://www.weather.gov/stormready/wi-sr

NOAA WEATHER RADIO

NOAA Weather Radio (NWR) is a nationwide network of radio stations broadcasting continuous weather information direct from a nearby National Weather Service office. NWR broadcasts National Weather Service warnings, watches, forecasts, and other hazard information 24 hours a day. It is also used to broadcast warning and post-event information for all types of hazards - both natural events (e.g., severe weather, flooding) and man-made events (e.g., Amber Alerts, toxic, chemical, and biological releases, terrorist attacks).The radios can be programmed to receive information specific to a certain geographic area and sound an alarm to alert users of approaching dangerous weather. NWR is the primary actuator of the Federal Communications Commission's Emergency Alert System (EAS).

The NOAA Weather Radio network provides authoritative weather and emergency information to the public.

As of June, 2012, the NWR network included 1,000 stations covering all 50 states, adjacent coastal waters, Puerto Rico, the U.S. Virgin Islands, and the U.S. Pacific Territories.

The Milwaukee/Sullivan Weather Service Forecast office is located in the town of Sullivan and serves 20 counties in south-central and southeast Wisconsin. NOAA Weather Radios are available through retail stores that sell electronic appliances, marine supply stores, truck stops, cable shopping networks, mail order catalogs, and the Internet.

[2] More information about StormReady is available from the Milwaukee/Sullivan Weather Service Forecast office. www.crh.noaa.gov/mkx/?n=stormready-mkx

URBAN STORMWATER MANAGEMENT ORDINANCES

New urban development brings with it increases in impervious surfaces such as rooftops, driveways, and streets. As areas develop into urban land uses, there is an increase in both volume and rate of runoff. To control the rate of runoff and potential downstream increases in peak flood elevations, some communities require detention of stormwater.

Jefferson County has adopted a stormwater management ordinance and each of the cities and villages have an ordinance as well.

EROSION AND SEDIMENT CONTROL ORDINANCES

Sediment from construction sites can deposit in local streams causing blockages that can result in potentially higher flood elevations during storm events. To control construction site erosion from construction sites, the Wisconsin Department of Commerce has adopted construction site erosion control regulations through the state Uniform Building Code. State erosion control regulations are enforced through the local building inspectors. In addition to the state regulations, the city of Watertown has adopted a citywide construction erosion control ordinance for new developments.

SHORELAND ZONING

Under Wisconsin Administrative Code NR 115, counties are required to adopt a shoreland zoning ordinance that controls development within the shoreland[3] of lakes and streams. The shoreland-zoning ordinance establishes minimum lot sizes–10,000 square feet on public sanitary sewer and 20,000 square feet on private sanitary systems. Buildings must be setback 75 feet from the ordinary high-water mark and comply with local floodplain zoning ordinances. The ordinance regulates the cutting of trees and shrubbery within 35 feet of the ordinary high-water mark and prohibits more than 30 feet of every 100 feet to be removed. Primary uses in the shoreland-zoning district are limited to open space, agricultural, and maintenance of piers, roadways, and public utilities. These development standards follow land when it is annexed into a city or village, unless the municipality has adopted an ordinance as strict as the county ordinance. Jefferson County has adopted an ordinance consistent with state requirements. No city or village in Jefferson County has adopted a shoreland zoning ordinance.

SHORELAND WETLAND ZONING

Under Wisconsin Administrative Code NR 115, counties are required to adopt a shoreland wetland zoning ordinance that creates a shoreland wetland zoning district to control the development of wetlands that are two acres or more in size within the shoreland area. Permitted uses in the shoreland wetland district are limited to:

- recreation (hiking, fishing, hunting, swimming, and boating)
- agriculture
- public roadways and railroad lines
- public utilities
- non-residential building used for aquaculture

These development standards follow land when it is annexed into a city or village, unless the municipality has adopted an ordinance as strict as the county ordinance. Jefferson County has adopted an ordinance consistent with state

[3] A shoreland is defined as land within the following distances from the ordinary high-water mark of navigable waters: 1000 feet from a lake, pond, or flowage; and 300 feet from a river or stream or the landward side of the floodplain, whichever is greater. (NR 115.03 (8))

requirements. No city or village in Jefferson County has adopted a shoreland zoning ordinance.

COMPREHENSIVE PLANS

In 1999, the Governor signed legislation that created a new framework for comprehensive planning in Wisconsin. By January 1, 2010, any community wanting to regulate land use must have an adopted comprehensive plan that meets minimum state requirements. Although state requirements do not require that natural hazard planning be a part of a comprehensive plan, communities do have an opportunity to consider natural hazards when devising land use plans and goals, objectives, and policies relating to land use and environmental management. Table 6-7 shows the status of these plans in the county.

Table 6-7. Status of Comprehensive Plans in Jefferson County: 2017 (June)

Jurisdiction	Status
Jefferson County	Sept. 8, 2012; February 14, 2012
City of Fort Atkinson	September 16, 2008
City of Jefferson	March 18, 2008; November 3, 2015
City of Lake Mills	February 17, 2009
City of Waterloo	August 7, 2008
City of Watertown [1]	2000; November 17, 2009
City of Whitewater [1]	February 2, 2010
Village of Cambridge [1]	No date (Title is Smart Growth 2025)
Village of Johnson Creek	January 26, 2009; October 16, 2014; April 11, 2016
Village of Lac La Belle [1]	October 20, 2010
Village of Palmyra	May 19, 2008: January 16, 2012
Village of Sullivan	November 10, 2009

Source: Verified with community February, 2017

Notes: 1. Municipality located in Jefferson County and another county

FARMLAND PRESERVATION PROGRAM

The state of Wisconsin created the Wisconsin Farmland Preservation Program in 1977 to support the efforts of counties to preserve agricultural resources. If a county has an approved agricultural preservation plan that meets the standards of Chapter 91, Wisconsin Statutes, farmland owners are eligible to receive a state income tax credit.

In October 1999, the county board adopted the *Jefferson County Agricultural Preservation and Land Use Plan*. The agricultural preservation goals of the plan are to:

- Preserve the rural character and aesthetic quality of Jefferson County.
- Provide equity and fairness to owners of land with comparable resources and location characteristics.
- Minimize nonagricultural development on prime agricultural soils.
- Maintain the integrity of agricultural districts allowing for accepted agricultural practices.

The County will be updating its current farmland preservation plan on in 2018/2019.

An additional benefit of agricultural preservation is the long-term protection of natural floodplains and flood storage. Sites managed for agricultural preservation will have minimal urban development. Under the agricultural preservation program, the county has established an A-3 Agricultural/Rural Residential Zoning District that limits the number of residential lots in agricultural areas to a maximum of three 2-acre lots per agricultural parcel. The result of the county's agricultural zoning is that much of the floodplain and flood storage areas will be preserved from urban development and increases in flood elevations due to upstream urbanization will be minimized.

ENVIRONMENTAL CORRIDORS

As part of its agricultural preservation and land use plan, Jefferson County designated certain land as environmental corridors where additional preservation policies and development standards apply. The environmental corridor protection effort is intended to:

- protect and preserve an environmental corridor system consisting of wetlands, floodplains, and steeply sloped glacial features,
- protect groundwater and surface water quality, and
- discourage development in areas that possess valuable natural resource characteristics and wildlife habitats.

Environmental corridors include the following area:

- Publicly-owned park, recreation, and conservancy lands.
- Water bodies and wetlands mapped as part of the wetland inventory conducted by the Wisconsin Department of Natural Resources.
- 100-year floodplains based on Federal Emergency Management Agency (FEMA) maps.
- Contiguous woodlands over 10 acres in size.
- Lands with slopes in excess of 20 percent.

Under the county's environmental corridor overlay district zoning, urban development is limited to one dwelling unit per 10 acres. Land disturbances associated with nonagricultural development are prohibited on slopes greater than 20 percent. No buildings should be constructed within 75 feet of wetlands designated by the Department of Natural Resources or navigable bodies of water. Within Jefferson County, 16,000 acres of environmental corridor is in public ownership. Approximately 55,000 acres, or 15.5 percent of the county, is wetland and/or land within the 100-year floodplain. The environmental corridor district provides another tier of protection for floodplains and flood storage areas such as wetlands. The result of the corridor program will be additional prohibition of building in flood-prone areas and greater protection of natural flood storage, minimizing future increases in flood elevations.

Tornado Siren

TORNADO SIRENS

Jefferson County has a variety of warning devices/methods. There is an outdoor warning siren system comprised of 41 sirens that reach about 37 percent of the county's population. This system is maintained by each municipality and is tested once a month throughout the year. The 911 Center activates all sirens with the exception of Fort Atkinson, Waterloo, and Fort Atkinson.

Annex B of the Jefferson County Emergency Operations Plan identifies the procedures and resources used to provide interagency communications between responders. The annex also identifies the county's procedures and resources used to provide warning to all county residents in the event of a disaster.

ROADWAY CLOSURES DURING FLOOD EVENTS

In some of the larger flood events, roadways in the county are blocked with water. This can create a potentially dangerous scenario for drivers, limit access to areas within the county, or cause travel delays. To deal with roadway closings, there are two categories of alternatives. The first are alternatives to modify the roadway (e.g. bridge replacement and elevate roadway) to prevent flooding. The second category includes maintenance of a system to actively close roadways when flooding occurs and identify alternate routes for emergency traffic.

Bridge Replacement. In some cases, an alternative to road inundation may be to increase the hydraulic opening of the bridges to allow less backwater on the upstream side of the bridge. The Flood Insurance Study does not provide enough information for most bridges to determine if the bridge is causing the roadway inundation. From the available information, it appears that most of the bridges in Jefferson County are inundated by backwater from downstream areas, and the bridge plays little roll in the roadway inundation. At this time, an active bridge replacement program with the sole purpose of reducing the frequency of inundation is recommended. When bridges are scheduled for replacement due to age or roadway expansion, the bridge designers should look at the effect of the bridge design on the roadway overtopping. If feasible, the new bridge should be replaced with a structure that would meet the criteria outlined in Table 6-8.

The Wisconsin Department of Transportation (WDOT) provides design criteria for structure crossings a stream in the Facilities Development Manual, Procedure 13-10-1. Major structures, such as bridges and box culverts, are designed using a process of selecting a design frequency which best produces a balance between structure costs and the cost of potential flood-related damages or risks. Structures in new locations are generally designed to accommodate the 100-year event without increasing the upstream flood stages over existing conditions. Replacement structures are generally designed not to increase the headwater elevation from existing conditions.

In some situations, structure sizes may be increased to reduce the upstream flood elevations. In those cases, if the existing structure is causing upstream flood storage, the flows will need to be re-evaluated to determine if the new structure will increase downstream flows and stages. Under Wisconsin Administrative Code NR 116, if a new bridge results in upstream or downstream increases in the flood elevation greater than 0.01 feet, easements from the affected landowners are required. Where feasible, roadway surfaces should be designed to provide emergency access during flood events. The recommended criterion for flood protection, based on roadway classification, is outlined in Table 6-6.

Elevation of Roadways An alternative to roadway inundation is to raise the pavement surface to above the regional flood elevation. Placing additional fill along the roadway corridor would raise the road surface. While this alternative would help maintain public access, the raising of the road surface may increase flood elevations upstream of the fill. The fill would need to be structurally designed to withstand the hydraulic pressures of the floodwaters. As with bridge replacement, wide-scale elevation of roadway surfaces is not recommended at this time. As roadway maintenance is scheduled, the designers should consider the alternative of roadway elevation. Roadways should only be raised where the project is cost effective.

Table 6-8. Recommended Roadway Flood Protection Level

Roadway Classification	Recommended Protection Level
Interstate and railroads	100-year flood
State & county highway	50-year flood
Local arterial	50-year flood
Minor and collector street	10-year flood

Road Closures During Flooding Drowning is the number one cause of flood deaths. More people drown in their cars than anywhere else. During flood events, the depth of the water over road surfaces is difficult to predict. Many drivers enter water they think is a few inches deep, only to find themselves in the center of a flowing stream. For years, Jefferson County and the local municipalities have closed and barricaded roadways that are flooded. The Jefferson County Emergency Operations Plan (March 2000) outlines the procedures for emergency response during flood events. A coordinated system between Jefferson County Emergency Management, the Jefferson County Sheriffs Department, and local municipalities is in place to close flooded roads and reroute traffic.

PUBLIC INFORMATION

Information is one of the most important tools in helping people mitigate the potential impacts of natural hazards. To be effective, information needs to be available from several sources and be offered on an on-going basis.

By way of example, Table 6-9 outlines the roles of the various organizations involved in public education with regards to floodplain issues.

Table 6-9. Organizations and Their Roles in Distributing Public Information Regarding Floodplain Management

Organization / Activities
Federal Emergency Management Agency (FEMA) ♦ Provides information on National Flood Insurance Program (NFIP) ♦ Provides training to insurance industry on implementation of NFIP ♦ Provides technical information on flood mitigation activities ♦ Maintains a national library of floodplain maps
Wisconsin Emergency Management ♦ Provides information and training in emergency management including preparedness, response, recovery, and mitigation activities.
Wisconsin Department of Natural Resources ♦ Provides information on National Flood Insurance Program (NFIP) ♦ Provides technical information on flood mitigation activities ♦ Maintains a state library of floodplain maps and flood profile models ♦ Provides training to local zoning administrators on implementation of floodplain zoning ordinances
Jefferson County Zoning and Sanitation Department ♦ Maintains local library of floodplain maps ♦ Provides information on National Flood Insurance Program (NFIP) ♦ Provides information on county floodplain regulations
Local Insurance Agents ♦ Provides information on National Flood Insurance Program (NFIP)
Local Lending Agencies ♦ Provides information on National Flood Insurance Program (NFIP). Flood insurance is required on federally-backed mortgages for properties located in a floodplain.
Real Estate Agents ♦ Provides information on National Flood Insurance Program (NFIP) ♦ Required by state law to notify buyers whether or not a structure is located in a regulatory floodplain

In an effort to keep state residents informed about natural hazards, Wisconsin Emergency Management sponsors a number of public awareness campaigns, including:

- Tornado & Severe Weather Week
- Rip Current Awareness Week
- Heat Awareness Day

- Lightning Safety Week proclamations

4. FUNDING SOURCES

AVAILABLE FEDERAL FUNDING SOURCES

The Federal Emergency Management Agency administers a number of programs that fund mitigation activities at the local and State level.

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. The HMGP is authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act.

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

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.

Repetitive Flood Claims Program The Repetitive Flood Claims (RFC) grant program was authorized by the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004, which amended the National Flood Insurance Act of 1968. Up to $10 million is available annually for FEMA to provide RFC funds to assist States and communities reduce flood damages to insured properties that have had one or more claims to the National Flood Insurance Program. Eligible activities include acquisition of properties, and either demolition or relocation of flood-prone structures, where the property is deed restricted for open space uses in perpetuity.

Severe Repetitive Loss Program The Severe Repetitive Loss (SRL) grant program was authorized by the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004, which amended the National Flood Insurance Act of 1968 to provide funding to reduce or eliminate the long-term risk of flood damage to severe repetitive loss (SRL) structures insured under the National Flood Insurance Program (NFIP). The act authorized up to $40 million for each fiscal year 2005 through 2009.

Eligible flood mitigation project activities include floodproofing (historical properties only), relocation, elevation, acquisition, mitigation reconstruction (demolition rebuild), and minor physical localized flood control projects.

FUNDING RECEIVED

Since 1996, Jefferson County has received more than $18.1 million in federal funding for mitigation activities (Table 6-10).

Table 6-10. Federal and State Funding for Mitigation Activities: 1965–2018

Year	Jurisdiction	Amount	Funding Source	Funded Activities
1991	Jefferson County	$108,684	Hazard Mitigation Grant Program through Presidential declaration FEMA-912-DR	Land acquisition – Flood Mitigation Program
1993	Jefferson County	$458,635	Hazard Mitigation Grant Program through Presidential declaration FEMA-994-DR	Land acquisition – Flood Mitigation Program
1993	Jefferson County	$509,000	Community Development Block Grant (CDBG)	Land acquisition – Flood Mitigation Program
1993	Jefferson County	$611,900	Urban Rivers Grant Program through Wisconsin Department of Natural Resources	Land acquisition – Flood Mitigation Program
1998	Jefferson County	$115,332	Flood Mitigation Assistance	
1999	Jefferson County	$22,660	Flood Mitigation Assistance (FMA) program	Prepare a floodplain hazard mitigation plan
2000	Jefferson County	$226,378	Hazard Mitigation Grant Program through Presidential declaration FEMA-1322-DR-WI	Land acquisition
2000	Jefferson County	$975,000	Hazard Mitigation Grant Program through Presidential declaration FEMA-1332-DR-WI	Land acquisition – Flood Mitigation Program
2002	Jefferson County	$344,582	Hazard Mitigation Grant Program through Presidential declaration FEMA-1369-DR-WI	Land acquisition – Flood Mitigation Program
2004	Jefferson County	$300,000	Hazard Mitigation Grant Program through Presidential declaration FEMA-1526-DR-WI	Land acquisition
2005	Jefferson County	$143,349	Flood Mitigation Assistance WI-2005-029	Land acquisition
2005	Jefferson County	$58,900	Flood Mitigation Assistance (FMA) program	Prepare a flood mitigation plan
2005/06	Jefferson County	$147,200	Flood Mitigation Assistance (FMA) program	Land acquisition – Flood Mitigation Program
2008	Jefferson County	$8,774,643	Hazard Mitigation Grant Program FEMA-1768-DR-WI	Land acquisition
2008	Jefferson County	$2,000,000	Community Development Block Grant	Land acquisition
2010	Jefferson County	$3,318,400	Hazard Mitigation Grant Program FEMA-1933-DR-WI	Land acquisition
--	Jefferson County	$____	forthcoming	Land acquisition
--	Jefferson County	$____	forthcoming	Land acquisition
	Total	$18,114,663		

Source: Jefferson County Emergency Management

5. REVIEW OF CAPABILITIES

This multi-jurisdictional plan covers all of the unincorporated area of Jefferson County and 11 municipalities – 5 villages and 6 cities. They all have different levels of resources and personnel that could be made available in the implementation of this plan.

Municipalities in the state are given the authority to adopt and enforce floodplain regulations. All municipalities have elected to do so. All of the municipalities also have adopted and enforce building codes.

Table 6-11. Summary of Staff Capabilities: 2018

	Administrator	Emergency Management Staff	Community Planner
Village			
Cambridge [1]	No	No	No
Johnson Creek	Yes	No	No
Lac La Belle [1]	No	No	No
Palmyra	No	No	No
Sullivan	No	No	No
City			
Fort Atkinson	Yes	No	Yes
Jefferson	Yes	No	No
Lake Mills	Yes	No	No
Waterloo	Yes	No	No
Watertown [1]	Yes	No	No
Whitewater [1]	Yes	Yes (1 FTE)	Yes
Jefferson County	Yes	Yes (1.2 FTE)	Yes

Notes:
1. Municipality located in Jefferson County and another county

6. Goals, Objectives, Policies, and Activities

This section builds off of the previous parts of the plan and presents a unified plan of action to mitigate the effects of natural hazards on property, people, and assets. It lists goals, objectives, and policies that should guide decision-makers and other officials. Goals are intended to describe an end state, usually in general terms. In contrast, objectives describe an end state in measurable and specific terms. Policies give clear direction on what will be done to help achieve a goal and objective.

Following the listing of goals, objectives, and policies, a chart lists specific action items along with an estimated implementation cost. Responsible entities are listed for each so that implementation is well defined.

The activity charts are a work in progress. As items are completed they should be deleted and as new opportunities or issues arise items will be added. Further, depending on available resources, including funding and staff time, priorities may change.

Prioritization Of Goals And Actions

Activities are prioritized as low, medium, or high based on the STAPLE+E approach. Exhibit 6-1 lists each of the criteria used to identify the priority. The mitigation actions with the highest priority were deemed to be the most cost effective and most compatible with the community's social and cultural values.

