

Oconto County, Wisconsin

2015 Hazard Mitigation Plan



Prepared by:
Oconto County Hazard Mitigation Plan Steering Committee
with assistance from the Bay-Lake Regional Planning Commission



Oconto County, Wisconsin

Hazard Mitigation Steering Committee Members

Name	Organization
Angela Pierce	Bay-Lake Regional Planning Commission
Anne Renel	Oconto County Times Herald
Ben Trembl	WI DNR Law Enforcement
Brad Rice	City of Oconto Falls Mayor
Buzz Kamke	Emergency Management
Charlene Meier	Village of Lena Clerk
Jason Valentine	Oconto Falls Utility
Clark Longsine	Sheriff's Department
Craig Johnson	Health & Human Services
Dale Mohr	UW Extension
Dan Ault	City of Oconto Police Chief
Debbie Konitzer	Public Health
Dennis Kroll	Emergency Management
Gerald Beekman	Emergency Management
Irene Drake	Gillett City Mayor
Jack Mlnarik	Fire/EMS Oconto Chief
Jay Tousey	Suring Village President
Jeremy Wusterbarth	Oconto Utility
John Hubacher	Oconto Hospital
John Lubbers	WI DNR Fire Management
John Pinkart	UW Extension
Kathy Henne	St. Clare Memorial Hospital
Kent Lyng	Oconto Electric Co-op
Kevin Hamann	Oconto County Administrator
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Lisa Mahoney	Public Health
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Melissa Wellens	Emergency Management
Mike Jansen	Sheriff
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Pat Virtues	Zoning/Planning
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Randy Winkler	American Red Cross
Robert Skaltzky	County Forest & Parks
Ryan Severson	WI DNR Forestry
Sara Perrizo	City of Oconto
Steve Marquardt	Lena Village President
Tim Magnin	Oconto Co. EM Director
Vicki Roberts	City of Oconto Falls
Victoria Bostedt	City of Oconto Mayor
Wayne Sleeter	Technology Services



OCONTO COUNTY, WISCONSIN HAZARD MITIGATION PLAN

**ADOPTED:
DECEMBER 17, 2015**

Prepared by:
Bay-Lake Regional Planning Commission
425 South Adams Street, #201
Green Bay, WI 54301
(920) 448-2820



The preparation of this document was financed through contract #13012-07 between Oconto County and the Bay-Lake Regional Planning Commission. The cost to develop this plan was funded through a grant from the Federal Emergency Management Agency (FEMA) and Wisconsin Emergency Management (WEM) under the Pre-Disaster Mitigation program. A local match for the grant was provided through in-kind efforts by Oconto County.

RESOLUTION OF ADOPTION

RESOLUTION # 106 - 15

TO: The Honorable Chairperson and Members of the Oconto County Board of Supervisors

RE: **ADOPTING THE OCONTO COUNTY 2015 MULTI-HAZARDS MITIGATION PLAN.**

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

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

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

NOW, THEREFORE BE IT RESOLVED THAT, the County Board of Oconto County, Wisconsin, hereby adopts the Oconto County 2015 Multi-Hazards Mitigation Plan, copies of which shall be kept on file in the office of the Oconto County Clerk and Oconto County Department of Emergency Management ; and

BE IT FURTHER RESOLVED THAT, upon approval of the Oconto County 2015 Multi-Hazards Mitigation Plan, the Bay-Lake Regional Planning Commission, on behalf of the Oconto County Emergency Management Department, will submit the adopted plan to Wisconsin Emergency Management and Federal Emergency Management Agency officials for final review and approval, as required under the Hazard Mitigation Grant Program.

Submitted this 17th. day of December, 2015

By: EMERGENCY MANAGEMENT COMMITTEE

Leland T. Rymer, Chairperson
Gerald Beekman
Paul Bednarik
Lowell "Buzz" Kamke
Dennis Kroll
Melissa Wellens

Reviewed by Corporation Counsel:

Adopted by Vote:

cam 11.11.2015
Initials of Date
Corp. Counsel Reviewed

Ayes: 30 Nays: 0 Absent: 1

STATE OF WISCONSIN } I, Kim Pytleski
County Oconto } do hereby certify
that the above is a true and correct copy of the
original now on file in the office of the County Clerk and
that it was adopted by the Oconto County Board of
Supervisors on this date.
Date: 12/17/15 Kim Pytleski
(Seal) County Clerk

FEMA/WEM APPROVAL LETTERS

U.S. Department of Homeland Security
Region V
536 S. Clark St., 6th Floor
Chicago, IL 60605-1509



FEMA

JAN 15 2016

Ms. Katie Sommers
State Hazard Mitigation Officer
Wisconsin Emergency Management
2400 Wright Street, P.O. Box 7865
Madison, WI 53707-7865

Dear Ms. Sommers:

Thank you for submitting the adoption documentation for the Oconto County Hazard Mitigation Plan update. The plan was reviewed based on the local plan criteria contained in 44 CFR Part 201, as authorized by the Disaster Mitigation Act of 2000. Oconto County met the required criteria for a multi-jurisdiction hazard mitigation plan and the plan is now approved for the county. Please submit the adoption resolutions for any remaining jurisdictions who participated in the planning process.

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

We encourage Oconto County and the participating jurisdictions to follow the plan's schedule for monitoring and updating the plan, and continue their efforts to implement the mitigation measures. The expiration date of the Oconto County Plan is five years from the date of this letter. In order to continue project grant eligibility, the plan must be reviewed, revised as appropriate, resubmitted, and approved no later than the plan expiration date.

Please pass on our congratulations to Oconto County and the participating jurisdictions for this significant action. If you or the communities have any questions, please contact Tom Smith at (312) 408-5220 or Thomas.Smith6@fema.dhs.gov.

Sincerely,

Christine Stack, Director
Mitigation Division

www.fema.gov



STATE OF WISCONSIN
DEPARTMENT OF MILITARY AFFAIRS
DIVISION OF EMERGENCY MANAGEMENT

Brian M. Satula
Administrator

Scott Walker
Governor

January 25, 2016

Tim Magnin, Director
Oconto County Emergency Management
301 Washington Street
Oconto, WI 54153

Dear Tim:

It gives me great pleasure to inform you that the *Oconto County, Wisconsin 2015 Hazard Mitigation Plan* has officially been approved for the County! Approval for the remaining jurisdictions is contingent upon receipt of their adoption resolutions. The plan complies with the requirements of the Disaster Mitigation Act of 2000. The County is eligible to apply for funding through the Hazard Mitigation Grant Program, Pre-Disaster Mitigation program, and Flood Mitigation Assistance program through January 15, 2021, for projects identified in the Plan.

With the FEMA Meets Requirements letter you received the Local Hazard Mitigation Plan Review Tool which includes recommended revisions for the required five-year update.

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

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

Sincerely,

Katie Sommers, CFM
State Hazard Mitigation Officer
Wisconsin Emergency Management

Enclosure

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

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EXECUTIVE SUMMARY

PLAN UPDATE SUMMARY

To highlight the changes that have been made to the *Oconto County 2009 Multi-Hazards Mitigation Plan* in this current update, Table 0.1 below lists the plan changes Table 0.2 shows the updates made to the identified mitigation strategies.

Table 0.1: Plan Update Summary

Chapter 1: Introduction	Updated recent disasters, planning process participants, and public review information. Several updates were made to the original steering committee to reflect changes in positions since the last plan was adopted. The steering committee updated the prioritized order of the hazards to be addressed and added coastal hazards, landslide, subsidence, and dam failure.
Chapter 2: Planning Area	Updated demographic profile information using the 2010 Census. Updated land use information.
Chapter 3: Risk Assessment	All hazard profiles, occurrences, and probabilities were updated. In addition, the risk assessments were updated. Hazard occurrences were updated to include all from 2000 to 2014. Hazard probabilities were updated based on updated occurrences. Update critical facilities and changed some categories names. A risk assessment was added for coastal hazards, landslide, subsidence, and dam failure. An assessment for climate change impacts was added.
Chapter 4: Mitigation Strategy	Updated the mitigation action plan to account for completed projects, updated timetables, and new project additions. Added specific municipal mitigation actions. Provided a climate change assessment.
Chapter 5: Plan Maintenance and Adoption Process	Updated plan maintenance process and plan update schedule.

Table 0.2: Plan Update Summary - Mitigation Strategies

Project	Changes
All Hazards	
Added Estimated Cost column and information for each strategy.	Table revision.
Install and maintain back-up generators for critical facilities identified as necessary for serving as communication centers and shelters.	Completed
The full implementation of CodeRED for all residents living and owning property in Oconto County.	Completed
Adoption and maintenance of local emergency plans.	Updated Timetable to "On-going."
Establish Mutual Aid Agreements for utility and communications systems including 9-1-1 that are similar to the Mutual Aid Box Alarm System (MABAS).	Updated Timetable to "On-going."
Acquire and promote use of NOAA weather radios which continually broadcast National Weather Service forecasts, warnings, and other crucial weather information as well as warnings regarding natural, man-made, or technological hazards.	Removed.
Enforce land use policies that encourages development to occur away from hazardous areas; reduce density in hazardous areas; and/or encourage greater development restrictions in hazardous areas.	Updated Timetable to "On-going."
Encourage residents to prepare themselves by stocking up with necessary items and planning for how family members should respond if any emergency or disaster events strike.	Updated Timetable to "On-going."
Collect "building footprints" for all critical facilities to allow for analysis of where facilities/structures are located.	Updated Priority from Low to Medium. Updated Timetable to "2015, then on-going updates."
Work with County, State, and Federal agencies to maintain a consistent critical facility database.	Updated Timetable to "On-going."
Maintain County CodeRED public notification system	Addition.
Ensure that all Human Service Department partner facilities are in the CodeRED system	Addition.
Continue to require emergency plans for all Human Service Department partner facilities	Addition.
Sign and maintain designated emergency transportation routes.	Moved to All Hazards from Tornado/High Winds.
Inventory facilities where back-up power is available and determine where it is needed	Addition.
Ensure that all Human Service Department partner facilities are in the CodeRED system	Addition.
Pursue opportunities for better cellular coverage enhance Code RED and 9-1-1 services	Addition.
Maintain updated orthophotography data, 2-foot contours data, and GIS	Addition.
Winter Storms	
	Merged Heavy Snow/Blizzards and Ice Storms.
Ensure plowing and sanding equipment is operational and available when needed.	Updated Timetable to "On-going/Annual." Updated Estimated Cost to "Highway Dept annual budget."
Improved communication system-all entities coordinated into one system/frequency.	Moved to All Hazards category. Updated Timetable to "On-going." Updated Estimated Cost to "Federal, State, and local budgets."
Provide education on the travel hazards during the winter months.	Updated Priority from Medium to Low. Updated Timetable to "On-going." Updated Responsible Party to "Media and private entities."
Distribute travel aid kits.	Completed.
Maintain community tree trimming programs.	Updated Timetable to "On-going/Annual."
Sign and maintain designated emergency transportation routes.	Updated Timetable to "As needed."
Institute a calling tree to check on the county's most vulnerable population.	Completed.
Promote the need to have a sufficient supply of pharmaceuticals and food on hand during emergencies.	Updated Timetable to "On-going."
Offer education on the hazards of tree trimming.	Removed.
Promotion of driver safety training/emergency preparedness kits.	Removed.
Burial of power lines where soils permit.	Removed.

Table 0.2: Plan Update Summary - Mitigation Strategies (cont'd)

Project	Changes
Tornado and Strong Wind	
Promote safety education.	Updated Timetable to "On-going/Annual." Updated Responsible Party to add "schools, private entities, and media."
Maintain and utilize emergency evacuation and shelter policies.	Updated Timetable to "On-going/Annual."
Improved communication system-all entities coordinated into one system/frequency.	Moved to All Hazards category and updated.
Heavy equipment agreements between municipalities and private haulers.	Completed.
Maintain heavy equipment agreements between municipalities and private haulers.	Addition.
Require tie-downs for mobile homes.	Updated Timetable to "On-going."
Institute and enforce building codes.	Updated Timetable to "On-going."
Construction of shelters in parks and trailer parks.	Updated Timetable to "On-going."
Burial of power lines where feasible.	Updated Timetable to "On-going." Updated Responsible Party to remove Oconto County.
Extreme Cold	
Conduct Red Cross sheltering evaluation for heating centers.	Addition.
Promoting public awareness and education.	Updated Timetable to "On-going."
Providing public assistance for furnace maintenance and payment of utility bills.	Changed Priority from "Medium" to "High." Updated Timetable to "On-going."
Monitoring and enforcement of building codes.	Updated Timetable to "On-going."
Maintain emergency evacuation shelters.	Changed Priority from "Low" to "Medium." Updated Timetable to "On-going." Added "municipalities" to Responsible Party.
Wildland Fires	
Use of fire prevention programs such as Smokey Bear.	Updated Priority from High to Medium. Updated Timetable to "On-going." Updated Responsible Party to remove Oconto County and add local fire departments.
Use of early detection methods like aircraft and citizen reporting.	Updated Timetable to "On-going."
Institution and enforcement of regulations-burning permits.	Updated Timetable to "On-going."
Promotion of fire suppression training and readiness.	Updated Timetable to "On-going."
Fire department training.	Updated Timetable to "On-going."
Establishment of suppression agreements between agencies.	Updated Timetable to "On-going." Updated Responsible Party to remove Oconto County.
Creation of community wildland protection plans.	Updated Timetable to "Updated regularly."
Year-round water access - dry hydrants.	Updated Timetable to "On-going."
Implementation of zoning and education programs regarding the urban and woodland interface.	Updated Timetable to "On-going."
Use of non-combustible building materials (building codes).	Updated Timetable to "On-going." Updated Responsible Party to remove Oconto County and add WDNR.
Provide fire prevention materials.	Addition.
Flooding	
Utilization of the CodeRED communication network.	Updated Timetable to "On-going."
Dredging of harbors and large rivers.	Moved to municipal mitigation strategies.
Mapping of floodplains, wetlands, and topography.	Completed. Floodplains mapped in 2010, wetlands in 2013, and topography in 2014.
Wave run-up/storm surge analysis along Green Bay.	Addition.
Instituting and enforcing ordinances and regulations.	Updated Timetable to "On-going."
Adopting and enforcing building codes.	Updated Timetable to "On-going." Updated Responsible Party to add building inspectors.
Promotion of flood insurance.	Updated Project to replace "Promotion of" with "Provide information about..." Updated Timetable to "On-going."
Requiring real estate disclosures.	Removed. The Steering Committee is unsure if this project is something the county has ever done.

Table 0.2: Plan Update Summary - Mitigation Strategies (cont'd)

Project	Changes
Flooding (cont'd)	
Public acquisition of vulnerable structures and critical facilities.	Moved to municipal mitigation strategies.
Installation of check valves to eliminate water back-up into homes and businesses.	Updated Timetable to "On-going." Updated Responsible Party to add WDNR and incorporated communities.
Site and structural modification to flood proof.	Updated Timetable to "On-going."
Ensure all large high risk dams have an updated emergency operations plan in place.	Updated Timetable to "On-going."
Ensure the new digitized floodplain mapping is integrated into the dam emergency operations plans when completed.	Completed.
Drought	
Adoption and compliance with regulations.	Updated Timetable to "On-going."
Develop contingency plans and alternative water delivery systems.	Updated Timetable to "On-going."
Use of drought resistant plants and crops, the practice of mulching and use of drip hoses.	Updated Timetable to "On-going."
Utilization of the most conducive land (heavy soils and nutrient composition).	Updated Timetable to "On-going."
Farming and timber harvesting practices.	Updated Timetable to "On-going."
Encourage the availability and use of rain barrels.	Updated Timetable to "On-going." Updated Responsible Party to remove Forestry Department, DATCP, and Farm Service Agency.
Pest Outbreaks	
Continued education- website information, EAB tool kits, outreach.	Updated Timetable to "On-going."
Placement and monitoring of detection surveys.	Updated Timetable to "On-going."
Promoting good harvesting guidelines.	Removed. Covered under the next project.
Maintaining healthy forests through application of sound management techniques.	Updated Timetable to "On-going."
Disposal and utilization of infested resources.	Revised Project to add "Promote and educate on proper" to the beginning. Updated Timetable to "On-going."
Spraying to slow the spread and for suppression.	Removed. Gypsy moth has moved west. Suppression is available if needed in the future.
Integrated pest control- biological, chemical, and silviculture.	Revised Project to add "Promote and educate" to the beginning. Updated Timetable to "On-going."
Utilization of complete or partial eradication.	Removed. Outdated.
Utilization of quarantines or susceptible or infected areas.	Updated Timetable to "On-going."
Extreme Heat	
Conduct Red Cross sheltering evaluation for cooling centers.	Addition.
Distribution of public awareness materials.	Revised Project to replace "Distribution of public awareness materials" with "Promote public awareness." Updated Timetable to "On-going." Revised Responsible Party to replace "Oconto County, schools, and Red Cross" with "WEM, Heath Services, and Oconto County Emergency Management."
Maintain a countywide database of large air conditioned buildings to be used for potential cooling centers.	Removed.
Ensure wastewater treatment plants have back-up power.	Revised project to replace "treatment plants" with "systems." Changed Priority from "Medium" to "High." Updated Project Timetable from "2010" to "2015." Added "Oconto County Emergency Management" to Responsible Party.
Maintain a countywide database of large crowd events.	Updated Project Timetable to "On-going." Revised Responsible Party to remove "Red Cross" and add "Sheriff's Department."

Table 0.2: Plan Update Summary - Mitigation Strategies (cont'd)

Project	Changes
Dense Fog	
Notification of problem areas through TV and radio broadcasts.	Updated Timetable to "On-going." Updated Estimated Cost to "Media budget."
Installation of proper warning signs in high risk areas.	Updated Timetable to "On-going."
Installation of road reflectors and the painting of road lanes.	Updated Timetable to "On-going."
Promotion of driver safety training/emergency preparedness kits.	Removed.
Hail	
Establishing local evacuation procedures.	Removed.
Distribution of informational publications to increase public awareness.	Updated Timetable to "On-going."
Promoting hail resistant materials through building codes.	Updated Timetable to "On-going."
Planting of natural wind breaks to lessen damage to nearby buildings.	Updated Timetable to "On-going."
Thunder/Lightning	
Distribution of educational brochures on what to do if caught in a lightning storm.	Updated Timetable to "On-going."
Continued training of fire, EMS and law enforcement personnel.	Updated Timetable to "On-going."
Utilization of protection devices for sensitive equipment, such as surge protectors.	Updated Timetable to "On-going."
Placement of information signs at places where large numbers of people congregate.	Removed.
Coastal Hazards	
Continue to enforce setbacks for properties adjacent to Lake Michigan under the county shoreland zoning ordinance.	Addition.

CHAPTER 1 - INTRODUCTION

PURPOSE OF THE PLAN

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

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

Disaster Mitigation Act of 2000

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

- The Act establishes a new requirement for local governments and tribal organizations to prepare a hazard mitigation plan in order to be eligible for funding from FEMA through the Pre-Disaster Mitigation Assistance Program and the Hazard Mitigation Grant Program.
- The Act establishes a requirement that natural hazards need to be addressed in the risk assessment/vulnerability analysis part of a hazard mitigation plan. Man-made/technological hazards are encouraged, but not required, to be addressed.
- The Act authorizes up to seven percent of Hazard Mitigation Grant Program funds available to a state after a federal disaster to be used for development of state, local and tribal organization hazard mitigation plans.
- The Act established November 1, 2004, as the date by which local governments and tribal organizations are to prepare and adopt their respective plans in order to be eligible for the FEMA Hazard Mitigation Grant Program; this deadline was November 1, 2003, for the Pre-Disaster Mitigation Program.
- If a plan is not prepared by November 1, 2004, and a major disaster is declared, in order for a local government or tribal organization to be eligible to receive funding through the Hazard Mitigation Grant Program, they must agree to prepare a hazard mitigation plan within one year.

- In addition, by not having a current, FEMA-approved, and adopted hazard mitigation plan, local and tribal governments cannot utilize funding through the Pre-Disaster Mitigation Grant Program.

Funding of the Hazard Mitigation Plan

In August 2013, the Oconto County received a planning grant to develop an update to their hazard mitigation plan in the amount of \$44,527 from FEMA and Wisconsin Emergency Management (WEM) under disaster declaration FEMA-4076-DR-WI. Through the grant, FEMA provided 75 percent of the funds (\$38,166), Wisconsin Emergency Management provided 12.5 percent of the required match (\$6,361), while the remaining 12.5 percent (\$6,361) was required by Oconto County to meet the local match.

Oconto County entered into a contract (#13012-07) with the Bay-Lake Regional Planning Commission to prepare the update to the hazard mitigation plan. Development of the plan began in December 2013.

Five Parts of this Natural Hazards Mitigation Plan

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

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

PLANNING PROCESS

Development of the *Oconto County Hazard Mitigation Plan* was based on the planning requirements and guidance provided by FEMA and WEM. Following these requirements and guidance, the plan meets the requirements of the Disaster Mitigation Act of 2000. Since the WEM guidance for hazard mitigation plans recommended that planning areas “be consistent with a community’s comprehensive planning boundary,” the planning area for this *Oconto County Hazard Mitigation Plan* covers all of Oconto County including the three cities (Gillett, Oconto, and Oconto Falls), and two villages (Lena and Suring), and 23 towns.

The steering committee comprised of county, city, and village representatives, emergency management personnel, organizations, business, and citizens guided the plan development process over a 15-month timeframe beginning in December 2013. Professional planning support and facilitation was provided by the Bay-Lake Regional Planning Commission. Public review and input was encouraged at all meetings and through an Open House to present the plan goals, mitigation actions plan, and mapped hazard areas.

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

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

Phase II: Reassessing risks and critical facilities

Phase III: Updating the mitigation strategies

Phase IV: Reviewing the policies and procedures for plan implementation

Phase V: Documenting the planning process and plan adoption

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

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

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

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

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

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

Hazard Mitigation Plan Steering Committee

Oconto County established a Hazard Mitigation Plan Steering Committee (Table 1.1), which was responsible for providing input, helping to guide the planning process, and reviewing draft chapters of the plan.

Table 1.1: Oconto County Hazard Mitigation Plan Steering Committee

Name	Organization
Angela Pierce	Bay-Lake Regional Planning Commission
Anne Renel	Oconto County Times Herald
Ben Trembl	WI DNR Law Enforcement
Brad Rice	City of Oconto Falls Mayor
Buzz Kamke	Emergency Management
Charlene Meier	Village of Lena Clerk
Jason Valentine	Oconto Falls Utility
Clark Longsine	Sheriff's Department
Craig Johnson	Health & Human Services
Dale Mohr	UW Extension
Dan Ault	City of Oconto Police Chief
Debbie Konitzer	Public Health
Dennis Kroll	Emergency Management
Gerald Beekman	Emergency Management
Irene Drake	Gillett City Mayor
Jack Mlnarik	Fire/EMS Oconto Chief
Jay Tousey	Suring Village President
Jeremy Wusterbarth	Oconto Utility
John Hubacher	Oconto Hospital
John Lubbers	WI DNR Fire Management
John Pinkart	UW Extension
Kathy Henne	St. Clare Memorial Hospital
Kent Lyng	Oconto Electric Co-op
Kevin Hamann	Oconto County Administrator
Leland Rymer	County Chairperson
Lisa Mahoney	Public Health
Mark Teuteberg	Land Information
Melissa Wellens	Emergency Management
Mike Jansen	Sheriff
Brad Olson	City of Oconto Falls Police
Miles Winkler	WI DNR Water/Engineering
Pat Scanlan	Highway Department
Pat Virtues	Zoning/Planning
Paul Bednarik	Emergency Management
Randy Winkler	American Red Cross
Robert Skaltzky	County Forest & Parks
Ryan Severson	WI DNR Forestry
Sara Perrizo	City of Oconto
Steve Marquardt	Lena Village President
Tim Magnin	Oconto Co. EM Director
Vicki Roberts	City of Oconto Falls
Victoria Bostedt	City of Oconto Mayor
Wayne Sleeter	Technology Services

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

- | | |
|----------------------------|-----------------------|
| 1. Winter Storms | 7. Pest Outbreaks |
| 2. Tornado and Strong Wind | 8. Extreme Heat |
| 3. Extreme Cold | 9. Dense Fog |
| 4. Wildland Fires | 10. Hail |
| 5. Flooding | 11. Thunder/Lightning |
| 6. Drought | 12. Coastal Hazards |

Steering Committee Plan Review

The steering committee reviewed and analyzed each section of the plan, and subsequently Table 0.1 was developed to document the sections of the plan that were revised as part of the update process. The steering committee held seven meetings to update the plan: April 1, 2014; May 6, 2014; June 26, 2014; August 28, 2014; October 21, 2014; October 28, 2014; and December 11, 2014. Additional plan review through E-mail occurred outside of these meetings. Copies of the sign-in sheets are included in Appendix A.

Public Involvement

Steering Committee Meetings

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

Public Informational Meeting

An informational meeting was held for the public on January 21, 2015 at the Oconto County Courthouse in Oconto, Wisconsin. This meeting was held to provide additional opportunity for the public to review and comment on the draft plan and maps. Notices were posted at County Courthouse, local government offices, and provided to local media. No comments were received from the public at this meeting.

County Board Meeting

On December 17, 2015, the Oconto County Board adopted this hazard mitigation plan update at a public meeting. A copy of the resolution of adoption can be found at the front of this plan on page iii.

Neighboring Jurisdictions

The Oconto County Hazard Mitigation Plan was sent to the emergency management directors in the adjacent counties for their review and comment. Adjacent counties include Brown, Marinette, Forest, Langlade, Menominee, and Shawano counties. No comments were received.

Contact Information

Tim Magnin
Oconto County Emergency Management Director
301 Washington St, Oconto, WI 54153
(920) 834-6850, Tim.Magnin@co.oconto.wi.us

CHAPTER 2 - COMMUNITY PROFILE

GENERAL GEOGRAPHY

The planning area for the *Oconto County Hazards Mitigation Plan* completely covers Oconto County and includes all of the municipalities within the county. Oconto County is located in the Northeast Wisconsin encompassing an area of approximately 1,016 square miles, or 650,766 acres. The county has 28 municipalities comprised of 23 towns and five incorporated communities including the cities of Oconto, Oconto Falls, and Gillett; and the villages of Lena and Suring.



Marinette County borders Oconto County to the north; Forest, Langlade, Menominee, and Shawano counties comprise the county's western border; and Brown County is its southern neighbor. Map 2.1 illustrates the location of Oconto County and its municipalities.

HISTORICAL AND CULTURAL SETTING

The Menominee People (meaning rice eaters) were the first nation to control Oconto County land. They were a peaceful nation whose main diet centered on the fish and wild rice of the area. The Menominee had a large settlement to the north in what is now Marinette. The city derives its name from a famous Indian woman who developed a large trading post where that city now stands. The two primary forms of transportation for the Menominee people were by canoe or by foot.

The first Europeans to write about being in the area of Oconto County were the French who worked for Canadian Samuel de Champlain. Men were sent from the colony of New France (Canada), founded in 1608, to learn the languages and customs of the Native Americans and form economic, political and military ties with them. Etienne Brule explored what is now northern Wisconsin in the 1620's, but it is not known if he came as far south as Oconto County. More likely the first to set foot in Oconto County was Jean Nicolet, who explored the Bay in 1634 for a short time, just 14 years after the founding of a colony Pilgrims at Plymouth Rock in New England. Twenty years later, the next Frenchmen to visit Wisconsin and the Oconto County area were probably traders Medart Chouart Sieur Des Groselliers and Pierre- Esprit Radisson in 1656. These two men were brothers-in-law and spent years exploring "Le Baye" as it is called now, and the surrounding area. Large amounts of furs were already being exchanged in Montreal, Canada, for European goods such as cloth, knives, and guns. But these two Frenchmen were more interested in exploration. Other Frenchmen trying to make their presence known in the Oconto County area were Father Allouez and his contemporary, Father Andre. Both these Catholic priests spent many years and endured enormous hardship in an effort to comfort, heal, educate, and sometimes convert members of the local tribes.

France, by 1671, had claimed the Great Lakes area for its own, which opened the forests of the region, including Oconto County, to an invasion of illegal courier de bois or "wood runners" which were unlicensed trappers and traders. Only one canoe filled with beaver pelts would bring great wealth to a voyageur, so illicit trading had great allure. By 1700, the French presence in the Great Lakes was strong and firmly established in trade, which continued even after the loss of the "French and Indian War" to the British in 1763. Because of the presence of so many French men and very few French women west of Montreal, and the need for these men to have wives

already possessing the skills to prepare and pack furs, survive and raise families in the wilderness, and lead independent lives with the husband gone a good amount of time each year, the Frenchmen turned to Native American women for marriage. Children of these mixed unions became known as the Metis. By the end of the 1700's this group of people was numerous and began to live in settlements all around the Great Lakes. They tended to separate themselves socially from both Indian tribes and European settlers, forming businesses and marriages with each other.

The region, including Oconto County, was claimed by Massachusetts, Connecticut, New York and Virginia immediately after the American Revolution. Ohio won the distinction of claiming the area in 1785, then Indiana, Illinois and finally Michigan as each surrounding state took a turn. The first saw mill in what became Oconto County was built in Pensaukee in 1827 on land leased from the Menominee Indians for \$15 a year and enough board lumber to make caskets. By the early 1830's, George Furwick was the first to purchase land from the government in what is now the City of Oconto. In 1848, Wisconsin achieved statehood, being the last in the Great Lakes Territory to do so. The first elections were held in what is now Oconto on November 4, 1851 to form the boundaries and name this new county separating from Brown County. Oconto City became the county seat at this time. The name "Oconto" was taken from an early Native American settlement named "Oak-a-toe". With the act of Congress that created Oconto County in 1851 from the northern part of Brown County, the white cities and villages officially came into existence and the Indian villages they replaced vanished forever.

By 1850, the U.S. Census listed the county as having a population of 415 and described them as "wilderness dwellers". The first steam powered circular saw was brought into production by Samuel B. Gilkey in 1853 and the first steamboats began moving along the Oconto River the following spring. Also in 1854, Henry Tourtilotte and his Indian wife and four children came to the Gillett area being the first to build a split level log cabin on what is now First and Main Streets. He was soon followed by Henry Clark and his Indian wife and their three children. A Potawatomi settlement was just north of them and artifacts are still unearthed by local residents. Older residents of the area remember seeing the Potawatomi cemetery with small wooden roofs covering the graves.

In 1855, the first road between the cities of Green Bay and Menominee began construction, northward. On March 11 of 1869 Oconto was chartered as a city by an Act of Legislature. Lumbering gave way to homestead farming, and in particular, dairying, in the latter half of the 1800's. Oconto County was an important reason why Wisconsin's rose to the stature of "Dairy Capitol of the World." Tracks for the train line between Green Bay and Menominee were being laid in 1871, but faced a major setback when the huge "Peshtigo Fire" burned nearly every foot of track along the route. The first Christian Science Church was built in 1886. In 1879, the final boundaries were set for present day Oconto County with the inclusion of Town of How from Shawano County. There are approximately 1000 square miles in this north central Wisconsin County. It has an elongated shape that measures approximately 66 mile north to south, and is bordered by Brown, Marinette, Forest, Shawano and Langlade Counties and the Menominee Reservation.¹

¹ Rita Neustifter. 1998.

GENERAL DEVELOPMENT PATTERN

A detailed field inventory of land use in the county was conducted in 2007 by the Bay-Lake Regional Planning Commission (Table 2.1). Using GIS, land use types were tabulated to calculate the total area of Oconto County at 650,766 acres, or approximately 1,016 square miles.

As summarized in Table 2.1, just over 91 percent of the county is classified as undeveloped, while existing development covers approximately nine percent of the county. The vast majority of the county is comprised of woodlands with nearly 397,000 acres or 61 percent of the land. Croplands/pasture comprise nearly 170,000 acres or 25 percent. Developed land is comprised of residential, commercial, industrial, transportation, communications/utilities, institutional/governmental, recreation, and agricultural structures. Residential development comprises just over one-third of the developed area (36 percent).

Table 2.1: Land Use, 2007, Oconto County

Land Use Type	Total (acres)	Developed Land (%)	Total Land
DEVELOPED			
Residential	21,317.6	36.4	7.8
<i>Single Family</i>	20,074.3	34.3	7.3
<i>Two Family</i>	26.8	0.0	0.0
<i>Multi-Family</i>	76.4	0.1	0.0
<i>Mobile Homes</i>	1,069.4	1.8	0.4
<i>Vacant Residential</i>	70.7	0.1	0.0
Transportation	6,343.7	10.8	2.3
Agricultural Structures	3,697.8	6.3	1.3
Recreational	2,710.7	4.6	1.0
Industrial	1,909.0	3.3	0.7
Commercial	1,231.0	2.1	0.4
Institutional/Governmental	767.5	1.3	0.3
Communications/Utilities	359.8	0.6	0.1
Total Developed Acres	58,527.4	100.0	21.4
Land Use Type	Total (acres)	Undeveloped	Total Land
UNDEVELOPED			
Woodlands	396,916.4	184.2	144.8
Croplands/Pasture	169,997.9	78.9	62.0
Other Natural Areas	30,677.3	14.2	11.2
Water Features	14,837.7	6.9	5.4
Total Undeveloped Acres	215,512.9	100.0	78.6
Total Land Area	274,040.3		

Source: Bay-Lake Regional Planning Commission, 2014.

General Development Trends

The following development trends have been observed in Oconto County. It is expected that these trends will influence the county's future growth and its preservation of natural, agricultural, and cultural resources. All local municipalities in the county will need to address them within their planning processes. These basic development trends include:

- The demand for larger lot sizes will increase and the number of persons per household will decrease over the coming two decades, resulting in a greater consumption of farmland, open spaces, and woodlands to accommodate future residential growth.
- Existing incorporated communities and areas noted as neighborhood mixed-use (i.e. Sobieski) will experience greater density development with the adjacent areas seeing development occur at lower densities.
- The county's natural features, such as floodplains and wetlands will continue to be negatively impacted due to the high rate of development witnessed throughout the county.
- Commercial and industrial land uses will continue to grow and develop within the five incorporated communities, in designated areas within the towns of Abrams and Little Suamico, and along main transportation corridors U.S. Highways 41 and 141, State Highways 32 and 54, 29, and several county roads such as A, C, and D.
- The northern area of Oconto County will continue to be a destination for those individuals seeking a variety of recreational opportunities.
- The growth anticipated in seasonal housing is an important trend to be addressed in future land use and hazard mitigation planning.
- Overall, Oconto County will experience an increased demand for public services as the median age for the county's population continues to rise.

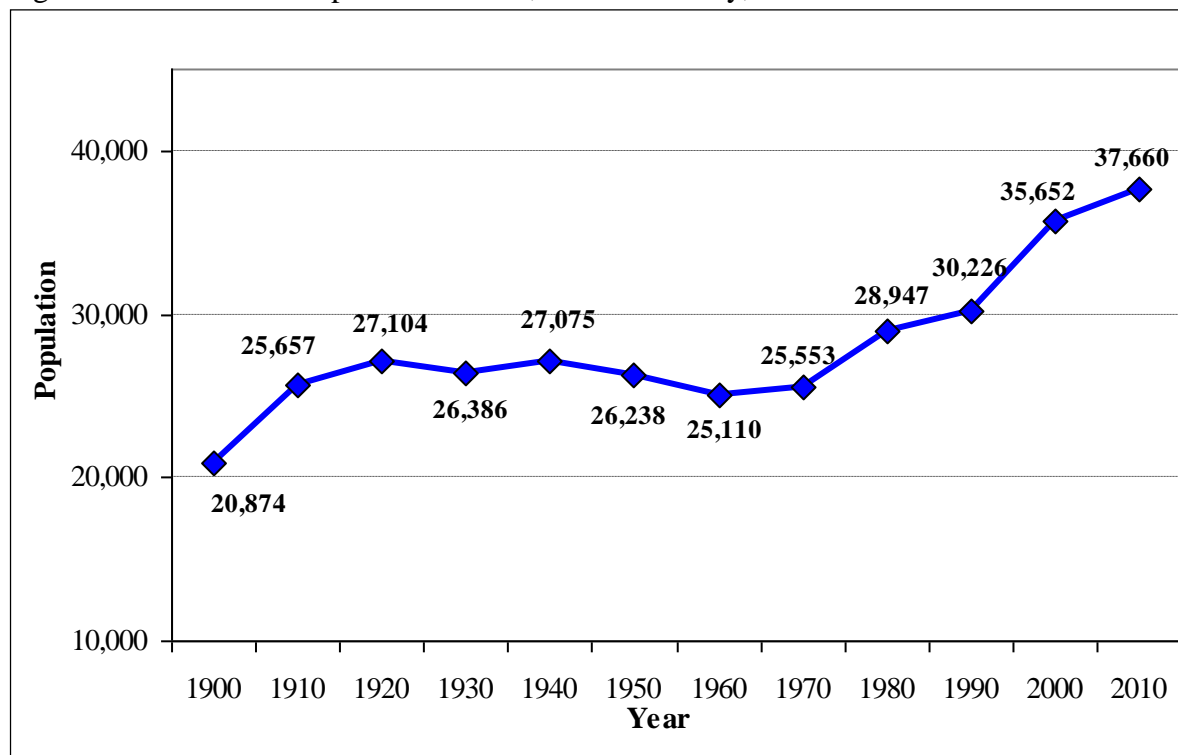
DEMOGRAPHIC TRENDS

In order to plan for hazards that may occur within Oconto County, it is important to gain an understanding of the current and projected future population and housing characteristics for each community within the county. Population estimates provided by the Wisconsin Department of Administration (WDOA) offer a clearer picture on where population increases are expected to occur within the county. Increases in population will drive the need for new homes (single and multi-family) and the services needed to meet the needs of those new residents. The following information summarizes population and housing data for the municipalities within Oconto County.

Population Trends

During the past 110 years, Oconto County's population has fluctuated up and down over the decades, but has increased overall by 45 percent or 16,786 persons. The county's population has been continually increasing since 1960. Figure 2.1 illustrates Oconto County's population change between the years of 1900 and 2010.

Figure 2.1: Historical Population Levels, Oconto County, 1900-2010



Source: U.S. Bureau of the Census, General Population Characteristics 1840-1970, Bay-Lake Regional Planning Commission, December 1975; Census 2000-2010; and Bay-Lake Regional Planning Commission, 2014.

Population Projections

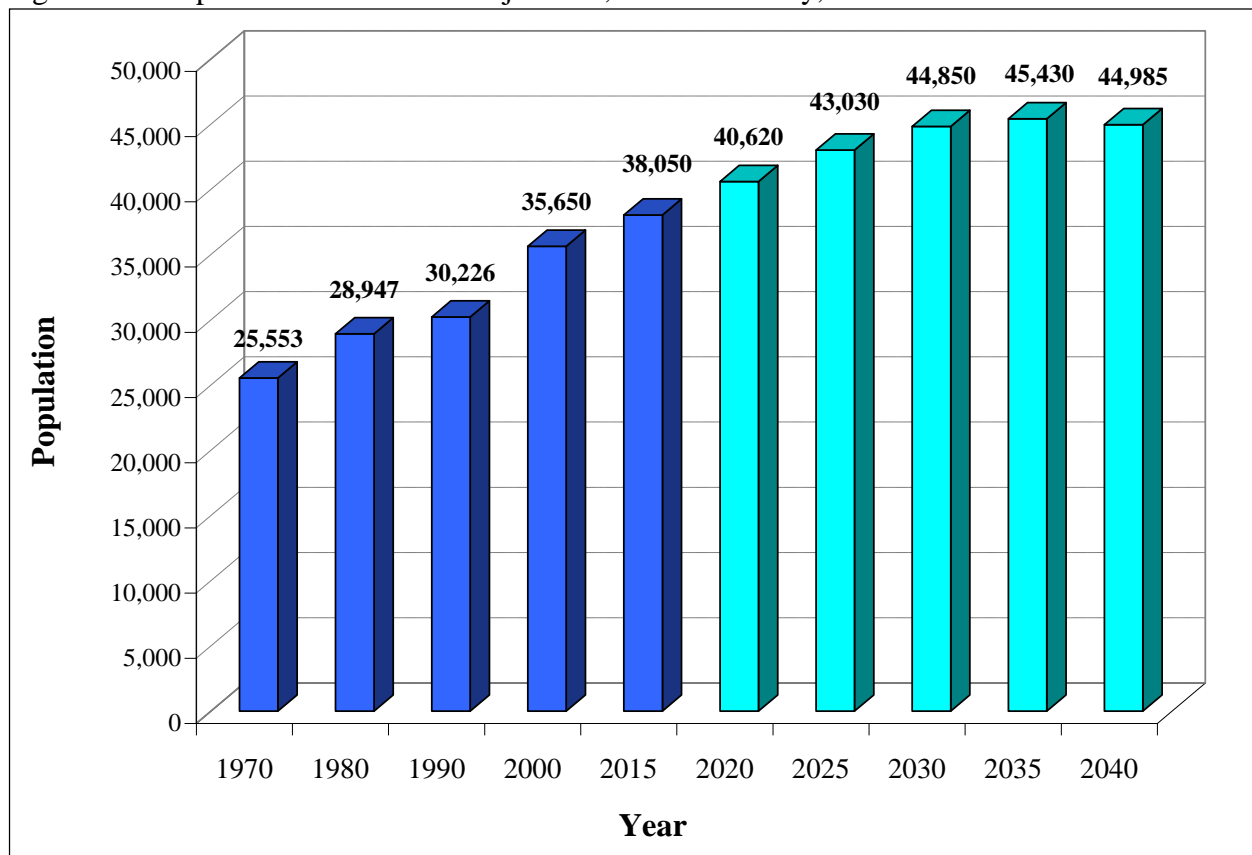
Oconto County is projected to see a slow, but steady growth in its population from 2010 to 2035 with a small dip in population from 2035 to 2040. Overall the county is projected to have a population of 44,985 by 2040, according to the Wisconsin Department of Administration (WDOA). This represents an increase of 7,325 persons, or 19.5 percent, from the 2010 Census count of 37,660 persons (Table 2.2 and Figure 2.2).

Table 2.2: Population Projections, Oconto County and Wisconsin, 2010-2040

Geographic Location	US Census 2010	Population Projections						# Change 2010-2040	% Change 2010-2040
		2015	2020	2025	2030	2035	2040		
Oconto County	37,660	38,050	40,620	43,030	44,850	45,430	44,985	7,325	19.5
Wisconsin	5,686,986	5,783,015	6,005,080	6,203,850	6,375,910	6,476,270	6,491,635	804,649	14.1

Source: U.S. Bureau of the Census, Census of Population and Housing, 2010; Wisconsin Department of Administration, Official Population Projections, 2013; and Bay-Lake Regional Planning Commission, 2014.

Figure 2.2: Population Trends and Projections, Oconto County, 1970-2030



Source: U.S. Bureau of the Census, 1970-2010; Wisconsin Department of Administration, Official Population Projections, 2013; Bay-Lake Regional Planning Commission, 2014.

Housing Trends

From 2000 to 2010, Oconto County gained 25,713 housing units (Table 2.3). Both Oconto County and the municipalities have seen a lot of fluctuation in the pace of housing growth over the decades; however, the trend continues upward.

Table 2.3: Housing Units, Oconto County, 1970-2010

Geographic Location	Year					Percent Change			
	1970	1980	1990	2000	2010	1970-80	1980-90	1990-2000	1970-2000
Oconto County	11,947	16,940	18,832	19,815	37,660	41.8	11.2	5.2	65.9
Wisconsin	1,472,466	1,863,897	2,055,774	2,321,144	5,686,986	26.6	10.3	12.9	57.6

Source: U.S. Bureau of the Census, Census 1970-2010; and Bay-Lake Regional Planning Commission, 2014.

EMPLOYMENT CHARACTERISTICS

As a result of the 2009 “Great Recession” that affected the entire country, there was a significant jump in the number of unemployed in the county during that time. The unemployment rate reached its highest level on record, 11.5 percent during this period. Recovery since 2009 has been slow but steady (Table 2.4).

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

population, changes in the number of residents aged 16 and over, and the proportion of this group working or seeking employment are all factors affecting the size of the labor force.

Table 2.4: Employment Statistics, 2000-2013, Oconto County

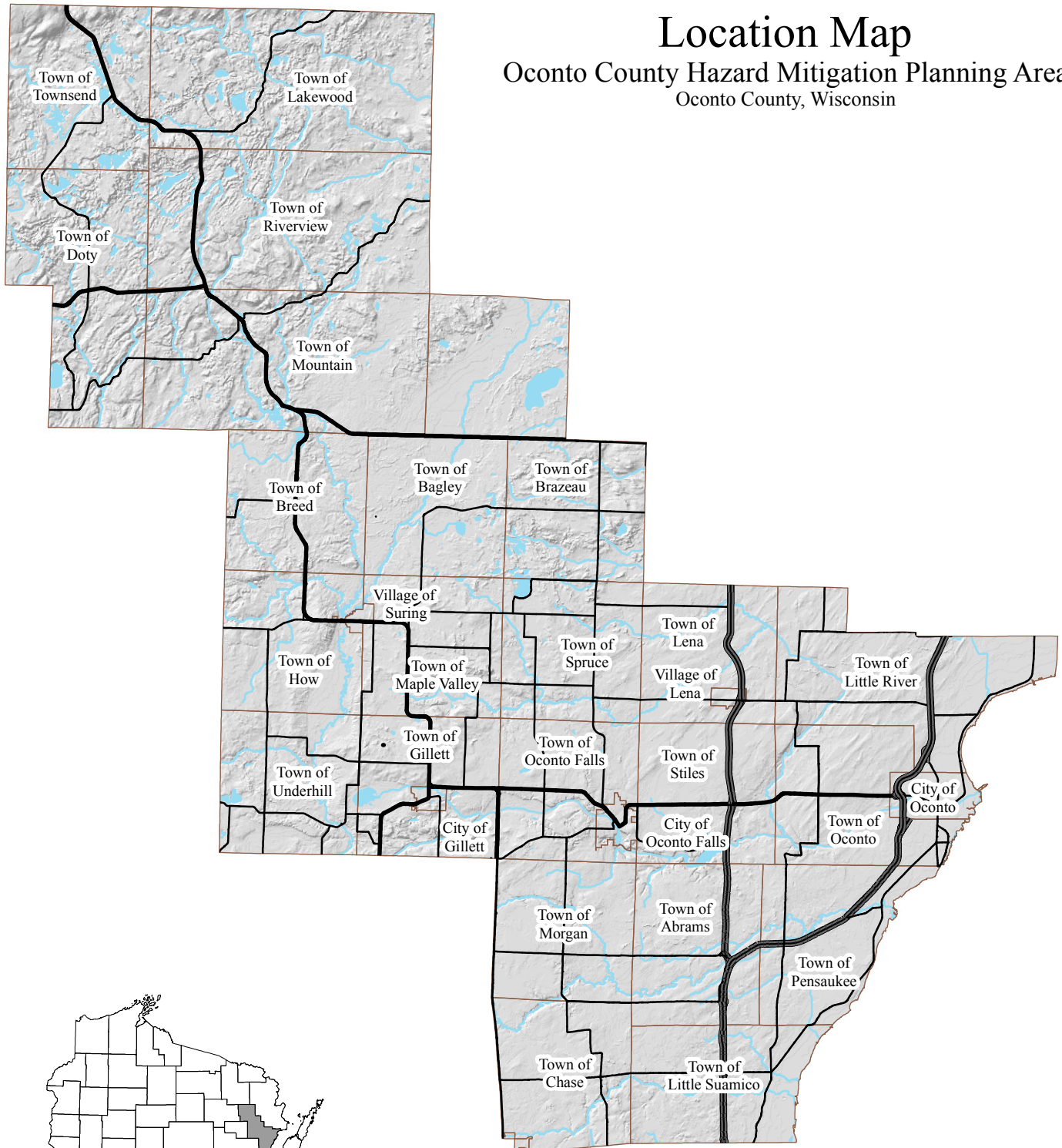
Year	Labor Force	Employed	Unemployed	Unemployment Rate
2000	19,493	18,811	682	3.5
2001	19,901	18,849	1,052	5.3
2002	19,962	18,724	1,238	6.2
2003	20,375	18,950	1,425	7
2004	20,513	19,206	1,307	6.4
2005	20,325	19,144	1,181	5.8
2006	20,657	19,407	1,250	6.1
2007	20,406	19,165	1,241	6.1
2008	20,278	19,011	1,267	6.2
2009	20,702	18,323	2,379	11.5
2010	20,596	18,560	2,036	9.9
2011	20,105	18,334	1,771	8.8
2012	19,896	18,323	1,573	7.9
2013	19,921	18,442	1,479	7.4

Source: Wisconsin Department of Workforce Development, Local Area Unemployment Statistics (LAUS), 2000-2013; Bay-Lake Regional Planning Commission, 2014.



Location Map

Oconto County Hazard Mitigation Planning Area
Oconto County, Wisconsin



Oconto County



Wisconsin

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

Source: Oconto County; Bay-Lake Regional Planning Commission, 2014.



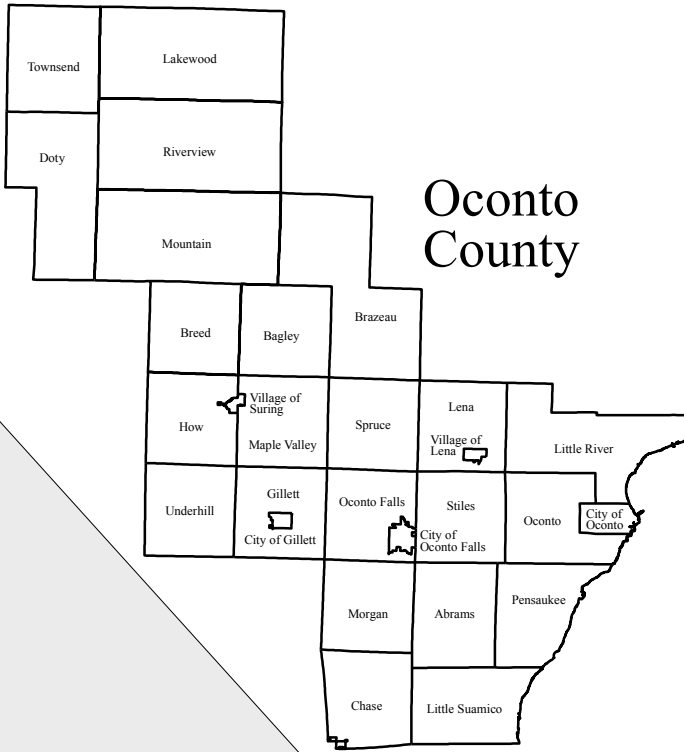
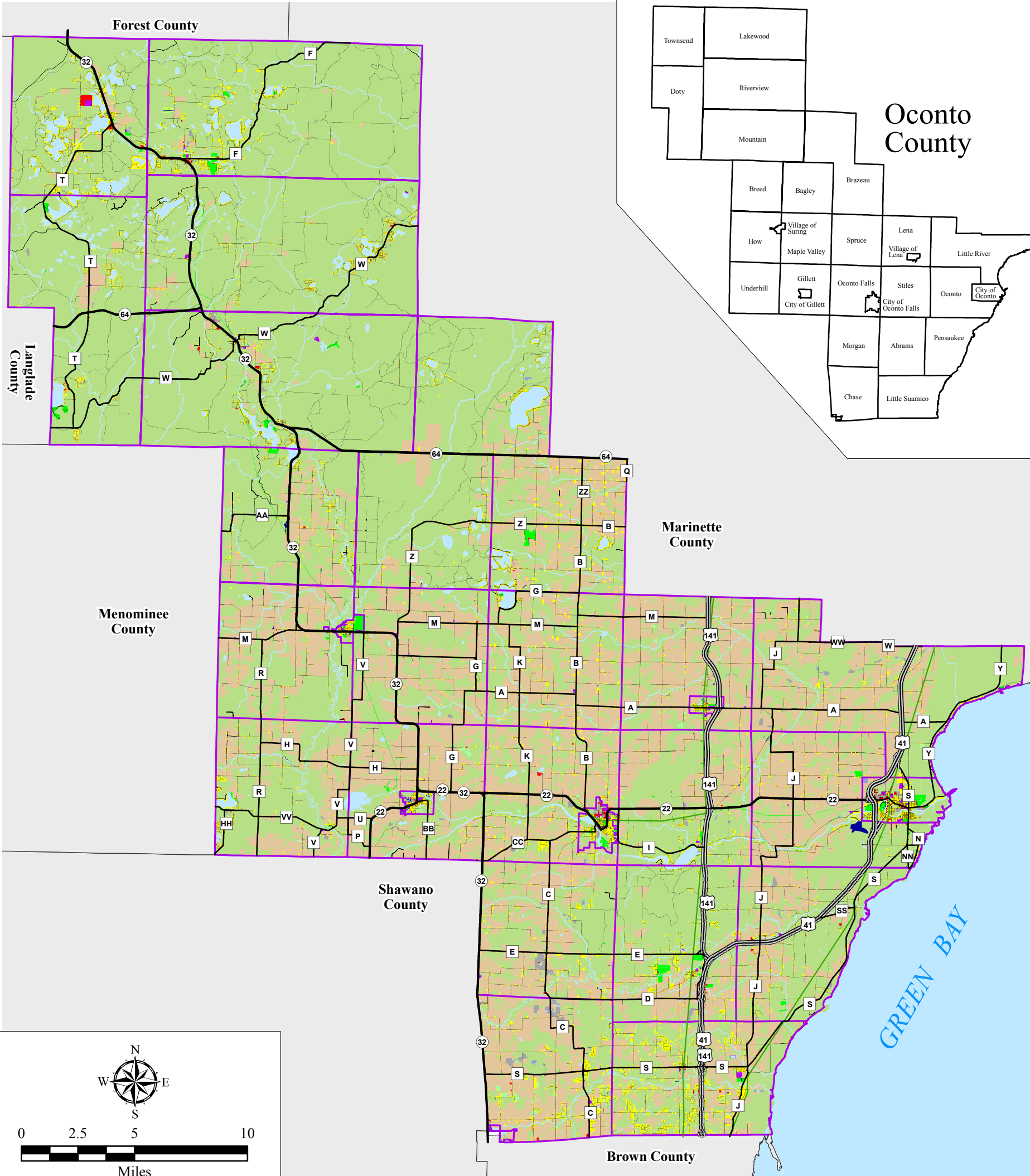
Base Map Features

- Interstate Highway
- U.S. Highway
- State Highway
- Surface Water

Land Use

Oconto County Hazard Mitigation Planning Area

Oconto County, Wisconsin



Base Map Features

- Community Boundary
- U.S. Highway
- State Highway
- County Highway
- Railroad
- Surface Water

- Residential
- Mobile Homes
- Commercial
- Industrial
- Roads
- Transportation
- Communications/Utilities

- Governmental/Institutional
- Parks and Recreation
- Open Space/Fallow Fields
- Agricultural
- Water Features
- Woodlands/Natural Areas



This map is neither a legally recorded map nor a survey and is not intended to be used as one. This drawing is a compilation of records, information and data used for reference purposes only. Bay-Lake RPC is not responsible for any inaccuracies herein contained.
Source: Oconto County; Bay-Lake Regional Planning Commission, 2014.

CHAPTER 3 - RISK ASSESSMENT

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

HAZARD IDENTIFICATION

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

Hazard Risk Assessment Ranking

To develop a hazard risk assessment ranking, a survey was conducted in 2008 and each plan steering committee member was asked to assign a risk rating of one point for low, two points for moderate, and three points for high to each of the following risk assessment criterion for each natural hazard:

- Frequency of past hazard occurrences
- Probability of hazard occurring in the future
- Degree of past hazard events causing injuries, sickness and/or deaths
- Degree of past hazard events causing damage to homes
- Degree of past hazard events causing damage to business and/or interruption of business trade
- Amount of local, state, and federal funds expended on past hazard recovery activities
- Amount of population still vulnerable to injury, sickness, and/or death from hazard
- Amount of homes still vulnerable to damage from hazard
- Amount of businesses still vulnerable to damage or interruption of business trade

The number of points for each criterion for each identified natural hazards was totaled and each natural hazard was ranked based on the total points.

During the plan update, the steering committee agreed by consensus at a meeting on April 1, 2014 to make some revisions to the hazard risk rankings based on historical hazard occurrence data. Table 3.1 shows the updated hazard risk assessment ranking for the plan.

Table 3.1: Updated Hazard Risk Assessment Ranking, Oconto County

2015 Ranking	Type
1	Winter Storms
2	Tornado and Strong Wind
3	Extreme Cold
4	Wildland Fires
5	Flooding
6	Drought
7	Pest Outbreaks
8	Extreme Heat
9	Dense Fog
10	Hail
11	Thunder/Lightning
12	Coastal Hazards

Source: Oconto County Hazard Mitigation Plan Steering Committee, 2014.

Natural Hazard Events Historical Summary

The National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center (NCDC) publishes National Weather Service (NWS) data describing past weather events and the resulting deaths, injuries, and damages associated with each of these events . Event occurrence information is available at a local, county, or regional level – depending on the area covered by the hazard event. Historical hazard events were available from January 1, 2000 through January 31, 2014. The query for that time period resulted in 199 events recorded (Table 3.2).

The data from the NCDC Storm Events Database shows that of the 199 events, the natural hazards occurring most frequently in Oconto County between January 2000 and January 2014 include: winter storms (70 events), tornado and strong wind (45 events), drought (33 events), and hail (30 events). Other less frequent events since 2000 include extreme cold (11 events), flooding (8 events), dense fog (2 events), and extreme heat (0 events). Some of the recorded hazard events may not have been specific to the Oconto County, and may have occurred across a larger regional area, or statewide. Additionally, some of the common hazard events, such as thunder/lightning or dense fog, may only get reported to the NCDC if they are extreme events that cause property damage, injury, or death.

Two injuries (tornado and strong wind) have been reported in Oconto County from hazard events since 2000. The most costly hazard events in terms of property damage since 2000 has been tornado and strong wind (\$10,600,500) and hail (\$3,000,000).

Table 3.2: Natural Hazard Occurrences Data, Oconto County 2000-2014

Natural Hazard	# of Events ¹	Avg #/Year	Risk ²	Deaths	Injuries	Property Damage ^{3,4}
Winter Storm	70	5	high	0	0	\$0
Tornado and Strong Wind	45	3	high	0	2	\$10,600,500
Extreme Cold	11	1	low	0	0	\$0
Wildland Fires ⁵	678	48	high	-	-	-
Flooding	8	1	low	0	0	\$0
Drought	33	2	medium	0	0	\$0
Pest Outbreaks ⁶	2	0.1 ⁷	low	-	-	-
Extreme Heat	0	0	low	0	0	\$0
Dense Fog	2	0.1 ⁷	low	0	0	\$0
Hail	30	2	medium	0	0	\$3,000,000
Thunder/Lightning	0	0.0	low	0	0	\$0
Coastal Hazards	No Data	-	low ⁸	-	-	-
Total Events	879	--	--	0	2	\$13,600,500

1. January 1, 2000 to January 31, 2014 (14 years, 1 month)

2. Risk based on occurrences per year: High >2; Medium 2; and Low <2

3. Includes Crop Damages.

4. Does not factor in private losses for most occurrences.

5. Data provided by Wisconsin DNR; 2014.

6. Data provided by Bob Skalitzy, County Forest Administrator; 2014.

7. Approximately one event every 10 years.

8. Based on information provided by *Resource Guide for Great Lakes Coastal Hazards in Wisconsin* (http://coastal.lic.wisc.edu/urpl999.htm#Section_4).

Source: NOAA NCDC Storms Database, 2000-2014; and WDNR Division of Forestry, Wildfire Statistics, 2000-2014.

Natural Hazards Prioritization

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

1. Winter Storms (includes Heavy Snow, Frost/Freeze, and Ice Storm)
2. Tornado and Strong Wind (includes Thunderstorm Wind, Strong Wind, Funnel Cloud, Tornado, Dust Devil, and High Wind)
3. Extreme Cold (includes Extreme Cold/Wind Chill and Cold/Wind Chill)
4. Wildland Fires
5. Flooding (includes Flash Flood, Heavy Rain, and Dam Failure Flooding)
6. Drought
7. Pest Outbreaks
8. Extreme Heat (includes heat)

9. Dense Fog
10. Hail
11. Thunder/Lightning
12. Coastal Hazards (Bluff Erosion, Ice Shoves, etc.)

Other Natural Hazards Determined Not to Pose a Significant Risk

The following natural hazards were determined to have a minimal chance of occurring or pose minimal risk to the safety of residents or property in Oconto County. These natural hazards are excluded from the full assessment, but are briefly discussed here to meet the comprehensive requirements for developing a natural hazards mitigation plan under Federal law.

Earthquakes

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

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

Landslides

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

The U.S. Geological Survey *Landslide Overview Map of the Conterminous United States* identifies low landslide risks for all of Oconto County. The majority of the land within Oconto County does not involve steep slopes and does not pose a landslide risk. While there are steeper portions of the county, the soils involved pose more of a gradual erosion risk, as opposed to the sudden, large-scale movement of ground associated with landslide hazards. Hillside erosion (minor landslides) within the county is very uncommon, and is the result of man-made impacts, such as the removal of vegetation. Hillside erosion has not posed substantial risk to life or property, and has been largely mitigated through subdivision law, site plan review and erosion control plans for construction sites.

There are no records of substantial damage or injury from large landslides within Oconto County, and these hazard threats are considered very low.

Subsidence

Land subsidence is an event in which a portion of the land surface collapses or settles. Common causes of subsidence in Wisconsin occur in areas with karst topography. Oconto County is not an area of particularly karst topography and there are no records of substantial damage or injury from land subsidence within Oconto County and these hazard threats are considered very low.

RISK AND VULNERABILITY ASSESSMENT

The risk and vulnerability assessment is intended to describe the frequency, severity, and probability of future occurrence of natural hazards that could impact the planning area. The following hazard profiles attempt to historically describe the characteristics of each natural hazard and how they have affected the population, infrastructure, and environment of the planning area, and the potential risk to the population and property that could occur because of each of these natural hazards. Critical facilities in the planning area have been identified and mapped, and are illustrated in Map 3.1.

Critical Facilities

Although the risk assessment focuses on the risk potential to the overall planning area, critical facilities are of particular concern. Critical facilities are necessary to preserve health, welfare, and quality of life in the county, and fulfill important public safety, emergency response, and/or disaster recovery functions, or they house vulnerable populations (such as schools, childcare, and mobile home parks).

Oconto County has a total of 745 critical facilities. Table 3.3 provides a description of each critical facility type and the reason it has been classified as a critical facility. Table 3.4 lists the types and number of critical facilities within the county. Table 3.5 lists the critical facilities by municipality.

Table 3.3: Critical Facility Type Description, Oconto County

Critical Facility Type	Description/Reason for Inclusion as a Critical Facility
Administrative Building	Public facilities that provide administrative functions including municipal buildings, post offices, library, highway shops, courthouses, etc. Administration buildings may house equipment or personnel necessary to respond to, or recover from a hazard event or may serve as gathering locations and shelters during a hazard event.
Airport	Public or private, paved or packed dirt, landing strip(s) for aircraft. Airports provide safe landing and take-off locations for emergency aircraft.
Boat Landing	Public boat access locations to adjacent waterways. Boat landings provide points of entry for water rescues.
Bridge	Infrastructure where a federal, state, or county roadways crosses a waterbody. They can range in size from a culvert to a multi-span bridge. Bridges can affect transportation and evacuation during a hazard event.
Church	Serve as gathering locations and shelters during a hazard event. Additionally, a large gathering of the population may be present at churches should a hazard event occur on a Sunday morning.
Communications	The infrastructure (such as cell and radio towers, and switching buildings) that make radio and phone communication possible before, during, and after hazard events.
Dams	A barrier constructed to contain the flow of water. The inventory of dams in the county is provided by the Wisconsin DNR Dam Safety Program. Failing or failed dams will likely create a flooding situation.
Day Care	Includes licensed daycare centers that provides care and supervision for less than 24 hours for nine or more children who are not related to the provider. Daycares house a vulnerable population.
Dry Hydrant	A dry hydrant is a non-pressurized pipe installed at a pond or lake that is in close proximity to an all weather road. Dry hydrants provide firefighters with a way to replenish their water supplies.
Electrical Facilities	The facilities infrastructure that supports the electrical power network including substations and anaerobic digesters.
Energy Facilities	The facilities and infrastructure that store and transport fuel such a bulk storage (over 1,000 lbs) and pipelines.
Fire Department	Municipal fire and rescue response facilities that house the equipment and personnel that can support, respond to, or help recovery from a hazard event.
Medical Facilities	Facilities where sick or injured people can receive medical or surgical care, including hospitals, major clinics, and urgent care facilities.
Mobile Home Park	A parcel of land consisting of a number of mobile or manufactured homes. Mobile home parks are typically more vulnerable to hazardous weather events.
Assisted Living Facilities	Facilities where unrelated individuals live, who because of their mental or physical condition, are given 24-hour personal and nursing care, but who do not require hospitalization. Assisted Living Facilities house a vulnerable population.
Plan Facilities (HazMat)	Facilities that have "extremely hazardous materials" over the threshold amounts on-site. The list a facilities is generated by the State Emergency Management along with the help of the Local Emergency Planning Committee (LEPC).
Police Department	Municipal law enforcement and public safety facilities that house the equipment and personnel that can support, respond to, or help recovery from a hazard event.
Recreation Facilities	Public facilities that provide recreational opportunities including parks, campgrounds, and golf courses. A large gathering of the population may be present at a recreation facilities at any time and may not be receiving emergency public information.
Recycling Center	Facilities that serve as collection locations for waste and recycling materials. These facilities could provide collection locations for debris and waste after a hazard event.
Rescue Department	Municipal rescue facilities that house the equipment and personnel that can support, respond to, or help recovery from a hazard event.
School	An educational institution that houses populations for less than a 24 hours. Schools house a vulnerable population, as well as could serve as gathering locations and shelters during a hazard event.
Utilities	The facilities and infrastructure that provide drinking water, and transport and treat human waste including water towers, wells, lift stations, and wastewater treatment plants.