Exhibit 6-1. STAPLE+E

Criteria	Description
S – Social	Mitigation actions are acceptable to the community if they do not adversely affect a particular segment of the population, do not cause relocation of lower income people, and if they are compatible with the community's social and cultural values.
T – Technical	Mitigation actions are technically most effective if they provide long- term reduction of losses and have minimal secondary adverse impacts.
A – Administrative	Mitigation actions are easier to implement if the jurisdiction has the necessary staffing and funding.
P – Political	Mitigation actions can truly be successful if all stakeholders have been offered an opportunity to participate in the planning process and if there is public support for the action.
L – Legal	It is critical that the jurisdiction or implementing agency have the legal authority to implement and enforce a mitigation action.
E – Economic	Budget constraints can significantly deter the implementation of mitigation actions. Hence, it is important to evaluate whether an action is cost-effective, as determined by a cost benefit review, and possible to fund.
E – Environmental	Sustainable mitigation actions that do not have an adverse effect on the environment, that comply with Federal, State, and local environmental regulations, and that are consistent with the community's environmental goals, have mitigation benefits while being environmentally sound.

Relationship To Other Local Planning Efforts

It is strongly recommended that these goals and actions be adopted as part of local comprehensive planning efforts where appropriate, especially in areas where existing problems can be corrected and to prevent problems from occurring in newly developed areas.

Cost Benefit Analysis For Goals And Actions

Specific cost benefit reviews will occur for each action in each participating jurisdiction during annual budget scenarios. Most identified actions are programmatic and not capital expenditures. The impact and cost of each program will be determined on an as needed basis prior to implementation. The information provided with each action is intended to assist in the cost benefit evaluation of each action. Costs estimates, funding sources, schedules, and responsible parties are preliminary and subject to change based on fiscal conditions. Federal funding for mitigation activities can only be obtained when benefits clearly outweigh the costs.

Major Accomplishments

Since this plan was first adopted in 2008, a number of significant work activities have been accomplished as described in Table 6-12.

Table 6-12. Major Accomplishments: 2008-2018

Description	Jurisdiction
1. Floodproofed or otherwise protected the Waterloo Carousel from flooding. (Activity #21 under Goal 2, Flooding in 2008 Plan)	City of Waterloo
2. Jefferson County Emergency Management secured funding from local, state, and federal sources to acquire more than 25 flood-prone properties. (Activity #2 under Goal 2, Flooding in 2008 Plan)	Jefferson County
3. Acquired a 1.6-acre site along the Maunesha River in the downtown area for flood storage. Demolished an old pickle factory (Both of these are related to Activity #21 under Goal 2, Flooding in 2008 Plan)	City of Waterloo
4. Jefferson County Emergency Management secured funding from local, state, and federal sources to acquire 21 flood-prone properties. (Activity #2 under Goal 2, Flooding in 2008 Plan)	Jefferson County
5. Worked with County Fair Director to establish radio and procedures for early weather detection and notification during events, and provide a copy of events at the fairgrounds to National Weather Service for early warning notifications.	Jefferson County
6. Conducted STEP training (Student Tools for Emergency Planning) in to local schools	Jefferson County
7. Conducted a number of table-top exercises	Jefferson County and others
8. Worked to get LP for county residents in 2015	Jefferson County
9. Developed a debris management plan	Jefferson County
10. Completed a feasibility study to establish a water gaging station on the Crawfish River near Hubbleton	Jefferson County
11. Amended the county's emergency operations plan to address extreme temperatures	Jefferson County
12. Implemented Integrated Public Alert and Warning System (IPAWS) in 2016	Jefferson County

As part of the 2010 update, significant changes were made to this section of the plan. Those goals, objectives, policies, and activities that were added as part of the 2018 plan update are so noted, along with those that have been revised. Those that ensure continued compliance with the National Flood Insurance are also so designated.

The following exhibit presents a summary of changes in objectives, policies, and implementation activities between the 2012 plan and the 2018 plan. Cost estimates were updated as appropriate.

Exhibit 6-2. Summary of Significant Changes to Objectives, Policies, and Activities in 2018 Plan

Goal	Objectives	Policies	Activities
Goal 1. Public Education and Communication	No change	No change	No change except to update status
Goal 2. Flooding and Dam Failure	No change	No change	Updated activity status; removed activity #3 and 19, 20 in previous plan
Goal 3. Tornadoes	No change	No change	Updated activity status

Goal 4. Extreme Temperature	No change	No change	Updated activity status, and removed #6 in previous plan because it was completed
Goal 5. Severe Storms, Hail & High Winds	No change	No change	Updated activity status, removed #1, 2, and 3 in previous plan
Goal 6. Drought	No change	No change	Updated activity status
Goal 7. Wildland Fire	No change	No change	Updated activity status, removed #4 in previous plan

Most of the cities and villages adopting this plan have identified one or more unique implementation activity. The cities of Fort Atkinson and Jefferson and the Village of Cambridge share a single implementation activity (#2 under Goal 2, Flooding). The City Administrator for the City of Whitewater worked with various departments and elected officials to identify potential implementation activities that are unique to the city and determined that the implementation activities it is responsible for are appropriate and that no unique implementation activity is warranted.

Goal 1. Public Education
Provide the public with the education they need to adequately prepare for and respond to natural hazards identified in this plan including dam failure, flooding, ice shoves, fog, tornado/high winds, hailstorms, thunderstorms, winter storms, extreme temperature, drought, and wildland fire. (**2008 Plan**)

Objectives
1. Strengthen emergency service preparedness and response by enhancing public education throughout the county. (**2008 Plan**)
2. Increase the number of households that have prepared a family emergency plan. (**2008 Plan**)
3. Increase the number of public outreach materials in Spanish. (**2008 Plan**)

Policies
1. Work with non-governmental organizations (youth, service, professional, religious) to promote mitigation education and awareness. (**2008 Plan**)
2. Look for multiple and varied opportunities to disseminate educational information to county residents. (**2008 Plan**)

Implementation Actions / Strategies	Cost Estimate (2018)	Priority	Schedule 2019 to 2023	Schedule 2024 to 2028	Responsible Entity
1. Develop, enhance, and implement education programs aimed at mitigating natural hazards and reducing the risk to citizens, public agencies, private property owners, businesses, and schools. (Safety Network, faith-based organizations, civic groups, Chambers of Commerce, etc.) (**2008 Plan; 2018 status – ongoing effort**	$5,000	Medium	X	X	Jefferson County Emergency Management; American Red Cross
2. Create displays for use at public events (health fair, public awareness day, county fair). (**2008 Plan; 2012 status – ongoing effort**)	Staff time and supplies	Low	X	X	Jefferson County Emergency Management
3. Establish a single webpage on the county's website to provide up-to-date hazard-related information. (**2008 Plan; 2018 status – Facebook site created but ongoing effort**)	Staff time	Medium	X	X	Jefferson County Emergency Management
4. Work with the schools within the county to promote hazard mitigation education and awareness and discuss ways to better integrate mitigation into the curriculum. (**2008 Plan; 2018 status – conducted STEP (Student Tools for Emergency Planning**) **in two schools)**	Staff time	Medium	X	X	Jefferson County Emergency Management; American Red Cross
5. Identify, improve, and sustain collaborative programs focusing on the real estate and insurance industries, public and private sector organizations, and individuals to avoid activity that increases risk to natural hazards. (**2008 Plan; 2018 status – no action**)	Staff time	Medium	X		Jefferson County Emergency Management; American Red Cross; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan
6. Develop and maintain a geographic database for natural hazard events, including location, weather conditions, and resulting damage. (**2008 Plan; 2018 status – no action**)	Staff time	High	X		Jefferson County Emergency Management; Jefferson County Land Information Office, National Weather Service (NWS)
7. Work to provide more hazard-related information in Spanish. (**2008 Plan; 2018 status – ongoing effort**)	Staff time	Medium	X		Jefferson County Emergency Management Jefferson County Literacy Council; United Migrant Opportunity Service; Jefferson County Public Health; Workforce Development
8. Enhance the Village's website (Village of Sullivan) to include more information about disaster preparedness (**2018 status – ongoing effort**)	Staff time	Medium	X		Village of Sullivan

Goal 2. Flooding
Protect the public health, safety, and welfare of county residents and public and private property during flood events. (**2008 Plan**)

Objectives
1. Minimize the impact of flooding on potentially affected structures. (**2008 Plan**)
2. Decrease the number of structures currently located in the 100-year floodplain that are not properly flood-proofed. (**2008 Plan**)
3. Minimize the amount of impervious surface in new development projects to allow more infiltration of stormwater into the ground. (**2008 Plan**)
4. Decrease the number of repetitive loss properties. (**2008 Plan**)
5. Decrease the number of repetitive loss communities in the county. (**2008 Plan**)
6. Increase public awareness of flooding. (**2008 Plan**)
7. Improve communication between the county and local units of government when floods occur or are likely to occur. (**2008 Plan**)

Policies
1. Continue to enforce floodplain regulations to ensure that future development in the 100-year floodplain meets established standards. (**2008 Plan**)
2. Continue the buyout program on Blackhawk Island. (**2008 Plan**)
3. Support the identification and conservation of land with high flood mitigation value (e.g., wetlands, upland storage, and infiltration areas). (**2008 Plan**)
4. Support land acquisition and other management strategies to preserve open space for flood mitigation purposes. (**2008 Plan**)
5. Ensure that governmental officials and employees, county residents, and real estate agents are aware of floodplain regulations. (**2008 Plan**)
6. Ensure that people owning property in the 100-year floodplain, and their agents, notify buyers when selling their property. (**2008 Plan**)
7. Adopt standards to control the proportion of a site that can be covered with impervious surfaces. (**2008 Plan**)
8. Locate public infrastructure outside of the 100-year floodplain. When infrastructure has be located in the 100-year floodplain, it should be flood proofed or otherwise protected from flood water. (**2008 Plan**)
9. Design and properly size all new stream crossings to not create a significant upstream back-water effect. (**2008 Plan**)
10. Continue to enforce stormwater management regulations. (**2008 Plan**)
11. Use data records in on-going assessment of flood problems and effectiveness or response programs. (**2008 Plan**)
12. Formalize communications links and establish procedures**.** (**2008 Plan**)
13. Update flood insurance rate maps (FIRMs) when it can be shown that they are substantially inaccurate. (**2008 Plan**)
14. Ensure that all large dams in the county have emergency action plans and that they are up to date. (**2008 Plan**)
15. Undertake such activities as may be required to remain compliant with the requirements of the National Flood Insurance Program. (**2008 Plan**)

Implementation Actions / Strategies	Cost Estimate (2018)	Priority	Schedule 2019 to 2023	Schedule 2024 to 2028	Responsible Entity
1. Identify and analyze feasible mitigation options for repetitive flood properties and other flood-prone properties. (**2008 Plan; 2018 status – ongoing effort**)	Staff time	Medium	X	X	Jefferson County Emergency Management
2. 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 flood proof repetitive loss sites and other flood-prone properties or remove them through acquisition followed by demolition or relocation. (**2008 Plan; 2018 status – in progress**)	Staff time	High	X	X	Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, and Watertown; village of Cambridge
3. Develop a computerized database containing information on each culvert and bridge within the county. (**2008 Plan; 2018 status – in progress**)	Staff time	Medium	X		Jefferson County Emergency Management
4. Identify those culverts and bridges that are undersized or are otherwise unable to handle expected flood flows. (**2008 Plan; 2018 status – ongoing effort**)	Staff time	Medium	X		Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan as appropriate

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Implementation Actions / Strategies	Cost Estimate (2018)	Priority	Schedule 2019 to 2023	Schedule 2024 to 2028	Responsible Entity
5. Develop a geographic database for public roadways that are susceptible to flooding. (**2008 Plan; 2018 status – ongoing**)	Staff time	Medium	X		Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan as appropriate
6. Prepare a strategy to prioritize road improvements for public roadways that are susceptible to flooding. (**2008 Plan; 2018 status – no action**)	Staff time	Medium	X		Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan as appropriate
7. Identify undeveloped areas of the county, if any, that have flood mitigation value and develop appropriate strategies to protect them. (**2008 Plan; 2018 status – no action**)	Staff time	Medium	X		Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan as appropriate
8. Establish a framework to compile and coordinate surface water management plans and data throughout Jefferson County. (**2008 Plan; 2018 status – no action**)	Staff time	Medium	X		Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan as appropriate
9. Post flood recovery plans and programs to help county residents rebuild and implement mitigation measures to protect against future floods. (**2008 Plan; 2018 status – ongoing effort**)	Staff time	Medium	X	X	Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan
10. Distribute National Flood Insurance Program information. (**2008 Plan; 2018 status – ongoing effort**)	Staff time	Medium	X	X	Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan
11. Explore options for improving the ability of local units of government to report flooding, receive information, and request assistance. (**2008 Plan; 2018 status – ongoing effort, email monthly updates to municipalities**)	Staff time	Medium	X		Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan
12. Develop and maintain a geographic database for natural hazard events, including location, weather conditions, and resulting damage. (**2008 Plan; 2018 status – no action**)	Staff time	High	X	X	Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan
13. Evaluate the support for and the feasibility of becoming part of the Community Rating System (CRS) to lower flood insurance premiums for property owners. (**2008 Plan; 2018 status – ongoing effort**)	Staff time	High	X		Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan

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Implementation Actions / Strategies	Cost Estimate (2018)	Priority	Schedule 2019 to 2023	Schedule 2024 to 2028	Responsible Entity
14. Work with the DNR to ensure that an emergency action plan is prepared for large dams and that they are periodically updated. (**2008 Plan; 2018 status – ongoing effort**)	Staff time	Medium	X		Jefferson County Emergency Management
15. Develop a prioritized list of areas of the county meriting detailed flood studies. (**2008 Plan; 2018 status – ongoing effort**)	Staff time	Medium	X		Jefferson County Emergency Management
16. Install a surface water gaging station on the Crawfish River near Hubbleton. (**2008 Plan; 2018 status – completed feasibility determination**)	Staff time	Medium	X		Jefferson County Emergency Management
17. Ensure that privately-owned large dams are inspected consistent with state law. (**2008 Plan; 2018 status – no action**)	Staff time	Medium	X		Jefferson County Emergency Management; Cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan as appropriate
18. Conduct a study to determine feasible and cost-effective solutions to minimize flooding in downtown Waterloo (Maunesha River). (**2008 Plan; 2018 status – in progress**)	$8,000 to $12,000	High	X		City of Waterloo
19. Enhance the 1.6-acre site the City acquired in 2012 for flood storage and restore the stream channel and other related efforts (**2018 status – new action item**)	Unknown	High	X		City of Waterloo
20. Repair the Mill Road Dam. (**2008 Plan; 2018 status – ongoing effort**)	Unknown	High	X		Village of Palmyra
21. Mitigation projects as may be identified as a result of the Water Resources Management Study within the Village of Johnson Creek. (**2008 Plan; 2018 status – no action**)	Variable	Variable	X		Village of Johnson Creek
22. Enlarge the capacity of the city's (Watertown) stormwater sewer system which may include detention basins (**2018 status – ongoing effort**)	Unknown	Medium	X	X	City of Watertown
23. Complete a dam failure analysis for the Spring Lake Dam (**2018 status – ongoing effort**)	Cost included in current budget	High	X		Village of Palmyra
24. Add a backup power to two well pump houses	$150,000 each	Medium	X		City of Fort Atkinson
25. Add two portable pumps for lift station use	$45,000 each	Medium	X		City of Fort Atkinson

Goal 3. Tornadoes
Lessen the effects of a tornado to the extent feasible and speed recovery following an event. (**2008 Plan**)

Objectives
1. Increase public education and awareness of the potential severity of tornadoes. (**2008 Plan**)
2. Minimize the amount of time that businesses damaged by a tornado are not operational. (**2008 Plan**)
3. Minimize the amount of time it takes to rebuild or restore dwellings damaged by a tornado. (**2008 Plan**)
4. Prevent injuries and death from tornadoes. (**2008 Plan**)

Policies
1. Bury overhead power and utility lines where feasible as a way to reduce power outages during all types of storm events. (**2008 Plan**)
2. Require that mobile homes and manufactured housing are securely anchored in place. (**2008 Plan**)
3. Ensure that adequate tornado shelters are available to county residents especially those living in mobile home parks. (**2008 Plan**)
4. Include redevelopment objectives in smart growth comprehensive plans to support post-disaster development activities. (**2008 Plan**)
5. Continue to support the efforts of severe weather spotters. (**2008 Plan**)
6. Keep the current siren system functioning and in good repair. (**2008 Plan**)
7. Encourage residents to obtain NOAA weather radios especially in those areas of the county that are not covered by a siren. (**2008 Plan**)

Implementation Actions / Strategies	Cost Estimate (2018)	Priority	Schedule 2019 to 2023	Schedule 2024 to 2028	Responsible Entity
1. Periodically assess whether there are enough shelters to house displaced persons. (**2008 Plan; 2018 status – ongoing effort**)	Staff time	Medium	X	X	Jefferson County Emergency Management; American Red Cross
2. Apply for mitigation funding to purchase NOAA weather radios for county residents. (**2008 Plan; 2018 status – no action**)	Staff time	Low	X		Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan
3. Study the feasibility of and support for adopting a local regulation which would require new mobile home parks and future expansions of existing parks to provide for a tornado shelter. (**2008 Plan; 2018 status – no action**)	Staff time	Medium	X		Jefferson County Emergency Management
4. Develop and implement strategies for debris management. (**2008 Plan; 2018 status – in progress and completion anticipated in 2019**)	Staff time	Medium	X		Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan
5. Amend land development regulations to require a storm shelter in mobile home parks when the number of mobile homes exceeds a threshold as established by the jurisdiction. (**2008 Plan; 2018 status – no action**)	Staff time	Medium	X		Jefferson County Zoning Department; Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan
6. Install storm shelters near or in existing mobile home parks and high occupancy campgrounds, such as Bark River Campground & Resort and River Bend. (**2008 Plan; 2018 status – no action**)	Staff time	Medium	X		Mobile home park operators and campground operations with Jefferson County Emergency Management
7. Investigate grant funding for storm shelters. (**New 2012; 2018 status – in progress**)	Staff time	Medium	X		Jefferson County Emergency Management
8. Develop and maintain a geographic database for natural hazard events, including location, weather conditions, and resulting damage. (**2008 Plan; 2018 status – no action**)	Staff time	High	X		Jefferson County Emergency Management; Jefferson County Land Information Office
9. Update and improve sirens (**2018 status – new action item**)	Unknown	Medium	X	X	City of Watertown
10. Update the city's outdoor storm warning system (7 sirens) (**2018 status – new action item**)	$210,000	Medium	X	X	City of Fort Atkinson

11.	Study the feasibility of constructing at storm shelter at Sand Beach trailer park (**2018 status – new action item**)	Budgeted	Medium	X	City of Lake Mills

Goal 4. Extreme Temperature
Protect the health of Jefferson County residents from extreme temperature. (**2008 Plan**)

Objectives
1. Prevent deaths from extreme temperature. (**2008 Plan**)

Policies
1. Encourage volunteers to look after vulnerable individuals, especially the elderly, during times of extreme temperature. (**2008 Plan**)
2. Open county and other public facilities with air conditioning as appropriate for public access during periods of extreme heat. (**2008 Plan**)
3. Ensure that county residents are aware that there are different forms of assistance to help qualified individuals pay their winter heating costs. (**2008 Plan**)