Table 3.4: Number of Critical Facilities by Type, Oconto County

Type	Total
Bridge	205
Boat Landing	88
Administrative Building	56
Recreation Facilities	51
Church	48
Dams	38
Human Services Facilities	30
Utilities	28
Communications	26
Recycling Center	26
School	22
Fire Department	19
Energy Facilities	18
Electrical Facilities	17
Mobile Home Park	13
Medical Facilities	12
Rescue Department	6
Police Department	6
Plan Facilities (HazMat)	6
Airport	6
Total	721

Source: Bay-Lake Regional Planning Commission; 2014.

Table 3.5: Critical Facilities by Municipality, Oconto County

Municipality	Total
City of Oconto	68
City of Oconto Falls	59
Town of Lakewood	51
Town of Lena	50
Town of Mountain	35
Town of Townsend	33
Town of Brazeau	32
City of Gillett	31
Town of Stiles	28
Town of Little Suamico	27
Town of Riverview	27
Village of Suring	25
Village of Lena	24
Town of Doty	20
Town of Spruce	20
Town of Abrams	18
Town of Oconto Falls	18
Town of Little River	18
Town of Chase	17
Town of Oconto	17
Town of Maple Valley	15
Town of Morgan	14
Town of Pensaukee	14
Town of Breed	14
Town of How	14
Town of Underhill	13
Town of Gillett	11
Town of Bagley	8
Total	721

Source: Bay-Lake Regional Planning Commission; 2014.

HAZARD PROFILES

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

Hazard Probabilities

Hazard probabilities are represented as high, medium, and low. High probability hazards are defined as hazards that occur on average more than twice per year; medium probability hazards are those that occur on average twice per year; and low probability hazards that occur on average less than twice per year.

Winter Storms

Description of Hazard

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

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

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

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

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

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

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

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

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

Winter storms in Wisconsin are typically caused by Canadian and Arctic cold fronts that push snow and ice deep into the interior of the United States. Much of the snowfall in Wisconsin occurs in small amounts of between one and three inches per occurrence. Heavy snowfalls (producing at least eight to ten inches of accumulation) happen on the average about five times per season. True blizzards are rare in Wisconsin, and are more likely to occur in northwestern Wisconsin than in southern portions of the state, even though heavy snowfalls are more frequent in southeastern Wisconsin. However, blizzard-like conditions often exist during heavy snow storms when gusty winds cause the severe blowing and drifting of snow.

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

there are three to five freezing rain events, and a major ice storm occurs on a frequency of about once every other year. If a half inch of rain freezes on trees and utility wires, extensive damage can occur, especially if accompanied by high winds that compound the effects of the added weight of the ice. There are also between three and five instances of glazing (less than one quarter inch of ice) throughout Wisconsin during a normal winter.

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

Previous Significant Hazard Occurrences

According to the NOAA National Climatic Data Center (NCDC), Oconto County has experienced 70 significant winter storm events in the last 14 years from January 1, 2000 to January 31, 2014 (including heavy snow, frost/freeze, and ice storms). Many of these hazard events may not have been specific to Oconto County, and may have been recorded for a larger regional area.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, Oconto County experiences approximately five significant winter storm events per year.

Probability of Hazards Occurring in the Future

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

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

Areas at Greatest Risk

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

Impacts from Hazard

Death and Injury

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

Structures at Risk

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

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

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

Critical Facilities

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

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

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

Economic Impacts

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

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

Property Damage

No significant public property damages have been reported from winter storm events for Oconto County over the last 14 years from January 1, 2000 to January 31, 2014 according to NCDC data.

Estimate of Potential Dollar Losses

An estimate of potential dollar losses cannot be calculated for winter storm events, since no vulnerable structures have been identified. Based on previous damages reported by the NCDC, property damages from winter storms has been minimal over the past 14 years. However, winter maintenance costs calculated by the Wisconsin Department of Transportation show that Oconto County has experienced a 30 to 39 percent increase in winter costs over the last five years due primarily to salt purchases.³

² Adams, R., Houston, L., Weiher, R. *The Value of Snow and Snow Information Services, Report prepared for NOAA's National Operational Hydrological Remote Sensing Center.* August, 2004.

³ WisDOT. *Winter Maintenance at a Glance.* 2013.

Tornado and Strong Wind

Description of Hazard

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

A tornado path averages four miles, but may reach up to 300 miles in length. Widths average 300 to 400 yards, but severe tornadoes have cut swaths a mile or more in width, or have formed groups of two or three funnels traveling together. On average, tornadoes move between 25 and 45 miles per hour, but speeds over land of up to 70 miles per hour have been recorded. Tornadoes rarely last more than a couple of minutes in a single location or more than 15 to 20 minutes in a ten mile area, but their short periods of existence do not limit their devastation of an area.

Table 3.6 shows the Enhanced Fujita Scale (EF Scale), which is recognized as the acceptable tornado magnitude measurement rating.

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

On the basis of 40 years of tornado history and more than 100 years of hurricane history, the United States has been divided into four wind zones that geographically reflect the number and strength of extreme wind storms.⁴ Wisconsin is split almost in half between Zone III (northern Wisconsin) and Zone IV (southern Wisconsin). Areas in Zone IV experience the most and the strongest tornado activity that has affected the entire U.S., with wind speeds of up to 250 miles per hour being recorded at some point. Areas in Zone III also experience a great deal of strong tornado activity with wind speeds of up to 200 miles per hour being recorded.

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

Wisconsin's tornado season runs from the beginning of April through September. The most severe tornadoes statewide typically occur during the months of April, May, and June. Many tornadoes strike in late afternoon or early evening. However, tornadoes have occurred during other times of the day. Personal property damage, deaths, and injuries have and will continue to occur due to tornado events in Wisconsin.

⁴ Federal Emergency Management Agency. 2014. Retrieved October 2014 from <http://www.fema.gov/safe-rooms/wind-zones-united-states>.

Table 3.6: Tornado Magnitude Measurement, EF Scale

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

Source: NOAA National Weather Service, 2011.

Strong winds, including thunderstorm winds and high winds can often be just as damaging as a tornado. Strong winds are most likely to happen in the spring and summer months and during the afternoon and evening hours, but can occur throughout the year and at all hours.

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

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

Previous Significant Hazard Occurrences

According to National Climatic Data Center (NCDC), Oconto County has experienced 45 significant tornado and strong wind events (including Thunderstorm Wind, Strong Wind, Funnel Cloud, Tornado, Dust Devil, and High Wind) in the last 14 years from January 1, 2000 to January 31, 2014.

One significant tornado of note was an EF-2 in the Town of Mountain that occurred on June 7, 2007 causing two injuries and \$10.5 million in damage.

Oconto County has experienced a number of tornados prior to 2000 that have resulted in injuries and property damage including the following:

- The “Great Tornado of June 1877” left Pensaukee (which included the towns of Pensaukee, Morgan, and Abrams at the time) in ruins, with six people dead and 32 injured.
- An F2 tornado on June 4, 1966 resulted in \$25,000 in damages.
- An F3 tornado on September 28, 1971 that impacted the Town of Mountain resulting in four people injured (“none seriously”) and \$250,000 in damages. Most of the damage occurred to buildings and mobile homes in Mountain.
- An F1 tornado on June 13, 1976 resulted in \$25,000 in damages.
- An F2 tornado on June 16, 1979 resulted in \$250,000 in damages. Most of the damage occurred to homes, barns, and crops.
- An F1 tornado on May 30, 1980 resulted in \$250,000 in damages. Most of the damage occurred to buildings, cars, and trees.
- A strong wind event (described as “violent thunderstorm downburst winds”) on August 1, 1987 resulted in one injury and \$400,000 in damages along a 10-mile path. Most of the damage occurred to homes, cottages, barns, sheds, and trees.
- A strong wind event on September 13, 1994 resulted in two injuries and \$200,000 in damages.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, Oconto County experiences approximately three significant tornado/strong wind events per year.

Probability of Hazard Occurring in the Future

Based on the hazard frequency, Oconto County is considered to have a **high** probability of experiencing a tornado/strong wind event in any given year.

Areas at Greatest Risk

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

Impacts from Hazard

Death and Injury

No deaths, but two injuries have been reported from tornado/strong wind events for Oconto County over the last 14 years from January 1, 2000 to January 31, 2014, according to NCDC

data. The two reported injuries were the result of an EF-2 tornado that occurred on June 7, 2007 in the Town of Mountain that caused minor injuries to two people as they sought shelter in a bedroom of their home.

Structures at Risk

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

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

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

Critical Facilities

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

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

Economic Impacts

A tornado can have a significant economic impact to a local economy due to irrecoverable businesses and infrastructure damages. A heavily damaged business, especially one that was struggling to make a profit, often never reopens after the hazard event.

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

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

Property Damage

Reported property damage from significant tornadoes/strong winds for Oconto County has totaled approximately \$10.6 million in public property and crop damages over the last 14 years from January 1, 2000 to January 31, 2014 according to NCDC data.

A majority of the property damage (\$10.5 million) occurred during an EF-2 tornado that occurred on June 7, 2007 in the area of the Town of Mountain.

Estimate of Potential Dollar Losses

Since mobile homes are especially vulnerable to tornadoes, a “worst case scenario” for this hazard would involve the total destruction of all mobile homes in the county. In such a “worst case scenario,” the total destruction of all buildings and facilities in the 13 mobile home parks in the County would result in an estimated dollar losses of approximately \$3.1 million plus with an additional estimated value of building contents of \$1.6 million (calculated as 50 percent of the building value), for total estimate of potential dollar losses of \$4.7 million.

Extreme Cold

Description of Hazard

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

Previous Significant Hazard Occurrences

According to National Climatic Data Center (NCDC), Oconto County has experienced 11 significant extreme cold events in the last 14 years from January 1, 2000 to January 31, 2014.

Hazard Frequency

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

Probability of Hazard Occurring in the Future

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

Areas at Greatest Risk

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

Impacts from Hazard

Death and Injury

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

Structures at Risk

Extreme cold conditions can result in burst water pipes. In addition, it is more expensive to heat homes and other buildings during extreme cold events, especially during fuel shortages.

Sometimes, residents of the planning area might consider use of space heaters during an extreme cold event. However, use of space heaters comes with its own risks, including a higher probability of fire to a structure if used improperly.

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

Critical Facilities

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

Economic Impacts

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

Property Damage

No significant public property damages have been reported from extreme cold events for Oconto County over the last 14 years from January 1, 2000 to January 31, 2014 according to NCDC data.

Estimate of Potential Dollar Losses

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

Wildland Fires

Description of Hazard

A wildland fire is any instance of unplanned burning in brush, marshes, grasslands, or field lands. Typical causes of these fires are lightning, human carelessness, or arson. The county has large expanses of forested areas that could be susceptible to wildland fires. Wildland fires can occur at any time of the year and during any time of the day. The primary factors that can contribute to the start of a wildland fire are land use, vegetation, amount of combustible

materials present, and weather conditions such as wind, low humidity, and lack of precipitation. Generally, fires are more likely when vegetation is dry from a winter with little snow or a spring and summer with sparse rainfall. As fires remain a possibility, fire stations in the county are prepared to respond in accordance with established response procedures, while local zoning setback controls and building codes provide additional mitigation measures.

Previous Significant Hazard Occurrences

Oconto County has experienced 678 wildland fire events of various sizes (with the average being 1.4 acres) in the last 14 years from January 2000 to January 2014. During this time, wildland fires have burned 950 acres in Oconto County, according to the Wisconsin Department of Resources (WDNR). Annual occurrence during those 14 years ranged from a low of 18 fires in 2013 to a high of 91 fires in 2003. One fire, the “Bay View Fire,” burned 215 acres in 2004. It was caused from an escaped broadcast burn.

The most disastrous fire in Wisconsin’s history is the Peshtigo fire, when more than 1.2 million acres of forest burned in northeastern Wisconsin, mainly in Oconto, Marinette, Shawano, Brown, Kewaunee, Door, and Manitowoc Counties. Three thousand people were estimated to have been made homeless by this fire. With 1,152 people killed and another 350 missing, this represents the greatest single loss of human life by fire in American history. However, the Great Chicago Fire occurred at the same time and received much more publicity than this historic Wisconsin fire.

Hazard Frequency

Based on previous hazard occurrences as reported by the WDNR, Oconto County experiences approximately 48 wildland fire events every year.

Probability of Hazard Occurring in the Future

According to the WDNR, Oconto County is split in half, north to south, between an “intensive protection area” in the northern half of the county, and a less severe “extensive protection area” in the southern half. Map 3.2 shows the county’s wildland fire risk and defined protection zones.

Intensive protection areas are the most heavily forested and contain the most fire hazards and risk in the state. They have more DNR fire suppression resources and ranger stations. Fire detection is accomplished with fire towers, aerial detection, and citizen reporting. The most restrictive debris burning laws are in effect, which are regulated by the DNR and require a burning permit for debris burning whenever the ground is not snow covered throughout the year.

Extensive protection areas have slightly less restrictive burning laws in effect. A burning permit for debris burning is required in these areas whenever the ground is not snow covered from January 1 through May 31 and other times when the WDNR so orders.

Overall, the probability of a wildland fire occurring is **high** for the county.

Areas at Greatest Risk

Wisconsin DNR has classified “communities at risk” and “communities of concern” for wildland fires throughout the state. The risk classifications include low risk, community of concern, high risk, and very high risk.

More than half of Oconto County has been classified as a high risk community or community of concern for wildland fires, with just 13 of the 28 communities in the county having low wildfire risk (Map 3.2). Seven towns throughout the county have been classified as a high risk

community. Table 3.7 lists the communities with wildfire risks, their size, and the acres of woodland.

Table 3.7: Wildland Fire Risk, Oconto County

Community	Risk Classification	Woodland Acres
Abrams	High	16,015
Breed	High	17,073
Lakewood	High	40,331
Little Suamico	High	11,673
Riverview	High	39,646
Townsend	High	20,399
Underhill	High	12,805
Bagley	Concern	19,383
Brazeau	Concern	28,516
Doty	Concern	30,844
Morgan	Concern	9,149
Mountain	Concern	41,959
Oconto (+ City of Oconto)	Concern	9,405
Stiles	Concern	12,973
Chase (+ Village of Pulaski)	Low	6,610
Gillett (+ City of Gillett)	Low	6,594
How (+ Village of Suring)	Low	11,575
Lena (+ Village of Lena)	Low	6,530
Little River	Low	16,474
Maple Valley	Low	10,628
Oconto Falls (+ City of Oconto Falls)	Low	7,745
Pensaukee	Low	11,529
Spruce	Low	9,035
Total		396,890

Source: Wisconsin DNR; and Bay-Lake Regional Planning Commission, 2014.

Impacts from Hazard

Death and Injury

Data on deaths or injuries is unavailable for wildland fire events for Oconto County over the last 14 years from January 1, 2000 to January 30, 2010 according to the NCDC data.

Structures at Risk

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

Residential housing is typically the most dominant type of structure found within the WUI. Though many parts of a home can be affected by wildfire damage, the roof is the most exposed

portion of the building and is more at risk from flying embers. Attics may also be affected by airborne embers that enter through open eaves and vents. Structures attached to homes, such as decks, garages, and fences, can also carry a fire into a home.

In Oconto County, from 2000 through 2014, 16 structures were lost to wildland fires and another 128 were threatened, yet ultimately saved by fire suppression efforts (Wisconsin DNR Division of Forestry, 2014).

Critical Facilities

Police, fire, and emergency response personnel are greatly affected by wildland fires – suffering increased workloads during and after events. Hospitals can see increases in patient load resulting from burn related injuries and individuals suffering from the effects of smoke inhalation.

Schools, if not affected by a fire, could potentially be used as temporary shelter for individuals that cannot return to their homes. All critical facilities located in the path of a wildland fire can be affected structurally and functionally if evacuation is deemed necessary.

Economic Impacts

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

Property Damage

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

Estimate of Potential Dollar Losses

Based on the land use data of properties within woodlands and within the High Fire Risk zone, there are approximately 6,291 parcels with structures potentially at risk throughout Oconto County from wildland fires. The value of all structures on at-risk parcels in the county is estimated at \$637 million. This information was obtained from Oconto County databases on improved values of real property overlaid with WDNR's Wisconsin Fire Risk Analysis Map.

Flooding

Description of Hazard

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

Dam Failure Flooding

Flooding can also result from dam failure. A "dam" is an artificial barrier, together with its appurtenant works, constructed in or across a waterway for the primary purpose of impounding or diverting water. Dam failure can occur for a number of reasons, including overtopping caused by floods that exceed the capacity of the dam, deliberate acts of sabotage, structural failure of

materials used in dam construction, movement and/or failure of the foundation supporting the dam, settlement and cracking of concrete or embankment dams, piping and internal erosion of soil in embankment dams, or inadequate maintenance and upkeep. In extreme cases, dam failure can occur with little warning and can result in the loss of life and significant property damage in areas downstream of the dam. Other failures and breaches can take much longer to occur.

As identified by the WDNR, there are a total of 42 dams in Oconto County. Of these, 13 are classified as large dams. A large dam has a structural height of over 6 feet and impounding 50 acre-feet or more, or having a structural height of 25 feet or more and impounding more than 15 acre-feet is classified as a large dam. The rest of the dams located in the county are regarded as small dams. Map 3.3 displays the dams in the county.⁵

The WDNR assigns hazard ratings to large dams within the state based on existing land use and land use controls (zoning) downstream of the dam. The hazard rating is not based on the physical attributes, quality, or strength of the dam itself, but rather the potential for loss of life or property damage should the dam fail. A high hazard rating indicates that a failure would put lives at risk. A significant hazard rating indicates that a failure could result in significant property damage. A low hazard rating is given when a failure would result in only minimal property damage and loss of life is unlikely.

Oconto County has five large dams with a high hazard rating, one large dam with a significant hazard rating, and seven large dams with a low hazard rating.

The areas of greatest risk from dam failure are those areas within the hydraulic shadow of dam of these two high and significant risk dams. The hydraulic shadow of the dam is the area of land downstream from a dam that would be inundated by water upon failure of the dam.

Previous Significant Hazard Occurrences

According to National Climatic Data Center (NCDC), Oconto County has experienced eight significant flooding events (including Flash Flood and Heavy Rain) in the last 14 years from January 1, 2000 to January 31, 2014. Some of these reported occurrences may not have been specific to Oconto County, and may have been recorded for a larger regional area.

Oconto County also experienced dam failure flooding associated with statewide flooding in 1993. Road damage was caused when reservoir/dummy dam gates failed to fully operate causing the lake to bypass through a low area.

Hazard Frequency

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

Probability of Hazard Occurring in the Future

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

⁵ Wisconsin Department of Natural Resources. 2012. Retrieved October 2014 from <http://dnr.wi.gov/topic/dams/damfacts.html>.

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

Areas at Greatest Risk

The areas at greatest risk from flooding include the “100-year floodplain” areas of Oconto County. FEMA Flood Insurance Rate Maps also call this the Special Flood Hazard Area, or “A Zone.” The base floodplains for the planning area are shown in Map 3.4. Properties that potentially lie within the floodplain and would be affected by the 100-year flood are shown in Map 3.5.

Impacts from Hazard

Death and Injury

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

Structures at Risk

Analysis of the data used to produce Map 3.5 indicates that 6,090 structures could potentially be impacted by the base flood in the planning area.

Repetitive Loss Properties

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

According to FEMA, there are four repetitive loss properties in Oconto County. They are all single-family residences in the City of Oconto. However, none of these properties have filed a loss since 1986.

Critical Facilities

Analysis of the GIS data used to produce Map 3.6, indicates that there are 184 critical facilities located within 100-year floodplains in Oconto County. However, 174 of these critical facilities are water-dependent facilities (bridges, dry hydrants, boat landings, and dams), so just ten critical facilities are located unnecessarily in the floodplain, including the following:

- Oconto City Recycling Center in the City of Oconto,
- Oconto Wastewater Treatment Plant in the City of Oconto,
- Riverview Court mobile home park in the City of Oconto, and
- Seven recreational facilities (five parks and two campgrounds)*.

* Since recreational facilities, especially parks does not impact the ability of the floodplains to store water and will result in minimal property damage during a flood event, their location in the floodplain causes little concern.

Economic Impacts

Property Damage

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

A review of FEMA flood insurance claims from January 1, 1978 through April 30, 2014, indicates that there were 66 paid claims in Oconto County totaling \$266,177.08.⁶

Value of Structures at Risk

The value of all at-risk structures is estimated at \$585.5 million. This information was obtained from Oconto County database on improved values of real property. The parcel map and the 100-year floodplains were merged to determine at-risk structures in the planning area.

Transportation Route Interruptions

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

Analysis of the GIS data used to produce Map 3.6, indicates that there are 100 bridges that could potentially be underwater during a base flood. In addition to the sites shown on the map, there may be a number of additional bridges in areas that are not included in the mapped 100-year flood zones, such as areas located along small tributary streams.

Estimate of Potential Dollar Losses

“Vulnerable structures” are those structures located in the 100-year flood hazard area identified in Map 3.4. Since there is no reliable building height data for buildings in these flood hazard areas, a “worst case scenario” of total structural damage for buildings in all of the flood zones of the planning area was assumed in estimating potential dollar losses to vulnerable structures. Building height/elevation data should be collected in the future in order to better assess the risks of damage to structures because of the flood hazard.

It is estimated that over \$585.5 million in losses would occur with the 100-year flood in zones projected to be impacted by the 100-year flood in a “worst case scenario” of total structural damage for all buildings in the county flood zones.

⁶ FEMA Claim Information by State. 2014. Retrieved October 2014 from <http://www.fema.gov/policy-claim-statistics-flood-insurance/policy-claim-statistics-flood-insurance/policy-claim-13>.

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

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

Development in Areas Subject to Flooding

Development in floodplains, watersheds, and natural resource areas are kept to a minimum through zoning. Oconto County has shoreland and floodplain zoning. This ordinance is a useful tool in keeping inappropriate development out of flood hazard zones in the county.

NFIP Participation

Oconto County has participated in the FEMA National Floodplain Insurance Program (NFIP) since January 1983 by adopting and enforcing floodplain management ordinances to reduce future flood damage. In exchange, the NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in the county.

Additionally, the following incorporated communities are also participating in the NFIP:

- City of Gillett since February 1984
- City of Oconto since August 1981
- City of Oconto Falls since July 1981
- Village of Lena since September 1985
- Village of Suring since December 1983

Drought

Description of Hazard

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

In general, droughts have the greatest impact on agriculture. Small droughts of limited duration can significantly reduce crop growth and yields. More substantial drought events can decimate croplands and can result in a total loss. Droughts can also greatly increase the risk of forest fires and wildfires because of extreme dryness. In addition, the loss of vegetation in the absence of sufficient water can result in flooding, even from average rainfall, following drought conditions.

Previous Significant Hazard Occurrences

According to National Climatic Data Center (NCDC), Oconto County has experienced 33 significant drought events in the last 14 years from January 1, 2000 to January 31, 2014.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, Oconto County experiences approximately two significant drought events each year.

Probability of Hazards Occurring in the Future

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

Areas at Greatest Risk

Droughts have no defined hazard area within the planning area. Past events have been relatively uniform across the planning area. However, agricultural croplands are most vulnerable to losses from drought events. Oconto County contains 169,998 acres of agricultural lands (based on land use data shown in Table 2.1).

Impacts from Hazard

Death and Injury

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

Structures at Risk

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

Critical Facilities

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

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

Economic Impacts

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

Livestock can also be adversely affected by droughts. Lack of water can lead to animal deaths. In addition, as drought conditions are often accompanied by periods of prolonged sun and high

temperatures, animals are at risk to overexposure and heatstroke. Death of livestock can also lead to substantial loss of income for farmers.

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

Property Damage

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

Estimate of Potential Dollar Losses

Agricultural croplands are most vulnerable to losses from drought events. A “worst case scenario” would involve the total destruction of all 169,998 acres of agricultural lands in the county (based on land use data shown in Table 2.1). The USDA conducts a Census of Agriculture every five years based on a sample of farms to estimate the market value of agricultural land and buildings. Based on the 2007 Census of Agriculture, the average value per acre of agricultural land in Oconto County was \$3,272.⁷ Therefore, it can be estimated that if this “worst case scenario” were to occur, the total destruction of all agricultural land in Oconto County would cause a loss of \$556,233,456.

Pest Outbreaks

Description of Hazard

Oconto County is characterized by the large segments of the county devoted to forest and agricultural lands. The county’s 400,000 acres of public and private forestlands are generally in good health and free of significant insect infestation, though periodic outbreaks do occur and problems do exist in certain stand types. Although there are other insect potential infestations, the following infestations are of primary concern: jack pine budworm, spruce budworm, forest tent caterpillar, emerald ash borer, and gypsy moth.

Trees in poor health or under drought stress may decline and die after repeated severe defoliation. Furthermore, defoliation will sometimes cause stress in otherwise healthy trees that may attract secondary pests. While the trees are bare, the lack of shade will decrease soil moisture during the dry season, which could cause mortality from lack of moisture.

With approximately 170,000 acres of agriculture land, the potential risk of pest outbreaks consuming and/or damaging large tracts of crops is deemed to be at a moderate level by the Steering Committee. Weather conditions ranging from very dry to abnormally wet serve as suitable environments for some of the more noted pests, such as corn earworm, European corn borer, potato leafhoppers, soybean aphid, grasshoppers, and cowpea aphid.

⁷ USDA. 2012 Census, Table 8. May 2014.

The county also is home to several Christmas tree operations. State and local forest staff are closely monitoring the spread of Balsam twig aphid. This pest could severely damage Balsams during warm wet springs.

Previous Significant Hazard Occurrences

The county has experienced a number of insect infestations over the past 30 years. However, none of them caused a significant amount of damage to either crops or forestlands. The Wisconsin Department of Natural Resources noted widespread heavy defoliation of several tree species in 1989 and 1990 by the forest tent caterpillar. Less damaging incidences of gypsy moth, jack pine budworm, and spruce budworm have occurred during this time period.

The weather extremes along with the change of season have combined to produce several incidences of crop insects in a number of areas in Oconto County. The central part of the county is the prime agricultural area. Farmers and UW-Extension staff have monitored the signs of infestations to ensure appropriate education and treatment measures have been taken to avoid transmittal and much greater damage to area fields.

According to the County Pest Suppression Coordinator, Oconto County has experienced two significant pest outbreak events in the last 14 years from January 1, 2000 to January 31, 2014.

Hazard Frequency

Based on previous hazard occurrences as reported by the County Pest Suppression Coordinator, Oconto County experiences approximately one significant pest outbreak event every ten years.

Probability of Hazards Occurring in the Future

The future incidence of pest outbreaks is highly unpredictable, making it difficult to determine probability with any accuracy. However, based strictly on the hazard frequency, Oconto County is considered to have a **low** probability of experiencing a pest outbreak event in any given year.

Areas at Greatest Risk

The northern one-third of the county is almost completely forestland. Oconto County's neighboring counties to the north and northwest are also covered with dense forestlands. A large outbreak of any pest, such as the emerald ash borer would be nearly catastrophic given the nature or that area of Wisconsin. With limited access to the federal forests for harvesting and managing purposes, these old, unmanaged forests are prime areas for pest infestations that could spread to the managed county and private forest lands.

The central one-third of the county is home to some of northeast Wisconsin's most valuable and productive farmland. Farmers are encouraged to rotate and vary their crops to avoid pest outbreaks and erosion of the soil. State and local farm experts have done a good job in educating landowners and farmers on pest infestations, and there have been only spotty and minimal outbreaks over the past several decades.

Impacts from Hazard

Death and Injury

No deaths or injuries have been reported from significant pest outbreak events for Oconto County over the last 14 years from January 1, 2000 to January 31, 2014.

Structures at Risk

Pest outbreaks would not have a significant impact on structures. However, the defoliation and eventual death of plants and trees could become a fuel source for fires putting structures at an increased fire risk.

Critical Facilities

Pest outbreaks would not have a significant impact on critical facilities. However, rural fire departments and emergency services could be susceptible to fires resulting from the increased fuel created from dead or dying trees. There may also be damage to infrastructure, such as power lines and communication facilities could also be damaged due to fires.

Economic Impacts

The economic impact due to pest outbreaks could be very substantial. Oconto County with its expansive tourism and agricultural industries may be susceptible to pest outbreaks. The Nicolet National Forest, Oconto County Forest, and private woodlands are valuable assets to the county in regards to recreational trails, campgrounds, parks, and recreation areas. People from around Wisconsin and the upper Midwest visit Oconto County for its vast outdoor recreation resources. Significant damage to these areas would severely comprise the ability of the county to attract people to the area; therefore, hurting revenues of local businesses. According to the Wisconsin Department of Tourism, Oconto County had a \$70 million tourism industry in 2006.

With 170,000 acres planted in crops or used for pasturelands, the county relies on the income generated from its agriculture economy. In a 2004 publication written by the UW-Extension department, Oconto County's agriculture industry employs 2,694 people, comprised some \$318 million in economic benefit, and paid nearly \$8 million in taxes. With the steady increase in commodity crop prices over the past year, large incidences of pest outbreaks could have a tremendous local economic impact that will be felt throughout the industry.

Property Damage

No data is available on public property damages from pest outbreak events for Oconto County over the last 14 years from January 1, 2000 to January 31, 2014.

Estimate of Potential Dollar Losses

Large pest outbreaks would have a sizable economic impact on the county. The county's large tourism, forestlands, and croplands contribute a great deal of revenue to the local economy. In mid-2014, corn per bushel is pushing \$5, soybeans are in the \$12 per bushel range, and lumber is at around \$350 per 1,000 board feet. Even a minor pest outbreak could have a substantial economic impact to the farmer or logger. Even though rough cut wood is at some historically low prices, the logging industry and local mills count on a quality and healthy forest crop for their economic livelihood.

Extreme Heat

Description of Hazard

Extreme heat (often referred to as a heat wave) is primarily a public health concern. During extended periods of very high temperatures or high temperatures with high humidity, individuals can suffer from several ailments, including heat exhaustion and heat stroke. Heat stroke is a particularly life-threatening condition that requires immediate medical attention. In addition to posing a public health hazard, periods of excessive heat usually result in high electrical

consumption, which can cause power outages and brown outs. A by-product of this hazard in Oconto County often involves periods of high heat with loss of power. The elderly, disabled, and other vulnerable populations are especially susceptible to extreme heat.

Previous Significant Hazard Occurrences

According to National Climatic Data Center (NCDC), Oconto County has not experienced any significant extreme heat events in the last 14 years from January 1, 2000 to January 31, 2014.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, Oconto County is not impacted by extreme heat events on a notable frequency.

Probability of Hazard Occurring in the Future

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

Areas at Greatest Risk

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

Impacts from Hazard

Death and Injury

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

Structures at Risk

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

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

Critical Facilities

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

Economic Impacts

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

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

Property Damage

No significant public property damages have been reported from extreme heat events for Oconto County over the last 14 years from January 1, 2000 to January 31, 2014 according to NCDC data.

Estimate of Potential Dollar Losses

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

Dense Fog

Description of Hazard

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

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

Previous Significant Hazard Occurrences

According to National Climatic Data Center (NCDC), Oconto County has experienced two significant dense fog events in the last 14 years from January 1, 2000 to January 31, 2014.

Hazard Frequency

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

Probability of Hazard Occurring in the Future

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

Areas at Greatest Risk

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

Impacts from Hazard

Death and Injury

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

Structures at Risk

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

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

Critical Facilities

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

Economic Impacts

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

Property Damage

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

Estimate of Potential Dollar Losses

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

Hail

Description of Hazard

A severe thunderstorm can produce frozen precipitation, or hail. Hailstones are ice crystals that form within a low-pressure front due to warm air rising rapidly into the upper atmosphere and the subsequent cooling of the air mass. Frozen droplets gradually accumulate on the ice crystals until they develop sufficient weight and fall as precipitation. The size of hailstones is a direct function of the severity and size of the storm. Significant damage does not result until the hailstones reach 1.5 inches in diameter, which occurs in less than half of all hailstorms. Hail in Wisconsin ranges from pea-sized to grapefruit-sized. Area coverage of individual hailstorms is highly variable and spotty because of the unstable nature of cumulonimbus clouds.

Previous Significant Hazard Occurrences

According to National Climatic Data Center (NCDC), Oconto County has experienced 30 significant hail storm events in the last 14 years from January 1, 2000 to January 31, 2014. Some of these reported occurrences may not have been specific to Oconto County, and may have been recorded for a larger regional area.

Although, outside of the timeframe, a significant hail event occurred on March 29, 1998 and produced hail “as large as baseballs and grapefruits” and resulted in one injury and much property damage.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, Oconto County experiences approximately two significant hail storm events per year.

Probability of Hazard Occurring in the Future

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

Areas at Greatest Risk

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

Impacts from Hazard

Death and Injury

No death or injuries have been reported from hail events in Oconto County over the last 14 years from January 1, 2000 to January 31, 2014, according to NCDC data.

Structures at Risk

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

Critical Facilities

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

Economic Impacts

Hail can damage or destroy crops. Taller crops, such as corn are particularly vulnerable to hail. Costly damage can occur to roofs, windows, and siding, as well as automobiles, RVs, and boats (including the body, paint and windshields and other windows).

Property Damage

Reported property damage from significant hail events for Oconto County has totaled \$3 million in public property and crop damages over the last 14 years from January 1, 2000 to January 31, 2014 according to NCDC data.

The \$3 million in property and crop damages occurred during one hail event around Suring and Oconto Falls on July 1, 2006 as a result of two to four-inch diameter hail that caused damage to more than 700 vehicles, denting them and smashing their windows. The hail damaged at least 800 homes, breaking windows, denting siding and knocking chunks out of vinyl siding. Business signs were smashed and foliage was stripped from trees by the hail.

Estimate of Potential Dollar Losses

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

Thunder/Lightning

Description of Hazard

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

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

Previous Significant Hazard Occurrences

According to National Climatic Data Center (NCDC), Oconto County has not experienced any significant lightning events in the last 14 years from January 1, 2000 to January 31, 2014.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, Oconto County is not impacted by significant thunder/lightning events on a notable frequency.

Probability of Hazard Occurring in the Future

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

Areas at Greatest Risk

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

Impacts from Hazard

Death and Injury

No deaths or injuries have been reported from significant thunder/lightning events for Oconto County over the last 14 years from January 1, 2000 to January 31, 2014, according to NCDC data.

Structures at Risk

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

Critical Facilities

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

Economic Impacts

Nationwide, lightning causes \$4 to 5 billion in losses each year⁸ and about \$2 billion annually in airline operating costs and passenger delays.⁹

Property Damage

No significant public property damages have been reported from significant thunder/lightning events for Oconto County over the last 14 years from January 1, 2000 to January 31, 2014 according to NCDC data.

Estimate of Potential Dollar Losses

An estimate of potential dollar losses cannot be calculated for lightning events, since no vulnerable structures have been identified. Based on previous damages reported by the NCDC, property damages from significant thunder/lightning events has been minimal over the past 14 years.

Coastal Hazards

Description of Hazard

In northeastern Wisconsin, coastal hazards can be described as natural hazards occurring along the shores of Lake Michigan. The coastal hazards of concern in Wisconsin include:

- Erosion of coastal bluffs, banks, beaches and near shore lake beds (including erosion from freezing and thawing of lake ice);
- Flooding from upland runoff, high lake levels and storm-induced surge (temporary water level changes); and
- Damage to shorelines and shoreline structures from storm waves and ice shoves and dams.

Previous Significant Hazard Occurrences

There is no record of significant coastal hazards for Oconto County and sources for past coastal hazard occurrences could not be found. However, Oconto County has experienced occurrences of flooding and ice shoves along Lake Michigan.

Hazard Frequency

There is no record of significant coastal hazards for Oconto County in order to develop a hazard frequency.

Probability of Hazard Occurring in the Future

According to the *Resource Guide for Great Lakes Coastal Hazards in Wisconsin* website¹⁰, Oconto County is most at risk for coastal flooding. Overall, the probability of coastal hazards is **medium** for the planning area.

Areas at Greatest Risk

Portions of the county situated along Lake Michigan are at risk for coastal hazards.

⁸ Kithil, R. *21st Century Lightning Safety for Facilities & Structures*. 2002.

⁹ *Northeast States Emergency Consortium*. Wakefield, Mass. 2002.

¹⁰ Hart, D. University of Wisconsin Sea Grant Institute. 2007. *Resource Guide for Great Lakes Coastal Hazards in Wisconsin*. Retrieved October, 2014 from <http://coastal.lc.wisc.edu/urpl999.htm>.

Impacts from Hazard

Death and Injury

No data on deaths or injuries is available for significant coastal hazard events for Oconto County over the last 14 years from January 1, 2000 to January 31, 2014.

Structures at Risk

Homes and other structures located along Lake Michigan are at risk to damage from coastal hazards. This risk increases where structures are closer to the shoreline, especially over high bluffs. There are 518 improved privately-owned structures directly adjacent to Lake Michigan in Oconto County.

Critical Facilities

There are five critical facilities located along Lake Michigan at risk of damage from coastal hazards; including three parks, a campground, and a boat landing.

Economic Impacts

Coastal hazards can have an extensive impact on the economy of an affected area by causing thousands of dollars in damages to public property and structures, as well as private property and houses.

Property Damage

No public property damages data is available for coastal hazard events in Oconto County over the last 14 years from January 1, 2000 to January 31, 2014.

Estimate of Potential Dollar Losses

A “worst case scenario” for potential dollar losses from coastal hazards in Oconto County would involve the total destruction of all private structures along Lake Michigan, which would cause a loss of \$30.2 million in private damages. There are no assessed values available for public properties.

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

NATURAL HAZARDS AND CLIMATE CHANGE

Hazard profiles provide information and predictions based on past hazard occurrence data. Climate change may make past trends unreliable sources for predicting future impacts, frequency, probability, and vulnerabilities. Climate change has and will continue to impact average annual temperatures causing increased frequency in heat waves; increased frequency of severe rainstorms; shorter, warmer winters with decreased lake ice cover; increased drought frequency, increase annual average precipitation, and other impacts. In general, Oconto County, along with most of Wisconsin, will grow warmer and drier during this century, especially in the summer. It is projected that over the next 30-50 years, Oconto’s climate will resemble that of current Detroit, Michigan according to the Wisconsin Initiative on Climate Change Impacts (WICCI) interactive mapping tool, which averages results from a number of climate models.¹¹

¹¹ *Wisconsin’s Changing Climate: Impacts and Adaptation*. 2011. Wisconsin Initiative on Climate Change Impacts. Nelson Institute for Environmental Studies, University of Wisconsin – Madison and the Wisconsin Department of Natural Resources. Madison, Wisconsin.

Climate Change Impact to Natural Hazards in Oconto County

Climate is projected to change in Oconto County over the next 30-50 years. These changes will have an impact on the severity, frequency, and probability of natural hazards. The following summarizes the available climate change predictions for each natural hazard that can impact the county.

Winter Storms

Wintertime precipitation in Wisconsin is projected to increase by +0.1 to +1.2 inches (+3% to +35%) by the mid-21st century. The average projection among the climate models is a 20% increase in wintertime precipitation across northern Wisconsin with average winter precipitation in Oconto County expected to increase by 0.5-1.0 inches. Statewide, the amount of precipitation that falls as rain rather than snow during the winter is also projected to increase significantly, and freezing rain is more likely to occur.

Tornado and Strong Wind

Climate science and WICCI are presently unable to address the climate change impacts on tornadoes and strong winds; however, large storm events are likely to increase in frequency during spring and fall. Additionally, wind strengths have increased over the Great Lakes and are expected to increase more in the future. Surface wind speeds above the lake are increasing by nearly 5 percent per decade, exceeding trends in wind speed over land¹².

Extreme Cold

Warming trends in Wisconsin are projected to be the largest in winter, with projected average increases of 5-11°F by the mid-21st century, with the greatest warming across northwest Wisconsin. Average wintertime temperatures for Oconto County are expected to increase 7.5°F.

Wildland Fires

Climate influences pests (such as the Emerald Ash Borer or Pine Bark Beetle), forest health, and fire regimes in two ways: directly, by affecting weather patterns such as droughts, which are conducive to fire ignition and spread; and indirectly, by causing shifts in plant communities through temperature and precipitation changes that favor or discourage fire-adapted plant species. Wisconsin's average temperatures will rise in the coming years, with longer summers and shorter winters. In addition, a change toward more heavy rainfall events but little change in total summertime rainfall implies more dry days in the summer. More dry days, coupled with higher summer temperatures and increases in evapotranspiration, can be associated with an increase in the likelihood of summer drought and wildland fires. Changes in fire regime may be most apparent for fire-prone natural communities, particularly in landscapes that are not fragmented, such as jack pine-dominated barrens in central and northwestern Wisconsin. A change in fire frequency and intensity will potentially have a great impact of northern upland and lowland forest communities.

Climate change will also increase the impacts of pests and forest health.

Flooding

Climate change in Wisconsin is likely to increase the severity and frequency of high flows and high water levels trending toward wetter conditions and more intense rainfall. Model projections

¹² Desai, A.R., J.A. Austin, V. Bennington, and G.A. McKinley. 2009. *Nature Geosci.* 2: 855-858.
www.nature.com/ngeo/journal/v2/n12/abs/ngeo693.html

show Wisconsin receiving more precipitation and more frequent intense events of at least two inches, especially during early spring. By the mid-21st century, Wisconsin may receive two to three more of these extreme events per decade, or roughly a 25 percent increase in their frequency. Oconto County is projected to have, on average, 2.5-3 more heavy precipitation events per decade. As in winter, early spring precipitation will be more likely to fall as rain than snow. The amount of precipitation that occurs as rain during the winter months of December to March is also expected to significantly increase. Winter rain can create stormwater management problems (e.g., icing) and increase risk of high water events during a season when rainfall does not normally occur in Wisconsin. Winter rain can also increase stormwater recharge, which can lead to groundwater flooding in some parts of the state.

Drought

Wisconsin's average temperatures will rise in the coming years, with longer summers and shorter winters. Increased temperatures will lead to an increased length in the growing season and higher rates of evapotranspiration during the summer and early fall months. A change toward more heavy rainfall events but little change in total summertime rainfall implies more dry days in the summer. More dry days, coupled with higher summer temperatures and increases in evapotranspiration rates, can be associated with an increase in the likelihood of summer drought. In the future, water loss through evapotranspiration associated with warmer temperatures would exacerbate any drought effect if increases in evapotranspiration exceed increases in precipitation, as future climate scenarios suggest.

Pest Outbreaks

Data on climate change effects on insect pests, invasive species, and pathogens is currently limited in northeast Wisconsin. However, they may pose moderate to high risks for people and all the natural community groups in Wisconsin.

Wisconsin climate projections show that increased flooding and heat events are likely to occur over the coming decades. These trends could influence the physical and biological conditions that allow for an increased occurrence of vector-borne diseases. With the warmer and wetter climate, changes may occur within vector populations. A vector is a species such as a mosquito or tick that can transmit a disease agent.

Current research shows new weed and pest species moving into Wisconsin's agricultural areas. Increased carbon dioxide levels and nitrogen deposition could drive changes in ecosystem nutrient cycling that make such a system more vulnerable to invasive species. While some effects of invasive species might be more direct and obvious, such as competition, displacement, and usurpation of pollinators and other resources, others might be more unobtrusive. Pests and pathogens are likely to experience changes in population cycles and competitive relationships. It is anticipated that there will be more over-wintering of pests due to warmer winter low temperatures. Some could become greater problems than they are now. Drought conditions also make trees and plants more susceptible to pests. Climate change impacts on pests will have a relatively high impact on Wisconsin northern upland and lowland forests.

Extreme Heat

According to the U.S. EPA, heat waves have become more frequent across the country over the last 40 years. They are also lasting longer with greater intensity. Heat waves, prolonged periods with stagnant air masses, and temperatures over 90°F have direct impacts on human health, and scientists expect to see more by the end of the century.

Summertime average temperatures are likely to rise 5-6°F statewide, with the greatest warming occurring in northern Wisconsin. Summer average temperature in Oconto County is projected to increase 5.5-6 (°F). In addition, to this warming, the number of summer days that exceed 90°F is projected to increase statewide. Northern regions of Wisconsin are likely to see an increase of very hot days by about two weeks. With projections for more days with temperatures greater than 90°F, heat waves will likely occur more frequently, more intensely, and persist longer.

Dense Fog

Climate science and WICCI are presently unable to address dense fog.

Hail

Climate science and WICCI are presently unable to specifically address climate change impacts on hail events; however, large storm events are likely to increase in frequency during spring and fall.

Thunder/Lightning

Climate science and WICCI are presently unable to specifically address climate change impacts on thunder or lightning; however, large storm events are likely to increase in frequency during spring and fall.

Coastal Hazards

Coastal communities will face projected increases in air temperature; precipitation during fall, winter and spring; heavy precipitation events; and evaporation resulting from warmer temperatures and reduced ice cover. Wind strengths have increased over the Great Lakes and are expected to increase more in the future. These climatic changes are expected to influence lake levels, coastal erosion, and spring flooding and shoreline stability.

Changing water levels

Water levels are expected to decline slightly, on average, but also continue to exhibit large variation over decades as they have in past 100 years. The scientific consensus is that average water levels of Lake Michigan will fall 0.8 feet to 1.4 feet by the end of the century. The combination of warmer temperatures and reduced ice cover will contribute to greater evaporation, which will eventually exceed the increases in precipitation that have been occurring. Water levels will vary widely around their averages. General expectations is that by end of the century, the highest and lowest water levels will be slightly lower than they have been for over past 100 years. Lower water levels will allow beaches and beach ridges to build, and the vegetation edge that anchor them will move toward the lake. Higher water levels with increased storm intensity and frequency could increase shore and bank erosion and damage existing lakefront property due to erosion from storm runoff and flooding and reduce the area of the beach.

Increasing wind strengths

Scientists make the case for increased wind strength over large lakes, such as Lake Michigan, based on observations and physical dynamic simulations. Surface wind speeds above the lake are increasing by nearly 5 percent per decade, exceeding trends in wind speed over land¹³. Increased wind strength will lead to greater offshore wave development, with higher waves along the coast;

¹³ Ibid.

and greater transport of airborne pollutants. Increasing winds combined with fewer days of ice cover on the Great Lakes could lead to more icing of coastal infrastructure.

Bluff and shoreline erosion

Changes in freeze-thaw cycles may adversely affect coastal bluff stability and accelerate slope erosion processes. Prolonged dry conditions can eventually lead to major slope failures during heavy rainfall events. Deep-rooted vegetation may help anchor coastal slopes, but changes in vegetation in response to climate changes may alter coastal vegetation forms. Changing lake levels, increasing wind strength and increased stormwater runoff will also increase shoreline erosion and recession.

Community Self-Assessment of Vulnerabilities and Impacts

Using *A Self-Assessment to Address Climate Adaptation Readiness in Your Community – Great Lakes Region* (Minnesota Sea Grant), in partnership with Wisconsin Sea Grant Institute, the plan steering committee completed several checklists to identify areas where Oconto County is potentially vulnerable to climate change. The steering committee decided to focus on the following potential vulnerabilities to climate trends (the perceived level of vulnerability is provided in parenthesis):

- Water Resources (low vulnerability)
- Operations and Maintenance (high vulnerability)
- Built Environment and Infrastructure (moderate vulnerability)
- Tourism and Recreation (high vulnerability)

The WICCI report was used to support and expand upon the potential vulnerabilities and impacts that the steering committee identified.

Water Resources (low vulnerability)

Water Resources are critical to the economic health and quality of life for Oconto County residents. While these resources currently meet local water demands and sustain water quality, a changing climate, in addition to land use changes, could put them at risk. Prolonged drought conditions, an increase in the use of high capacity wells, and the increased frequency of wildfires will increase the demand on water resources. In addition, an increase in heavy rainfall events, particularly in the spring, will increase runoff pollution to streams, rivers, and Lake Michigan. Potential impacts to the community include:

- Taxed local water supplies available for drinking water, fighting fires, and industry.
- Low lake levels increase the need for dredging and increase risk of re-suspending contaminated sediments, lower property values, and negatively impact tourism.
- Heavy rainfall contributes to an increase in septic system failures.
- Increased agricultural runoff of fertilizer and manure that negatively impact sensitive ecological systems and recreational activities (e.g., trout fishing). Fish kills become more frequent.
- Increased erosion of slopes by intense rainfall events leads to high sediment and phosphorus loading to surface waters.

- Rural residential wellheads contaminated by flood waters and high groundwater.
- Impoundments and stormwater detention ponds fail more frequently.
- Stormwater inflow and groundwater infiltration to sanitary sewers, results in untreated municipal wastewater flowing into to lakes and streams.

Operations and Maintenance (high vulnerability)

Oconto County is already experiencing a need for additional infrastructure operations and maintenance work associated with extreme weather events (including winter storms, heavy rainfall, tornadoes, and extreme cold) increasing the need for snowplowing, storm sewer repair, and street repairs from road buckles and pot holes. Tree maintenance and replacement of urban trees and county forest is also on the rise as new pests (e.g., Emerald Ash Borer) are migrating north. Potential impacts to the community include:

- Increased risk of accidents, injury, and death.
- Increased frequency in travel disruption and road closures.
- Delayed construction activities.
- Increase in road buckling due to changing freeze/thaw cycles.
- Weakened or washed out soils and culverts that support roads, tunnels, and bridges.
- Limited or lost tourism opportunities.
- Loss of county forest increasing wildfire risk and decreasing stream cover and agricultural buffers that maintain and protect water resources.
- Increased wildfire risk due to drought.

Built Environment and Infrastructure (moderate vulnerability)

Future climate trends include an increase in the frequency and severity of extreme storm events, increased snowfall and flooding, greater wind speeds. Infrastructure such as roads and drainage are susceptible to erosion and flooding. Municipal infrastructure is designed using standards based on rainfall data from the latter half of the 20th century. By having assumed “stationarity” of climate in the design of infrastructure, communities are now vulnerable to more frequent and intense rainfall events and elevated groundwater.

Climate change may also cause the water levels on Lake Michigan to extend beyond the range measured since 1860. Residential and commercial structures and property on the coast are vulnerable to erosion and flooding. The migration of the Ordinary High Water Mark (OHWM) towards the lake during extended periods of low lake levels may encourage development in hazardous areas. Industrial facilities such as power plants and water/sewer treatment facilities are vulnerable to extreme water levels that exceed their design. In addition, shore protection structures need to be maintained over time and may not be effective if lake levels extend beyond their design parameters. While Great Lakes water level fluctuations can increase the vulnerability of coastal infrastructure (e.g., marinas, docks), the steering committee determined that Oconto County’s coastline was not at risk.

Vulnerability of Oconto County’s community’s infrastructure (i.e., storm sewers, wastewater, drinking water, roads and bridges, detention basins, ports, marinas, docks) was primarily related

to emergency response challenges, such as equipment availability and state, regional, and local agency communication and coordination. In order to ensure that the safety and effectiveness of Oconto County's infrastructure is restored after an extreme weather event, the need for a well-coordinated response effort, particularly in more densely populated areas, will increase as heavy participation and extreme weather events become more frequent. Potential impacts to the community's infrastructure include:

- Increased risk of property damage or death, particularly for vulnerable populations.
- Lost tourism opportunities.
- Longer recovery period resulting in economic losses for small businesses and private sector-owned infrastructure.
- Conveyance systems filled beyond capacity, causing flooded homes and streets.
- Roadways and bridges wash-out or become impassable.
- Rain gardens and other biofiltration BMPs fail due to saturated soil conditions.
- Heavy rains and flooding can overwhelm sewer and stormwater systems, leading to a rise in water pollution and the risk of waterborne diseases such as cryptosporidium and giardia. An increase in extreme precipitation events is already being seen in Wisconsin.

Tourism and Recreation (high vulnerability)

Tourism is an important and valuable industry in Oconto County. Climate contributes to the suitability of locations for many tourist activities and is also a principal driver of seasonality on tourism demand. Warmer winters, wetter springs, changing lake levels, and increased pests and invasive species will change the conditions that currently support Oconto's forests, trout streams, and coastline. Changes in water temperatures and circulation patterns could affect mixing patterns in coastal waters. Potential impacts to the community include:

- Loss of suitable trout habitat from warming temperatures, increased runoff, and loss of forest cover along stream banks.
- Increased variability in weather conditions (e.g., reduced snowpack, cooler temperatures) potentially impact tourism – both number of visitors and activities.
- Elevated levels of bacteria from stormwater runoff that reduces beach health and aesthetics, increases public health risks, and impacts tourism in coastal communities.
- Increased agricultural and stormwater runoff that reduces nearshore health affecting walleye populations and other Green Bay fisheries.
- Changing lake levels that alter the beach and nearshore habitat, with changes in fish spawning habitat resulting from wetland loss or siltation due to increasing erosion rates. Impairment to fish spawning and nurseries results in fewer young fish of certain species and affects the overall health of fisheries.
- As evapotranspiration rates increase in the future, water levels in northern lakes and wetlands could decline further during future periods of drought.

- Changing lake levels, increased wind speeds and more frequent coastal storm events increase the risk of damage to coastal property and infrastructure (e.g., vacation homes, marinas).
- Reduced forest health and increased risk for wildfire.

Additional Vulnerabilities

In addition to those identified during the community self-assessment, WICCI working groups identified vulnerabilities communities could face from potential changes in Wisconsin's climate. Some of the potential vulnerabilities for Oconto County include:

- Residential and commercial structures and property on the coast are vulnerable to erosion and flooding. The migration of the Ordinary High Water Mark (OHWM) towards the lake during extended periods of low lake levels may encourage development in hazardous areas.
- Harbors and marinas are susceptible to extreme water levels and winter icing.
- Industrial facilities such as power plants and water/sewer treatment facilities are vulnerable to extreme water levels that exceed their design.
- Shore protection structures need to be maintained over time and may not be effective if lake levels extend beyond their design parameters.
- Water intakes may become ineffective during low water levels.

Additional Potential Impacts

In addition to those identified during the community self-assessment, WICCI working groups have investigated how potential changes in Wisconsin's climate might impact natural and human systems around the state. Some of the potential impacts of concern for Oconto County include:

- More intense coastal storms could impact dredging and re-suspend contaminated sediments.
- An increase in intense precipitation and storm events along with the impacts of warmer and wetter winters (more freeze/thaw cycles and less lake ice cover) could increase coastal erosion and may lead to more frequent episoidal deep-seated landslides.
- Warmer nighttime temperatures might lead to more extreme heat waves, increasing the risk for heat stroke in some populations. At the same time, observed and projected trends show fewer cold temperature extremes, which may mean reduced health risks due to exposure in the winters.
- Air pollution, increasing temperatures, changing circulation patterns, and other processes combine to increase ground-level ozone, which affects respiratory health.
- Changes in temperatures and precipitation results in an increase in disease-carrying insects, including ticks and mosquitoes, putting people at a greater risk for contracting vector-borne diseases, such as Lyme disease and West Nile encephalitis.
- Changes in temperature and precipitation affect growing seasons, crop yields, weed and pest infestations, and dairy productivity.
- Groundwater flooding of property and cropland increases.

Solutions/Adaptations

Although the impacts of climate change are already being seen in Wisconsin, there are things Oconto County policymakers, business leaders, and residents can do to help reduce potential impacts from climate change. Ongoing comprehensive planning and improved implementation of existing plans is necessary. It is beneficial to incorporate climate adaptation planning into existing planning processes (e.g., hazard mitigation and comprehensive planning) to help mitigate the unavoidable impacts from climate change on water resources, operations and maintenance, the built environment and infrastructure, and tourism and recreation. The following are some solutions or adaptations to climate change impacts that could be employed in Oconto County. Many of the identified solutions/adaptations were developed by the WICCI working groups.

Water Resources

- Promote integrated water management planning using long-term projections of supply and demand, tied to land use and economic growth forecasts. Encourage large water users to locate in areas with sustainable water sources (e.g., near large rivers or Lake Michigan). Encourage water conservation (rural and urban) through incentives and regulation.
- Enhance infiltration in headwater areas, near watershed divides, and in areas with lower groundwater levels by reducing impervious surfaces in urban/riparian areas and improving land management practices. Protect recharge/infiltration areas and riparian buffers from overland flow of polluted runoff.
- Protect floodplains, wetlands, and other natural “green infrastructure” features that can hold flood waters and enable winter infiltration.
- Implement green infrastructure practices to help reduce flooding (e.g., extended detention wetlands; retention ponds; rooftops that store or absorb water (i.e. blue and green roofs); rain barrels and cisterns; stormwater tree trenches; use of permeable pavers for parking lots, driveways, etc.; bioswales and rain gardens).
- Restore prior-converted wetlands in upland areas to provide storage and siltation and to mitigate storm flows and nutrient loading downstream. Protect and restore wetland hydrologic regimes. Control polluted runoff to wetlands.
- Incorporate water management strategies into farm-based nutrient management plans. Resize manure storage facilities, wastewater facilities, stormwater drains and infrastructure to accommodate increased storm flows to protect water quality.
- Land use planning that limits sprawl, reduces emissions from driving, habitat destruction, fragmentation and reduces the amount of paving and impervious surface.
- Implement beach improvement projects that reduce stormwater runoff to beaches and nearshore waters and integrate natural infiltration features such as dunes and vegetated swales.
- Lake water levels education and outreach (some lakes may not be suited for all uses such as recreational boating in shallow waters or during low water periods).

Operations and Maintenance

- Review evacuation routes such as revising plowing guidelines and adding emergency routes (such as in development regulations). Housing areas that have only one entry road may need add emergency secondary access roads.
- Revise weight limits for winter road use. Dirt roads used for industrial transport (such as logging) often have higher weight limits during the winter, when freezing makes the roads firmer. These may need to be revised.
- Emerald Ash Borer tree inventory and replacement plan.
- Increase energy efficiency in government owned buildings and facilities.

Built Environment and Infrastructure

- Use a risk/consequence approach to evaluate and modify existing infrastructure to accommodate observed and predicted changes in climate.
- Implement development setbacks based on defensible scientific data.
- Relocate structures that are threatened by flooding or erosion.
- Education for developers, bankers, and insurance agents.
- Follow guidelines established in the NFIP Community Rating System (CRS).

Emergency response/transportation

- Strengthen public health response and warning systems.
- Review flood hazards related to roads and install permanent, remotely activated warning signs to free up personnel to focus on higher priority actions during an emergency.
- Diversify power supply in the event of power plant failures during extreme heat, extreme cold and severe weather events.

Stormwater Infrastructure

- Make infrastructure adjustments related to water systems, along lakeshores and in harbors to ensure ability to function under a generally more variable climate (especially under conditions of drier summers and wetter winters).
- Sewer backflow and downspout disconnections.
- Protect facilities and make any needed building code changes to protect against extreme weather events. This includes stormwater infrastructure upgrades such as larger culverts, stream bank stabilization through planting trees and vegetation, green and grey infrastructure implementation and relocation of structures threatened by flooding or erosion.
- Residential green infrastructure programs (e.g., rain barrels, rain gardens, and pervious pavement).
- Use best management practices for site design to control stormwater runoff.
- Develop and evaluate alternative tools and strategies for the design of stormwater-related infrastructure, using a collaborative process that includes climate scientists, water

resource managers, design engineers, and regulators, and members of relevant business communities.

Coastal Infrastructure

- Design port and harbor infrastructure that can accommodate increased variability in lake levels, e.g. harbor slips that float.
- Develop plans for the stability enhancement of steep slopes (e.g., slow erosion by planting vegetation on steep slopes).
- Improve or restore natural shore protection features (e.g., beaches, dunes, nearshore shoals, and islands).
- Incorporate lake level research into planning and zoning standards for lakeshore development. Establish a clear understanding of the ordinary high-water mark.

Tourism and Recreation

Forests/Ecosystems

- Conduct vulnerability and risk assessment of land and water resources. Tree and soil inventory. Assess vulnerable parcels (e.g., preserve forest land, watershed forestry, best management practices, climate scenario planning).
- Adopt adaptive plant selections for forestry, stream buffers, and urban trees through climate matching.
- Establish monitoring sites for forest ecosystems. These complex communities are most likely to see climate change impacts and will provide the means to track the rate of change, including changes in wildlife species, trees, shrubs and herbs.
- Protect and enhance migration corridors to allow species to migrate as the climate changes and rehabilitate riparian and floodplain forests to help shade and cool streams; reduce flooding by intercepting surface runoff, sediment loading, and pollution; provide recreational opportunities; create habitat for wildlife; slow food flows; stabilize stream banks and shorelines; and provide litter and woody debris for aquatic organisms.
- Continue aquatic and terrestrial invasive species management programs, education, and outreach.
- Enhance and restore shoreline habitat (e.g., coarse wood, littoral and riparian vegetation, bio-engineered erosion control) to withstand variations in water levels.
- Study the impact of climate change on tourism economics.

Fisheries

- Conduct a vulnerability and risk assessment of important fish species. Use temperature and fish models to evaluate streams and their watersheds. Identify cold water resources for protection and restoration, and allow for the evaluation of potential responses to climate change scenarios so that managers can make informed decisions when allocating management resources.
- Adopt riparian and watershed land use practices that promote infiltration of precipitation and recharge of groundwater to maintain or enhance groundwater inputs into springs,

ponds, and streams. Reduce existing, or limit creation of addition, impervious surfaces in critical watersheds containing cold water streams, and utilize best runoff management practices in urban areas. Continue enforcement of laws governing groundwater use that are critical to protecting cold water streams and trout fisheries from climate change.

- Use a triage approach to protecting cold water streams from the impacts of climate change by setting realistic management expectations for success and evaluating possible climate change impacts on different cold water streams. Use stream restoration techniques that promote colder water temperatures (for example, narrowing and deepening channels), and target restoration efforts to streams most likely to realize those benefits under a changing climate.
- Manage riparian vegetation to promote stream bank and channel stability, reduce erosion, and siltation, and protect streams from damage from high-flow events. Provide shading to maintain the lower temperatures of groundwater input over longer lengths of cold water streams.
- Northern Pike fishery: examine zoning regulations for adequacy in protecting hydrologic integrity of both surface and groundwater of west Green Bay coastal zone.
- Invasive species education and outreach for boaters, anglers, and other recreation audiences.

Climate Mitigation

Community priorities that also mitigate greenhouse gas emissions should be advanced. Examples include implementing cost-effective clean energy policies and programs, and reducing carbon emissions. Climate change and clean energy policies and programs can reduce greenhouse gas emissions, lower energy costs, improve air quality and public health, and help achieve economic development goals. The following are some mitigation actions that may also advance community priorities:

- Increase energy efficiency in public buildings, facilities, and equipment.
- Incorporate renewable energy sources such as wind, solar, geothermal, and biomass.
- Increase vehicle fuel economy.
- Invest in clean transportation choices.
- Encourage bicycle and pedestrian transportation and expand availability options such as the implementation of complete streets.

Adaptation and Vulnerability Assessment Resources

The following are some additional resources that may be helpful for assessing community adaptation and vulnerability.

CREAT (Climate Resilience Evaluation and Awareness Tool)

Software tool to assist drinking water and wastewater utility owners and operators in understanding potential climate change threats and in assessing related risks at their individual utilities.

- <http://water.epa.gov/infrastructure/watersecurity/climate/creat.cfm>

- <http://water.epa.gov/infrastructure/watersecurity/climate/upload/epa817f12011.pdf>

Nature Serve Vista

Spatial decision-support system that helps users integrate data and expert knowledge on conservation with land use and resource planning. Planners, resource managers, scientists, and conservationists can use NatureServe Vista to assess cumulative effects for any number of climate change scenarios.