Implementation Actions / Strategies	Cost Estimate (2018)	Priority	Schedule 2019 to 2023	Schedule 2024 to 2028	Responsible Entity
1. Develop a directory of public buildings that would be open to the public during heat waves (and also during the evening hours). (**2008 Plan; 2018 status – in progress**)	Staff time	Medium	X	X	Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan
2. 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 temperature. (**2008 Plan; 2018 status – no action**)	Staff time	High	X		Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan
3. Investigate the possibility of establishing a database of individuals who are vulnerable to extreme temperature and who have voluntarily placed their name on the call list. (**2008 Plan; 2018 status – in progress**)	Staff time	Medium	X		Jefferson County Volunteer Organization Acting in Disasters (VOAD); Jefferson County Emergency Management; Jefferson County Public Health
4. Publicize available programs that help residents pay for their utility expenses. (**2008 Plan; 2018 status – ongoing activity**)	Staff time	Medium	X		Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan
5. Develop and maintain a geographic database for natural hazard events, including location, weather conditions, and resulting damage. (**2008 Plan; 2018 status – no action**)	Staff time	High	X		Jefferson County Emergency Management; Jefferson County Land Information Office
6. Amend the county's emergency operations plan to address extreme temperatures. (**2008 Plan; 2018 status – ongoing effort**)	Staff time	High	X		Jefferson County Emergency Management; American Red Cross; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan

Goal 5. Severe Storms, Hail, & High Winds
Protect and prepare Jefferson County residents from the dangers of extreme weather. (**2008 Plan**)

Objectives
1. Increase public education and awareness of the potential dangers of thunderstorms, snow storms, hail, and windstorms. (**2008 Plan**)

Policies
1. Bury overhead power and utility lines where feasible as a way to reduce power outages during all types of storm events. (**2008 Plan**)
2. Provide citizens with early storm warnings. (**2008 Plan**)
3. Encourage the use of surge protectors on critical electronic equipment in governmental and critical facilities. (**2008 Plan**)
4. Work with utility companies to assess and to improve, when necessary, electric service reliability. (**2008 Plan**)
5. Work with utility companies to ensure that trees are properly trimmed near utility lines. (**2008 Plan**)

Implementation Actions / Strategies	Cost Estimate (2018)	Priority	Schedule 2019 to 2023	Schedule 2024 to 2028	Responsible Entity
1. Produce and distribute emergency preparedness information related to thunderstorms, snow storms, hailstorms, and windstorm hazards. (**2008 Plan; 2018 status – ongoing effort**)	Staff time	Medium	X		Jefferson County Emergency Management; American Red Cross
2. Identify and pursue funding opportunities to develop and implement local and county mitigation activities. (**2008 Plan; 2018 status – ongoing effort**)	Staff time	Medium	X		Jefferson County Emergency Management; American Red Cross; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan
3. Install lightning grade surge protection devices for critical electronic components used by government, public service, and public safety facilities, such as warning systems, control systems, communications, and computers. (**2008 Plan; 2018 status – ongoing effort**)	$3,000	Medium	X		Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan
4. Provide the public with information about proven lightning safety guidelines to reduce the risk of lightning hazards. (**2008 Plan; 2018 status – ongoing effort**)	Staff time	Medium	X		Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan
5. Develop and implement strategies for debris management. (**2008 Plan; 2018 status – ongoing effort**)	Staff time	Medium	X		Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan
6. Apply for mitigation funding to purchase NOAA weather radios for county residents. (**2008 Plan; 2018 status – no action**)	Staff time	Medium	X		Jefferson County Emergency Management
7. Develop and maintain a geographic database for natural hazard events, including location, weather conditions, and resulting damage. (**2008 Plan; 2018 status – no action**)	Staff time	High	X		Jefferson County Emergency Management; Jefferson County Land Information Office

Goal 6. Drought

Protect the public health, safety, and welfare of Jefferson County residents during periods of drought. (**2008 Plan**)

Objectives

1. Decrease water consumption during periods of drought. (**2008 Plan**)
2. Minimize the economic impacts of drought on the local economy. (**2008 Plan**)

Policies

1. Encourage water conservation during periods of drought. (**2008 Plan**)
2. Impose watering restrictions during periods of extreme drought. (**2008 Plan**)
3. Work with multiple agencies to conserve water, provide drought prediction, and provide stream and groundwater monitoring. (**2008 Plan**)
4. Work with agencies that can assist with and promote soil health, preserve soil moisture and help to minimize the loss of the crops and topsoil in the event of a drought. (**2008 Plan**)
5. Continue to monitor groundwater levels to identify the status of groundwater resources and trends. (**2008 Plan**)
6. Work cooperatively with state agencies and other levels of government in developing appropriate strategies on a regional basis. (**2008 Plan**)
7. Provide water for livestock when the needs of humans have been or are being met. (**2008 Plan**)

			Schedule		
Implementation Actions / Strategies	**Cost Estimate (2018)**	**Priority**	**2019 to 2023**	**2024 to 2028**	**Responsible Entity**
1. Create an ordinance to prioritize or control water use during drought conditions. (**2008 Plan; 2018 status – no action**)	Staff time	Medium	X	X	Municipalities with public water systems
2. Provide public education about the potential severity of drought events. (**2008 Plan; 2018 status – ongoing effort**)	Staff time	Low	X		Jefferson County Emergency Management, cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan
3. Develop a set of procedures for water distribution during drought to those in need. (**2008 Plan; 2018 status – no action**)	Staff time	Medium	X		Jefferson County Emergency Management
4. Develop and maintain a geographic database for natural hazard events, including location, weather conditions, and resulting damage. (**2008 Plan; 2018 status – no action**)	Staff time	High	X		Jefferson County Emergency Management; Jefferson County Land Information Office

Goal 7. Wildland Fire
Protect structures and residents in Jefferson County from the hazard of uncontrolled wildfire. (**2008 Plan**)

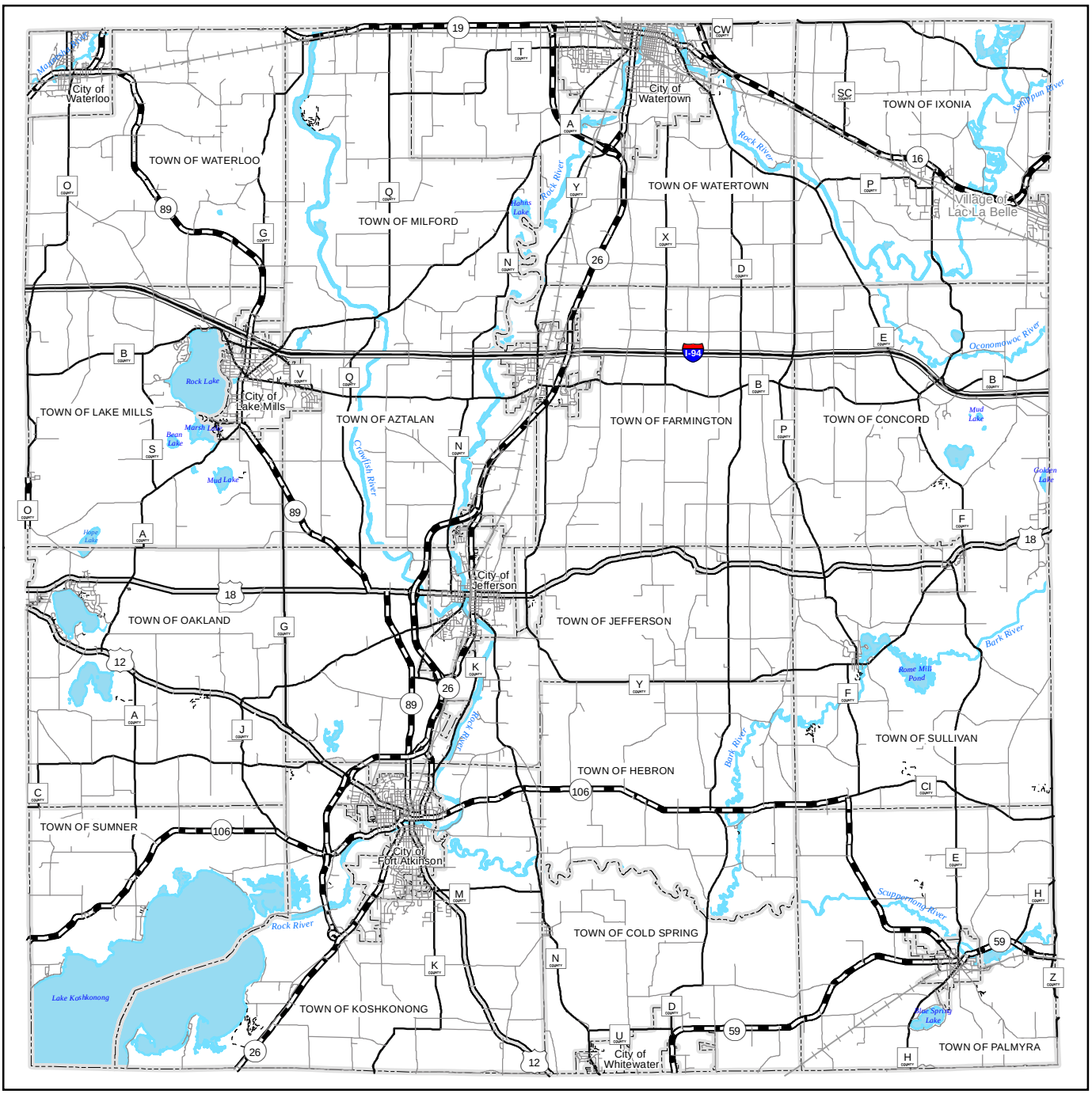
Objectives
1. Decrease the number of wildland fires occurring in the county. (**2008 Plan**)
2. Decrease the number of acres burned from wildland fires. (**2008 Plan**)
3. Increase public education. (**2008 Plan**)

Policies
1. Support the use of controlled burns as a way of reducing the threat of dangerous wildland fires. (**2008 Plan**)
2. Enhance emergency services to increase the efficiency of wildfire response and recovery activities. (**2008 Plan**)
3. Keep track of wildfire events in the county to better document the extent and location of these events. (**2008 Plan**)

Implementation Actions / Strategies	Cost Estimate (2018)	Priority	Schedule 2019 to 2023	Schedule 2024 to 2028	Responsible Entity
1. Apply for federal and state grants to enhance the capability of local fire departments. (**2008 Plan; 2018 status – no action**)	Staff time	Medium	X	X	Jefferson County Emergency Management; local fire departments
2. Provide education to county and municipality 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. (**2008 Plan; 2018 status – no action**)	Staff time	Low	X		Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan
3. Study the feasibility of and support for adopting a local burning permit program at the Town level. (**2008 Plan; 2018 status – no action**)	Staff time	Medium	X		Jefferson County Emergency Management working with the Towns
4. Develop and maintain a geographic database for natural hazard events, including location, weather conditions, and resulting damage. (**2008 Plan; 2018 status – no action**)	Staff time	High	X		Jefferson County Emergency Management; Jefferson County Land Information Office
5. Investigate the establishment of a uniform way of providing information to the public regarding issuance of burning permits. (**2008 Plan; 2018 status – no action**)	Staff time	High	X		Jefferson County Sheriff's Department; local fire departments

MAP SERIES

1. Road Network: 2018
2. Land Use; Unincorporated Jefferson County: 2008
3. Surface Water Resources: 2018
4. Campgrounds and Mobile Home Parks: 2018
5. Bridges and Dams: 2018
6. Public-Use Airports and Railroads: 2018
7. Telecommunication Facilities: 2018
8. Energy Facilities: 2018
9. Public Water and Wastewater Facilities: 2018
10. Public Safety Facilities: 2018
11. Government Facilities: 2018
12. Schools: 2018
13. Special Care Residential Facilities: 2018
14. Special Care Non-Residential Facilities: 2018
15. Health Care Facilities: 2018
16. Facilities with Hazardous Materials: 2018
17. Structures in 100-Year Floodplain: 2008
18. Critical Facilities by Type: 2018



Legend

- Private Road
- Local Road
- Collector Road
- State Highway
- Federal Highway
- Interstate
- RailRoads
- Water Body
- River
- Municipal Boundary

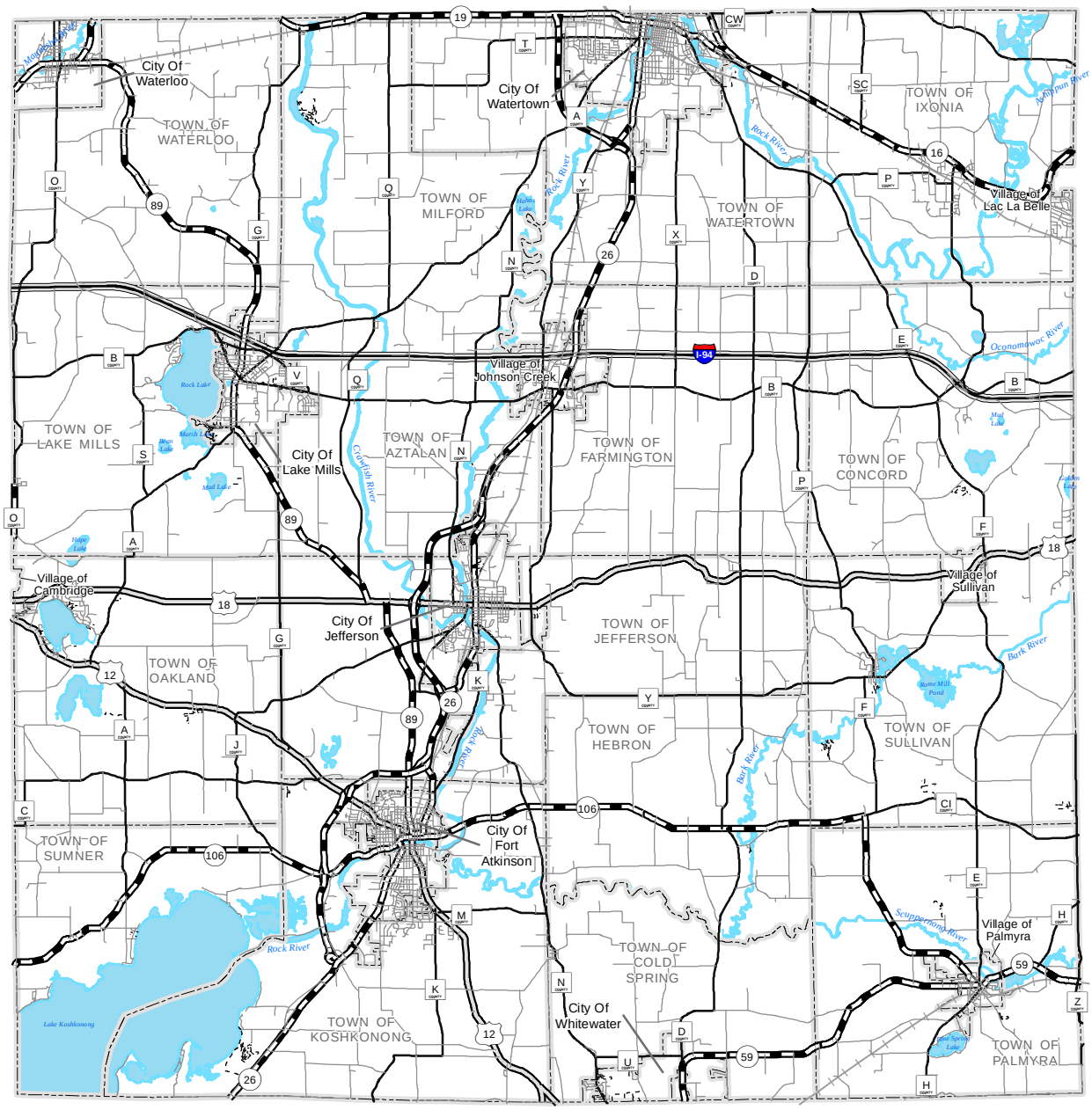
Source: Basemap from Jefferson County Land Information Office

0 1 2 3 Miles

N

Map 1
Road Network: 2018

Jefferson County Hazard Mitigation Plan



Legend

- Open Space
- Agriculture
- Industrial
- Institutional
- Residential
- Retail
- Road
- River
- Water Body
- Municipal Boundary