- <http://coast.noaa.gov/digitalcoast/tools/natureserve-vista>

C-CAP Land Cover Atlas

Provides access to regional land cover and land cover change information developed through NOAA's Coastal Change Analysis Program. This tool helps users to visually analyze and explore NOAA's geospatial land cover data by county and land cover changes for specific date ranges.

- <http://coast.noaa.gov/digitalcoast/tools/lca>

National LID Atlas

National NEMO Network: Low impact development (LID) Atlas is an online resource providing geo-referenced examples of innovative stormwater practices across the country.

- <http://lidmap.uconn.edu/>

NIACS (Northern Institute of Applied Climate Science Climate Change Response Framework)

A collaborative approach to helping land managers understand the potential effects of climate change on forest ecosystems and integrating climate change considerations into management.

- <http://www.nrs.fs.fed.us/niacs/climate/framework/>
- <http://www.nrs.fs.fed.us/niacs/climate/northwoods/>

United States Forest Service

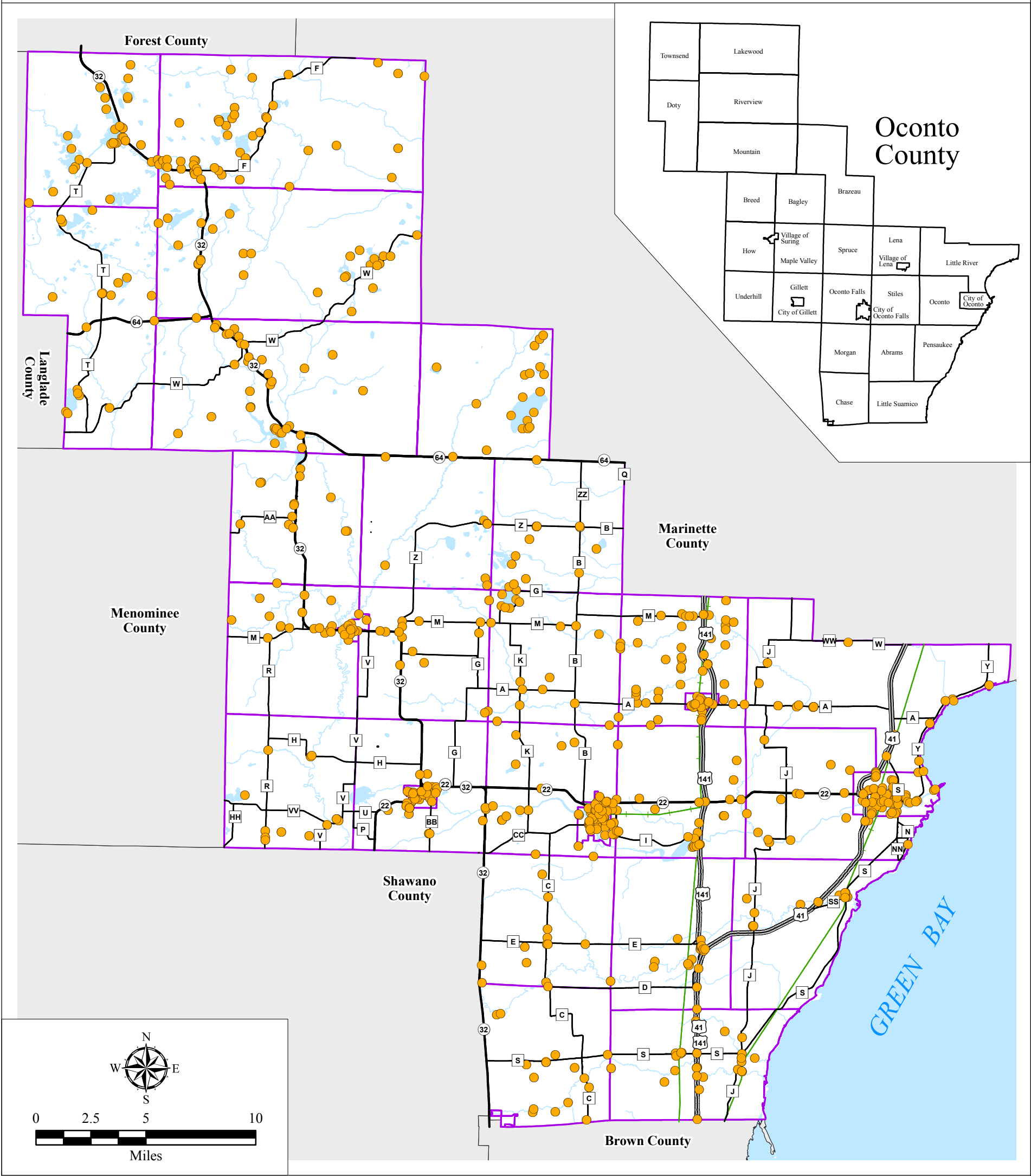
Co-operative programs for non-national forests.

- Urban and Community Forestry Program (<http://www.fs.fed.us/ucf/>)
- Forest Stewardship Program (<http://www.fs.fed.us/spf/coop/programs/loa/fsp.shtml>)
- Forests on the Edge (<http://www.fs.fed.us/openspace/fote/index.html>)
- Forest Legacy Program (<http://www.fs.fed.us/spf/coop/programs/loa/flp.shtml>)

Critical Facilites

Oconto County Hazard Mitigation Planning Area

Oconto County, Wisconsin



Base Map Features

- Community Boundary
- U.S. Highway
- State Highway
- County Highway
- Railroad
- Surface Water

Orange Dot Critical Facilities

Note: See Table 3.3 for Definition of Critical Facilities

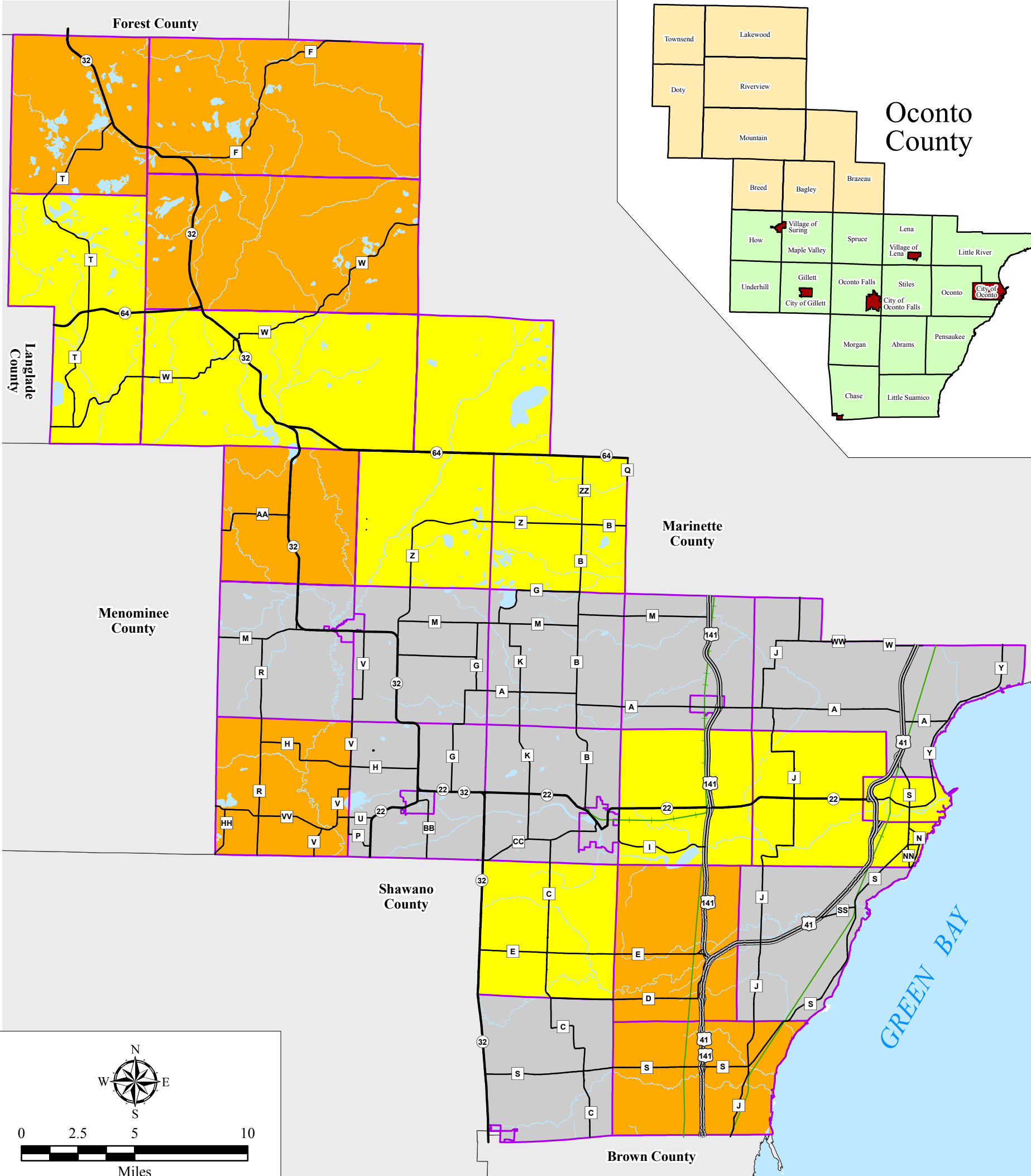


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Source: Oconto County; Bay-Lake Regional Planning Commission, 2014.

Areas of Greatest Wildland Fire Risk

Oconto County Hazard Mitigation Planning Area

Oconto County, Wisconsin



- Base Map Features**
- Community Boundary
 - U.S. Highway
 - State Highway
 - County Highway
 - Railroad
 - Surface Water



This map is neither a legally recorded map nor a survey and is not intended to be used as one. This drawing is a compilation of records, information and data used for reference purposes only. Bay-Lake RPC is not responsible for any inaccuracies herein contained.
Source: WDNR, 2008; Oconto County; Bay-Lake Regional Planning Commission, 2014.

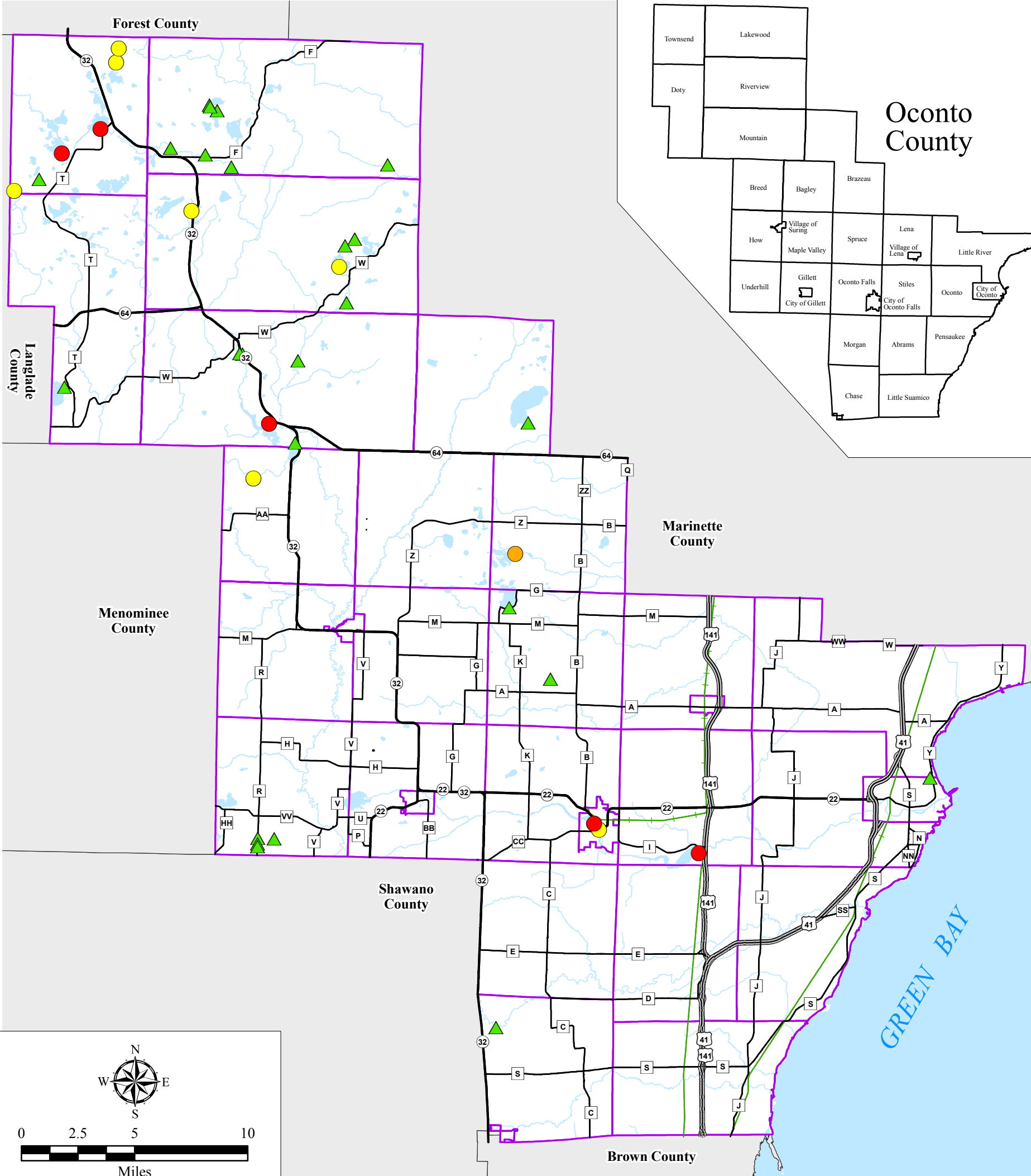
- High Risk Community
- Community of Concern
- Low Risk Community

- County Inset Map**
- Intensive Protection are regulated by the DNR and require a burning permit for debris burning throughout the year whenever the ground is not completely snow covered.
 - Extensive Protection are regulated by the DNR and require a burning permit whenever the ground is not completely snow covered from January 1 through May 31 and other times when the Department so orders.
 - Cooperative Fire Protection are not regulated by the DNR. These areas, or areas within incorporated cities and villages, are regulated by town chairpersons, or local and county officials.

Dams

Oconto County Hazard Mitigation Planning Area

Oconto County, Wisconsin



Base Map Features

- Community Boundary
- U.S. Highway
- State Highway
- County Highway
- Railroad
- Surface Water

- Large Dam/High Hazard Rating
- Large Dam/Significant Hazard Rating
- Large Dam/Low Hazard Rating
- Small Dam

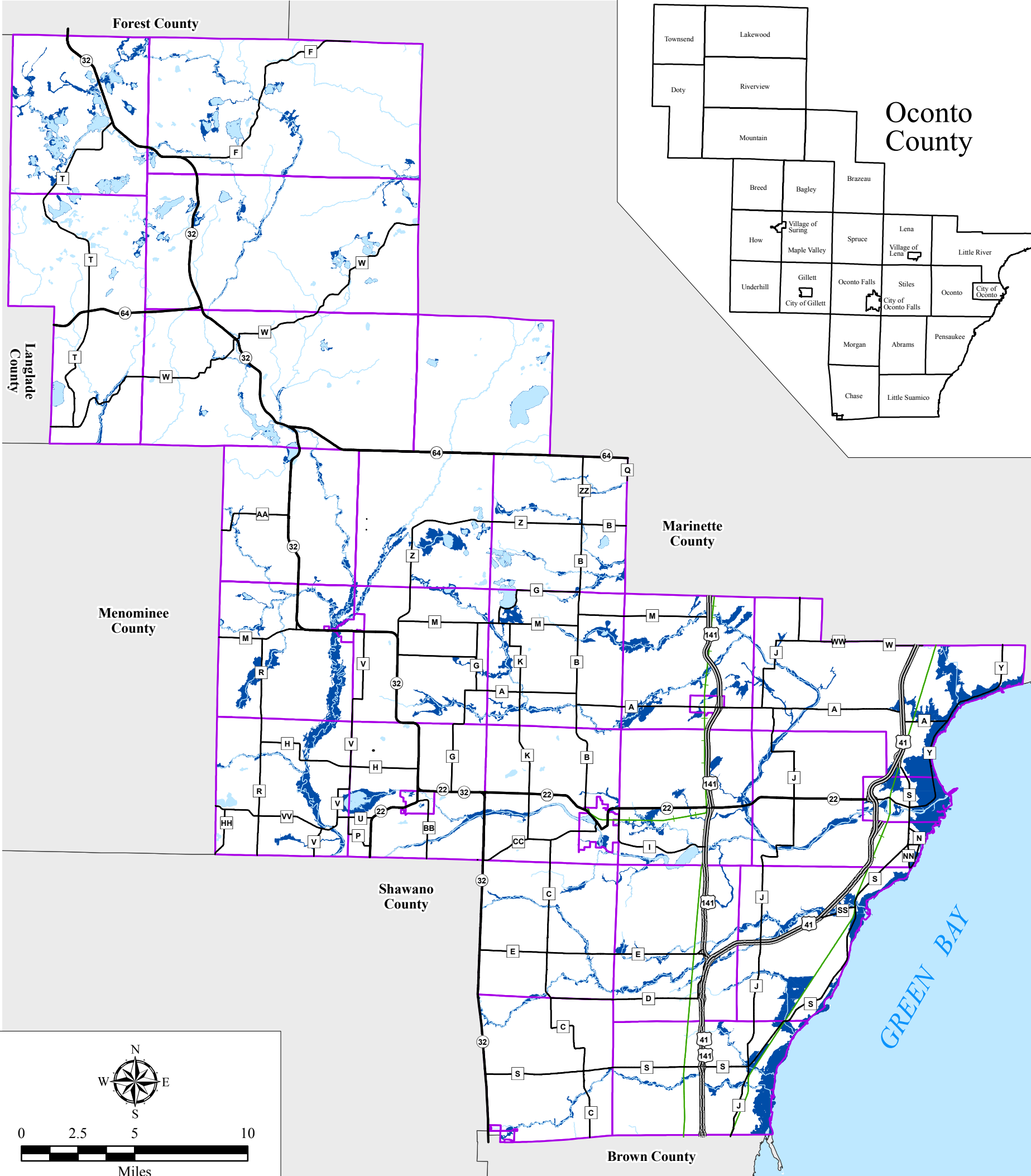


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Source: WDNR: Oconto County; Bay-Lake Regional Planning Commission, 2014.

100-Year Floodplains

Oconto County Hazard Mitigation Planning Area

Oconto County, Wisconsin



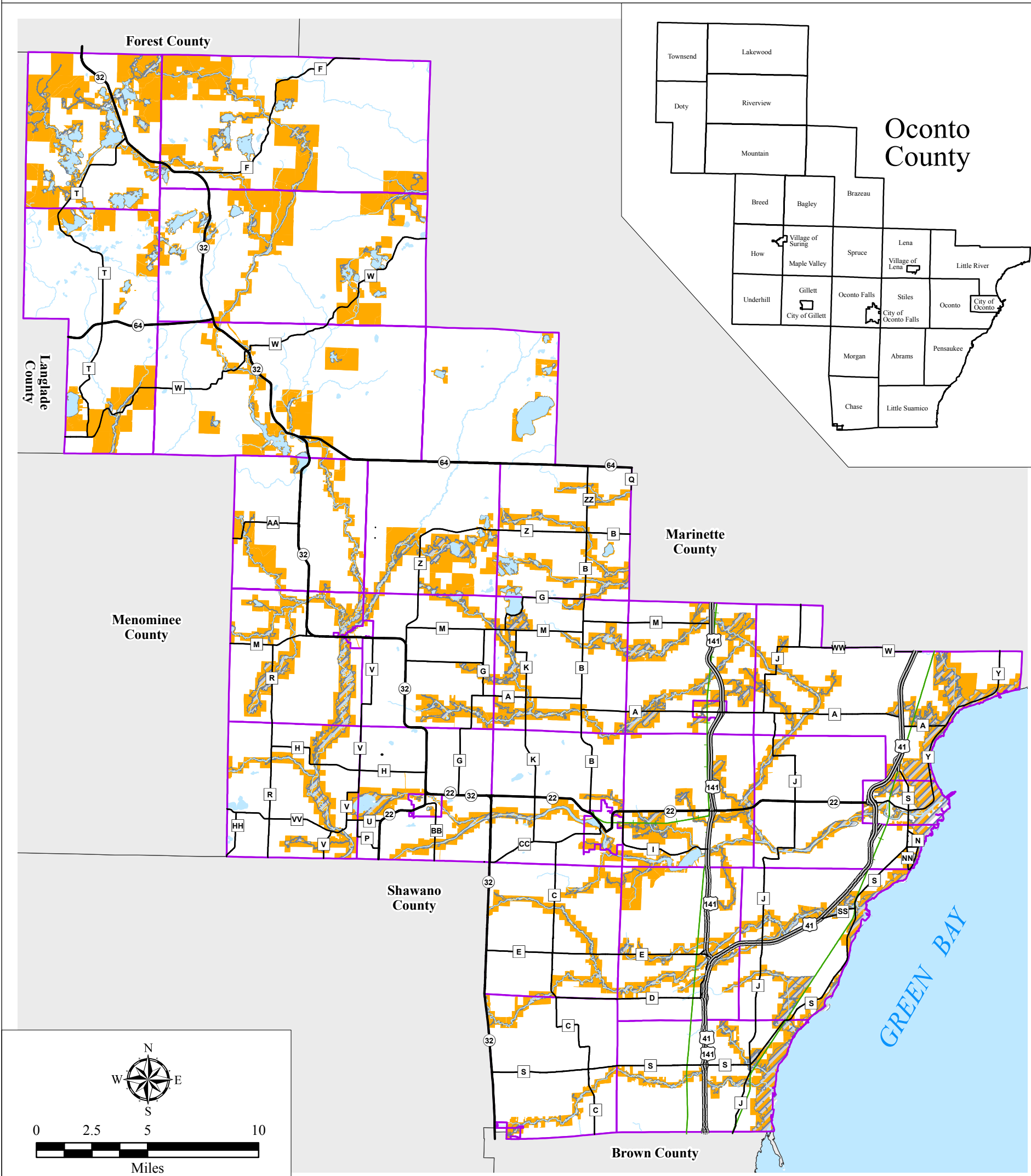
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Source: FEMA, 2009; Oconto County; Bay-Lake Regional Planning Commission, 2014.

Properties within the 100-Year Floodplains

Oconto County Hazard Mitigation Planning Area

Oconto County, Wisconsin



- Base Map Features**
- Community Boundary
 - U.S. Highway
 - State Highway
 - County Highway
 - Railroad
 - Surface Water
 - FEMA 100-Year Floodplain
 - Properties Potentially in the 100-Year Floodplain



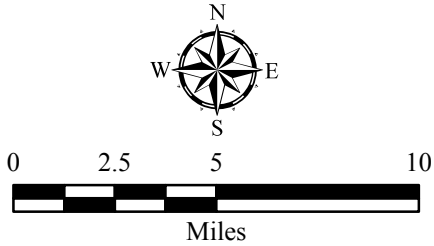
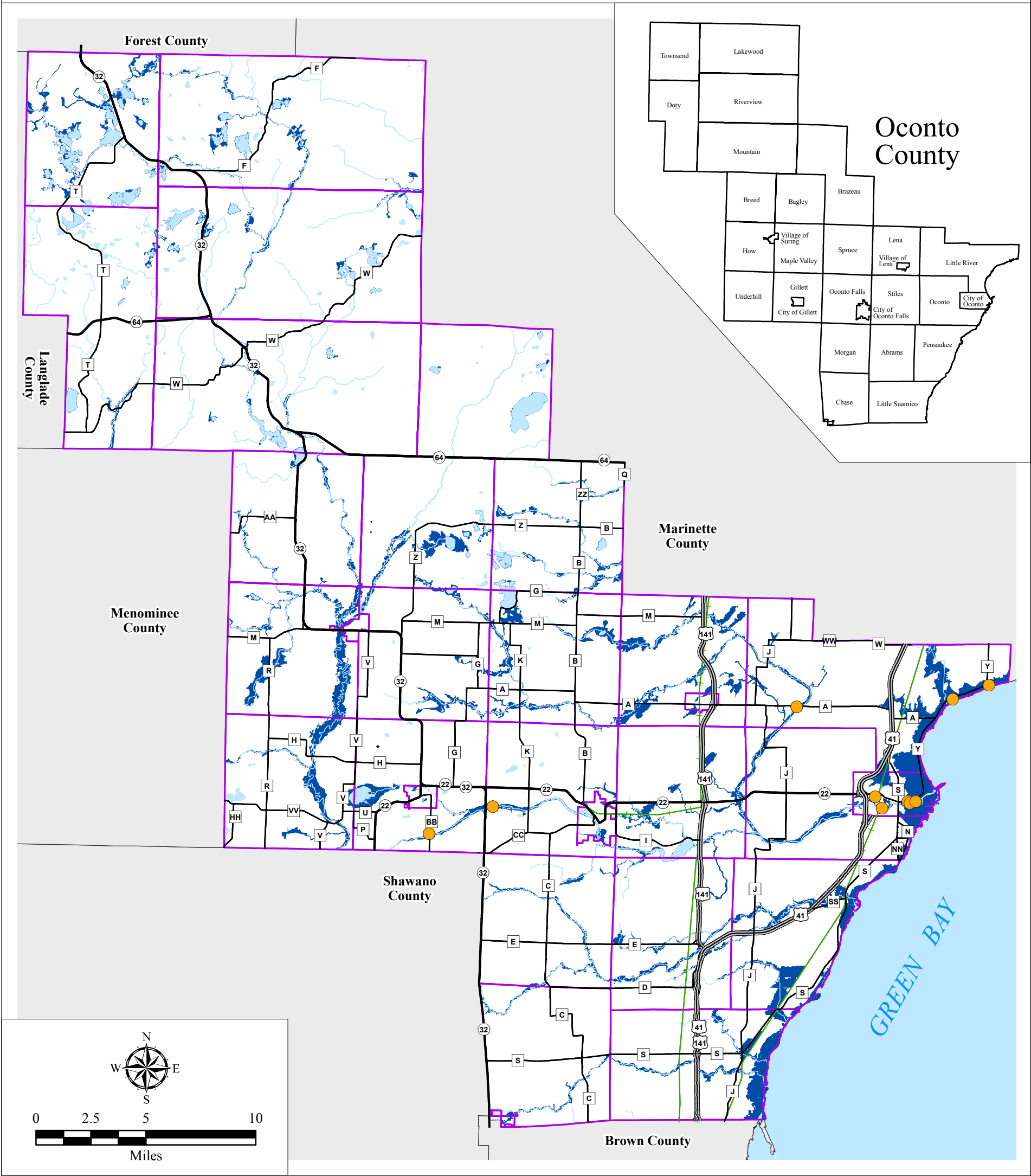
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Source: FEMA, 2009; Oconto County; Bay-Lake Regional Planning Commission, 2014.

Critical Facilities within the 100-Year Floodplains

Oconto County Hazard Mitigation Planning Area

Oconto County, Wisconsin



Base Map Features

- Community Boundary
- U.S. Highway
- State Highway
- County Highway
- Railroad
- Surface Water

- Critical Facilities Potentially in the 100-Year Floodplain*
- FEMA 100-Year Floodplain



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

Source: FEMA, 2009; Oconto County; Bay-Lake Regional Planning Commission, 2014.

*Note: Excludes water-dependent critical facilities including boat landings, bridges, dry hydrants, and dams.

CHAPTER 4 - MITIGATION STRATEGY

INTRODUCTION

As defined by the Disaster Mitigation Act of 2000, mitigation is a "sustained action that reduces or eliminates long-term risk to people and property from natural hazards and their effects."

Mitigation planning is the systematic process of learning about the hazards that can affect the planning area, setting clear goals, identifying appropriate actions, and following through with an effective mitigation strategy. Mitigation encourages long-term reduction of hazard vulnerability and can reduce the enormous cost of disasters to the government and property owners.

Mitigation can also protect critical community facilities and infrastructure; reduce exposure to liability; and minimize community disruption.

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

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

MITIGATION GOALS

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

Goal #1: Implement policies and programs that are designed to reduce or eliminate the impacts of hazards on people and property.

Goal #2: Collect and utilize data needed to improve policy making and the identification of appropriate mitigation projects.

Goal #3: Build and support local capacity and commitment to continuously lessen the impacts of hazards on people and property.

Goal #4: Enhance enforcement measures to reduce the impacts of hazards on people and property.

Goal #5: Enhance the use of natural resource protection measures as a means to reduce the impacts of hazards on people and property.

Goal #6: Obtain and maximize additional resources that are necessary to reduce the impact of hazards on people and property.

Goal #7: Enhance training, education and outreach efforts that describe potential effects of hazards and ways to reduce their impact.

Goal #8: Promote intergovernmental coordination and cooperation in planning for and implementing hazard mitigation strategies.

HAZARD MITIGATION STRATEGIES

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

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

Prioritization Process

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

Cost-Benefit Review

In developing this mitigation strategy, members of the plan steering committee considered, from their perspective, the costs and benefits of the various proposed action items. The cost-benefit review was a factor of the prioritization process. Full-blown cost-benefit calculations were not prepared for each strategy item included in the plan. A detailed cost-benefit analysis for a strategy will be undertaken during the project development process when implementation is being pursued.

COMPLETED MITIGATION ACTIONS

Some of identified mitigation actions have been completed since the preparation of the previous hazard mitigation plan for Oconto County. The following is a list of those strategies that have been completed.

- Install and maintain back-up generators for critical facilities identified as necessary for serving as communication centers and shelters.
- The full implementation of CodeRED for all residents living and owning property in Oconto County.
- Distribute travel aid kits.
- Institute a calling tree to check on the county’s most vulnerable population. *This was implemented through CodeRED, which was established countywide in 2009.*

Table 4.1: County Hazard Mitigation Strategies

All Hazards						
Item	Project	Priority	Project Timetable	Estimated Cost	Responsible Party	Notes
1	Inventory facilities where back-up power is available and determine where it is needed	High	2015	Covered under existing budgets	Oconto County Emergency Management and Red Cross	
2	Ensure that all Health and Human Services Department partner facilities are in the CodeRED system	High	2015	Covered under existing budgets	Oconto County Health and Human Services Department	
3	Pursue opportunities for better cellular coverage to enhance Code RED and 9-1-1 services	High	2015-2020	Covered under existing budgets	Oconto County Emergency Management, Economic Development, and Sheriff's Department	Potential to partner with Marinette, Forest, Florence, and/or Menominee counties as they also have this issue.
4	Maintain updated orthophotography data, 2-foot contours data, and GIS	High	On-going	Covered under existing budgets	Oconto County Land and Water Resources Department	Update Orthophotography every five years.
5	Adoption and maintenance of local emergency plans	High	On-going	Covered under existing budgets	Oconto County, incorporated communities, Red Cross, schools, and medical facilities	
6	Establish Mutual Aid Agreements for utility and communications systems including 9-1-1 that are similar to the Mutual Aid Box Alarm System (MABAS)	High	On-going	Covered under existing budgets	Oconto County, local emergency service providers (fire and rescue), WisDOT, and WDNR	
7	Enforce land use policies that encourages development to occur away from hazardous areas; reduce density in hazardous areas; and/or encourage greater development restrictions in hazardous areas	High	On-going		Oconto County and incorporated communities	The unincorporated communities are under county zoning. The county enforces shoreland and floodplain zoning.
8	Maintain County CodeRED public notification system.	High	On-going	\$15,000/year	Oconto County Emergency Management and CodeRED (contractor)	Includes annual testing.
9	Improved communication system with all entities coordinated into one system/frequency	High	On-going	Federal, State, and local budgets	Oconto County, local communities, Red Cross, state departments, and federal offices	

Table 4.1: County Hazard Mitigation Strategies (cont'd)

All Hazards (cont'd)						
Item	Project	Priority	Project Timetable	Estimated Cost	Responsible Party	Notes
10	Collect "building footprints" for all critical facilities to allow for analysis of where facilities/structures are located	Medium	2015, then on-going updates	Grant(s) + covered under existing budgets	Oconto County and incorporated communities	
11	Encourage residents to prepare themselves by stocking up with necessary items and planning for how family members should respond if any emergency or disaster events strike	Medium	On-going	Covered under existing budgets	Oconto County, incorporated communities, schools, Red Cross, and state departments	
12	Continue to require emergency plans for all Health and Human Services Department partner facilities	Medium	On-going	Covered under existing budgets	Oconto County Health and Human Services Department	
13	Work with County, State, and Federal agencies to maintain a consistent critical facility database	Low	On-going	Covered under existing budgets	Oconto County and Red Cross	
14	Sign and maintain designated emergency transportation routes	Low	On-going	Covered under existing budgets	Oconto County and incorporated communities	Primary street routes are the unofficial main transportation routes through the incorporated communities.
Winter Storms						
	Project	Priority	Project Timetable	Estimated Cost	Responsible Party	Notes
15	Ensure plowing and sanding equipment is operational and available when needed	High	On-going/Annual	Highway Dept annual budget	Oconto County and local communities	
16	Provide education on the travel hazards during the winter months	Low	On-going	Unknown	Media and private entities	
17	Maintain community tree trimming programs	Low	On-going/Annual	Covered under existing budgets	Oconto County, local communities, and utility providers	
18	Sign and maintain designated emergency transportation routes	Low	As needed	Covered under existing budgets	Oconto County and local communities	Primary street routes are the unofficial main transportation routes through the incorporated communities.
19	Promote the need to have a sufficient supply of pharmaceuticals and food on hand during emergencies	Medium	On-going	Covered under existing budgets	Oconto County Health and Human Services Department, hospitals, and Red Cross	

Table 4.1: County Hazard Mitigation Strategies (cont'd)

Tornado/High Winds						
	<i>Project</i>	<i>Priority</i>	<i>Project Timetable</i>	<i>Estimated Cost</i>	<i>Responsible Party</i>	<i>Notes</i>
20	Promote safety education	High	On-going/ Annual	Primarily state budget	Oconto County, WEM, schools, private entities, and media	
21	Maintain and utilize emergency evacuation and shelter policies	High	On-going/ Annual	Covered under existing budgets	Schools, hospitals, long-term care facilities, and some larger businesses.	All schools, hospitals, and long-term care institutions maintain plans and use them for periodic drills.
22	Heavy equipment agreements between municipalities and private haulers	Medium	On-going	Covered under existing budgets	Oconto County and local heavy equipment vendors	
23	Require tie-downs for mobile homes	Medium	On-going	Covered under existing budgets	Oconto County and incorporated communities	
24	Institute and enforce building codes	Medium	On-going	Covered under existing budgets	Oconto County and incorporated communities	Oconto County and the five incorporated communities enforce zoning codes.
25	Construction of shelters in parks and trailer parks	Medium	On-going	\$35,000/shelter, covered by grant(s)	Oconto County and incorporated communities	
26	Burial of power lines where feasible	Low	On-going	Unknown	Utility companies	
Extreme Cold						
	<i>Project</i>	<i>Priority</i>	<i>Project Timetable</i>	<i>Estimated Cost</i>	<i>Responsible Party</i>	<i>Notes</i>
27	Promoting public awareness and education	High	On-going	Covered under existing budgets	Oconto County Health and Human Services Department	
28	Conduct Red Cross sheltering evaluation for heating centers	High	On-going	Covered under existing budgets	Oconto County Emergency Management and Health and Human Services departments and Red Cross	

Table 4.1: County Hazard Mitigation Strategies (cont'd)

Extreme Cold (cont'd)						
	<i>Project</i>	<i>Priority</i>	<i>Project Timetable</i>	<i>Estimated Cost</i>	<i>Responsible Party</i>	<i>Notes</i>
29	Providing public assistance for furnace maintenance and payment of utility bills	High	On-going	Covered under existing budgets	Oconto County Health and Human Services Department, Community Action Agency, and Red Cross	
30	Monitoring and enforcement of building codes	Low	On-going	Covered under existing budgets	Oconto County	
31	Maintain emergency evacuation shelters	Medium	On-going	Covered under existing budgets	Municipalities, Red Cross, and Oconto County	
Wildland Fires						
	<i>Project</i>	<i>Priority</i>	<i>Project Timetable</i>	<i>Estimated Cost</i>	<i>Responsible Party</i>	<i>Notes</i>
32	Use of early detection methods like aircraft and citizen reporting	High	On-going	Covered under existing budgets	Oconto County, WDNR, and US Forest Service	
33	Institution and enforcement of regulations and burning permits	High	On-going	Covered under existing budgets	Oconto County, incorporated communities, WDNR, and US Forest Service	
34	Promotion of fire suppression training and readiness	High	On-going	Covered under existing budgets	Oconto County, local fire departments, WDNR, and US Forest Service	
35	Fire department training	High	On-going	Covered under existing budgets	Local fire departments and WDNR	
36	Use of fire prevention programs, such as Smokey Bear	Medium	On-going	Covered under existing budgets	WDNR, US Forest Service, and local fire departments	
37	Provide fire prevention materials	Medium	On-going	Covered under existing budgets	WDNR, US Forest Service, and local fire departments	
38	Establishment of suppression agreements between agencies	Medium	On-going	Covered under existing budgets	WDNR, US Forest Service, local fire departments	
39	Creation of community wildland protection plans	Medium	Updated regularly		Towns, WDNR, and US Forest Service	As of 2014, the Town of Riverview was updating its Community Wildfire Protection Plan.

Table 4.1: County Hazard Mitigation Strategies (cont'd)

Wildland Fires (cont'd)						
	<i>Project</i>	<i>Priority</i>	<i>Project Timetable</i>	<i>Estimated Cost</i>	<i>Responsible Party</i>	<i>Notes</i>
40	Ensure availability of year-round water access (i.e. dry hydrants)	Medium	On-going	Covered under existing budgets	Local fire departments and WDNR	
41	Provide fire education programs aimed at the wildland urban interface	Low	On-going	Covered under existing budgets	WDNR, Oconto County, and incorporated communities	The use and promotion of the existing "Firewise" programs.
42	Promote the use of non-combustible building materials in building codes	Low	On-going	Covered under existing budgets	WDNR	Information provided in Firewise Education materials.
Flooding (including dam failure flooding)						
	<i>Project</i>	<i>Priority</i>	<i>Project Timetable</i>	<i>Estimated Cost</i>	<i>Responsible Party</i>	<i>Notes</i>
43	Utilization of the CodeRED communication network	High	On-going	Covered under existing budgets	Oconto County Emergency Management and Sheriff's Department and Red Cross	
44	Wave run-up/storm surge analysis along Green Bay	Medium	2015-2016	WDNR and FEMA budgets	FEMA and WDNR	
45	Instituting and enforcing shoreland, floodplain, and wetland ordinances and regulations	Medium	On-going	Covered under existing budgets	Oconto County and incorporated communities	
46	Adopting and enforcing building codes	Low	On-going	Covered under existing budgets	Oconto County, communities, and building inspectors	
47	Provide information about flood insurance	Low	On-going	Covered under existing budgets	Oconto County and private insurance companies	
48	Installation of check valves to eliminate water back-up into homes and businesses	Low	On-going	Covered under existing budgets	Home and property owners, WDNR, and incorporated communities	
49	Site and structural modification to floodproof structures	Low	On-going	Covered under existing budgets	Home and property owners	
50	Ensure all large high risk dams have an updated emergency operations plan in place	High	On-going	Covered by WDNR budget	WDNR and Oconto County	All five of the large, high risk dams have EOPs in place.

Table 4.1: County Hazard Mitigation Strategies (cont'd)

Drought						
	<i>Project</i>	<i>Priority</i>	<i>Project Timetable</i>	<i>Estimated Cost</i>	<i>Responsible Party</i>	<i>Notes</i>
51	Adoption and compliance with regulations	High	On-going	Covered under existing budgets	Incorporated communities, US Forest Service, DATCP, and WDNR	
52	Develop contingency plans and alternative water delivery systems	Medium	On-going	Covered under existing budgets	Incorporated communities, US Forest Service, local fire departments, DATCP, and WDNR	
53	Provide education on, and encourage the use of drought resistant plants and crops, the practice of mulching, and use of drip hoses	Low	On-going	Covered under existing budgets	Oconto County UW-Extension	
54	Provide education on utilizing the most conducive land (heavy soils and nutrient composition) for agriculture	Low	On-going	Covered under existing budgets	Oconto County UW-Extension, DATCP, Farm Service Agency, and farmers	
55	Provide education about the use of no-till agriculture practices to reduce water loss to evaporation	Low	On-going	Covered under existing budgets	Oconto County UW-Extension and Forestry Department, DATCP, Farm Service Agency, farmers	Many private woodland owners are part of the state MFL program.
56	Encourage the availability and use of rain barrels	Low	On-going	Covered under existing budgets	Oconto County UW-Extension	
Pest Outbreaks						
	<i>Project</i>	<i>Priority</i>	<i>Project Timetable</i>	<i>Estimated Cost</i>	<i>Responsible Party</i>	<i>Notes</i>
57	Continued education including website information, EAB toolkits, outreach	High	On-going	Covered under existing budgets	Oconto County, WDNR, DATCP, and US Forest Service	
58	Placement and monitoring of detection surveys	High	On-going	Covered under existing budgets	Oconto County, WDNR, DATCP, and US Forest Service	
59	Maintaining healthy forests through application of sound management techniques	Medium	On-going	Covered under existing budgets	Oconto County, WDNR, and DATCP	
60	Promote and educate on proper disposal and utilization of infested resources	Medium	On-going	Covered under existing budgets	Oconto County, WDNR, DATCP, and US Forest Service	

Table 4.1: County Hazard Mitigation Strategies (cont'd)

Pest Outbreaks (cont'd)						
	<i>Project</i>	<i>Priority</i>	<i>Project Timetable</i>	<i>Estimated Cost</i>	<i>Responsible Party</i>	<i>Notes</i>
61	Promote and educate about integrated pest control (biological, chemical, and silviculture)	Low	On-going	Covered under existing budgets	Oconto County, WDNR, DATCP, and US Forest Service	
62	Utilization of quarantines for susceptible or infected areas.	Low	On-going	Covered under existing budgets	Oconto County, WDNR, DATCP, and US Forest Service	
Extreme Heat						
	<i>Project</i>	<i>Priority</i>	<i>Project Timetable</i>	<i>Estimated Cost</i>	<i>Responsible Party</i>	<i>Notes</i>
63	Promote public awareness	High	On-going	Covered under existing budgets	Oconto County, schools, and Red Cross	
64	Conduct Red Cross sheltering evaluation for cooling centers	High	2015	Covered under existing budgets	Oconto County Emergency Management and Health and Human Services departments and Red Cross	
65	Ensure wastewater systems have back-up power	High	2015	Covered under existing budgets	Incorporated communities and WDNR	
66	Maintain a countywide database of large crowd events	Low	On-going	Covered under existing budgets	Oconto County Emergency Management and Sheriff's Department	
Dense Fog						
	<i>Project</i>	<i>Priority</i>	<i>Project Timetable</i>	<i>Estimated Cost</i>	<i>Responsible Party</i>	<i>Notes</i>
67	Notification of problem areas through TV and radio broadcasts	High	On-going	Media budget	Sheriffs Department, media, and National Weather Service	
68	Installation of proper warning signs in high risk areas	High	On-going	Covered under existing budgets	Oconto County Highway Department, incorporated communities, and WisDOT	

Table 4.1: County Hazard Mitigation Strategies (cont'd)

Dense Fog (cont'd)					
<i>Project</i>	<i>Priority</i>	<i>Project Timetable</i>	<i>Estimated Cost</i>	<i>Responsible Party</i>	<i>Notes</i>
69	Medium	On-going	Covered under existing budgets	Oconto County Highway Department, incorporated communities, and WisDOT	
Hail					
<i>Project</i>	<i>Priority</i>	<i>Project Timetable</i>	<i>Estimated Cost</i>	<i>Responsible Party</i>	<i>Notes</i>
70	High	On-going	Covered under existing budgets	Oconto County, schools, and Red Cross	
71	Low	On-going	Covered under existing budgets	Oconto County and builders association	
72	Low	On-going	Covered under existing budgets	Oconto County and builders association	
Thunder/Lightning					
<i>Project</i>	<i>Priority</i>	<i>Project Timetable</i>	<i>Estimated Cost</i>	<i>Responsible Party</i>	<i>Notes</i>
73	High	On-going	Covered under existing budgets	Oconto County, incorporated communities, Red Cross, schools, and hospitals	
74	High	On-going	Covered under existing budgets	Oconto County, local fire departments, hospitals, and Red Cross	
75	Medium	On-going	Covered under existing budgets	Oconto County and incorporated communities	
Coastal Hazards					
<i>Project</i>	<i>Priority</i>	<i>Project Timetable</i>	<i>Estimated Cost</i>	<i>Responsible Party</i>	<i>Notes</i>
76	Medium	On-going	Covered by existing budgets	Oconto County Planning Department	

Table 4.2: Municipal Hazard Mitigation Strategies

Hazard Type	Mitigation Measures	Priority	Costs of Project	Project Timetable	Notes
City of Oconto					
Tornado and Strong Wind	Install 2 - 3 additional tornado sirens in the city	Low	\$30,000 - \$45,000	As funds become	
Flooding	Dredging of harbors and large rivers	Medium	Covered under Harbor Assistance Grant Program	On-going	The City of Oconto has instituted a dredging cycle for the Oconto River to limit future flooding.
Flooding	Provide materials to prevent flooding	Medium	\$50,000 - \$100,000	As funds become	
Flooding	Public acquisition of vulnerable structures and critical facilities in floodplains	Low	FEMA grants	As funds become available	The City of Oconto has four repetitive flood prone properties. They are all single-family residences. However, none of these properties have filed a loss since 1986.
City of Oconto Falls					
All Hazards	Acquire additional sirens and generators	Low	\$20,000	As funds become	
City of Gillett					
All Hazards	Institute and enforce building codes	Medium	Covered under existing budgets	On-going	
Village of Lena					
Tornado and Strong Wind	Update tornado siren	Medium	\$20,000	2015-2016	
Village of Suring					
All Hazards	Installation of permannet generators at each of the following buildings: fire department, municipal garage, and municipal building that houses village police department, clerk, computer, server, library, and meeting rooms	High	\$96,314	2015	Will allow village operations to function in a long-term power outage/disaster and provide some temporary shelter for displaced citizens.

Policies, Programs, and Resources for Mitigation

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

- Oconto County Planning & Zoning
 - Relevant policies and programs include planning and zoning (including enforcement of county shoreland and floodplain management regulations).
- Oconto County Emergency Management
 - Relevant policies and programs include coordinating effective disaster response and recovery efforts in the county through response, recovery, planning, training, and exercises, and mitigation.
- Fire Departments and Emergency Medical Services
 - Relevant policies and programs include coordinating emergency preparedness, mitigation, response, and recovery efforts.
- Law Enforcement
 - Relevant policies and programs include coordinating emergency preparedness, mitigation, response, and recovery efforts.
- Oconto County Sheriff's Department – Dispatch
 - Relevant policies and programs include coordinating emergency response and recovery efforts with regard to communication between the public and police, fire, and EMS.
- Oconto County Highway Department
 - Relevant policies and programs include road maintenance, stormwater management, and management of salt storage for winter storms.
- Oconto County Health and Human Services Department
 - Relevant policies and programs focus on protecting and promoting the health and safety of the people in the county in cooperation with community partners (includes assisting citizens with emergency preparedness).
- Wisconsin Emergency Management
 - Relevant policies and programs include supporting effective disaster response and recovery efforts in support of local government through planning, training, and exercises.
- Wisconsin Department of Natural Resources
 - Relevant policies and programs include regulation enforcement of state shoreland and floodplain management rules, and wildland fire response and education.

- Power Utilities (Wisconsin Public Service, WE Energies, Oconto Electric Cooperative, Oconto Falls Municipal Utilities,)
 - Relevant policies and programs include maintaining electrical power and transmission facilities.
- American Red Cross
 - Relevant policies and programs include disaster relief and educational programs that promote health and safety.
- Oconto County UW-Extension
 - Relevant policies and programs included education to local officials and citizens on wise agricultural practices and land use.
- National Weather Service (Green Bay Regional Office)
 - Relevant policies and programs include publicizing information, and providing outreach and education about hazardous weather.

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

Potential Funding Sources for Mitigation

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

Federal Programs

EDA Public Works and Development Facilities

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

FEMA Assistance to Firefighters Grant

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

The Fire Prevention and Safety Grants (FP&S) are part of the Assistance to Firefighters Grants (AFG) and are under the purview of the National Preparedness Directorate in the Federal

Emergency Management Agency. FP&S grants support projects that enhance the safety of the public and firefighters from fire and related hazards. The primary goal is to target high-risk populations and mitigate high incidences of death and injury.

FEMA Flood Mitigation Assistance Program

The Flood Mitigation Assistance (FMA) program was created as part of the National Flood Insurance Reform Act (NFIRA) of 1994 with the goal of reducing or eliminating claims under the National Flood Insurance Program (NFIP). FEMA provides FMA funds to assist States and communities implement measures that reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the National Flood Insurance Program. Eligible activities include: acquisition, relocation, elevation, and flood-proofing of flood-prone insured properties; flood mitigation planning; and technical assistance. In order to be eligible for funding through this program the local government must be in compliance with the National Flood Insurance Program.

FEMA Hazard Mitigation Grant Program

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

FEMA Pre-Disaster Mitigation Program

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

Pipeline and Hazardous Materials Safety Administration, Hazardous Materials Emergency Preparedness

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

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

This grant program is designed to provide funds to Local Education Agencies (LEA) to strengthen and improve their emergency response and crisis plans, at the district and school-building level. Grantees are required to address all four phases of crisis planning: prevention and mitigation, preparedness, response, and recovery. In addition, LEAs are required to form partnerships and collaborate with community organizations, local law enforcement agencies, heads of local governments, and offices of public safety, health, and mental health as they review and revise school crisis plans. Plans must be coordinated with state or local homeland security plans and support implementation of the National Incident Management System (NIMS). Grant funds may be used for the following activities: training school safety teams and students; conducting building and facilities audits; communicating emergency response policies to parents and guardians; implementing an Incident Command System (ICS); purchasing school safety equipment (to a limited extent); conducting drills and tabletop simulation exercises; and preparing and distributing copies of crisis plans.

State of Wisconsin Programs

WDNR Lake Planning Grant Program

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

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

WDNR Municipal Flood Control Grant Program

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

WDNR River Planning Grant Program

Under this grant program, counties, cities, towns, villages, tribes, other local governmental units, qualified river management organizations, and qualified nonprofit conservation organizations are eligible to apply for funding under this program. Projects funded by this program must be designed to collect, assess and disseminate information on riverine ecosystems; assist in developing organizations to help manage rivers; assist the public in understanding riverine ecosystems; and/or create management plans for the long term protection and improvement of

riverine ecosystems. Eligible activities include: organizational development for existing river protection/improvement organizations; assistance with the formation of a qualified river management organization; public education projects; and planning and assessment projects. Capital improvement projects are not eligible for funding under this grant.

WDNR Volunteer Fire Assistance Grant

Volunteer Fire Assistance (VFA) grants are available to Wisconsin county/area fire associations statewide. Grant funding is intended to support wildland fire suppression capabilities in an area through broad-ranging projects of benefit to all of the local fire departments. Successful applications will have a positive impact on the prevention, detection, and suppression of wildland fires in all of the communities served by a county/area fire association. Grant funds can be used for: fire fighter safety; fire fighter training; fire prevention (particularly in the Wildland Urban Interface); dry hydrants and other water resources; mapping; enhanced communications; wildland fire suppression equipment; and the organization of a new fire department.

WDOA Comprehensive Planning Grant Program

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

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

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

CHAPTER 5 - PLAN ADOPTION AND MAINTENANCE

PLAN ADOPTION PROCESS

The Oconto County Hazard Mitigation Plan development process was guided by the County Hazard Mitigation Plan Steering Committee over a 15-month timeframe, with professional planning support from the Bay-Lake Regional Planning Commission. A list of Steering Committee members is located in Chapter 1 - Introduction of this document.

Both WEM and FEMA reviewed and conditionally approved the County's hazard mitigation plan prior to adoption by the Oconto County Board. The plan was adopted by resolution by the Oconto County Board on December 17, 2015. The resolution adopting the plan can be found on page iii, just before the Table of Contents. After the plan was adopted by the Oconto County Board, it received final approval by WEM and FEMA. Approval letters from WEM and FEMA can be found on page v.

PLAN MAINTENANCE

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

Plan Monitoring, Evaluation, and Updating

The Oconto County Hazard Mitigation Plan will continue to be monitored, evaluated, and updated by the county Emergency Management Department. Every five years, the plan will be comprehensively reviewed, fully updated, and approved by the County Board. The update shall involve the collection of the most current data to support the plan and the development of new mitigation strategies and an implementation plan. The planning effort will be comprehensive, and will incorporate opportunities for public involvement to meet all requirements of 44 CFR Part 201.6 and/or any applicable requirements or regulations developed over the next five years. All meetings to update the plan shall be subject to the Wisconsin Open Meeting Law, and shall be properly noticed to allow for public involvement and comment.

Additional Plan Review

Additional review above and beyond the 5-year update will occur following a disaster. A special post-disaster review of the plan will occur within three to six months following a significant natural hazard event (as determined by the Steering Committee). Information concerning the disaster shall be collected by the Oconto County Emergency Management Director from local law enforcement personnel, fire department personnel, disaster response personnel, Wisconsin Emergency Management staff, FEMA staff, affected citizens, and any other pertinent entities. This information shall be provided to the Steering Committee for its review.

At a public meeting, the Steering Committees will analyze the contributing factors to the impact(s) of the hazard event, the likelihood of the event recurring, and any strategies that should be implemented to mitigate the impact(s) in the future. The County Emergency Management Director will have primary responsibility for establishing post-disaster review meeting dates, distributing related materials, facilitating the meetings, and advertising these special meetings to affected county departments, citizens, and community groups, so that additional input and comment can be received. Special post-disaster review meetings shall be subject to the

Wisconsin Open Meeting Law and shall be properly noticed to allow for public involvement and comment.

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

PLAN COORDINATION

Many of the hazard mitigation strategies identified in Table 4.1 are tied to county plans and policies. As the county and jurisdictions in the planning area develop or update their comprehensive plans, incorporation of the hazard mitigation plan is highly recommended. The Wisconsin comprehensive planning law includes a detailed description of elements that need to be addressed in all comprehensive plans. The following items must be considered when incorporating the hazard mitigation plan into the required elements of local comprehensive plans for jurisdictions in the planning area:

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

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

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

- Population, housing, and employment data from the Bureau of the Census (2000 and 2010);
- Bay-Lake Regional Planning Commission land use inventory data (2007);
- Risk Assessment Matrix Worksheet adapted from the *Resource Guide to All Hazards Mitigation Planning in Wisconsin* (AWRPC, 2003);
- Local Hazard Mitigation Plan Review Crosswalk, Completed for Oconto County in March 2010 was used to complete the updated Crosswalk;
- *State of Wisconsin Hazard Mitigation Enhanced Plan* (2009) was used to develop hazard descriptions for the risk assessment;
- FEMA *Local Mitigation Plan Review Guide* (2011) was used to ensure the plan contained all required information;
- Past hazard occurrences were obtained from National Oceanic and Atmospheric Administration (NOAA) – National Climatic Data Center – severe weather event data (January 2000 – January 2014);
- U.S. Geological Survey maps on landslides, land subsidence and earthquakes were used to describe those hazards;
- FEMA Flood Insurance Studies and FEMA Flood Insurance Rate Maps (FIRMs) were used to map floodplain areas;
- Parcel data from Oconto County was used to determine impacts of hazards with defined areas;
- Assessed valuation data from Oconto County was used to derive estimates of potential dollar losses;
- *Oconto County Emergency Operations Plan* contributed to the development of the mitigation strategies;
- *Oconto County Comprehensive Plan* was used to develop the community profile and contributed to the development of the mitigation strategies;
- Local municipal comprehensive plans contributed to the development of the mitigation strategies; and
- FEMA *Mitigation Ideas: Possible Mitigation Measures by Hazard Type* (2013) contributed to the development of the mitigation strategies.

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

APPENDIX A - STEERING COMMITTEE SIGN-IN SHEETS

In order to assist in plan development, Oconto County established a Hazard Mitigation Plan Steering Committee. A table listing all members of the Committee can be found in Chapter 1 - Introduction. The plan steering committee met on seven occasions: April 1, 2014; May 6, 2014; June 26, 2014; August 28, 2014; October 21, 2014; October 28, 2014; and December 11, 2014. This Appendix contains the sign-in sheets from each of these meetings to verify attendance and participation by Committee members.

Sign-In Sheet
Oconto County Multi-Hazards Mitigation Plan
Steering Committee Meeting
04/1/14

Please write legibly!

Please write legibly!

1. <u>Melissa Wellens</u> Name	<u>Emg. Mgt. Com. O.C.</u> Affiliation	<u>20</u> Mileage
2. <u>Dennis Kroll</u> Name	<u>Emg. Mgt. Com. O.C.</u> Affiliation	<u>50</u> Mileage
3. <u>Paul Bednarik</u> Name	<u>Emg. Mgt. Com. OC</u> Affiliation	<u>38</u> Mileage
4. <u>Buzz Kamke</u> Name	<u>Emg. Mgt. Com. O.C.</u> Affiliation	<u>30</u> Mileage
5. <u>Vicki Roberts</u> Name	<u>City of Oconto Falls</u> Affiliation	<u>30</u> Mileage
6. <u>Kathy Henne</u> Name	<u>CMH</u> Affiliation	<u>30</u> Mileage
7. <u>Kevin Hamann</u> Name	<u>Oconto County</u> Affiliation	<u>0</u> Mileage
8. <u>Pat Virtues</u> Name	<u>Oconto County</u> Affiliation	<u>26</u> Mileage
9. <u>Clark Longino</u> Name	<u>Oconto County Sheriff's Office</u> Affiliation	<u>2</u> Mileage
10. <u>Jack Mharik</u> Name	<u>City of Oconto Fire & Rescue Dept</u> Affiliation	<u>0</u> Mileage
11. <u>JOHN LUBBERS</u> Name	<u>WI-DNR - Fire Management</u> Affiliation	<u>61</u> Mileage
12. <u>Ben Tremel</u> Name	<u>WI-DNR CE</u> Affiliation	<u>61</u> Mileage
13. <u>MILES WINKLER</u> Name	<u>WI-DNR FLOODPLAIN DAM SAFETY / TOWN UNDERHILL</u> Affiliation	<u>61</u> Mileage
14. <u>JEREMY WUSTERRARTH</u> Name	<u>CITY OF OCONTO</u> Affiliation	<u>0</u> Mileage
15. <u>John Hubacher</u> Name	<u>Bellin Health Oconto Hosp.</u> Affiliation	<u>0</u> Mileage

Please write legibly!

Please write legibly!

- | | | | |
|-----|-------------------------------------|--|--|
| 16. | <u>Dale Mohr</u>
Name | <u>UW EXTENSION Oconto</u>
Affiliation | <u>68 68</u>
Mileage |
| 17. | <u>Mark Taurang</u>
Name | <u>LIS Oconto County</u>
Affiliation | <u>58</u>
Mileage |
| 18. | <u>TIM MITCHELL</u>
Name | <u>Oconto EM</u>
Affiliation | <u>30</u>
Mileage |
| 19. | <u>Angela Pierce</u>
Name | <u>Bay-Lake RPE</u>
Affiliation | <u>—</u>
Mileage |
| 20. | <u>Anne Renel</u>
Name | <u>Oconto Times Herald</u>
Affiliation | <u>—</u>
Mileage |
| 21. | <u> </u>
Name | <u> </u>
Affiliation | <u> </u>
Mileage |

Sign-In Sheet
Oconto County Multi-Hazards Mitigation Plan
Steering Committee Meeting
05/6/14

Please write legibly!

Please write legibly!

1.	<u>Travis Roberts</u> Name	<u>City of Oconto Falls</u> Affiliation	<u>30</u> Mileage
2.	<u>[Signature]</u> Name	<u>Village of Seneca</u> Affiliation	<u>90</u> Mileage
3.	<u>Paul Badnaw</u> Name	<u>County Board</u> Affiliation	<u>38</u> Mileage
4.	<u>Chk L</u> Name	<u>Oconto County Sheriff's Dept</u> Affiliation	<u>1</u> Mileage
5.	<u>Pat Virtues</u> Name	<u>Oconto Co. Zoning</u> Affiliation	<u>24</u> Mileage
6.	<u>Kathy Henne</u> Name	<u>Com Memorial Hospital</u> Affiliation	<u>30</u> Mileage
7.	<u>Paul Mohr</u> Name	<u>UW-Extension</u> Affiliation	<u>38</u> Mileage
8.	<u>Larry a. Belongia</u> Name	<u>Village of Seneca</u> Affiliation	<u>30</u> Mileage
9.	<u>Angela Pierce</u> Name	<u>Bay-Lake RPC</u> Affiliation	<u>—</u> Mileage
10.	<u>[Signature]</u> Name	<u>Emergency Management</u> Affiliation	<u>30</u> Mileage
11.	_____ Name	_____ Affiliation	_____ Mileage
12.	_____ Name	_____ Affiliation	_____ Mileage
13.	_____ Name	_____ Affiliation	_____ Mileage
14.	_____ Name	_____ Affiliation	_____ Mileage
15.	_____ Name	_____ Affiliation	_____ Mileage

Sign-In Sheet
Oconto County Multi-Hazards Mitigation Plan
Steering Committee Meeting
06/26/14

Please write legibly!

Please write legibly!

1. <u>Angela Pierce</u> Name	<u>Bay-Lake RPC</u> Affiliation	<u> </u> Mileage
2. <u>TIM MAGNIN</u> Name	<u>OCONTO CO. EM</u> Affiliation	<u>28</u> Mileage
3. <u>Dennis Kroll</u> Name	<u>supervisor</u> Affiliation	<u>50</u> Mileage
4. <u>Paul Bednarik</u> Name	<u>cty. Brd</u> Affiliation	<u>38</u> Mileage
5. <u>MILES WINKLER</u> Name	<u>DNR</u> Affiliation	<u>70</u> Mileage
6. <u>Larry Belongia</u> Name	<u>Village of Lena</u> Affiliation	<u>30</u> Mileage
7. <u>John Hbacher</u> Name	<u>Bellin Health</u> Affiliation	<u> </u> Mileage
8. <u>CRAIG JOHNSON</u> Name	<u>OCONTOPT H&HS</u> Affiliation	<u>70</u> Mileage
9. <u>Kevin Hamann</u> Name	<u>Oconto County</u> Affiliation	<u> </u> Mileage
10. <u>Deb Konitzer</u> Name	<u>Oconto Co H&HS</u> Affiliation	<u>28</u> Mileage
11. <u> </u> Name	<u> </u> Affiliation	<u> </u> Mileage
12. <u> </u> Name	<u> </u> Affiliation	<u> </u> Mileage
13. <u> </u> Name	<u> </u> Affiliation	<u> </u> Mileage
14. <u> </u> Name	<u> </u> Affiliation	<u> </u> Mileage
15. <u> </u> Name	<u> </u> Affiliation	<u> </u> Mileage

Sign-In Sheet
Oconto County Multi-Hazards Mitigation Plan
Steering Committee Meeting
08/28/14

Please write legibly!

Please write legibly!

1. <u>Clark G Longene</u> Name	<u>Sheriff's Dept.</u> Affiliation	<u>1</u> Mileage
2. <u>Paul Bednarek</u> Name	<u>CTY. Brcl.</u> Affiliation	<u>38</u> Mileage
3. <u>G. BECKMAAL</u> Name	<u>CTY BD</u> Affiliation	<u>2</u> Mileage
4. <u>Buzz Kamke</u> Name	<u>CTY BD</u> Affiliation	<u>30</u> Mileage
5. <u>Ryan Severson</u> Name	<u>WDNR Forestry</u> Affiliation	<u>30</u> Mileage
6. <u>MILES WINKLER</u> Name	<u>WDNR WATER REG</u> Affiliation	<u>60</u> Mileage
7. <u>Kathy Henne</u> Name	<u>CMH</u> Affiliation	<u>30</u> Mileage
8. <u>Deb Konitzer</u> Name	<u>Health + Human Services</u> Affiliation	<u>30</u> Mileage
9. <u>John Hubacher</u> Name	<u>Bellin Health Oconto Hospital</u> Affiliation	<u>—</u> Mileage
10. <u>Ben Treml</u> Name	<u>WDNR - CE</u> Affiliation	<u>60</u> Mileage
11. <u>Angela Pierce</u> Name	<u>BLRPC</u> Affiliation	<u>—</u> Mileage
12. <u>Tim MAGNIN</u> Name	<u>Oconto ECU</u> Affiliation	<u>30</u> Mileage
13. <u>Craig Johnson</u> Name	<u>Health + Human Services</u> Affiliation	<u>70</u> Mileage
14. <u>Pat Virtues</u> Name	<u>Oconto Co. Zoning</u> Affiliation	<u>26</u> Mileage
15. _____ Name	_____ Affiliation	_____ Mileage

Sign-In Sheet
Oconto County Multi-Hazards Mitigation Plan
Steering Committee Meeting
10/21/14

Please write legibly!