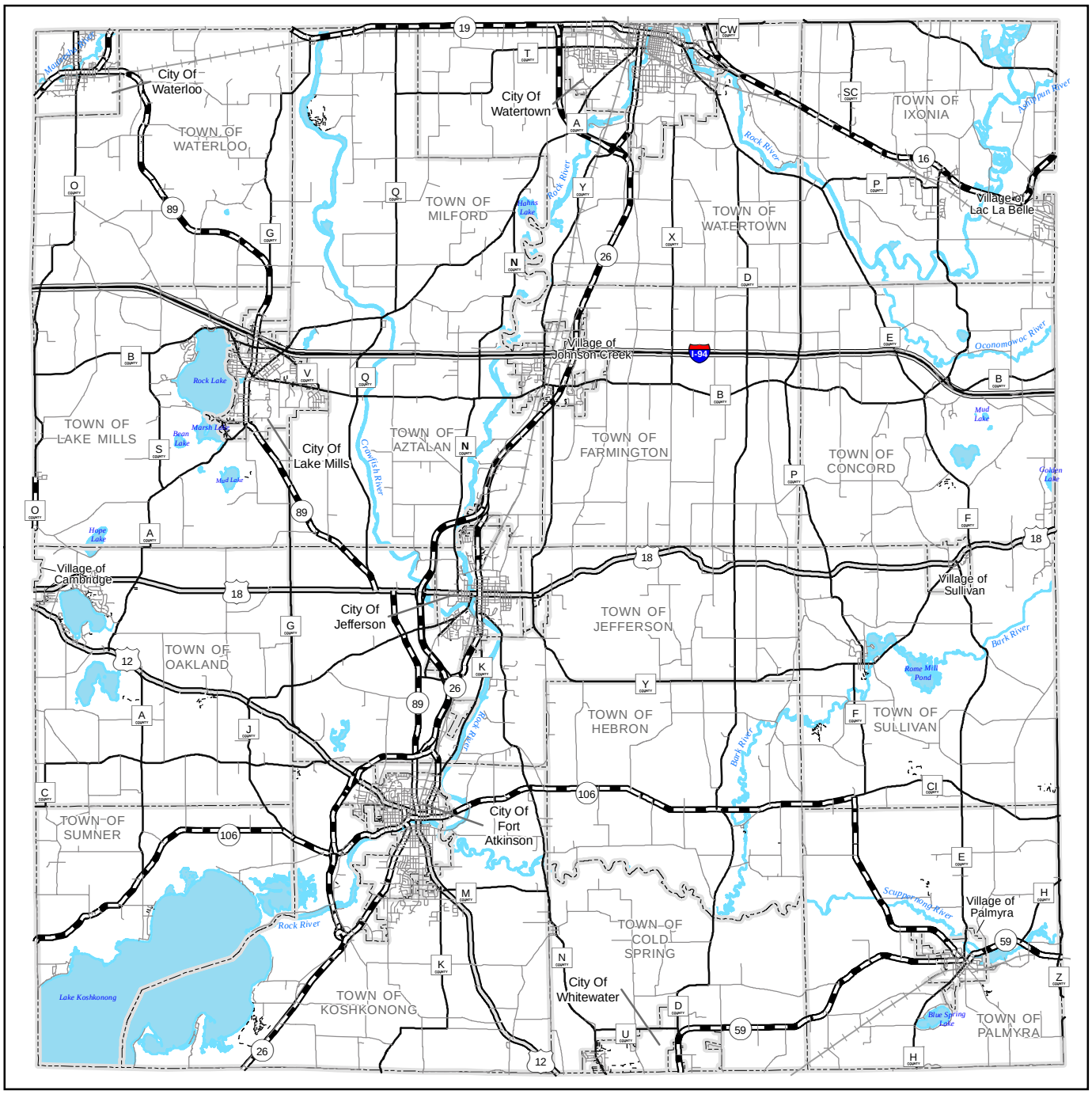
0 1 2 3 Miles

N

Source: Basemap from Jefferson County Land Information Office

Map 2
Unincorporated Jefferson County Land Use: 2018

Jefferson County Hazard Mitigation Plan



Legend

100 Year Floodplain

Road

Stream

River

Water Body

Municipal Boundary

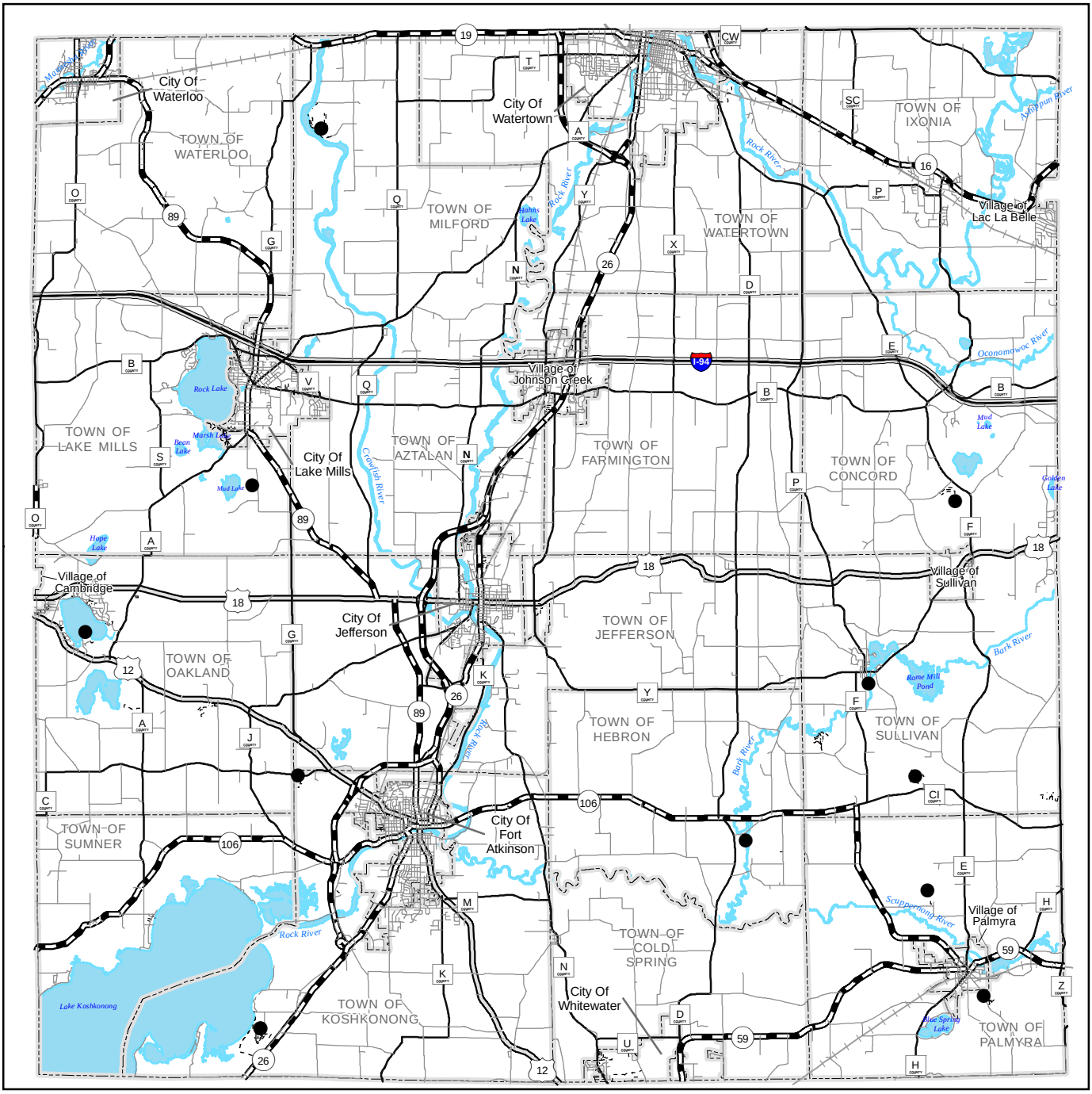
0 1 2 3 Miles

N

Source: Basemap from Jefferson County Land Information Office

Map 3
Surface Water Resources: 2018

Jefferson County Hazard Mitigation Plan



Legend

- Campground
- Water Body
- Towns
- Road
- Rivers

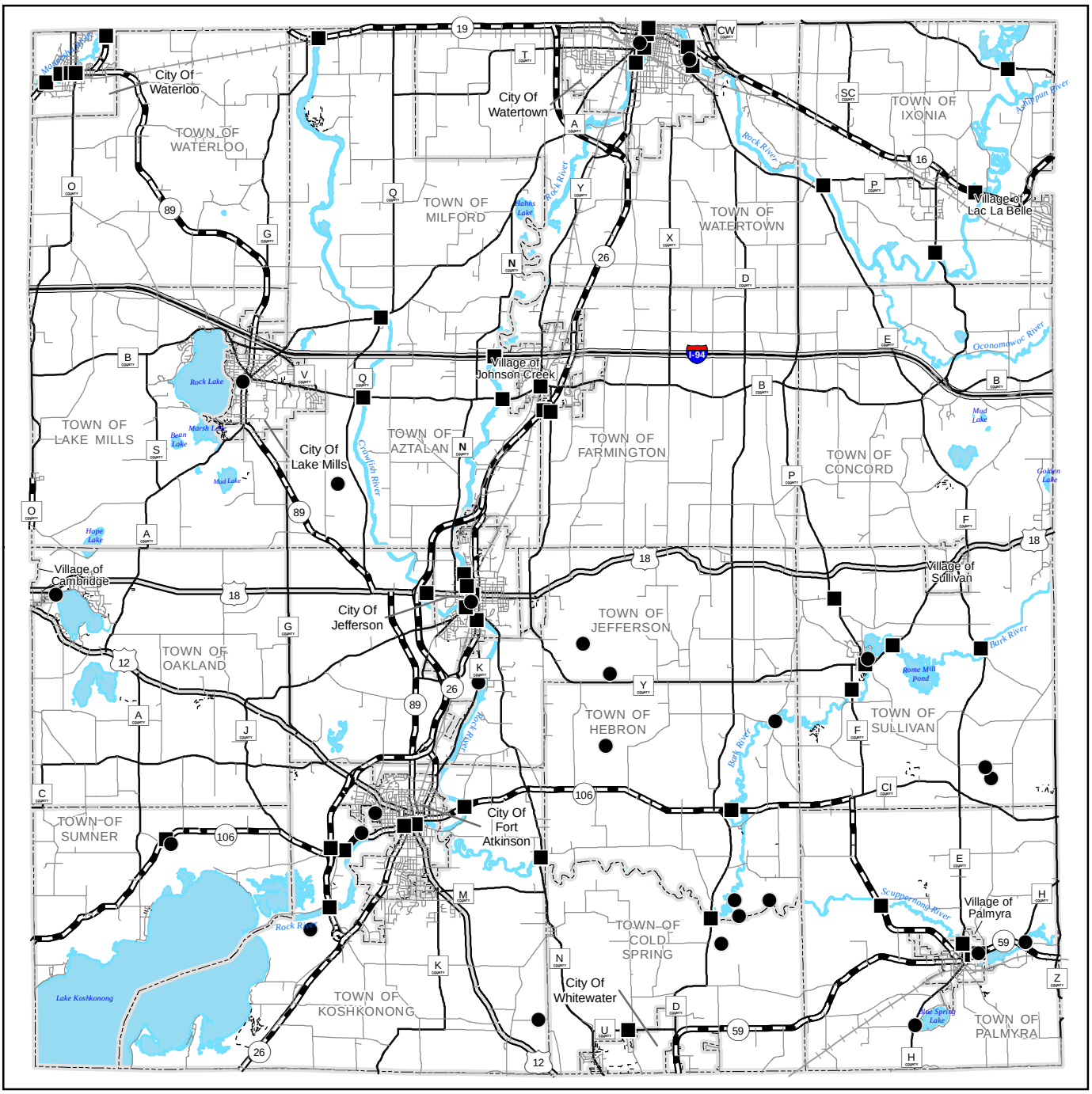
0 1 2 3 Miles

N

Source: Jefferson County Land Information Office

Map Theme : Map 1-11
Campgrounds

Jefferson County
Hazard Mitigation Plan



Legend

- Bridge
- Dam
- Road
- River
- Water Body
- Municipal Boundary

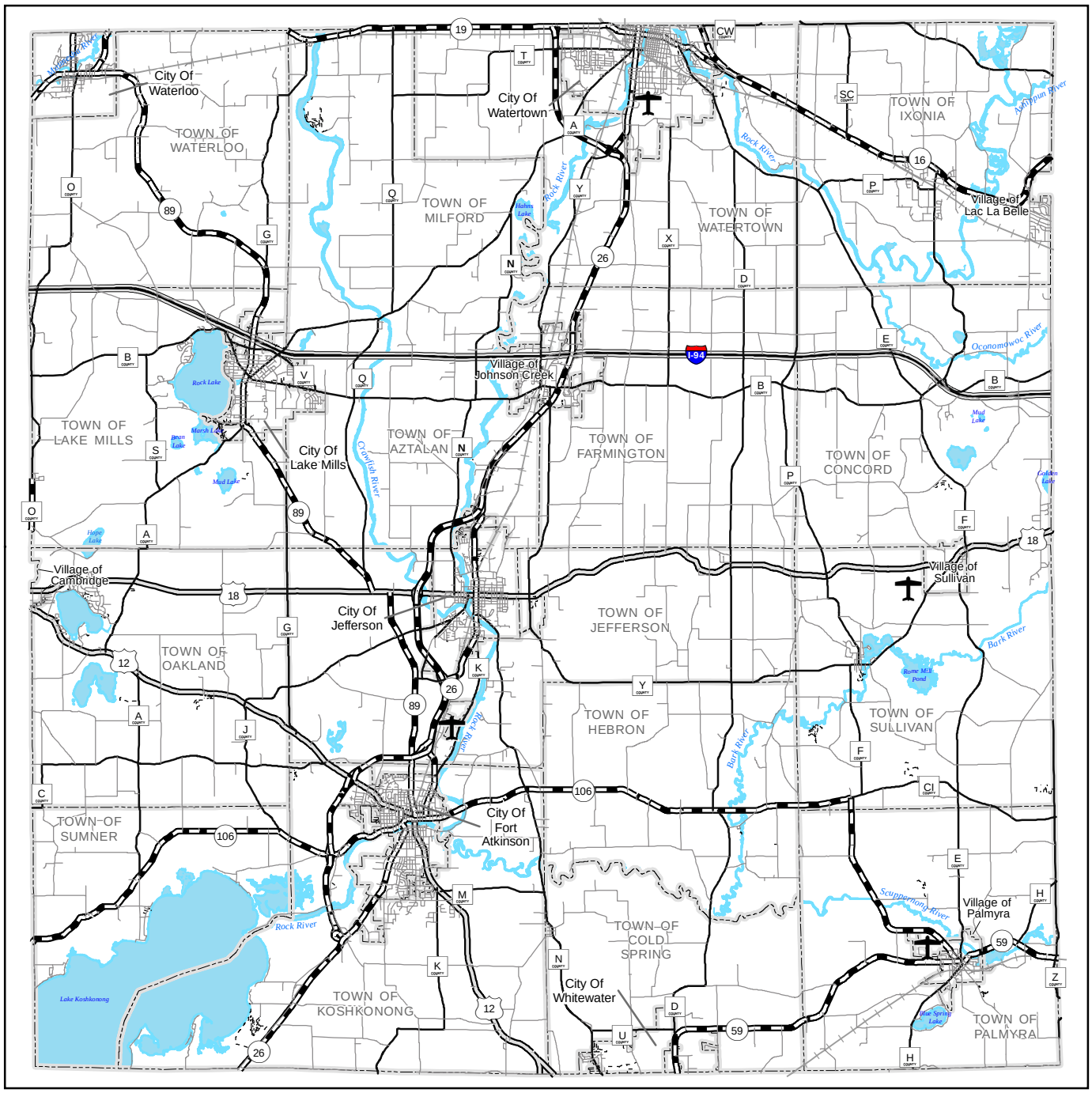
Source: Basemap from Jefferson County Land Information Office

0 1 2 3 Miles

N

Map 5
Bridges and Dams: 2018

Jefferson County Hazard Mitigation Plan



Legend

- Airport
- RailRoad
- Road
- River
- Water Body
- Municipal Boundary

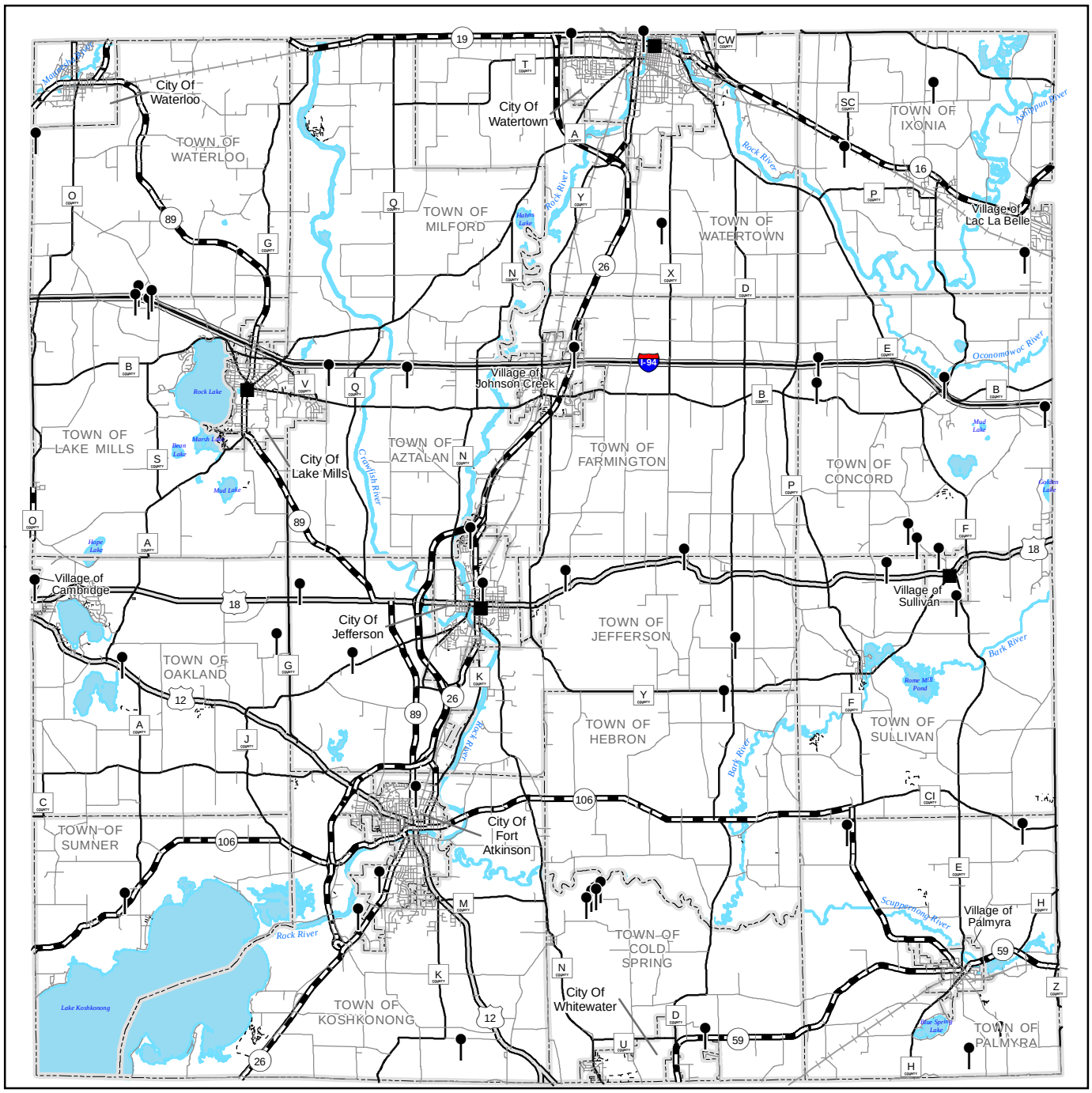
Source: Basemap from Jefferson County Land Information Office

0 1 2 3 Miles

N

Map 6
Public Use Airports and Railroads: 2018

Jefferson County Hazard Mitigation Plan



Legend

- Communication Tower
- Telephone Facility
- Road
- River
- Water Body
- Municipal Boundary

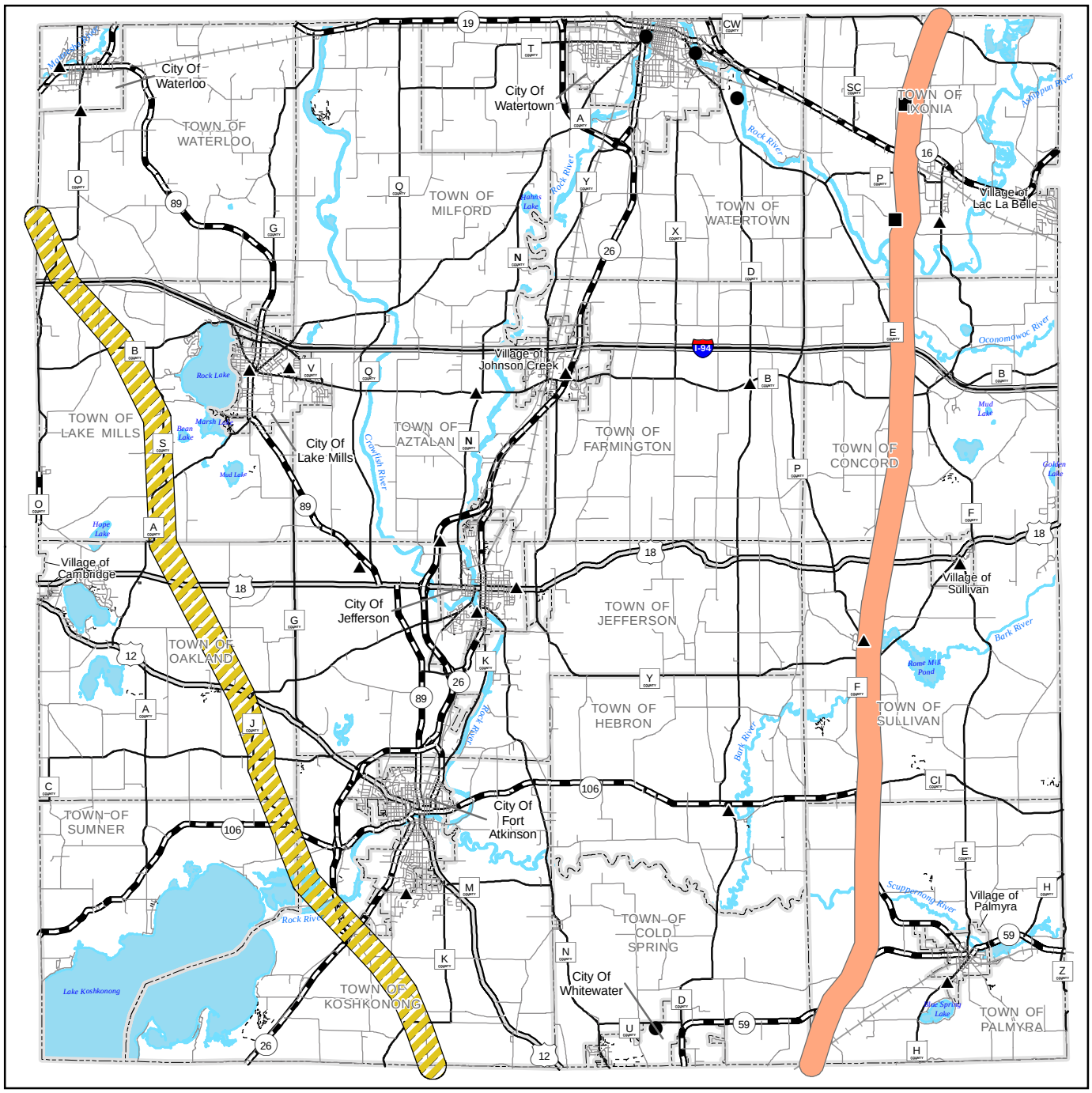
Source: Basemap from Jefferson County Land Information Office

0 1 2 3 Miles

N

Map 7
Telecommunication Facilities: 2018

Jefferson County Hazard Mitigation Plan



Legend

- Electric Substation
- Electric Powerplant
- Natural Gas Facility
- Crude Oil Pipeline (approximate location)
- Natural Gas Pipeline (approximate location)
- Road
- River
- Water Body
- Municipal Boundary

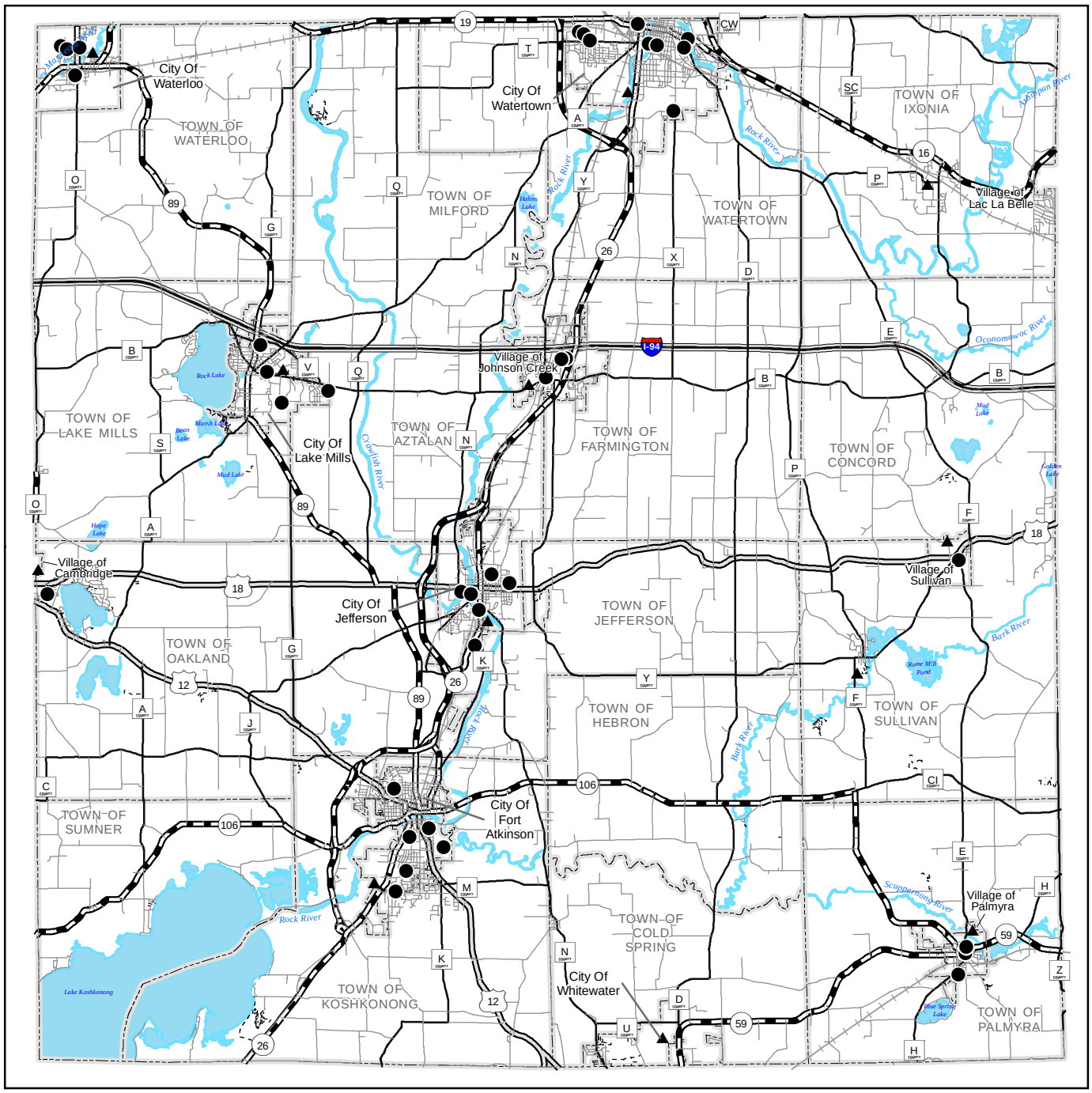
Source: Basemap from Jefferson County Land Information Office

0 1 2 3 Miles

N

Map 8
Energy Facilities: 2018

Jefferson County Hazard Mitigation Plan



Legend

- ● Public Water Facility
- ▲ Wastewater Treatment Facility
- Road
- River
- Water Body
- Municipal Boundary

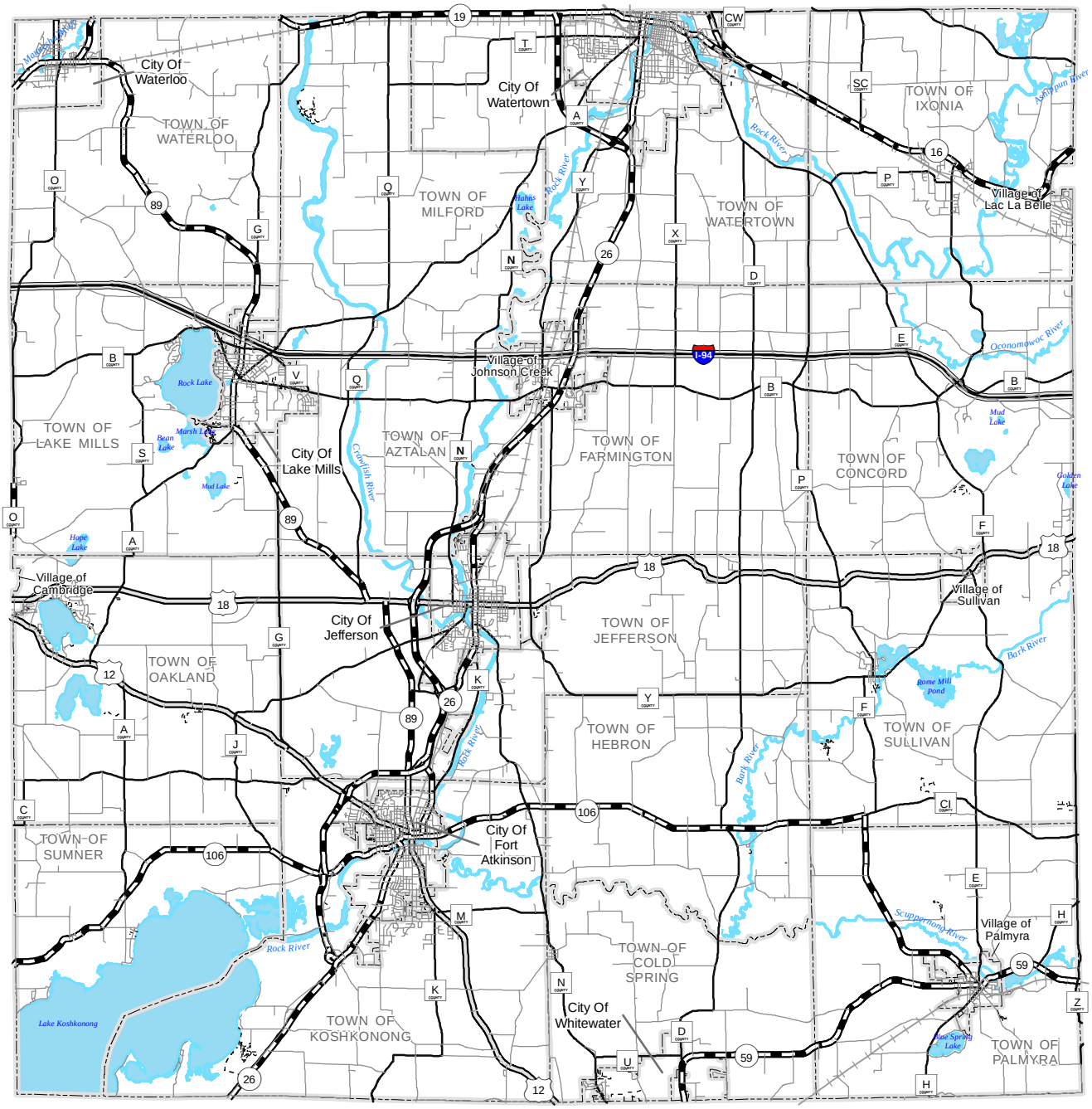
Source: Basemap from Jefferson County Land Information Office

0 1 2 3 Miles

N

Map 9
Public Water and Wastewater Facilities: 2018

Jefferson County Hazard Mitigation Plan



Legend

- ▲ Military Facility
- ● EMS Facility
- ★ Fire Station
- ■ Police Station
- Road
- River
- Water Body
- Municipal Boundary

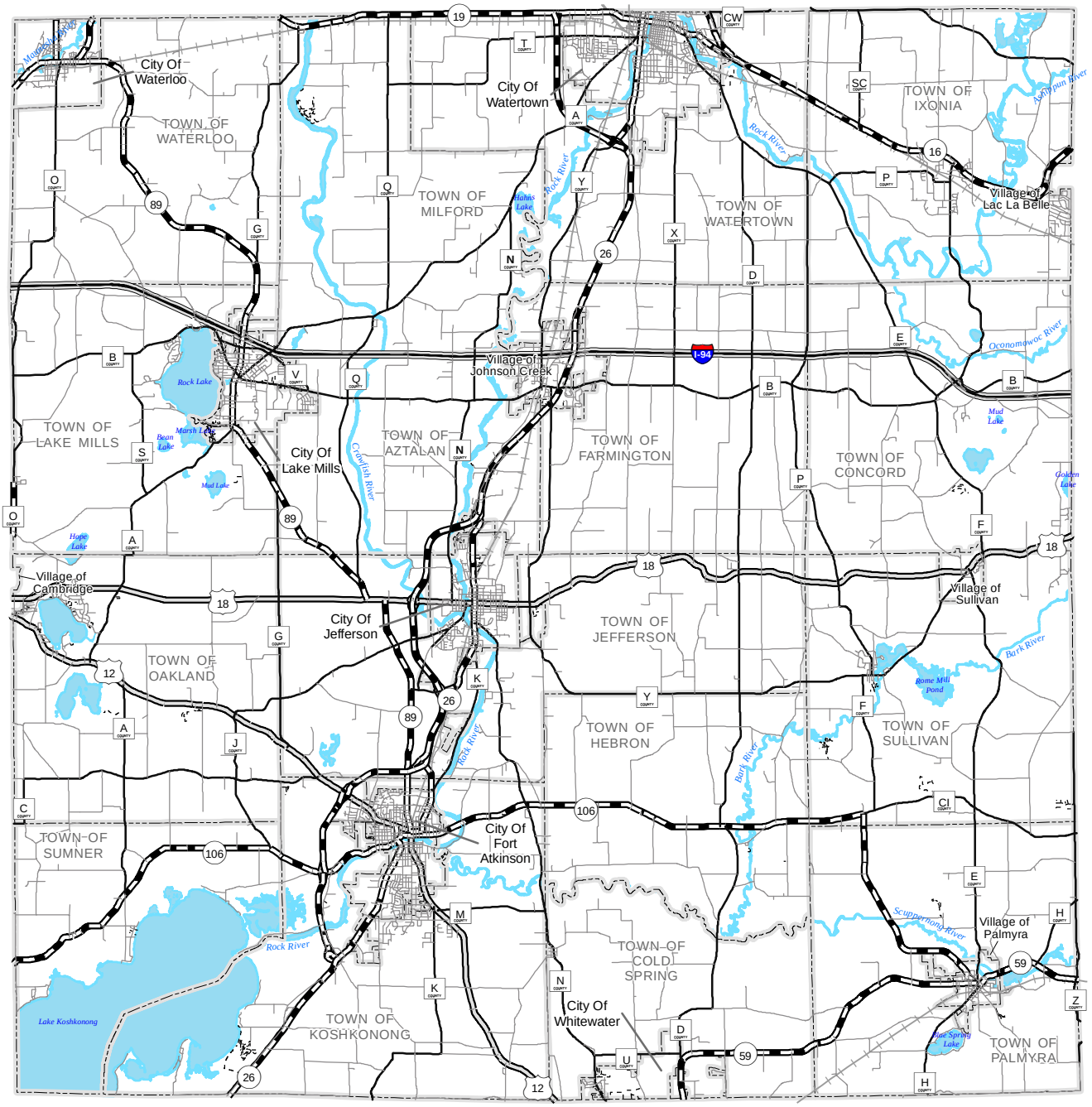
Source: Basemap from Jefferson County Land Information Office

0 1 2 3 Miles

N

Map 10
Public Safety Facilities: 2018

Jefferson County Hazard Mitigation Plan



Legend

- Post Office
- Municipal Office and Other
- Community Center
- Municipal Garage
- Senior Center
- Road
- River
- Water Body
- Municipal Boundary

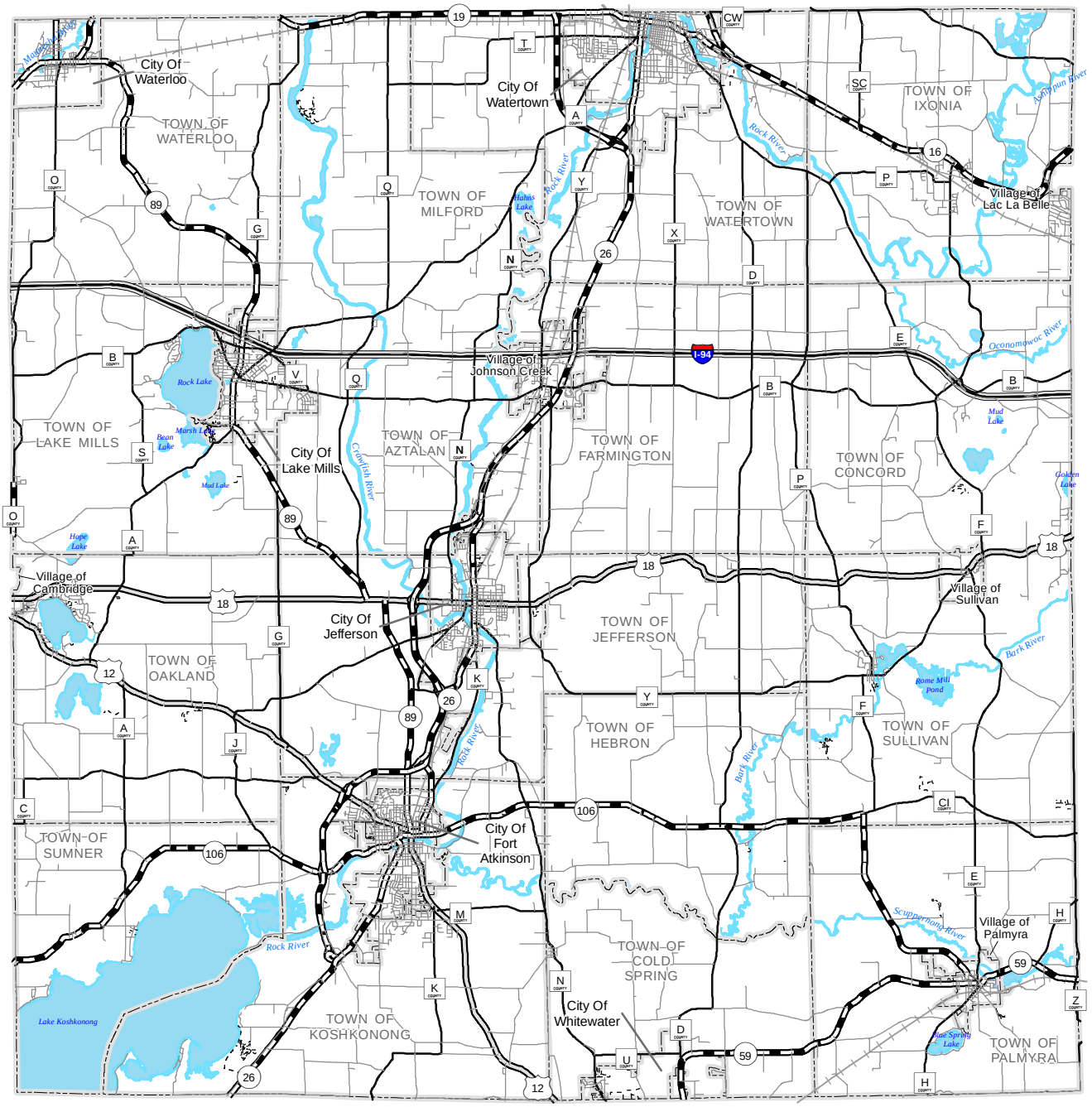
Source: Basemap from Jefferson County Land Information Office

0 1 2 3 Miles

N

Map 11
Government Facilities: 2018

Jefferson County Hazard Mitigation Plan



Legend

- ● Preschool - 12
- ▲ Post High School
- Road
- River
- Water Body
- Municipal Boundary

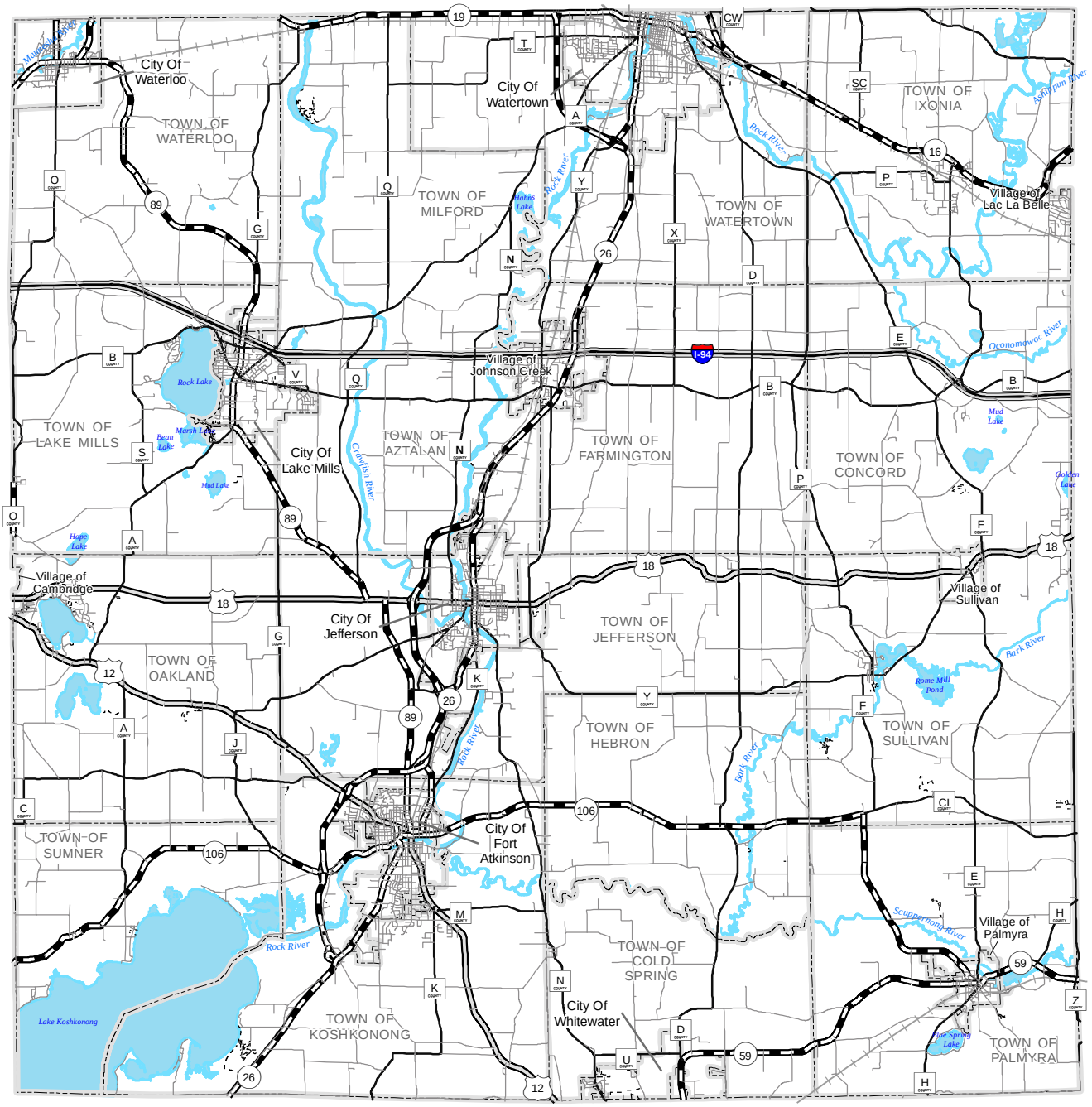
Source: Basemap from Jefferson County Land Information Office