Please write legibly!

1. <u>TIM MAGWIN</u>	<u>Oconto EM</u>	<u>30</u>
Name	Affiliation	Mileage
2. <u>PAUL Beckmark</u>	<u>Cty. Bnd.</u>	<u>38</u>
Name	Affiliation	Mileage
3. <u>Pat Virtues</u>	<u>Oconto Zoning</u>	<u>20</u>
Name	Affiliation	Mileage
4. <u>Patrick J Scanlan</u>	<u>Oconto Co Highway</u>	
Name	Affiliation	Mileage
5. <u>Vanessa Peters</u>	<u>Oconto Co. Hwy</u>	
Name	Affiliation	Mileage
6. <u>JOHN LUBBERS</u>	<u>W-DNR Forestry</u>	<u>60</u>
Name	Affiliation	Mileage
7. <u>Angela Pierce</u>	<u>BAY-LAKE RPC</u>	
Name	Affiliation	Mileage
8. <u>Dennis Kroff</u>	<u>Cty Bd</u>	<u>50</u>
Name	Affiliation	Mileage
9. <u>Kathy Henne</u>	<u>St. Clare Memorial Hosp</u>	<u>30</u>
Name	Affiliation	Mileage
10. <u>Craig Johnson</u>	<u>Healer + Human Services</u>	<u>35</u>
Name	Affiliation	Mileage
11. _____	_____	_____
Name	Affiliation	Mileage
12. _____	_____	_____
Name	Affiliation	Mileage
13. _____	_____	_____
Name	Affiliation	Mileage
14. _____	_____	_____
Name	Affiliation	Mileage
15. _____	_____	_____
Name	Affiliation	Mileage

Sign-In Sheet
Oconto County Multi-Hazards Mitigation Plan
Steering Committee Meeting
10/28/14

Please write legibly!

Please write legibly!

1. <u>TIM MAGWIN</u> Name	<u>Oconto Co. EM</u> Affiliation	<u>30</u> Mileage
2. <u>Paul Bednerik</u> Name	<u>Oconto Co EM</u> Affiliation	<u>38</u> Mileage
3. <u>Melissa Wellens</u> Name	<u>Oconto Co. EM</u> Affiliation	<u>20</u> Mileage
4. <u>Kevin Hamann</u> Name	<u>Oconto Co. Admin.</u> Affiliation	<u>0</u> Mileage
5. <u>Dennis Kroll</u> Name	<u>Oconto Co. EM</u> Affiliation	<u>50</u> Mileage
6. <u>Vanessa Peters</u> Name	<u>Oconto Co. Hwy Dept</u> Affiliation	<u>0</u> Mileage
7. <u>JOHN LUBBERS</u> Name	<u>WI - DNR</u> Affiliation	<u>60</u> Mileage
8. <u>Ben Trembl</u> Name	<u>DNR</u> Affiliation	<u>60</u> Mileage
9. <u>Angela Pierce</u> Name	<u>Bay-Lake RPC</u> Affiliation	<u>—</u> Mileage
10. <u>Julia Noordy</u> Name	<u>UW Sea Grant</u> Affiliation	<u>—</u> Mileage
11. <u>Hilaine Sorensen</u> Name	<u>UW Sea Grant</u> Affiliation	<u>—</u> Mileage
12. _____ Name	_____ Affiliation	_____ Mileage
13. _____ Name	_____ Affiliation	_____ Mileage
14. _____ Name	_____ Affiliation	_____ Mileage
15. _____ Name	_____ Affiliation	_____ Mileage

Sign-In Sheet
Oconto County Multi-Hazards Mitigation Plan
Steering Committee Meeting
12/11/14

Please write legibly!

Please write legibly!

1. <u>Tim Maguin</u> Name	<u>Oconto Co. EM</u> Affiliation	<u>30</u> Mileage
2. <u>Craig Johnson</u> Name	<u>Oconto HHS</u> Affiliation	<u>70</u> Mileage
3. <u>Bruce Bodnar</u> Name	<u>City Emrg. Gvt</u> Affiliation	<u>38</u> Mileage
4. <u>Melissa Wellens</u> Name	<u>City Emrg. Mgt.</u> Affiliation	<u>20</u> Mileage
5. <u>Kent Lyng</u> Name	<u>Oconto Electric Coop</u> Affiliation	<u>26</u> Mileage
6. <u>Kevin Hamann</u> Name	<u>Oconto County</u> Affiliation	<u>0</u> Mileage
7. <u>Vanessa Peters</u> Name	<u>Oconto County Hwy</u> Affiliation	<u>0</u> Mileage
8. <u>Dale Mohr</u> Name	<u>UW-Extension</u> Affiliation	<u>80</u> Mileage
9. <u>Mike Winkler</u> Name	<u>DNR</u> Affiliation	<u>60</u> Mileage
10. <u>Pat Virtues</u> Name	<u>Oconto County</u> Affiliation	<u>24</u> Mileage
11. <u>Kathy Henne</u> Name	<u>St. Clare Memorial Hosp.</u> Affiliation	<u>30</u> Mileage
12. <u>Julia Noordyk</u> Name	<u>Sea Grant</u> Affiliation	<u>X</u> Mileage
13. <u>Angela Pierce</u> Name	<u>Bay-Lake RPC</u> Affiliation	<u>X</u> Mileage
14. <u>Jack Munk</u> Name	<u>Jack Munk</u> Affiliation	<u>X</u> Mileage
15. _____ Name	_____ Affiliation	_____ Mileage

APPENDIX B - MULTI-JURISDICTIONAL COOPERATION EXERCISE

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

Communities were provided a listing of their critical facilities, goals identified in the plan, and hazards mitigation actions, and were asked to review and comment on the materials. Additionally, they were asked to identify mitigation actions specific to their community.

The following is the letter that was sent to the municipalities in Oconto County and Table B.5.1 below displays the communities that returned the reviewed materials.

December 21, 2014

{ Clerk }
{ City/Village }
{ Address }
{ City, WI Zip }

RE: Request for Review of Hazard Mitigation Materials

(Please forward to your Plan Commission, Common Council, or Municipal Board)

Oconto County Emergency Management and the Bay-Lake Regional Planning Commission have been working with a local Steering Committee to update the Hazard Mitigation Plan for Oconto County and the municipalities. A draft of the plan is available at: <http://tinyurl.com/OCPlan>.

The Disaster Mitigation Act of 2000 established a **requirement for local governments** to prepare a Hazard Mitigation Plan to be eligible for funding from FEMA through the Pre-Disaster Mitigation Grant Program, the Flood Mitigation Assistance Program, the Hazard Mitigation Grant Program, and disaster assistance.

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

The following materials have been enclosed to facilitate your participation in development of this plan update:

- A current inventory of the critical facilities found in your community, plus a list of the critical facility types/categories that are to be included. It is very likely that some critical facilities have been omitted or others need to be removed. **Please review this information for accuracy and write in any edits.**
 - Ensure that there is an address or lat/long coordinates provided for each critical facility that you add.
 - Add missing dry hydrants and fuel storage tanks (over 1,000 lbs) and their locations (address or lat/long). *This may require review by your fire department.*
- Mitigation goals for the plan. **Please review, comment, and sign indicating your approval.**
- The mitigation actions identified by the steering committee. **Please review, comment, and sign indicating your approval** and **ADD AT LEAST ONE MITIGATION ACTION SPECIFIC TO YOUR COMMUNITY** that you plan to implement or would like to implement if grant funding were available.
- Natural hazards to be addressed in the plan listed in prioritized order based on impact and frequency (from the steering committee). **Please review, comment, and sign indicating your approval.**

If you have any questions or need any additional information (including electronic copies), please contact Angela Pierce with the Bay-Lake Regional Planning Commission at (920) 448-2820 or apierce@baylakerpc.org. Please return your information (with or without edits) **no later than January 5, 2015** to Bay-Lake Regional Planning Commission, 425 S. Adams Street, Suite 201, Green Bay, WI 54301. Thank you for your participation in reviewing the enclosed materials.

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

Sincerely,

Tim Magnin
Emergency Management Director

Enclosures (4):

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

Table B.5.1: Returned Hazard Mitigation Plan Update Review Materials

Municipality	Community Representative		
	Name	Title	Date Signed
City of Gillett	Leone Christensen	Deputy Clerk	1/13/2015
City of Oconto	Jack Mlnarik	Fire Chief	12/11/2014
City of Oconto Falls	Vicki A. Roberts	City Administrator	1/16/2015
Village of Lena	Larry A. Belongia	Board Member	12/29/2014
Village of Suring	Carol M. Heise	Clerk - Treasurer	2/3/2015

Source: Bay-Lake Regional Planning Commission, 2015.

APPENDIX C - CRITICAL FACILITIES BY COMMUNITY

The Oconto County Hazard Mitigation Plan Steering Committee and community representatives identified critical infrastructure assets for all the communities in the county.

Table C.5.2 below summarizes the critical facilities for Oconto County, sorted by municipality.

Table C.5.2: Critical Facilities, Oconto County

Type	Name	Address	Municipality
Administrative Building	Gillett City Hall	150 N Mckenzie St	City of Gillett
Administrative Building	Gillett Public Library	200 E Main St	City of Gillett
Administrative Building	Post Office	205 E Main St	City of Gillett
Church	St John Catholic Rectory	127 Garden Ave	City of Gillett
Church	St John's Lutheran Church	101 W Main St	City of Gillett
Church	Tabor United Methodist Church	120 W Main St	City of Gillett
Communications	Cellcom Tower	5686 Finnegan Lake Rd	City of Gillett
Communications	T 264	5686 Finnegan Lake Rd	City of Gillett
Electrical Facilities	Electrical Substation	130 N Richmond Ave	City of Gillett
Energy Facilities	Buckholz Oil/Gas Plant	320 W Park St	City of Gillett
Energy Facilities	Larsen Cooperative Bulk Propane	550 W Washington St	City of Gillett
Fire Department	Gillett Fire Department	310 W Park St	City of Gillett
Human Services Facilities	New View Industries	222 W Park St	City of Gillett
Human Services Facilities	Sunshine Child Center	213 W Park Street	City of Gillett
Human Services Facilities	Woodland Village	330 Robin Hood Ln	City of Gillett
Medical Facilities	Gillett Primary Care Clinic	340 N Green Bay Ave	City of Gillett
Mobile Home Park	Rolling Hills Mobile Home Park	319 S Green Bay Ave	City of Gillett
Police Department	Gillett Police Department	150 N Mckenzie St	City of Gillett
Recreation Facilities	Honey Park	N Richmond Ave	City of Gillett
Recreation Facilities	Jones Sports Complex	Church Ln	City of Gillett
Recreation Facilities	Park	STH 22	City of Gillett
Recreation Facilities	Zippel Park	N Mckenzie St	City of Gillett
Recycling Center	Gillett City/Town Recycling Center	310 West Park St	City of Gillett
Rescue Department	Gillett Area Rescue	225 W Park St	City of Gillett
School	Gillett Elementary School	208 W Main St	City of Gillett
School	Gillett High School	208 W Main St	City of Gillett
Utilities	Seneca Discharge	200 N Green Bay Ave	City of Gillett
Utilities	Water Tower	5686 Finnegan Lake Rd	City of Gillett
Utilities	Well #2	135 E Washington St	City of Gillett
Utilities	Well #3	546 E Foelker St	City of Gillett
Utilities	Well #4	228 S Green Bay Ave	City of Gillett
Administrative Building	Farnsworth Library	715 Main St	City of Oconto
Administrative Building	NEWCAP, INC	1201 Main St	City of Oconto
Administrative Building	Oconto City Hall	1210 Main St	City of Oconto
Administrative Building	Oconto County Couthouse	301 Washington St	City of Oconto
Administrative Building	Oconto County Jail	301 Washington St	City of Oconto
Administrative Building	Oconto Highway Shop	202 Van Dyke St	City of Oconto
Administrative Building	Post Office	129 Congress St	City of Oconto
Boat Landing	Breakwater Park	Harbor Rd	City of Oconto
Boat Landing	Oconto City Docks	Park Ln	City of Oconto
Boat Landing	Oconto River Access	Holtwood Way	City of Oconto
Bridge	Bridge	Brazeau Ave/Oconto River	City of Oconto
Bridge	Bridge	Scherer Ave/Oconto River	City of Oconto
Bridge	Bridge	Park Ave/Oconto River	City of Oconto
Bridge	Bridge	USH 41/Oconto River	City of Oconto
Bridge	Bridge	USH 41/STH 22	City of Oconto
Bridge	Bridge	USH 41/Cook Ave	City of Oconto
Bridge	Bridge	USH 41/Cook Ave	City of Oconto
Bridge	Bridge	Cook Ave/Unnammed Waterway	City of Oconto
Church	Christian Science Reading Room	423 Chicago St	City of Oconto
Church	First American Lutheran Church	511 Madison St	City of Oconto

Table C.5.2: Critical Facilities, Oconto County (cont'd)

Type	Name	Address	Municipality
Church	First Presbyterian Church	133 Jackson St	City of Oconto
Church	Freedom By the Word	622 Madison St	City of Oconto
Church	Holy Trinity Parish	716 Madison St	City of Oconto
Church	Oconto Gospel Chapel	251 Michigan Ave	City of Oconto
Church	Pentecostal Lighthouse Church	821 Superior Ave	City of Oconto
Church	United Methodist Church	641 Washington St	City of Oconto
Church	Zion Lutheran Church	1700 Superior Ave	City of Oconto
Communications	T 265 (42)	Scherer Ave	City of Oconto
Dams	Oconto Marsh Wildlife Area	Unnamed Waterway	City of Oconto
Electrical Facilities	Electrical Substation	Cook Ave	City of Oconto
Fire Department	Oconto Fire Department	1210 Main St	City of Oconto
Human Services Facilities	Becky's Busy Kids	317 Jefferson St	City of Oconto
Human Services Facilities	Country House	229 Van Dyke St	City of Oconto
Human Services Facilities	Oconto Headstart	1007 Pecor St	City of Oconto
Human Services Facilities	Sun Valley Homes II	425 Pecor St	City of Oconto
Human Services Facilities	Superior House	1204 Superior Ave	City of Oconto
Human Services Facilities	Woodland Village	101 First St	City of Oconto
Medical Facilities	Aurora Health Center	530 Smith Ave	City of Oconto
Medical Facilities	Bellin Health Oconto Hospital	820 Arbutus Ave	City of Oconto
Medical Facilities	Oconto Primary Care Clinic	103 First St	City of Oconto
Medical Facilities	Prevea Health Clinic	820 Arbutus Ave	City of Oconto
Medical Facilities	Prevea Oconto Health Center	620 Smith Ave	City of Oconto
Mobile Home Park	R & B Mobile Home Park	350 Hanson Ave	City of Oconto
Mobile Home Park	Riverview Court	140 Farnsworth Ave	City of Oconto
Mobile Home Park	Shore Dr Mobile Court	7th St	City of Oconto
Plan Facilities (HazMat)	Cruisers Yachts	804 Pecor St	City of Oconto
Police Department	Oconto County Sheriff	301 Washington St	City of Oconto
Police Department	Oconto Police Department	1210 Main St	City of Oconto
Recreation Facilities	Breakwater Park	1301 Harbor Rd	City of Oconto
Recreation Facilities	Copper Culture Mounds State Park	260 Mill St	City of Oconto
Recreation Facilities	Docks Park	Park Ln	City of Oconto
Recreation Facilities	Holtwood Campground	400 Holtwood Way	City of Oconto
Recreation Facilities	Holtwood Park	115 Holtwood Way	City of Oconto
Recreation Facilities	Oconto Golf Club	532 Jefferson St	City of Oconto
Recreation Facilities	Sharps Park	7th St	City of Oconto
Recycling Center	Oconto County Materials Recovery Facility	153 Evergreen Rd	City of Oconto
Recycling Center	Oconto Recycling Center	1616 Main St	City of Oconto
Rescue Department	Oconto Rescue	1210 Main St	City of Oconto
School	Oconto Elementary School	810 Scherer Ave	City of Oconto
School	Oconto High School	1717 Superior Ave	City of Oconto
School	Oconto Middle School/Day Care	400 Michigan Ave	City of Oconto
Utilities	Oconto Wastewater Treatment Plant	1620 Main St	City of Oconto
Utilities	Sewage Pumping Station	334 Pecor St	City of Oconto
Utilities	Water Tower	Evergreen Rd	City of Oconto
Utilities	Water Tower	Scherer Ave	City of Oconto
Utilities	Well #5	Madison St	City of Oconto
Utilities	Well #7	Van Hecke Ave	City of Oconto
Utilities	Well #8	7th St	City of Oconto
Administrative Building	DNR Ranger Station	195 E Highland Dr	City of Oconto Falls
Administrative Building	Oconto Falls City Hall	500 N Chestnut Ave	City of Oconto Falls
Administrative Building	Oconto Falls Community Library	251 N Main St	City of Oconto Falls
Administrative Building	Post Office	145 N Franklin St	City of Oconto Falls
Administrative Building	Utilities Warehouse	223 Monroe St	City of Oconto Falls
Boat Landing	Oconto River Access	STH 22	City of Oconto Falls
Boat Landing	Oconto River Access	N Flatley Ave	City of Oconto Falls
Bridge	Bridge	CTH CC/Oconto River	City of Oconto Falls
Church	Grace Lutheran Church/Day Care	501 S Main St	City of Oconto Falls
Church	Jehovahs Witnesses	506 N Chestnut Ave	City of Oconto Falls
Church	Riverview Alliance Church	628 N Main St	City of Oconto Falls
Church	St Anthony's Parish	253 N Franklin St	City of Oconto Falls
Church	St. Paul Evangelical Lutheran Church	301 S Chestnut Ave	City of Oconto Falls
Church	United Methodist	165 S Farm Rd	City of Oconto Falls
Communications	Cell Phone Tower	Chestnut Rd	City of Oconto Falls
Communications	T 270	102 Jackson St	City of Oconto Falls
Communications	Tower	223 Monroe St	City of Oconto Falls

Table C.5.2: Critical Facilities, Oconto County (cont'd)

Type	Name	Address	Municipality
Dams	Lower Oconto Falls Dam	Oconto River	City of Oconto Falls
Dams	Upper Oconto Falls Dam	Oconto Falls Pond/Oconto River	City of Oconto Falls
Electrical Facilities	Electrical Substation	Ralph Lemorande Dr/Hank Marks Dr	City of Oconto Falls
Electrical Facilities	Electrical Substation	102 Jackson St	City of Oconto Falls
Energy Facilities	Country Style Bulk Propane	200 Bob Hammond St	City of Oconto Falls
Energy Facilities	Country Visions Bulk Gas/Diesel Storage	718 Ralph Lemorande Dr	City of Oconto Falls
Fire Department	Oconto Falls Fire Department	78 Jackson	City of Oconto Falls
Human Services Facilities	Jamies Child Care	294 Park Ave	City of Oconto Falls
Human Services Facilities	King Street House	106 King St	City of Oconto Falls
Human Services Facilities	Lauries Child Care	431 Green Bay Ave	City of Oconto Falls
Human Services Facilities	New Beginings	230 Van Buren St	City of Oconto Falls
Human Services Facilities	Sharpe Care	100 E Highland Dr	City of Oconto Falls
Human Services Facilities	The Cottages	751 E Highland Dr	City of Oconto Falls
Human Services Facilities	Tiny Treasures Early Learning Center	535 N Munsert Ave	City of Oconto Falls
Medical Facilities	Bellin Health Family Medical Center Clinic	833 S Main St	City of Oconto Falls
Medical Facilities	St. Clare Memorial Hospital	855 S Main St	City of Oconto Falls
Mobile Home Park	Mobile Home Park	Sheridan St	City of Oconto Falls
Plan Facilities (HazMat)	ST Paper LLC	106 E Central Ave	City of Oconto Falls
Plan Facilities (HazMat)	Techniply LLC	711 Ralph Lemorande Dr	City of Oconto Falls
Police Department	Oconto Falls Police Department	500 N Chestnut Ave	City of Oconto Falls
Recreation Facilities	East Side Beach	631 N Main St	City of Oconto Falls
Recreation Facilities	Memorial Field	Jefferson St	City of Oconto Falls
Recreation Facilities	Park	Willow Creek Rd/Cardinal Dr	City of Oconto Falls
Recreation Facilities	Park	Green Bay Ave	City of Oconto Falls
Recreation Facilities	Park	Elm Ave/Sherman St	City of Oconto Falls
Recreation Facilities	Park	STH 22/Highland Dr	City of Oconto Falls
Recreation Facilities	River Island Golf Course	100 River Island Dr	City of Oconto Falls
Recreation Facilities	West Side Beach	410 N Flatley Ave	City of Oconto Falls
Recycling Center	Oconto Falls Recycling Center	325 Pioneer Dr	City of Oconto Falls
Rescue Department	Oconto Falls Area Ambulance Service	831 S Main St	City of Oconto Falls
School	Falls Alternative Learning Site	320 Central Ave	City of Oconto Falls
School	NWTC	649 E Jackson St	City of Oconto Falls
School	Oconto Falls Elementary School/Day Care	415 Marie Volk Dr	City of Oconto Falls
School	Oconto Falls High School	210 N Farm Rd	City of Oconto Falls
School	St Anthony's School	253 N Franklin St	City of Oconto Falls
School	Washington Middle School	102 S Washington St	City of Oconto Falls
Utilities	Oconto Falls Wastewater Treatment Plant	Sheridan St/Maple Ave	City of Oconto Falls
Utilities	Water Tower	102 Jackson St	City of Oconto Falls
Utilities	Water Tower	223 Monroe St	City of Oconto Falls
Utilities	Well #3	S Chestnut Ave	City of Oconto Falls
Utilities	Well #3	Central Ave/N Adams St	City of Oconto Falls
Utilities	Well #4	238 Water St	City of Oconto Falls
Administrative Building	Lena Public Library	200 E Main St	Village of Lena
Administrative Building	Lena Village Hall	117 E Main St	Village of Lena
Administrative Building	Post Office	133 E Railroad St	Village of Lena
Bridge	Culvert	W Main St/Unnamed Waterway	Village of Lena
Church	Christ's Community Church of Seventh-day Adventists	238 W Harley St	Village of Lena
Church	Our Saviors Lutheran Church	327 S Rosera St	Village of Lena
Church	St. Anne's Parish	209 E Main St	Village of Lena
Communications	Cell Phone Tower	301 W Railroad St	Village of Lena
Communications	Telephone Terminal	2015 S Rosera St	Village of Lena
Electrical Facilities	Electrical Substation	E Pelkey St	Village of Lena
Energy Facilities	Ferrellgass Bulk Propane	E Railroad St	Village of Lena
Fire Department	Lena Fire Department	220 2nd St	Village of Lena
Human Services Facilities	Di Dis Kids	411 W Main St	Village of Lena
Medical Facilities	Lena Primary Care Clinic	200 S Rosera St	Village of Lena
Plan Facilities (HazMat)	Saputo Cheese USA Inc	317 N Rosera St	Village of Lena
Police Department	Lena Police Department	117 E Main St	Village of Lena
Recycling Center	Lena Recycling Center	301 W Railroad St	Village of Lena
School	Lena Elementary School/Day Care	304 E Main St	Village of Lena
School	Lena High/Middle School	304 E Main St	Village of Lena
School	Lena School Athletic Field	304 E Main St	Village of Lena
Utilities	Sewer Plant	W Railroad St	Village of Lena

Table C.5.2: Critical Facilities, Oconto County (cont'd)

Type	Name	Address	Municipality
Utilities	Water Tower	W Railroad St	Village of Lena
Utilities	Well #1	117 E Main St	Village of Lena
Utilities	Well #2	439 Harley St	Village of Lena
Administrative Building	Post Office	507 Main St	Village of Suring
Administrative Building	Suring Area Public Library	604 E Main St	Village of Suring
Administrative Building	Suring Village Hall	604 E Main St	Village of Suring
Boat Landing	Oconto River Access	Riverside Dr	Village of Suring
Bridge	Bridge	E Main St/Oconto River	Village of Suring
Church	Mt Olive Evangelical Lutheran Church	206 N Burk St	Village of Suring
Church	St. Michaels Catholic Church	210 N Krueger St	Village of Suring
Church	Suring United Methodist Church	404 E Main St	Village of Suring
Communications	Telephone Switching Station	N Mill St/North St	Village of Suring
Fire Department	Suring Fire Department	210 Heasley Street	Village of Suring
Human Services Facilities	Woodland Village	430 Manor Dr	Village of Suring
Medical Facilities	Bellin Health	307 S Manor Dr	Village of Suring
Medical Facilities	Suring Primary Care Clinic	913 E MAIN ST	Village of Suring
Mobile Home Park	Mobile Home Park	207 E Algoma St	Village of Suring
Police Department	Suring Police Department	604 E Main St	Village of Suring
Recreation Facilities	Red Maple Golf Club	501 Golf Course Rd	Village of Suring
Recreation Facilities	Riverside Memorial Park	115 West St	Village of Suring
Recreation Facilities	Veterans Memorial Park	E Brook St	Village of Suring
Recycling Center	Suring/How Recycling Center	364 S Knapp St	Village of Suring
School	Suring Elementary School	411 E Algoma St	Village of Suring
School	Suring High School	411 E Algoma St	Village of Suring
School	Suring School Athletic Field	S Burk St	Village of Suring
Utilities	Waste Water Treatment Plant	Alder Ln	Village of Suring
Utilities	Well #1	STH 32	Village of Suring
Utilities	Well #3	STH 32	Village of Suring
Administrative Building	Abrams Town Hall	5877 Main St	Town of Abrams
Administrative Building	Post Office	5886 Main St	Town of Abrams
Bridge	Bridge	Valentine Rd/Pensaukee River	Town of Abrams
Bridge	Bridge	Sandalwood Rd/Pensaukee River	Town of Abrams
Bridge	Bridge	Oak Orchard Rd/USH 41	Town of Abrams
Bridge	Bridge	CTH D/USH 41	Town of Abrams
Bridge	Bridge	CTH EE/Pensaukee River	Town of Abrams
Bridge	Bridge	USH 141/Pensaukee River	Town of Abrams
Bridge	Bridge	USH 141/Pensaukee River	Town of Abrams
Bridge	Bridge	USH 41 Exit/USH 141Exit	Town of Abrams
Bridge	Bridge	USH 41 Exit/USH 141Exit	Town of Abrams
Bridge	Bridge	USH 141 Exit/USH 41Exit	Town of Abrams
Fire Department	Abrams Fire Department	5844 Oak Orchard Rd	Town of Abrams
Mobile Home Park	Habeck Mobile Home Park	3360 Habeck Rd	Town of Abrams
Recreation Facilities	Pine Acres Golf Course	3235 CTH EE	Town of Abrams
Recreation Facilities	Sandalwood Country Club	2954 Sandalwood Rd	Town of Abrams
Recycling Center	Abrams Recycling Center	3394 Nikodem Ln	Town of Abrams
School	Abrams Elementary School/Day Care	3000 Elm St	Town of Abrams
Administrative Building	Bagley Town Hall	9812 CTH Z	Town of Bagley
Boat Landing	Pecor Lake Access	White Lake Rd	Town of Bagley
Boat Landing	Ucil Lake Access	CTH Z	Town of Bagley
Boat Landing	White Lake Access	White Lake Rd	Town of Bagley
Bridge	Bridge	STH 64/ Peshtigo Brook	Town of Bagley
Bridge	Bridge	Sleeter Rd/ Peshtigo Brook	Town of Bagley
Energy Facilities	Gas Pipeline Facility	11345 STH 64	Town of Bagley
Recycling Center	Bagley Recycling Center	9812 CTH Z	Town of Bagley
Administrative Building	Brazeau Town Hall	10892 Parkway Rd	Town of Brazeau
Boat Landing	Bass Lake Access	Otter Ln	Town of Brazeau
Boat Landing	Half Moon Lake Access	EW Whiting Rd	Town of Brazeau
Boat Landing	Holt Lake Access	S Sand Hill Ln	Town of Brazeau
Boat Landing	Kelly Lake Access	Kelly Lake Access Rd #5	Town of Brazeau
Boat Landing	Leigh Lake Access	Lee Lake Public Access Rd	Town of Brazeau
Boat Landing	Perch Lake Access	Reader Lake Ln	Town of Brazeau
Boat Landing	Pickereel Lake Access	Lawrence Ln	Town of Brazeau
Boat Landing	Pickereel Lake Access	Pickereel Access Rd	Town of Brazeau

Table C.5.2: Critical Facilities, Oconto County (cont'd)

Type	Name	Address	Municipality
Boat Landing	Ranch Lake Access	Ranch Lake Dr	Town of Brazeau
Boat Landing	Rost Lake Access	E Rost Lake Rd	Town of Brazeau
Boat Landing	Round Lake Access	Round Lake Park Ln	Town of Brazeau
Boat Landing	Shay Lake Access	W Shay Lake Ln	Town of Brazeau
Boat Landing	White Potato Public Access	White Potato Public Access #6	Town of Brazeau
Boat Landing	White Potato Public Access	White Potato Public Access #5	Town of Brazeau
Boat Landing	White Potato Public Access	White Potato Public Access #3	Town of Brazeau
Boat Landing	White Potato Public Access	White Potato Public Access #2	Town of Brazeau
Boat Landing	White Potato Public Access	White Potato Public Access #1	Town of Brazeau
Boat Landing	White Potato Public Access	De Baker Ln	Town of Brazeau
Bridge	Bridge	CTH Z/McDonald Creek	Town of Brazeau
Bridge	Bridge	CTH B/McDonald Creek	Town of Brazeau
Bridge	Bridge	Old 64 Rd/ Peshtigo Brook	Town of Brazeau
Bridge	Bridge	CTH B/Messenger Creek	Town of Brazeau
Communications	T 293	12303 Old 64 Rd	Town of Brazeau
Communications	Tower	9012 Nelsen Ln	Town of Brazeau
Dams	Kelly Lake Waterways	Leigh Flowage/Messenger Creek	Town of Brazeau
Dams	White Potato Lake Dam	White Potato Lake/Unnamed Waterway	Town of Brazeau
Fire Department	Brazeau Fire Department	10892 Parkway Rd	Town of Brazeau
Mobile Home Park	Kobus/Sheve Manufactured Home Park	12735 S White Potato Lake Rd	Town of Brazeau
Recreation Facilities	Parkway Golf Course	9004 Mulligan Way	Town of Brazeau
Recycling Center	Brazeau Recycling Center	10892 Parkway Rd	Town of Brazeau
Rescue Department	Brazeau Ambulance	12071 Parkway Rd	Town of Brazeau
Administrative Building	Breed Town Hall	11155 STH 32	Town of Breed
Airport	Bowman Airstrip	11632 STH32	Town of Breed
Airport	Breed Airport	10769 STH 32	Town of Breed
Boat Landing	Moody Lake Access	Public Access	Town of Breed
Boat Landing	Weso Flowage Access	Weso Flowage Rd	Town of Breed
Bridge	Bridge	CTH AA/SB Oconto River	Town of Breed
Bridge	Bridge	Hill Rd/SB Oconto River	Town of Breed
Bridge	Bridge	N Branch Rd/NB Oconto River	Town of Breed
Bridge	Bridge	Logan Rd/NB Oconto River	Town of Breed
Bridge	Bridge	N Branch Rd/NB Oconto River	Town of Breed
Church	Emmanuel Evangelical Lutheran Church	13346 CTH AA	Town of Breed
Dams	Weso Creek Dam	Weso Creek	Town of Breed
Energy Facilities	Gasco Bulk Propane	STH 32	Town of Breed
Recycling Center	Breed Recycling Center	Dump Rd	Town of Breed
Administrative Building	Chase Town Hall	8481 CTH S	Town of Chase
Administrative Building	Sampson Highway Shop	8437 Major Lane	Town of Chase
Bridge	Bridge	CTH C/Little Suamico River	Town of Chase
Bridge	Bridge	South Chase Rd/Little Suamico River	Town of Chase
Bridge	Bridge	Jaworski Rd/Unnamed Waterway	Town of Chase
Bridge	Bridge	Jaworski Rd/Little Suamico River	Town of Chase
Bridge	Bridge	Schwartz Rd/Little Suamico River	Town of Chase
Bridge	Bridge	CTH S/Unnamed Waterway	Town of Chase
Bridge	Bridge	Safian Rd/Pensauckee River	Town of Chase
Bridge	Bridge	Schwartz Rd/Unnamed Waterway	Town of Chase
Dams	Seroogy Dam	Unnamed Waterway	Town of Chase
Human Services Facilities	Country Kids Family Day Care	7973 Regal Ln	Town of Chase
Human Services Facilities	Precious Cargo	1231 Corine Ct	Town of Chase
Mobile Home Park	Van Hefty Acres	250 Pleasant View Dr	Town of Chase
Plan Facilities (HazMat)	Belgioioso Cheese	7700 N Brown County Line Rd	Town of Chase
Recycling Center	Chase Recycling Center	8481 CTH S	Town of Chase
School	Sunnyside Elementary School/Day Care	720 CTH C	Town of Chase
Administrative Building	Doty Town Hall	16894 Star Lake Rd	Town of Doty
Boat Landing	Bass Lake Access	S Bass Lake Boat Landing	Town of Doty
Boat Landing	Boot Lake Access	Boot Campground Ln	Town of Doty
Boat Landing	Boulder Lake Access	Boulder Campground	Town of Doty
Boat Landing	Star Lake Access	N Star Lake Ln	Town of Doty
Bridge	Bridge	CTH W/SB Oconto River	Town of Doty
Bridge	Bridge	STH 64/Hills Pond Creek	Town of Doty
Bridge	Bridge	STH 64/SB Oconto River	Town of Doty
Bridge	Bridge	CTH T/SB Oconto River	Town of Doty