0 1 2 3 Miles

N

Map 12 Schools: 2018

Jefferson County Hazard Mitigation Plan



Legend

- Adult Family Home
- Community Based Residential Facility
- Nursing Home
- Residential Care Apartment Complex
- Road
- River
- Water Body
- Municipal Boundary

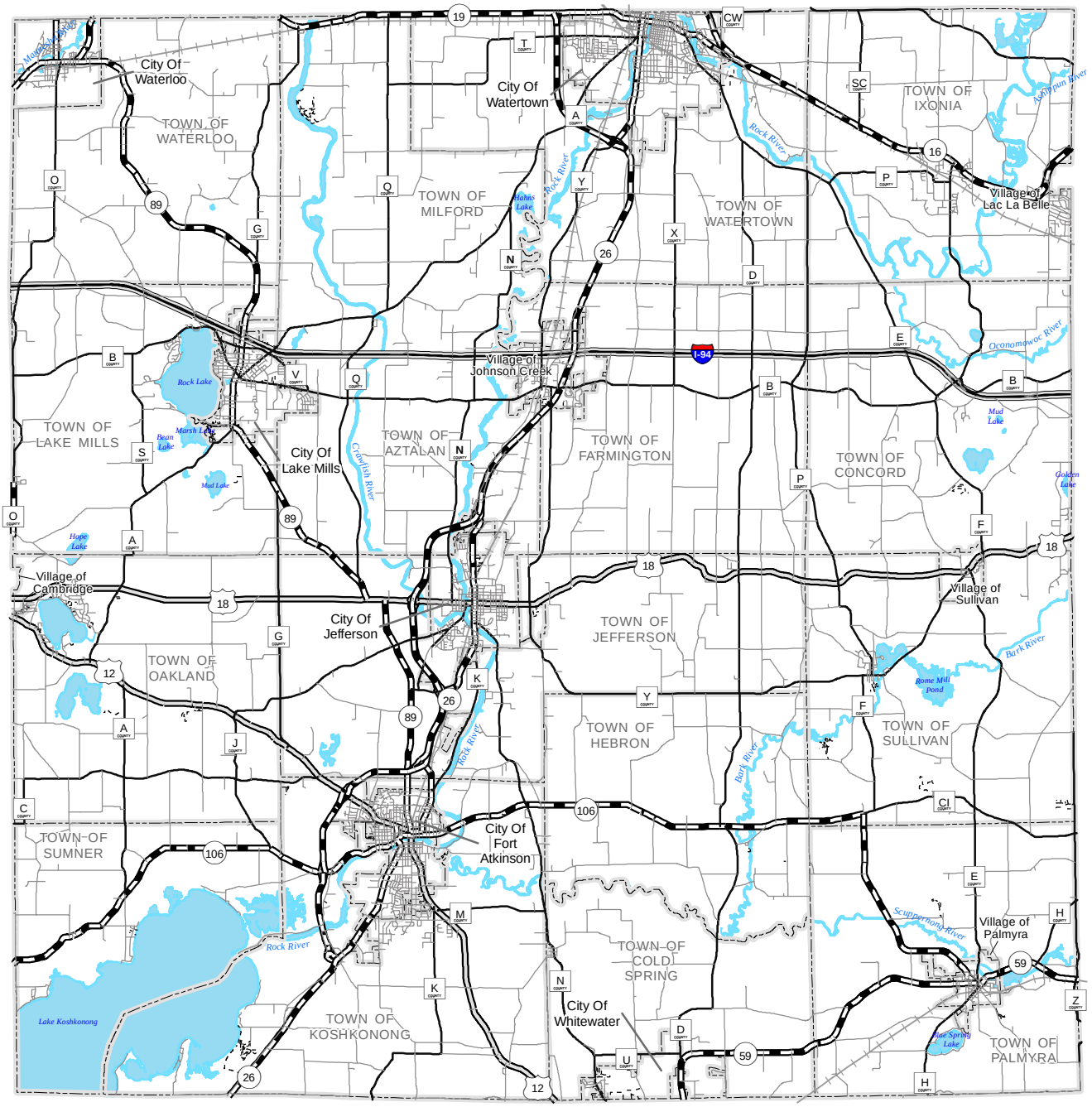
Source: Basemap from Jefferson County Land Information Office

0 1 2 3 Miles

N

Map 13 Special Care Residential Facilities: 2018

Jefferson County Hazard Mitigation Plan



Legend

- ▲ Group Child Care Center
- ● Adult Day Care
- Road
- River
- Water Body
- Municipal Boundary

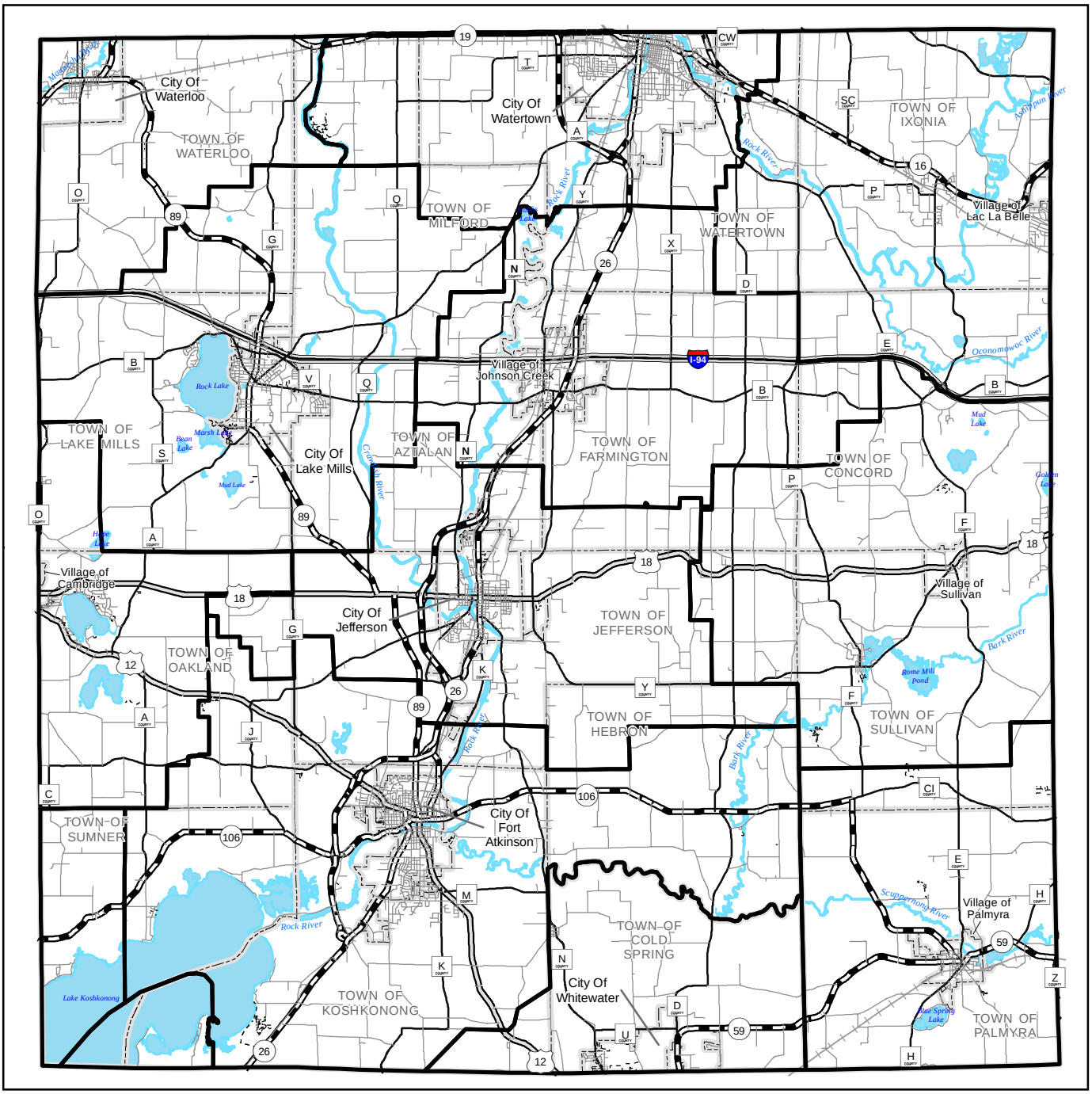
Source: Basemap from Jefferson County Land Information Office

0 1 2 3 Miles

N

Map 14 Special Care Non-Residential Facilities: 2018

Jefferson County Hazard Mitigation Plan



Legend

- Hospital
- Health Care Facility
- EMS
- Road
- River
- Water Body
- Municipal Boundary

Source: Basemap from Jefferson County Land Information Office

0 1 2 3 Miles

N

Map 15 Health Care Facilities: 2018

Jefferson County Hazard Mitigation Plan

Legend

- Hazardous Facility
- Road
- River
- Water Body
- Municipal Boundary

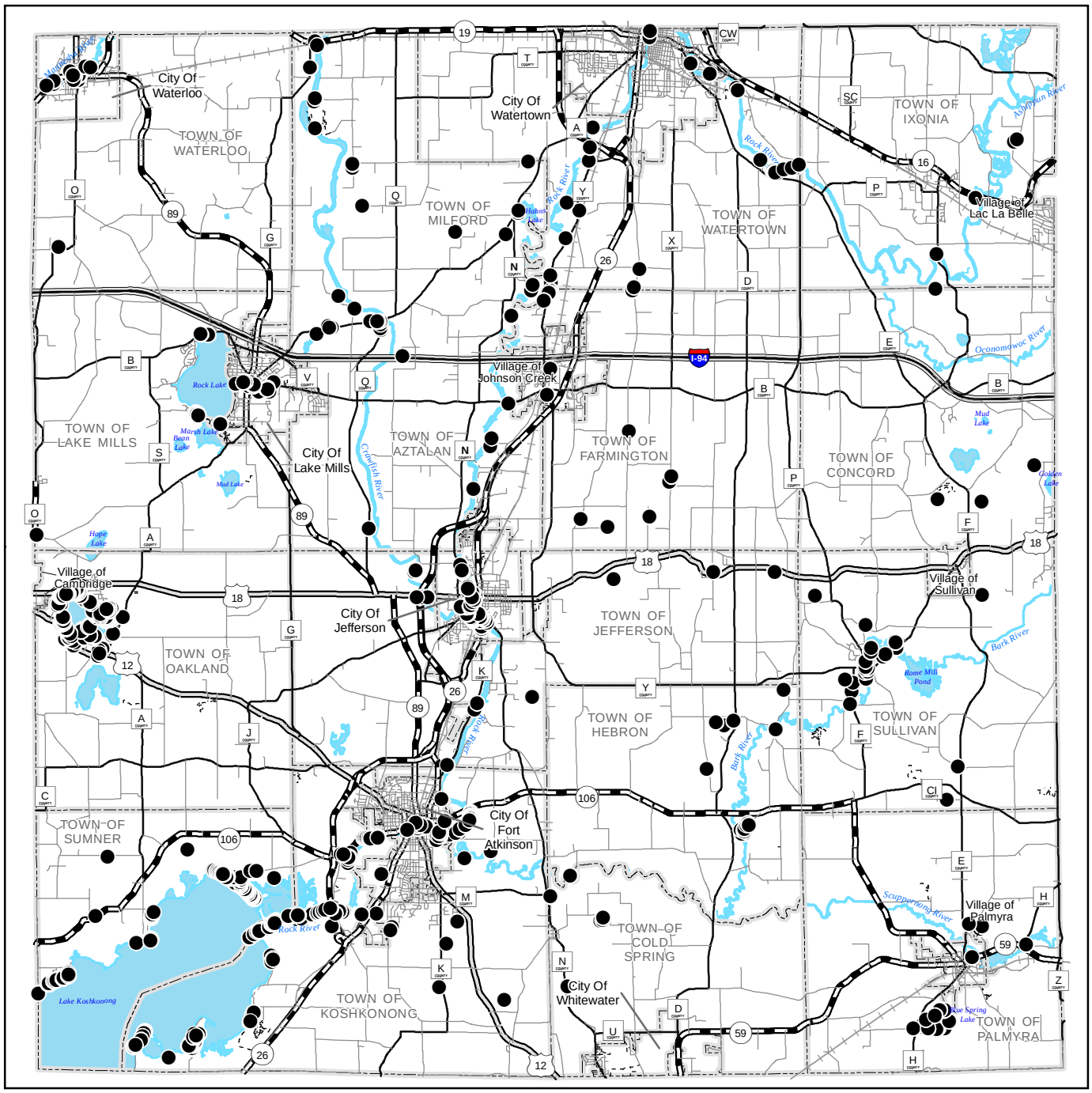
Source: Basemap from Jefferson County Land Information Office

0 1 2 3 Miles

N

Map 16
Facilities with Hazardous Materials: 2018

Jefferson County Hazard Mitigation Plan



Legend

- Structure
- 100 Year Floodplain
- Road
- River
- Water Body
- Municipal Boundary

Source: Basemap from Jefferson County Land Information Office

0 1 2 3 Miles

N

Map 17
Structures in 100 Year Floodplain: 2018

Jefferson County Hazard Mitigation Plan

Legend

- ▲ Type I
- ■ Type II
- ● Type III
- ⬟ Type IV
- Road
- River
- Water Body
- Municipal Boundary

Source: Basemap from Jefferson County Land Information Office

0 1 2 3 Miles

N

Map 18
Critical Facility by Type: 2018

Jefferson County Hazard Mitigation Plan

PUBLIC PARTICIPATION DOCUMENTATION

2017 Public Participation Plan A-2

Sample correspondence sent to municipalities regarding participation A-3

Sample of completed form for appointment of a point of contact A-4

Municipal point of contacts A-5

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Sample correspondence sent to the towns regarding review and comment on draft of the plan A-8

Sample correspondence sent to the cities and villages regarding review and comment on draft of the plan A-9

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2018 Acknowledgement form – City of Jefferson A-11

2018 Acknowledgement form – City of Lake Mills A-12

2018 Acknowledgement form – City of Waterloo A-14

2018 Acknowledgement form – City of Watertown A-15

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2018 Acknowledgement form – Village of Cambridge A-17

2018 Acknowledgement form – Village of Johnson Creek A-18

2018 Acknowledgement form – Village of Palmyra A-20

2018 Acknowledgement form – Village of Sullivan A-21

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Correspondence to Jefferson County Planning Director
regarding incorporating hazard mitigation plan into other planning efforts A-25

Public Participation Plan (2017)
Jefferson County Hazard Mitigation Plan 5-Year Update

Working in concert with local jurisdictions, Jefferson County has initiated a project to update the Jefferson County hazard mitigation plan that was first adopted in 2008. The items listed below are the ways in which the County will facilitate public participation in the plan update.

- **Formation of a Steering Committee**. A steering committee will be established to guide the project and provide oversight and input. Members will include county officials and staff and local officials and representatives who wish to participate.
- **Public Notices for Steering Committee Meetings**. All Steering Committee meetings will be formally noticed and open to the public consistent with the state's open meeting law.
- **Local Government Involvement**. Each of the local governments in Jefferson County will be contacted early in the process and informed about the project and asked to enter into a memorandum of understanding (MOU) with the County. Although the MOU would be non-binding, it would establish a framework for intergovernmental cooperation and coordination in terms of information sharing and give the jurisdiction the opportunity to also adopt the updated plan making it eligible for federal mitigation funding.
- **Local Jurisdiction Survey**. A set of maps, a listing of critical facilities in the jurisdiction, and a draft version of the assessment matrix used in the plan will be sent to each of the jurisdictions in the County. Local officials will have an opportunity to review and comment on the materials prepared up to that date.
- **Website**. Information about the project will be posted on the County's website, along with draft documents, maps, meeting notices and agendas, and project-related news.
- **Material Availability**. As various drafts are competed, copies will be sent to each of the local jurisdictions in Jefferson County and other interested parties for review and comment.
- **Acknowledgement by municipalities**. Each of the cities and villages in the county will be sent a proposed copy of the plan along with a form they can use to acknowledge that they have reviewed the plan, and either recommend one or more revisions or accept the plan as drafted.
- **Public Hearing**. The Board of Supervisors will hold at least one public hearing to formally accept public comment on the proposed plan. Each of the cities and villages in the county will need to conduct separate public hearings to collect public input from within their particular jurisdiction.
- **Press Releases**. Throughout the course of the project, press releases will be issued to the local media as necessary.
- **Other Means**. The County may provide other avenues for public participation and local government involvement during the course of the project.

Adopted July 11, 2017 by the Jefferson County Board of Supervisors

Sample Correspondence Sent to Municipalities Regarding Participation

Scott Masche, Chairperson
Town of Aztalan
PO Box 214
Lake Mills, WI 53551

Subject: Update to Jefferson County's Hazards Mitigation Plan

Dear Mr. Masche:

Jefferson County prepared a multi-jurisdictional hazards mitigation plan in 2008 and has updated it every five years after that.

The county is embarking on another five-year update, and we need the involvement of all of the towns, cities, and villages in Jefferson County to make sure we address local issues and concerns.

As in the past, cities and villages will have the opportunity to adopt the updated plan — doing so will allow them to qualify to apply for federal funding for hazard mitigation projects and activities.

If your jurisdiction would like to participate, complete the enclosed memorandum of understanding and appoint one person from your jurisdiction who will (1) verify the accuracy of a list of critical facilities that will be prepared for your jurisdiction, (2) review and comment on the draft plan, and (3) serve as a liaison. If that individual would like to be more involved, he or she can also volunteer to serve on a steering committee that will have a direct role in overseeing the plan update process.

I hope you can see the benefits (and low cost) of participating in this project. To participate, sign the enclosed memorandum and then appoint one person to represent your jurisdiction in the process. Please mail the completed forms in the enclosed stamped envelope to me by August 31, 2017.

The County Board has hired Civi Tek Consulting of Lake Mills to help prepare the plan update. If you should have any questions, you may contact me at (920) 674-7450 or at donnah@jeffersoncountywi.gov.

Sincerely,
Jefferson County Office of Emergency Management

Donna Haugom, Director

enc. Memorandum of understanding and appointment form
cc: Sandra Marks, Town Clerk; N6501 Ziebell Road; Jefferson, WI 53549

Sample of Completed Form for Appointment of Point of Contact

Appointment of Local Representative

Jefferson County Hazards Mitigation Plan Update

Town of Milford, (name of jurisdiction) hereby appoints the person identified below to assist in the preparation and review of the all hazards mitigation plan update for Jefferson County. The appointee understands that he or she will be asked to (1) verify the accuracy of a list of critical facilities that will be prepared for your jurisdiction, (2) review and comment on the draft plan, and (3) serve as a liaison – no meetings are anticipated.

If the appointee wishes, he or she may also volunteer to serve on a steering committee that is responsible for overseeing the preparation of the plan update – one meeting is anticipated. To do so, check the box.

☐ Yes, this person is willing to serve on the steering committee.

Name: Jason Hoffman

Title (if an elected official or employee): Supervisor

Address: N8472 West Road

City: Watertown Zip code: 53094

Daytime telephone number: 920-650-0462

Evening telephone number: 920-650-0462

Email address (if any): muleboy7@gmail.com

Please complete this form and the memorandum of understanding and mail them to Donna Haugom by August 31, 2017, at the address listed below.

Donna Haugom, Emergency Management Director
Jefferson County Office of Emergency Management
411 S. Center Avenue
Jefferson, WI 53549

Municipal Point of Contacts

Municipality	Point of Contact
Town	
Aztalan	Mike Burow, Supervisor
Cold Spring	Richard Rozelle, Supervisor
Concord	Bill Ingersoll, Town Chairman **
Farmington	None
Hebron	Kathleen Gross, Town Clerk
Ixonia	Nancy J. Zastrow, Clerk/Treasurer **
Jefferson	Mike Hollinger, Plan Commissioner
Koshkonong	Stacy Kutz, Supervisor
Lake Mills	Hope Oostdik, Chair **
Milford	Jason Hoffman, Supervisor
Oakland	Ted Vratny, Town Supervisor
Palmyra	Larry Kau, Town Chairman
Sullivan	Paul Goegleir, Town Employee and Rome Fire Chief
Sumner	Glendan Rewoldt, Town Clerk **
Waterloo	Robert L. Peter ** James Peschel, Town Chair
Watertown	Robert Preuss, Town Supervisor **
Village	
Cambridge	Ted Kumbier, Village Trustee **
Johnson Creek	Kyle L. Ellefson, Village Administrator **
Lac La Bell	none
Palmyra	James Small, Fire Chief **
Sullivan	Heather Rupnow, Clerk/Treasurer
City	
Fort Atkinson	Daryl Rausch, Fire Chief **
Jefferson	Joseph Szwec, Lieutenant of Policy/ Designated Emergency Response Coordinator
Lake Mills	Todd J. Yandre, Deputy Fire Chief **
Waterloo	Denis Sorensen, Chief of Police
Watertown	Kraig Biefeld, Assistant Fire Chief
Whitewater	Todd Lindert, City Employee - Emergency Operations Manager

** Also served on Steering Committee

Steering Committee Meeting #1
November 14, 2017

AGENDA

Jefferson County
Hazard Mitigation Plan Update Steering Committee
Kick-off Meeting

November 14, 2017, 3:00 p.m.

UW Extension Rooms 8 & 9
864 Collins Road
Jefferson, WI 53549

1. Introductions
2. Certification of compliance with open meetings law
3. Public comment
4. Communications
5. Project description – What is a hazard mitigation plan?
6. Role of steering committee
7. Project timeline
8. Prioritize hazards in terms of importance
9. Review mitigation strategies
10. Feedback and questions
11. Set date and time for next meeting (if needed)
12. Adjourn

Meeting Attendance

Ted Vratny, Town of Oakland
Glendan K. Rewoldt, Town of Sumner
Hope Oostdik, Town of Lake Mills
Kyle Ellefson, Village of Johnson Creek
Stacy Kutz, Town of Koshkonong
Todd Yandre, City of Lake Mills
Ben Herzog, National Weather Service
Daryl Rausch, City of Fort Atkinson
Kraig Biefeld, City of Watertown
Tracy Thom, City of Waterloo
Joe Szwec, City of Jefferson
Donna Haugom, Jefferson County
Mike Hollinger, Town of Jefferson

Correspondence to the American Red Cross and Adjoining Counties

Date: December 12, 2018

To: Patty Flowers, Regional Chief Executive Officer; American Red Cross in Southeastern Wisconsin

Charles Tubbs, Dane County Emergency Management

Lt. John Ennis, Walworth County Emergency Management

Kathy Schwei, Waukesha County Emergency Management Coordinator

Amy Nehls, Dodge County Emergency Management

Sgt. Shena Kohler, Rock County Emergency Management

From: Donna Haugom, Director; Jefferson County Emergency Management

Subject: Jefferson County Natural Hazards Mitigation Plan: 2019-2023

Jefferson County Emergency Management has completed a 5-year update of our county-wide hazards mitigation plan. I have posted the plan on the County's website as a PDF file. You may access it at: http://www.jeffersoncountywi.gov.

It is posted on the "Emergency Management" page under "Department Services." It is entitled "Natural Hazard Mitigation Plan Draft." There is also an excerpt for the goals, objectives, policies, and mitigation projects. It is also listed in the left navigation pane.

If you have any comments, please send them to me by December 28, 2018 at DonnaH@co.jefferson.wi.us.

Thank you for your time and effort – I really appreciate it.

Sample Correspondence to the Towns Regarding Review and Comment on Draft of the Plan

Gene Olson, Chairperson
Town of Aztalan
N5322 Watertown Road
Jefferson, WI 53549

Subject: Update to Jefferson County's Hazards Mitigation Plan – Review of Draft 3

Dear Mr. Olson:

Jefferson County Emergency Management has been working with an ad hoc steering committee to update the county-wide hazard mitigation plan that was first adopted in 2008. I have enclosed five copies of the executive summary of the most recent draft for your review and comment. Please distribute them to the town board and others you deem appropriate, including Supervisor Frohmader who represented the Town on the steering committee.

If you would like to review the entire plan, it will be posted online by Wednesday, October 17, 2012. Go to: http://www.jeffersoncountywi.gov/jc/public/jchome.php?page_id=427&page_name=Emergency%20Management.

If your community is thinking about doing a specific hazard mitigation project and wants to potentially apply for federal grant funding, it must be listed in the section of the plan that lists the goals, objectives, policies, and activities. If a project that you would like to do is not listed, please provide us with the following information: (1) project description; (2) cost estimate; (3) potential funding source, (4) priority - low, medium, high; (5) timeframe for doing the project; and (6) name of entity that will be responsible for spearheading the project. Please be aware that having a project listed does not obligate you to do the project, nor does it guarantee funding.

After you or others have had a chance to review the executive summary, please return the enclosed acknowledgement form to me by Monday, November 5, 2012. We will then prepare the final draft of the plan based on the comments we receive from you and the other municipalities. I will notify you when the final plan has been adopted by the County Board of Supervisors – towns do not need to take any action to adopt the plan.

If you should have any questions or comments about this draft, you may contact me at (920) 674-7450 or at donnah@jeffersoncountywi.gov.

Sincerely,
Jefferson County Office of Emergency Management

Donna Haugom, Director

enc. Executive Summary of *Jefferson County Natural Hazards Mitigation Plan: 2013-2017* – DRAFT 3
Acknowledgement letter

cc: Sandra Marks, Town Clerk; N6501 Ziebell Road; Jefferson, WI 53549 (without enclosures)

Sample Correspondence to the Cities and Villages Regarding Review and Comment on Draft of the Plan

Jeff Milsap, President
Village of Cambridge
PO Box 99
Cambridge, WI 53523

Subject: Update to Jefferson County's Hazards Mitigation Plan – Review of Draft 3

Dear Mr. Milsap:

Jefferson County Emergency Management has been working with an ad hoc steering committee to update the county-wide hazard mitigation plan that was first adopted in 2008. I have enclosed the most recent draft of the updated plan for your review and comment. Please forward this plan to others you deem appropriate, including Trustee Christianson who served as the village's point of contact for this project. The plan will be posted online by Wednesday, October 17, 2012, at: www.jeffersoncountywi.gov/jc/public/jchome.php?page_id=427&page_name=Emergency%20Management.

If the Village of Cambridge would like to adopt the updated plan when it is done, we need your continued involvement.

Although I encourage you to review the entire plan, you should in particular review the goals, objectives, policies, and activities listed in Chapter 7. If your community is thinking about doing a specific hazard mitigation project and wants to potentially apply for federal grant funding, it must be listed in this section. If a project that you would like to do is not listed, please provide us with the following information: (1) project description; (2) cost estimate; (3) potential funding source, (4) priority - low, medium, high; (5) timeframe for doing the project; and (6) name of entity that will be responsible for spearheading the project. Please be aware that having a project listed does not obligate you to do the project, nor does it guarantee funding.

After you or others have had a chance to review the draft plan, please return the enclosed acknowledgement form to me by Monday, November 5, 2012. We will then prepare the final draft of the plan based on the comments we receive from you and the other municipalities. When the final plan has been prepared, we will send you those pages of the plan that have been revised.

To adopt the plan, your municipality will need to adopt a resolution. ***However, do not adopt a resolution until after you receive a letter from me along with the revised pages.*** For your convenience, I will send you a sample resolution for your consideration.

If you should have any questions or comments about this draft, you may contact me at (920) 674-7450 or at donnah@jeffersoncountywi.gov.

Sincerely,
Jefferson County Office of Emergency Management

Donna Haugom, Director

enc. *Jefferson County Natural Hazards Mitigation Plan: 2013-2017* – DRAFT 3
Acknowledgement letter
Memorandum regarding specific mitigation activities

cc: Norma DeHaven, Clerk/Treasurer; PO Box 99; Cambridge, WI 53523-0099 (without enclosures)
Dwight Christianson, Village Trustee; 406 E. Madison St; Cambridge, WI 53523 (without enclosures)

2018 **Acknowledgement Form – City of Fort Atkinson**

2018 **Acknowledgement Form – City of Jefferson**

2018 **Acknowledgement Form – City of Lake Mills**

2018 Acknowledgement Form – City of Waterloo

2018 Acknowledgement Form – City of Watertown

2018 Acknowledgement Form – City of Whitewater

2018 Acknowledgement Form – Village of Cambridge

2018 Acknowledgement Form – Village of Johnson Creek

2018 Acknowledgement Form – Village of Palmyra

2018 Acknowledgement Form – Village of Sullivan

Law Enforcement and Emergency Management Committee Agenda – December 28, 2018

Jefferson County Board Meeting Agenda – January 8, 2018

Correspondence to Jefferson County Planning Director Regarding Incorporating Hazard Mitigation Plan into Other Planning Efforts

August 8, 2013

Robert Klotz, Director of Planning & Zoning
Jefferson County
320 S. Main Street, Room #201
Jefferson, WI 53913

Dear Mr. Klotz,

I am writing in regard to the natural hazard mitigation plan that is currently being updated.

The mitigation plan, as you are aware, focuses on the hazards that are present in Jefferson County. The plan takes an analytical review of the hazards and presents mitigation actions and projects that are designed to reduce the risks these threats pose. The actions and projects presented are a tool to be used not only by communities interested in mitigation work, but also your department's planning efforts.

Looking into the future, I encourage you to keep the natural hazard mitigation plan in mind when completing updates to the comprehensive plan. Also, the mitigation plan is a great tool and may be used in land use agreements and plans, transportation development, and any other work your office takes part in that might benefit from the actions and projects listed in the mitigation plan.

I will send you a PDF copy of the adopted natural hazard mitigation plan in the near future. Please keep this copy on file. An updated copy of the plan will be sent to you, should the mitigation plan be modified prior to the next formal update in five years.

If you have any questions or concerns, please do not hesitate to contact me.

Sincerely,

Donna Haugom, Emergency Management Director

Table 6-11. Summary of Staff Capabilities: 2018

	Administrator	Emergency Management Staff	Community Planner
Village			
Cambridge [1]	No	No	No
Johnson Creek	Yes	No	No
Lac La Belle [1]	No	No	No
Palmyra	No	No	No
Sullivan	No	No	No
City			
Fort Atkinson	Yes	No	Yes
Jefferson	Yes	No	No
Lake Mills	Yes	No	No
Waterloo	Yes	No	No
Watertown [1]	Yes	No	No
Whitewater [1]	Yes	Yes (1 FTE)	Yes
Jefferson County	Yes	Yes (1.2 FTE)	Yes

Notes:
1. Municipality located in Jefferson County and another county

6. Goals, Objectives, Policies, and Activities

This section builds off of the previous parts of the plan and presents a unified plan of action to mitigate the effects of natural hazards on property, people, and assets. It lists goals, objectives, and policies that should guide decision-makers and other officials. Goals are intended to describe an end state, usually in general terms. In contrast, objectives describe an end state in measurable and specific terms. Policies give clear direction on what will be done to help achieve a goal and objective.

Following the listing of goals, objectives, and policies, a chart lists specific action items along with an estimated implementation cost. Responsible entities are listed for each so that implementation is well defined.

The activity charts are a work in progress. As items are completed they should be deleted and as new opportunities or issues arise items will be added. Further, depending on available resources, including funding and staff time, priorities may change.

Prioritization Of Goals And Actions

Activities are prioritized as low, medium, or high based on the STAPLE+E approach. Exhibit 6-1 lists each of the criteria used to identify the priority. The mitigation actions with the highest priority were deemed to be the most cost effective and most compatible with the community's social and cultural values.

Exhibit 6-1. STAPLE+E

Criteria	Description
S – Social	Mitigation actions are acceptable to the community if they do not adversely affect a particular segment of the population, do not cause relocation of lower income people, and if they are compatible with the community's social and cultural values.
T – Technical	Mitigation actions are technically most effective if they provide long- term reduction of losses and have minimal secondary adverse impacts.
A – Administrative	Mitigation actions are easier to implement if the jurisdiction has the necessary staffing and funding.
P – Political	Mitigation actions can truly be successful if all stakeholders have been offered an opportunity to participate in the planning process and if there is public support for the action.
L – Legal	It is critical that the jurisdiction or implementing agency have the legal authority to implement and enforce a mitigation action.
E – Economic	Budget constraints can significantly deter the implementation of mitigation actions. Hence, it is important to evaluate whether an action is cost-effective, as determined by a cost benefit review, and possible to fund.
E – Environmental	Sustainable mitigation actions that do not have an adverse effect on the environment, that comply with Federal, State, and local environmental regulations, and that are consistent with the community's environmental goals, have mitigation benefits while being environmentally sound.

Relationship To Other Local Planning Efforts

It is strongly recommended that these goals and actions be adopted as part of local comprehensive planning efforts where appropriate, especially in areas where existing problems can be corrected and to prevent problems from occurring in newly developed areas.

Cost Benefit Analysis For Goals And Actions

Specific cost benefit reviews will occur for each action in each participating jurisdiction during annual budget scenarios. Most identified actions are programmatic and not capital expenditures. The impact and cost of each program will be determined on an as needed basis prior to implementation. The information provided with each action is intended to assist in the cost benefit evaluation of each action. Costs estimates, funding sources, schedules, and responsible parties are preliminary and subject to change based on fiscal conditions. Federal funding for mitigation activities can only be obtained when benefits clearly outweigh the costs.

Major Accomplishments

Since this plan was first adopted in 2008, a number of significant work activities have been accomplished as described in Table 6-12.

Table 6-12. Major Accomplishments: 2008-2018

Description	Jurisdiction
1. Floodproofed or otherwise protected the Waterloo Carousel from flooding. (Activity #21 under Goal 2, Flooding in 2008 Plan)	City of Waterloo
2. Jefferson County Emergency Management secured funding from local, state, and federal sources to acquire more than 25 flood-prone properties. (Activity #2 under Goal 2, Flooding in 2008 Plan)	Jefferson County
3. Acquired a 1.6-acre site along the Maunesha River in the downtown area for flood storage. Demolished an old pickle factory (Both of these are related to Activity #21 under Goal 2, Flooding in 2008 Plan)	City of Waterloo
4. Jefferson County Emergency Management secured funding from local, state, and federal sources to acquire 21 flood-prone properties. (Activity #2 under Goal 2, Flooding in 2008 Plan)	Jefferson County
5. Worked with County Fair Director to establish radio and procedures for early weather detection and notification during events, and provide a copy of events at the fairgrounds to National Weather Service for early warning notifications.	Jefferson County
6. Conducted STEP training (Student Tools for Emergency Planning) in to local schools	Jefferson County
7. Conducted a number of table-top exercises	Jefferson County and others
8. Worked to get LP for county residents in 2015	Jefferson County
9. Developed a debris management plan	Jefferson County
10. Completed a feasibility study to establish a water gaging station on the Crawfish River near Hubbleton	Jefferson County
11. Amended the county's emergency operations plan to address extreme temperatures	Jefferson County
12. Implemented Integrated Public Alert and Warning System (IPAWS) in 2016	Jefferson County

As part of the 2010 update, significant changes were made to this section of the plan. Those goals, objectives, policies, and activities that were added as part of the 2018 plan update are so noted, along with those that have been revised. Those that ensure continued compliance with the National Flood Insurance are also so designated.

The following exhibit presents a summary of changes in objectives, policies, and implementation activities between the 2012 plan and the 2018 plan. Cost estimates were updated as appropriate.

Exhibit 6-2. Summary of Significant Changes to Objectives, Policies, and Activities in 2018 Plan

Goal	Objectives	Policies	Activities
Goal 1. Public Education and Communication	No change	No change	No change except to update status
Goal 2. Flooding and Dam Failure	No change	No change	Updated activity status; removed activity #3 and 19, 20 in previous plan
Goal 3. Tornadoes	No change	No change	Updated activity status

Goal 4. Extreme Temperature	No change	No change	Updated activity status, and removed #6 in previous plan because it was completed
Goal 5. Severe Storms, Hail & High Winds	No change	No change	Updated activity status, removed #1, 2, and 3 in previous plan
Goal 6. Drought	No change	No change	Updated activity status
Goal 7. Wildland Fire	No change	No change	Updated activity status, removed #4 in previous plan

Most of the cities and villages adopting this plan have identified one or more unique implementation activity. The cities of Fort Atkinson and Jefferson and the Village of Cambridge share a single implementation activity (#2 under Goal 2, Flooding). The City Administrator for the City of Whitewater worked with various departments and elected officials to identify potential implementation activities that are unique to the city and determined that the implementation activities it is responsible for are appropriate and that no unique implementation activity is warranted.

Goal 1. Public Education
Provide the public with the education they need to adequately prepare for and respond to natural hazards identified in this plan including dam failure, flooding, ice shoves, fog, tornado/high winds, hailstorms, thunderstorms, winter storms, extreme temperature, drought, and wildland fire. (**2008 Plan**)

Objectives
1. Strengthen emergency service preparedness and response by enhancing public education throughout the county. (**2008 Plan**)
2. Increase the number of households that have prepared a family emergency plan. (**2008 Plan**)
3. Increase the number of public outreach materials in Spanish. (**2008 Plan**)

Policies
1. Work with non-governmental organizations (youth, service, professional, religious) to promote mitigation education and awareness. (**2008 Plan**)
2. Look for multiple and varied opportunities to disseminate educational information to county residents. (**2008 Plan**)

Implementation Actions / Strategies	Cost Estimate (2018)	Priority	Schedule 2019 to 2023	Schedule 2024 to 2028	Responsible Entity
1. Develop, enhance, and implement education programs aimed at mitigating natural hazards and reducing the risk to citizens, public agencies, private property owners, businesses, and schools. (Safety Network, faith-based organizations, civic groups, Chambers of Commerce, etc.) (**2008 Plan; 2018 status – ongoing effort**	$5,000	Medium	X	X	Jefferson County Emergency Management; American Red Cross
2. Create displays for use at public events (health fair, public awareness day, county fair). (**2008 Plan; 2012 status – ongoing effort**)	Staff time and supplies	Low	X	X	Jefferson County Emergency Management
3. Establish a single webpage on the county's website to provide up-to-date hazard-related information. (**2008 Plan; 2018 status – Facebook site created but ongoing effort**)	Staff time	Medium	X	X	Jefferson County Emergency Management
4. Work with the schools within the county to promote hazard mitigation education and awareness and discuss ways to better integrate mitigation into the curriculum. (**2008 Plan; 2018 status – conducted STEP (Student Tools for Emergency Planning**) **in two schools)**	Staff time	Medium	X	X	Jefferson County Emergency Management; American Red Cross
5. Identify, improve, and sustain collaborative programs focusing on the real estate and insurance industries, public and private sector organizations, and individuals to avoid activity that increases risk to natural hazards. (**2008 Plan; 2018 status – no action**)	Staff time	Medium	X		Jefferson County Emergency Management; American Red Cross; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan
6. Develop and maintain a geographic database for natural hazard events, including location, weather conditions, and resulting damage. (**2008 Plan; 2018 status – no action**)	Staff time	High	X		Jefferson County Emergency Management; Jefferson County Land Information Office, National Weather Service (NWS)
7. Work to provide more hazard-related information in Spanish. (**2008 Plan; 2018 status – ongoing effort**)	Staff time	Medium	X		Jefferson County Emergency Management Jefferson County Literacy Council; United Migrant Opportunity Service; Jefferson County Public Health; Workforce Development
8. Enhance the Village's website (Village of Sullivan) to include more information about disaster preparedness (**2018 status – ongoing effort**)	Staff time	Medium	X		Village of Sullivan

Goal 2. Flooding
Protect the public health, safety, and welfare of county residents and public and private property during flood events. (**2008 Plan**)

Objectives
1. Minimize the impact of flooding on potentially affected structures. (**2008 Plan**)
2. Decrease the number of structures currently located in the 100-year floodplain that are not properly flood-proofed. (**2008 Plan**)
3. Minimize the amount of impervious surface in new development projects to allow more infiltration of stormwater into the ground. (**2008 Plan**)
4. Decrease the number of repetitive loss properties. (**2008 Plan**)
5. Decrease the number of repetitive loss communities in the county. (**2008 Plan**)
6. Increase public awareness of flooding. (**2008 Plan**)
7. Improve communication between the county and local units of government when floods occur or are likely to occur. (**2008 Plan**)

Policies
1. Continue to enforce floodplain regulations to ensure that future development in the 100-year floodplain meets established standards. (**2008 Plan**)
2. Continue the buyout program on Blackhawk Island. (**2008 Plan**)
3. Support the identification and conservation of land with high flood mitigation value (e.g., wetlands, upland storage, and infiltration areas). (**2008 Plan**)
4. Support land acquisition and other management strategies to preserve open space for flood mitigation purposes. (**2008 Plan**)
5. Ensure that governmental officials and employees, county residents, and real estate agents are aware of floodplain regulations. (**2008 Plan**)
6. Ensure that people owning property in the 100-year floodplain, and their agents, notify buyers when selling their property. (**2008 Plan**)
7. Adopt standards to control the proportion of a site that can be covered with impervious surfaces. (**2008 Plan**)
8. Locate public infrastructure outside of the 100-year floodplain. When infrastructure has be located in the 100-year floodplain, it should be flood proofed or otherwise protected from flood water. (**2008 Plan**)
9. Design and properly size all new stream crossings to not create a significant upstream back-water effect. (**2008 Plan**)
10. Continue to enforce stormwater management regulations. (**2008 Plan**)
11. Use data records in on-going assessment of flood problems and effectiveness or response programs. (**2008 Plan**)
12. Formalize communications links and establish procedures**.** (**2008 Plan**)
13. Update flood insurance rate maps (FIRMs) when it can be shown that they are substantially inaccurate. (**2008 Plan**)
14. Ensure that all large dams in the county have emergency action plans and that they are up to date. (**2008 Plan**)
15. Undertake such activities as may be required to remain compliant with the requirements of the National Flood Insurance Program. (**2008 Plan**)

Implementation Actions / Strategies	Cost Estimate (2018)	Priority	Schedule 2019 to 2023	Schedule 2024 to 2028	Responsible Entity
1. Identify and analyze feasible mitigation options for repetitive flood properties and other flood-prone properties. (**2008 Plan; 2018 status – ongoing effort**)	Staff time	Medium	X	X	Jefferson County Emergency Management
2. 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 flood proof repetitive loss sites and other flood-prone properties or remove them through acquisition followed by demolition or relocation. (**2008 Plan; 2018 status – in progress**)	Staff time	High	X	X	Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, and Watertown; village of Cambridge
3. Develop a computerized database containing information on each culvert and bridge within the county. (**2008 Plan; 2018 status – in progress**)	Staff time	Medium	X		Jefferson County Emergency Management
4. Identify those culverts and bridges that are undersized or are otherwise unable to handle expected flood flows. (**2008 Plan; 2018 status – ongoing effort**)	Staff time	Medium	X		Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan as appropriate

Continued on next page

Continued

Implementation Actions / Strategies	Cost Estimate (2018)	Priority	Schedule 2019 to 2023	Schedule 2024 to 2028	Responsible Entity
5. Develop a geographic database for public roadways that are susceptible to flooding. (**2008 Plan; 2018 status – ongoing**)	Staff time	Medium	X		Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan as appropriate
6. Prepare a strategy to prioritize road improvements for public roadways that are susceptible to flooding. (**2008 Plan; 2018 status – no action**)	Staff time	Medium	X		Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan as appropriate
7. Identify undeveloped areas of the county, if any, that have flood mitigation value and develop appropriate strategies to protect them. (**2008 Plan; 2018 status – no action**)	Staff time	Medium	X		Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan as appropriate
8. Establish a framework to compile and coordinate surface water management plans and data throughout Jefferson County. (**2008 Plan; 2018 status – no action**)	Staff time	Medium	X		Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan as appropriate
9. Post flood recovery plans and programs to help county residents rebuild and implement mitigation measures to protect against future floods. (**2008 Plan; 2018 status – ongoing effort**)	Staff time	Medium	X	X	Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan
10. Distribute National Flood Insurance Program information. (**2008 Plan; 2018 status – ongoing effort**)	Staff time	Medium	X	X	Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan
11. Explore options for improving the ability of local units of government to report flooding, receive information, and request assistance. (**2008 Plan; 2018 status – ongoing effort, email monthly updates to municipalities**)	Staff time	Medium	X		Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan
12. Develop and maintain a geographic database for natural hazard events, including location, weather conditions, and resulting damage. (**2008 Plan; 2018 status – no action**)	Staff time	High	X	X	Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan
13. Evaluate the support for and the feasibility of becoming part of the Community Rating System (CRS) to lower flood insurance premiums for property owners. (**2008 Plan; 2018 status – ongoing effort**)	Staff time	High	X		Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan

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Implementation Actions / Strategies	Cost Estimate (2018)	Priority	Schedule 2019 to 2023	Schedule 2024 to 2028	Responsible Entity
14. Work with the DNR to ensure that an emergency action plan is prepared for large dams and that they are periodically updated. (**2008 Plan; 2018 status – ongoing effort**)	Staff time	Medium	X		Jefferson County Emergency Management
15. Develop a prioritized list of areas of the county meriting detailed flood studies. (**2008 Plan; 2018 status – ongoing effort**)	Staff time	Medium	X		Jefferson County Emergency Management
16. Install a surface water gaging station on the Crawfish River near Hubbleton. (**2008 Plan; 2018 status – completed feasibility determination**)	Staff time	Medium	X		Jefferson County Emergency Management
17. Ensure that privately-owned large dams are inspected consistent with state law. (**2008 Plan; 2018 status – no action**)	Staff time	Medium	X		Jefferson County Emergency Management; Cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan as appropriate
18. Conduct a study to determine feasible and cost-effective solutions to minimize flooding in downtown Waterloo (Maunesha River). (**2008 Plan; 2018 status – in progress**)	$8,000 to $12,000	High	X		City of Waterloo
19. Enhance the 1.6-acre site the City acquired in 2012 for flood storage and restore the stream channel and other related efforts (**2018 status – new action item**)	Unknown	High	X		City of Waterloo
20. Repair the Mill Road Dam. (**2008 Plan; 2018 status – ongoing effort**)	Unknown	High	X		Village of Palmyra
21. Mitigation projects as may be identified as a result of the Water Resources Management Study within the Village of Johnson Creek. (**2008 Plan; 2018 status – no action**)	Variable	Variable	X		Village of Johnson Creek
22. Enlarge the capacity of the city's (Watertown) stormwater sewer system which may include detention basins (**2018 status – ongoing effort**)	Unknown	Medium	X	X	City of Watertown
23. Complete a dam failure analysis for the Spring Lake Dam (**2018 status – ongoing effort**)	Cost included in current budget	High	X		Village of Palmyra
24. Add a backup power to two well pump houses	$150,000 each	Medium	X		City of Fort Atkinson
25. Add two portable pumps for lift station use	$45,000 each	Medium	X		City of Fort Atkinson

Goal 3. Tornadoes
Lessen the effects of a tornado to the extent feasible and speed recovery following an event. (**2008 Plan**)

Objectives
1. Increase public education and awareness of the potential severity of tornadoes. (**2008 Plan**)
2. Minimize the amount of time that businesses damaged by a tornado are not operational. (**2008 Plan**)
3. Minimize the amount of time it takes to rebuild or restore dwellings damaged by a tornado. (**2008 Plan**)
4. Prevent injuries and death from tornadoes. (**2008 Plan**)

Policies
1. Bury overhead power and utility lines where feasible as a way to reduce power outages during all types of storm events. (**2008 Plan**)
2. Require that mobile homes and manufactured housing are securely anchored in place. (**2008 Plan**)
3. Ensure that adequate tornado shelters are available to county residents especially those living in mobile home parks. (**2008 Plan**)
4. Include redevelopment objectives in smart growth comprehensive plans to support post-disaster development activities. (**2008 Plan**)
5. Continue to support the efforts of severe weather spotters. (**2008 Plan**)
6. Keep the current siren system functioning and in good repair. (**2008 Plan**)
7. Encourage residents to obtain NOAA weather radios especially in those areas of the county that are not covered by a siren. (**2008 Plan**)

Implementation Actions / Strategies	Cost Estimate (2018)	Priority	Schedule 2019 to 2023	Schedule 2024 to 2028	Responsible Entity
1. Periodically assess whether there are enough shelters to house displaced persons. (**2008 Plan; 2018 status – ongoing effort**)	Staff time	Medium	X	X	Jefferson County Emergency Management; American Red Cross
2. Apply for mitigation funding to purchase NOAA weather radios for county residents. (**2008 Plan; 2018 status – no action**)	Staff time	Low	X		Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan
3. Study the feasibility of and support for adopting a local regulation which would require new mobile home parks and future expansions of existing parks to provide for a tornado shelter. (**2008 Plan; 2018 status – no action**)	Staff time	Medium	X		Jefferson County Emergency Management
4. Develop and implement strategies for debris management. (**2008 Plan; 2018 status – in progress and completion anticipated in 2019**)	Staff time	Medium	X		Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan
5. Amend land development regulations to require a storm shelter in mobile home parks when the number of mobile homes exceeds a threshold as established by the jurisdiction. (**2008 Plan; 2018 status – no action**)	Staff time	Medium	X		Jefferson County Zoning Department; Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan
6. Install storm shelters near or in existing mobile home parks and high occupancy campgrounds, such as Bark River Campground & Resort and River Bend. (**2008 Plan; 2018 status – no action**)	Staff time	Medium	X		Mobile home park operators and campground operations with Jefferson County Emergency Management
7. Investigate grant funding for storm shelters. (**New 2012; 2018 status – in progress**)	Staff time	Medium	X		Jefferson County Emergency Management
8. Develop and maintain a geographic database for natural hazard events, including location, weather conditions, and resulting damage. (**2008 Plan; 2018 status – no action**)	Staff time	High	X		Jefferson County Emergency Management; Jefferson County Land Information Office
9. Update and improve sirens (**2018 status – new action item**)	Unknown	Medium	X	X	City of Watertown
10. Update the city's outdoor storm warning system (7 sirens) (**2018 status – new action item**)	$210,000	Medium	X	X	City of Fort Atkinson

11.	Study the feasibility of constructing at storm shelter at Sand Beach trailer park (**2018 status – new action item**)	Budgeted	Medium	X	City of Lake Mills

Goal 4. Extreme Temperature
Protect the health of Jefferson County residents from extreme temperature. (**2008 Plan**)

Objectives
1. Prevent deaths from extreme temperature. (**2008 Plan**)

Policies
1. Encourage volunteers to look after vulnerable individuals, especially the elderly, during times of extreme temperature. (**2008 Plan**)
2. Open county and other public facilities with air conditioning as appropriate for public access during periods of extreme heat. (**2008 Plan**)
3. Ensure that county residents are aware that there are different forms of assistance to help qualified individuals pay their winter heating costs. (**2008 Plan**)

Implementation Actions / Strategies	Cost Estimate (2018)	Priority	Schedule 2019 to 2023	Schedule 2024 to 2028	Responsible Entity
1. Develop a directory of public buildings that would be open to the public during heat waves (and also during the evening hours). (**2008 Plan; 2018 status – in progress**)	Staff time	Medium	X	X	Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan
2. 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 temperature. (**2008 Plan; 2018 status – no action**)	Staff time	High	X		Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan
3. Investigate the possibility of establishing a database of individuals who are vulnerable to extreme temperature and who have voluntarily placed their name on the call list. (**2008 Plan; 2018 status – in progress**)	Staff time	Medium	X		Jefferson County Volunteer Organization Acting in Disasters (VOAD); Jefferson County Emergency Management; Jefferson County Public Health
4. Publicize available programs that help residents pay for their utility expenses. (**2008 Plan; 2018 status – ongoing activity**)	Staff time	Medium	X		Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan
5. Develop and maintain a geographic database for natural hazard events, including location, weather conditions, and resulting damage. (**2008 Plan; 2018 status – no action**)	Staff time	High	X		Jefferson County Emergency Management; Jefferson County Land Information Office
6. Amend the county's emergency operations plan to address extreme temperatures. (**2008 Plan; 2018 status – ongoing effort**)	Staff time	High	X		Jefferson County Emergency Management; American Red Cross; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan

Goal 5. Severe Storms, Hail, & High Winds
Protect and prepare Jefferson County residents from the dangers of extreme weather. (**2008 Plan**)

Objectives
1. Increase public education and awareness of the potential dangers of thunderstorms, snow storms, hail, and windstorms. (**2008 Plan**)

Policies
1. Bury overhead power and utility lines where feasible as a way to reduce power outages during all types of storm events. (**2008 Plan**)
2. Provide citizens with early storm warnings. (**2008 Plan**)
3. Encourage the use of surge protectors on critical electronic equipment in governmental and critical facilities. (**2008 Plan**)
4. Work with utility companies to assess and to improve, when necessary, electric service reliability. (**2008 Plan**)
5. Work with utility companies to ensure that trees are properly trimmed near utility lines. (**2008 Plan**)

Implementation Actions / Strategies	Cost Estimate (2018)	Priority	Schedule 2019 to 2023	Schedule 2024 to 2028	Responsible Entity
1. Produce and distribute emergency preparedness information related to thunderstorms, snow storms, hailstorms, and windstorm hazards. (**2008 Plan; 2018 status – ongoing effort**)	Staff time	Medium	X		Jefferson County Emergency Management; American Red Cross
2. Identify and pursue funding opportunities to develop and implement local and county mitigation activities. (**2008 Plan; 2018 status – ongoing effort**)	Staff time	Medium	X		Jefferson County Emergency Management; American Red Cross; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan
3. Install lightning grade surge protection devices for critical electronic components used by government, public service, and public safety facilities, such as warning systems, control systems, communications, and computers. (**2008 Plan; 2018 status – ongoing effort**)	$3,000	Medium	X		Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan
4. Provide the public with information about proven lightning safety guidelines to reduce the risk of lightning hazards. (**2008 Plan; 2018 status – ongoing effort**)	Staff time	Medium	X		Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan
5. Develop and implement strategies for debris management. (**2008 Plan; 2018 status – ongoing effort**)	Staff time	Medium	X		Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan
6. Apply for mitigation funding to purchase NOAA weather radios for county residents. (**2008 Plan; 2018 status – no action**)	Staff time	Medium	X		Jefferson County Emergency Management
7. Develop and maintain a geographic database for natural hazard events, including location, weather conditions, and resulting damage. (**2008 Plan; 2018 status – no action**)	Staff time	High	X		Jefferson County Emergency Management; Jefferson County Land Information Office

Goal 6. Drought

Protect the public health, safety, and welfare of Jefferson County residents during periods of drought. (**2008 Plan**)

Objectives

1. Decrease water consumption during periods of drought. (**2008 Plan**)
2. Minimize the economic impacts of drought on the local economy. (**2008 Plan**)

Policies

1. Encourage water conservation during periods of drought. (**2008 Plan**)
2. Impose watering restrictions during periods of extreme drought. (**2008 Plan**)
3. Work with multiple agencies to conserve water, provide drought prediction, and provide stream and groundwater monitoring. (**2008 Plan**)
4. Work with agencies that can assist with and promote soil health, preserve soil moisture and help to minimize the loss of the crops and topsoil in the event of a drought. (**2008 Plan**)
5. Continue to monitor groundwater levels to identify the status of groundwater resources and trends. (**2008 Plan**)
6. Work cooperatively with state agencies and other levels of government in developing appropriate strategies on a regional basis. (**2008 Plan**)
7. Provide water for livestock when the needs of humans have been or are being met. (**2008 Plan**)

			Schedule		
Implementation Actions / Strategies	**Cost Estimate (2018)**	**Priority**	**2019 to 2023**	**2024 to 2028**	**Responsible Entity**
1. Create an ordinance to prioritize or control water use during drought conditions. (**2008 Plan; 2018 status – no action**)	Staff time	Medium	X	X	Municipalities with public water systems
2. Provide public education about the potential severity of drought events. (**2008 Plan; 2018 status – ongoing effort**)	Staff time	Low	X		Jefferson County Emergency Management, cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan
3. Develop a set of procedures for water distribution during drought to those in need. (**2008 Plan; 2018 status – no action**)	Staff time	Medium	X		Jefferson County Emergency Management
4. Develop and maintain a geographic database for natural hazard events, including location, weather conditions, and resulting damage. (**2008 Plan; 2018 status – no action**)	Staff time	High	X		Jefferson County Emergency Management; Jefferson County Land Information Office

Goal 7. Wildland Fire
Protect structures and residents in Jefferson County from the hazard of uncontrolled wildfire. (**2008 Plan**)

Objectives
1. Decrease the number of wildland fires occurring in the county. (**2008 Plan**)
2. Decrease the number of acres burned from wildland fires. (**2008 Plan**)
3. Increase public education. (**2008 Plan**)

Policies
1. Support the use of controlled burns as a way of reducing the threat of dangerous wildland fires. (**2008 Plan**)
2. Enhance emergency services to increase the efficiency of wildfire response and recovery activities. (**2008 Plan**)
3. Keep track of wildfire events in the county to better document the extent and location of these events. (**2008 Plan**)

Implementation Actions / Strategies	Cost Estimate (2018)	Priority	Schedule 2019 to 2023	Schedule 2024 to 2028	Responsible Entity
1. Apply for federal and state grants to enhance the capability of local fire departments. (**2008 Plan; 2018 status – no action**)	Staff time	Medium	X	X	Jefferson County Emergency Management; local fire departments
2. Provide education to county and municipality 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. (**2008 Plan; 2018 status – no action**)	Staff time	Low	X		Jefferson County Emergency Management; cities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Watertown, and Whitewater; villages of Cambridge, Johnson Creek, Lac La Belle, Palmyra, and Sullivan
3. Study the feasibility of and support for adopting a local burning permit program at the Town level. (**2008 Plan; 2018 status – no action**)	Staff time	Medium	X		Jefferson County Emergency Management working with the Towns
4. Develop and maintain a geographic database for natural hazard events, including location, weather conditions, and resulting damage. (**2008 Plan; 2018 status – no action**)	Staff time	High	X		Jefferson County Emergency Management; Jefferson County Land Information Office
5. Investigate the establishment of a uniform way of providing information to the public regarding issuance of burning permits. (**2008 Plan; 2018 status – no action**)	Staff time	High	X		Jefferson County Sheriff's Department; local fire departments