Table C.5.2: Critical Facilities, Oconto County (cont'd)

Type	Name	Address	Municipality
Bridge	Bridge	Sauls Spring Rd/SB Oconto River	Town of Doty
Bridge	Culvert	Star Lake Rd/Second SB Oconto River	Town of Doty
Bridge	Culvert	Island Lake Rd/Unnamed Waterway	Town of Doty
Communications	Cell Tower	Star Lake Rd	Town of Doty
Dams	Boulder Lake Dam	Boulder Lake/Unnamed Waterway	Town of Doty
Fire Department	Doty Fire Department	16894 Star Lake Rd	Town of Doty
Recreation Facilities	Boot Lake Campground	Boot Campground Ln	Town of Doty
Recreation Facilities	Boulder Lake Campground	Boulder Campground Ln	Town of Doty
Recreation Facilities	Boulder Lake Lodge Campground	17250 Boulder Lake Ln	Town of Doty
Recreation Facilities	Echo Valley Resort	17240 Echo Valley Ln	Town of Doty
Recycling Center	Doty Recycling Center	16894 Star Lake Rd	Town of Doty
Administrative Building	Gillett Town Hall	10908 Gillett Town Hall Rd	Town of Gillett
Boat Landing	Finnegan Lake Access	Finnegan Lake Rd	Town of Gillett
Boat Landing	Oconto River Access	CTH BB	Town of Gillett
Bridge	Bridge	CTH BB/Oconto River	Town of Gillett
Church	Faith United Lutheran Church	11465 Old U Rd	Town of Gillett
Church	Gillett Baptist Church	10780 Town Hall Rd	Town of Gillett
Church	Hillside Assembly of God	5890 STH 22	Town of Gillett
Church	Immanuel Lutheran Church	11653 CTH H	Town of Gillett
Energy Facilities	Gas Pipeline Facility	10599 STH 22/32	Town of Gillett
Human Services Facilities	The Sandbox Day Care	9737 Sandy Corners Rd	Town of Gillett
Recreation Facilities	Riverside County Park	5277 CTH BB	Town of Gillett
Administrative Building	How Town Hall	12896 STH 32	Town of How
Boat Landing	Grignon Lake Access	Grignon Ln	Town of How
Boat Landing	Wiscobee Lake Access	Wiscobee Ln	Town of How
Bridge	Bridge	River Rd/SB Oconto River	Town of How
Bridge	Bridge	STH 32/SB Oconto River	Town of How
Bridge	Bridge	Pecore Rd/Pecore Creek	Town of How
Bridge	Bridge	Hays Rd/Hays Creek	Town of How
Bridge	Culvert	CTH M/Unnamed Waterway	Town of How
Church	St John's Lutheran Church	8905 St Johns Rd	Town of How
Communications	Cell Phone Tower	12790 STH 32	Town of How
Communications	T 286 WRVM Radio Station Tower	12701 STH 32	Town of How
Electrical Facilities	Anaerobic Digester	9101 STH 32	Town of How
Human Services Facilities	Little Imaginations Child Care	12587 STH 32	Town of How
School	St John's Lutheran School	8905 St Johns Rd	Town of How
Administrative Building	Lake County Public Library	15235 STH 32	Town of Lakewood
Administrative Building	Lakewood Town Hall	17258 North Rd	Town of Lakewood
Administrative Building	Post Office	15283 STH 32	Town of Lakewood
Administrative Building	USFS Ranger District Office	15085 STH 32	Town of Lakewood
Airport	Lakewood Airpark	North Rd	Town of Lakewood
Boat Landing	Chain Lake Access	Chain Lake Dr	Town of Lakewood
Boat Landing	Chain Lake Boat Access	E Chain Lake Rd	Town of Lakewood
Boat Landing	John Lake Access	Hatchery Ln	Town of Lakewood
Boat Landing	John Lake Access	Lake John Rd	Town of Lakewood
Boat Landing	Munger Lake Access	Lake John Rd	Town of Lakewood
Boat Landing	Pine Ridge Lake Access	Pine Ridge Lake Ln	Town of Lakewood
Boat Landing	Pine Ridge Lake Access	Crowell Ln	Town of Lakewood
Boat Landing	Waubee Lake Access	Waubee Park Ln	Town of Lakewood
Boat Landing	Wheeler Lake Access	W Wheeler Lake Access	Town of Lakewood
Bridge	Bridge	STH 32/McMaslin Brook	Town of Lakewood
Bridge	Bridge	E Chain Lake Rd/McMaslin Brook	Town of Lakewood
Bridge	Bridge	W Riverside Rd/NB Oconto River	Town of Lakewood
Bridge	Bridge	CTH F/NB Oconto River	Town of Lakewood
Bridge	Bridge	Smyth Rd/NB Oconto River	Town of Lakewood
Bridge	Bridge	Sullivan Springs Rd/NB Oconto River	Town of Lakewood
Bridge	Bridge	CTH F/McCaslin Brook	Town of Lakewood
Bridge	Bridge	McCauslin Crossing Ln/McCaslin Brook	Town of Lakewood
Bridge	Bridge/Culvert	North Rd/McCaslin Brook	Town of Lakewood
Bridge	Culvert/Bridge	Thunder Creek Rd/Unnamed Waterway	Town of Lakewood
Bridge	Culvert/Bridge	Knowles Creek Rd/Battle Creek	Town of Lakewood
Bridge	Culvert/Bridge	Knowles Creek Rd/Knowles Creek	Town of Lakewood
Bridge	Culvert/Bridge	Lake John Rd/Unnamed Waterway	Town of Lakewood

Table C.5.2: Critical Facilities, Oconto County (cont'd)

Type	Name	Address	Municipality
Bridge	Culvert/Bridge	Landing 11 Rd/Unnamed Waterway	Town of Lakewood
Bridge	Culvert/Bridge	La Fave Rd/Unnamed Waterway	Town of Lakewood
Bridge	Culvert/Bridge	Chickadee Rd/Unnamed Waterway	Town of Lakewood
Bridge	Culvert/Bridge	Chickadee Rd/Unnamed Waterway	Town of Lakewood
Bridge	Culvert/Bridge	Holt Ranch Rd/Forbes Creek	Town of Lakewood
Bridge	Culvert/Bridge	Adam Ross Ln/McCaslin Brook	Town of Lakewood
Church	First Presbyterian Church	15552 State Highway 32	Town of Lakewood
Church	Northwoods Bible Fellowship	15253 Long Street	Town of Lakewood
Church	St. Mary's Church	15232 CTH F	Town of Lakewood
Communications	T 282	16946 Archibald Lake Rd	Town of Lakewood
Dams	Archibald Dam	McCaslin Brook	Town of Lakewood
Dams	John Challoner	McCaslin Brook	Town of Lakewood
Dams	Lakewood Fish Hatchery	Unnamed Waterway	Town of Lakewood
Dams	Lakewood Fish Hatchery	Unnamed Waterway	Town of Lakewood
Dams	Munger Lake Dam	Munger Lake/Unnamed Waterway	Town of Lakewood
Dams	Reuben La Fave Dam	Forbes Creek	Town of Lakewood
Dams	Sheridan Dam	McCaslin Brook	Town of Lakewood
Fire Department	Chain Lake Dry Hydrant	E Chain Lake Rd/Chain Lake	Town of Lakewood
Fire Department	Lakewood Fire Department	17372 North Rd	Town of Lakewood
Human Services Facilities	Lakewood Assisted Living	17185 Flynn Ln	Town of Lakewood
Recreation Facilities	Heaven's Up North Campground	18344 Lake John Rd	Town of Lakewood
Recreation Facilities	McCauslin Brook Golf and Country Club	17067 Club House Ln	Town of Lakewood
Recreation Facilities	US Forest Service Beach	W Wheeler Lake Ln	Town of Lakewood
Recycling Center	Lakewood Recycling Center	17372 North Rd	Town of Lakewood
Administrative Building	Lena Town Hall	6087 Goatsville Rd	Town of Lena
Bridge	Bridge	CTH A/USH 141	Town of Lena
Bridge	Bridge	USH 141/Kelly Brook	Town of Lena
Bridge	Bridge	USH 141/Kelly Brook	Town of Lena
Bridge	Bridge	Techmeir Rd/NB Little River	Town of Lena
Bridge	Bridge	USH 141/NB Little River	Town of Lena
Bridge	Bridge	USH 141/NB Little River	Town of Lena
Bridge	Bridge	Midway Rd/NB Little River	Town of Lena
Bridge	Bridge	CTH M/NB Little River	Town of Lena
Bridge	Bridge	Belgian Rd/NB Little River	Town of Lena
Bridge	Bridge	Goatsville Rd/Kelly Brook	Town of Lena
Bridge	Bridge	CTH A/Kelly Brook	Town of Lena
Bridge	Bridge	Fireside Rd/Kelly Brook	Town of Lena
Bridge	Bridge	Sunshine Rd/Kelly Brook	Town of Lena
Bridge	Bridge	Jagiello Rd/Kelly Brook	Town of Lena
Bridge	Bridge	Belgian Rd/Kelly Brook	Town of Lena
Bridge	Bridge	Jagiello Rd/NB Little River	Town of Lena
Bridge	Bridge	Midway Rd/Unnamed Waterway	Town of Lena
Bridge	Bridge	Midway Rd/Unnamed Waterway	Town of Lena
Bridge	Bridge	Midway Rd/Unnamed Waterway	Town of Lena
Bridge	Bridge	Belgian Rd/Unnamed Waterway	Town of Lena
Bridge	Bridge	CTH A/Unnamed Waterway	Town of Lena
Bridge	Bridge	CTH M/Unnamed Waterway	Town of Lena
Bridge	Bridge	Belgian Rd/Unnamed Waterway	Town of Lena
Bridge	Culvert	Old 141 Rd S/Unnamed Waterway	Town of Lena
Bridge	Culvert	Sunshine Rd/Unnamed Waterway	Town of Lena
Bridge	Culvert	Meadow Brook Rd/Unnamed Waterway	Town of Lena
Bridge	Culvert	CTH A/Unnamed Waterway	Town of Lena
Bridge	Culvert	Sunshine Rd/Unnamed Waterway	Town of Lena
Bridge	Culvert	Belgian Rd/Unnmmed Waterway	Town of Lena
Bridge	Culvert	CTH A/Unnmmed Waterway	Town of Lena
Bridge	Culvert	Jagiello Rd/Unnmmed Waterway	Town of Lena
Bridge	Culvert	Jagiello Rd/Unnmmed Waterway	Town of Lena
Bridge	Culvert	Jagiello Rd/Unnmmed Waterway	Town of Lena
Bridge	Culvert	Jagiello Rd/Unnmmed Waterway	Town of Lena
Bridge	Culvert	Goatsville Rd/Unnmmed Waterway	Town of Lena
Bridge	Culvert	Charolais Rd/Unnmmed Waterway	Town of Lena
Bridge	Culvert	Charolais Rd/NB Little River	Town of Lena
Bridge	Culvert	Charolais Rd/Unnmmed Waterway	Town of Lena

Table C.5.2: Critical Facilities, Oconto County (cont'd)

Type	Name	Address	Municipality
Bridge	Culvert	CTH M/Unnamed Waterway	Town of Lena
Bridge	Culvert	Henrichs Ln/Unnamed Waterway	Town of Lena
Bridge	Culvert	CTH M/Unnamed Waterway	Town of Lena
Bridge	Culvert	Belgian Rd/Unnamed Waterway	Town of Lena
Bridge	Culvert	Belgian Rd/Unnamed Waterway	Town of Lena
Bridge	Culvert	Lawler Rd/Unnamed Waterway	Town of Lena
Bridge	Culvert	Starlite Rd/Unnamed Waterway	Town of Lena
Bridge	Culvert	Midway Rd/Unnamed Waterway	Town of Lena
Church	Community Bible Church	7560 Old 141 Rd	Town of Lena
Energy Facilities	Gas Pipeline Facility	8590 Kottke Ln	Town of Lena
Energy Facilities	Gas Pipeline Facility	7478 Old 141 Rd	Town of Lena
Administrative Building	Little River Town Hall	3627 CTH A	Town of Little River
Boat Landing	D E Hall County Park	CTY Y	Town of Little River
Bridge	Bridge	CTH A/Little River	Town of Little River
Bridge	Bridge	CTH Y/Thomas Slough	Town of Little River
Bridge	Bridge	CTH Y/Unnamed Waterway	Town of Little River
Bridge	Bridge	Little River Rd/Unnamed Waterway	Town of Little River
Bridge	Bridge	Bay Shore Rd/Unnamed Waterway	Town of Little River
Bridge	Bridge	CTH A/Unnamed Waterway	Town of Little River
Bridge	Bridge	CTH J/Little River	Town of Little River
Bridge	Bridge	CTH Y/Unnamed Waterway	Town of Little River
Bridge	Bridge	USH 41 Exit/USH 41	Town of Little River
Communications	Cell Phone Tower	7164 USH 41	Town of Little River
Fire Department	Little River Fire Department	3627 CTY A	Town of Little River
Human Services Facilities	Stepping Stones Family Child Care	3021 CTH WW	Town of Little River
Recreation Facilities	D E Hall County Park	7840 CTH Y	Town of Little River
Recreation Facilities	Grange County Park	3921 CTH A	Town of Little River
Recreation Facilities	North Bay Shore Recreation Area	500 Bay Rd	Town of Little River
Recycling Center	Little River Recycling Center	3627 CTH A	Town of Little River
Administrative Building	Little Suamico Town Hall	5956 CTH S	Town of Little Suamico
Administrative Building	Post Office	1145 Grosse Rd	Town of Little Suamico
Administrative Building	State Patrol Waystation	1965 USH 41/141	Town of Little Suamico
Bridge	Bridge	Brown Rd/USH 41	Town of Little Suamico
Bridge	Bridge	E Frontage Rd/Little Suamico River	Town of Little Suamico
Bridge	Bridge	Lade Beach Rd/Tibbet Creek	Town of Little Suamico
Bridge	Bridge	CTH J/Little Suamico River	Town of Little Suamico
Bridge	Bridge	UH 41/Little Suamico River	Town of Little Suamico
Bridge	Bridge	UH 41/Little Suamico River	Town of Little Suamico
Bridge	Bridge	Geano Beach Rd/USH 41	Town of Little Suamico
Bridge	Bridge	Gross Rd/Little Suamico River	Town of Little Suamico
Bridge	Bridge	Gross Rd/Little Suamico River	Town of Little Suamico
Bridge	Bridge	Rost Rd/Tibbet Creek	Town of Little Suamico
Bridge	Bridge	CTH S/USH 41	Town of Little Suamico
Bridge	Bridge	Allen Rd/USH 41	Town of Little Suamico
Bridge	Bridge	CTH J/Tibbet Creek	Town of Little Suamico
Bridge	Bridge	Railroad/Little Suamico River	Town of Little Suamico
Church	St. John's Lutheran Church	1253 CTH J	Town of Little Suamico
Church	St. Maximum	Chapel St	Town of Little Suamico
Communications	T 279	1028 Hilbert Rd	Town of Little Suamico
Electrical Facilities	Electrical Substation	6011 CTH S	Town of Little Suamico
Electrical Facilities	Oconto Electric Co-op (Little Suamico Substation)	1578 CTH J	Town of Little Suamico
Fire Department	Little Suamico Fire Department	5974 CTH S	Town of Little Suamico
Human Services Facilities	Building Blocks Child Development Center	6090 CTH S	Town of Little Suamico
Human Services Facilities	Home Away From Home	5587 Allen Rd	Town of Little Suamico
Mobile Home Park	Rustic Acres Mobile Home Park	634 E Frontage Rd	Town of Little Suamico
Recycling Center	Little Suamico Recycling Center	6297 Allen Rd	Town of Little Suamico
Administrative Building	Maple Valley Town Hall	9088 CTH Z	Town of Maple Valley
Administrative Building	Suring Highway Shop	8890 Highway 32	Town of Maple Valley
Bridge	Bridge	Peshtigo Brook Rd/Pestigo Brook	Town of Maple Valley
Bridge	Bridge	Trail Rd/Daly Creek	Town of Maple Valley
Church	Hickory Church of Christ	8892 CTH G	Town of Maple Valley
Church	Hickory United Methodist Church	9872 CTH M	Town of Maple Valley
Church	Maple Valley Community Church	8992 CTH Z	Town of Maple Valley

Table C.5.2: Critical Facilities, Oconto County (cont'd)

Type	Name	Address	Municipality
Church	Our Redeemers Lutheran Church	10997 CTH M	Town of Maple Valley
Church	Trinity Lutheran Church	8538 Trinity Church Rd	Town of Maple Valley
Energy Facilities	Flynn Oil	8285 STH 32	Town of Maple Valley
Energy Facilities	Gas Pipeline Facility	11698 STH 32	Town of Maple Valley
Recycling Center	Maple Valley Recycling Center	8362 Brock Rd	Town of Maple Valley
Utilities	Kelly Lake Sewage Plant	McNally Dr	Town of Maple Valley
Utilities	Suring Municipal Well	8794 STH 32	Town of Maple Valley
Utilities	Suring Water Tower	11597 STH 32	Town of Maple Valley
Administrative Building	Morgan Town Hall	3276 CTH C	Town of Morgan
Bridge	Bridge	CTH C/Pensaukee River	Town of Morgan
Bridge	Bridge	CTH E/NB Pensaukee River	Town of Morgan
Bridge	Bridge	CTH C/NB Pensaukee River	Town of Morgan
Bridge	Culvert	Holtz Rd/Unnamed Waterway	Town of Morgan
Bridge	Culvert	Konitzer Rd/Coopman Creek	Town of Morgan
Church	St John's Lutheran Church	3374 CTH C	Town of Morgan
Electrical Facilities	Electrical Substation	8612 CCC Rd	Town of Morgan
Electrical Facilities	Electrical Substation	Havlik Rd	Town of Morgan
Fire Department	Green Valley - Morgan Fire Department	3542 CTY C	Town of Morgan
Human Services Facilities	Kim Dercks Day Care	9650 Dudzik Rd	Town of Morgan
Human Services Facilities	Lucky Ones Child Care	2942 Havlik Rd	Town of Morgan
Recycling Center	Morgan Recycling Center	3276 CTH C	Town of Morgan
School	Fairview Elementary School	2840 STH 32	Town of Morgan
Administrative Building	Mountain Highway Shop	14068 Old 32 Road	Town of Mountain
Administrative Building	Mountain Town Hall	13503 Weller Rd	Town of Mountain
Administrative Building	Post Office	14092 STH 32	Town of Mountain
Boat Landing	Anderson Lake Access	Leo's Rd	Town of Mountain
Boat Landing	Bear Paw Lake Access	Bear Paw Lake Ln	Town of Mountain
Boat Landing	Chute Lake Field House Access	Chute Dam Ln	Town of Mountain
Boat Landing	Chute Pond Access	Kingston Rd	Town of Mountain
Boat Landing	Chute Pond Access	S Shore Dr	Town of Mountain
Boat Landing	Chute Pond Access	E Park Ln	Town of Mountain
Boat Landing	Farr Lake Access	Bachman Ln	Town of Mountain
Boat Landing	Green Lake Access	STH 32 64	Town of Mountain
Boat Landing	Green Lake Access	Pavlat Ln	Town of Mountain
Boat Landing	McComb Lake Access	N McComb Lake Ln	Town of Mountain
Bridge	Bridge	STH 32/NB Oconto River	Town of Mountain
Bridge	Bridge	CTH W/NB Oconto River	Town of Mountain
Bridge	Bridge	STH 32/Waupee Creek	Town of Mountain
Bridge	Bridge	Iron Bridge Rd/NB Oconto River	Town of Mountain
Bridge	Bridge	Kingston Rd/Chute Pond	Town of Mountain
Bridge	Bridge	Bonita Rd/First SB Oconto River	Town of Mountain
Bridge	Bridge	STH 32/NB Oconto River	Town of Mountain
Communications	T 283 (19)	13775 Silver Hill Rd	Town of Mountain
Dams	Anderson Lake Dam	Anderson Lake/Unnamed Waterway	Town of Mountain
Dams	Chute Dam	Chute Pond/N Branch Oconto River	Town of Mountain
Dams	Lower Dam	Waupee Creek	Town of Mountain
Dams	Mountain Fish Hatchery Dam	Town Creek	Town of Mountain
Dams	Theodore J Witek Dam	Unnamed Waterway	Town of Mountain
Electrical Facilities	Electrical Substation	14190 Old 32 Rd	Town of Mountain
Fire Department	Mountain Fire Department	13824 STH 32 64	Town of Mountain
Medical Facilities	Mountain Primary Care Clinic	14353 STH 32/64	Town of Mountain
Mobile Home Park	Evergreen Park	12525 Knollwood Ln	Town of Mountain
Recreation Facilities	Bagley Rapids Campground	Bagley Rapids Rd	Town of Mountain
Recreation Facilities	Campground	12375 E Park Dr	Town of Mountain
Recreation Facilities	Chute Pond County Park	13674 Parkwau Rd	Town of Mountain
Recycling Center	Mountain Recycling Center	14375 Old 32	Town of Mountain
Rescue Department	Mountain Ambulance Service	14336 STH 32/64	Town of Mountain
Administrative Building	Oconto Town Hall	3907 STH 22	Town of Oconto
Airport	Oconto-Bake Municipal Airport	2983 Airport Rd	Town of Oconto
Boat Landing	North River Road Access	N River Rd	Town of Oconto
Bridge	Bridge	CTH J/Little River	Town of Oconto
Bridge	Bridge	CTH J/Oconto River	Town of Oconto
Bridge	Bridge	Stiles Rd/Little River	Town of Oconto

Table C.5.2: Critical Facilities, Oconto County (cont'd)

Type	Name	Address	Municipality
Bridge	Bridge	USH 41/Exit/USH 41	Town of Oconto
Church	Fairhaven Baptist Church	5584 Fairhaven Ln	Town of Oconto
Church	Lena Mennonite Church	5999 County Road J	Town of Oconto
Communications	WOCO Radio Station Tower	3829 STH 22	Town of Oconto
Electrical Facilities	Electrical Substation	Funk Rd/Cook Rd	Town of Oconto
Energy Facilities	Gas Pipeline Facility	Logtown Rd/S Range Line Rd	Town of Oconto
Human Services Facilities	Christine Reed	3060 STH 22	Town of Oconto
Recreation Facilities	Couillardville Park	CTH J/Stiles Rd	Town of Oconto
Recreation Facilities	Irish Greens Golf Course	2946 Logtown Rd	Town of Oconto
Recreation Facilities	Oconto City Park	5182 CTH N	Town of Oconto
Recycling Center	Oconto Recycling Center	6608 Elm Grove School Rd	Town of Oconto
Administrative Building	Oconto Falls Town Hall	8680 STH 22	Town of Oconto Falls
Bridge	Bridge	STH 32/Oconto River	Town of Oconto Falls
Bridge	Bridge	CTH K/Oconto River	Town of Oconto Falls
Bridge	Culvert	Beaver Lake Rd/Unnamed Waterway	Town of Oconto Falls
Bridge	Culvert	Little Beaver Lake Rd/Unnamed Waterway	Town of Oconto Falls
Bridge	Culvert	Sandy Carvers Rd/Unnamed Waterway	Town of Oconto Falls
Bridge	Culvert	Sandy Carvers Rd/Unnamed Waterway	Town of Oconto Falls
Bridge	Culvert	Degantown Rd/Unnamed Waterway	Town of Oconto Falls
Bridge	Culvert	Gray Lake Rd/Unnamed Waterway	Town of Oconto Falls
Church	St John's Riverside Lutheran Church	5686 STH 32	Town of Oconto Falls
Communications	T 95 (285)	9095 Johnson Ln	Town of Oconto Falls
Communications	Tower	7967 Gallas Rd	Town of Oconto Falls
Electrical Facilities	OEC Building	7492 Rea Rd	Town of Oconto Falls
Electrical Facilities	Substation	7492 Rea Rd	Town of Oconto Falls
Energy Facilities	Gas Pipeline Facility	5897 Chestnut Rd	Town of Oconto Falls
Energy Facilities	Larsen Cooperative Bulk Propane	7363 STH 22	Town of Oconto Falls
Recreation Facilities	Balcom Lake Public Park	Balcom Lake Rd	Town of Oconto Falls
Recreation Facilities	Pine Bend Public Park	Pine Bend Rd	Town of Oconto Falls
Administrative Building	Pensaukee Town Hall	4720 Brookside Rd	Town of Pensaukee
Boat Landing	Pensaukee River Access	Lower State Rd	Town of Pensaukee
Bridge	Bridge	CTH S/Unnammed Waterway	Town of Pensaukee
Bridge	Bridge	CTH S/Pensaukee River	Town of Pensaukee
Bridge	Bridge	Old 41 Rd/Pensaukee River	Town of Pensaukee
Bridge	Bridge	CTH J/Pensaukee River	Town of Pensaukee
Bridge	Bridge	USH 41/Pensaukee River	Town of Pensaukee
Bridge	Bridge	Bell Bridge Rd/Pensaukee River	Town of Pensaukee
Bridge	Bridge	USH 41/Pensaukee River	Town of Pensaukee
Bridge	Bridge	Railroad/Unnammed Waterway	Town of Pensaukee
Bridge	Bridge	Railroad/Pensaukee River	Town of Pensaukee
Communications	T 260 (47)	4135 Peters Ln	Town of Pensaukee
Fire Department	Pensaukee Fire Department	4710 Brookside Rd	Town of Pensaukee
Recycling Center	Pensaukee Recycling Center	4720 Brookside Rd	Town of Pensaukee
Administrative Building	Riverview Town Hall	15471 STH 32	Town of Riverview
Boat Landing	Bass Lake Access	Fox Rd	Town of Riverview
Boat Landing	Boundary Lake Access	Dell Lake Rd	Town of Riverview
Boat Landing	Crooked Lake Access	W Crooked Lake Ln	Town of Riverview
Boat Landing	Gilkey Lake Access	Sunset Rd	Town of Riverview
Boat Landing	Little Gillett Access	Little Gillett Ln	Town of Riverview
Boat Landing	Maiden Lake Access	Maiden Landing Ln	Town of Riverview
Boat Landing	Nelligan Lake Access	Nelligan Landing	Town of Riverview
Boat Landing	Paya Lake Access	S Paya Lake Access	Town of Riverview
Boat Landing	Sunrise Lake Access	Sunrise Cir	Town of Riverview
Boat Landing	Waupee Flowage Access	Waupee Dam Rd	Town of Riverview
Bridge	Bridge	Thelen Rd/First SB Oconto River	Town of Riverview
Bridge	Bridge	Tar Dam Rd/NB Oconto River	Town of Riverview
Bridge	Bridge	STH 64/First SB Oconto River	Town of Riverview
Bridge	Bridge	Old 32 Rd/NB Oconto River	Town of Riverview
Dams	Crooked Lake Dam	Crooked Lake/Waupee Creek	Town of Riverview
Dams	Middle Dam	Waupee Creek	Town of Riverview
Dams	Upper Dam	Waupee Creek	Town of Riverview
Dams	Waupee Flowage Dam	Waupee Flowage/Waupee Creek	Town of Riverview
Dams	Winslow Lake Dam	Winslow Lake/Winslow Creek	Town of Riverview

Table C.5.2: Critical Facilities, Oconto County (cont'd)

Type	Name	Address	Municipality
Energy Facilities	Lakewood Propane	15091 STH 32	Town of Riverview
Fire Department	Crooked Lake Fire Department	15441 CTY W	Town of Riverview
Fire Department	Riverview Fire Department	15408 STH 32	Town of Riverview
Plan Facilities (HazMat)	Centrylink - Lakewood	15580 STH 32	Town of Riverview
Recreation Facilities	Camp Lake Resort	15860 Tree Farm Rd	Town of Riverview
Recycling Center	Riverview Recycling Center	14319 Tar Dam Rd	Town of Riverview
Recycling Center	Riverview Recycling Center	CTH W/LaFave Rd	Town of Riverview
Administrative Building	Kelly Lake Sanitary Dist Office	9530 Green Acres St	Town of Spruce
Administrative Building	Spruce Town Hall	9097 CTY B	Town of Spruce
Boat Landing	Kelly Lake Access	Kelly Lake Access Rd #1	Town of Spruce
Boat Landing	Kelly Lake Access	Kelly Lake Access Rd #3	Town of Spruce
Boat Landing	Kelly Lake Access	Kelly Lake Access Rd #4	Town of Spruce
Boat Landing	Kelly Lake Access	Kelly Lake Access Rd #2	Town of Spruce
Boat Landing	Porcupine Lake Access	N Porcupine Lake Rd	Town of Spruce
Bridge	Bridge	Daly Creek Rd/Daly Creek	Town of Spruce
Bridge	Bridge	S Porcupine Lake Rd/Kelly Brook	Town of Spruce
Bridge	Bridge	CTH M/Kelly Brook	Town of Spruce
Bridge	Bridge	CTH K/Kelly Brook	Town of Spruce
Bridge	Bridge	CTH A/Kelly Brook	Town of Spruce
Bridge	Bridge	CTH KDaly Creek	Town of Spruce
Bridge	Bridge	CTH B/Kelly Brook	Town of Spruce
Bridge	Culvert	Valley Line Rd/Unnamed Waterway	Town of Spruce
Church	St. Mark's Evangelical Lutheran Church	8608 CTH A	Town of Spruce
Dams	Kelly Lake Dam	Kelly Lake/Unnamed Waterway	Town of Spruce
Dams	St. Aubins Dam	Unnamed Waterway	Town of Spruce
Recreation Facilities	Holt Park	9601 Holt Park Rd	Town of Spruce
Recycling Center	Spruce Recycling Center	8407 CTH M	Town of Spruce
Administrative Building	Stiles Town Hall	5718 Watercrest Rd	Town of Stiles
Airport	Dolata Airport	5104 STH 22	Town of Stiles
Airport	Larson Studio Airport	5784 Larson Ln	Town of Stiles
Boat Landing	Machickanee Flowage Access	Landing Ln	Town of Stiles
Boat Landing	Oconto River Access	County Forest Rd 109	Town of Stiles
Bridge	Bridge	STH 22/Little River	Town of Stiles
Bridge	Bridge	USH 141/Oconto River	Town of Stiles
Bridge	Bridge	USH 141/STH 22	Town of Stiles
Bridge	Bridge	USH 141/STH 22	Town of Stiles
Bridge	Bridge	USH 141/Oconto River	Town of Stiles
Bridge	Bridge	CTH I/Machickanee Flowage	Town of Stiles
Bridge	Bridge	Railroad/Oconto River	Town of Stiles
Bridge	Culvert	Fireside Rd/Unnamed Waterway	Town of Stiles
Bridge	Culvert	Firestone Rd/Unnamed Waterway	Town of Stiles
Church	St Patrick's Church	5246 St. Patrick's Rd	Town of Stiles
Communications	Cell Phone Tower	5858 Landing Rd	Town of Stiles
Communications	Cell Phone Tower	6842 STH 22	Town of Stiles
Communications	Tower	5396 CTH I	Town of Stiles
Dams	Stiles Dam	Machickanee Flowage/Oconto River	Town of Stiles
Electrical Facilities	Electrical Substation	CTH I	Town of Stiles
Electrical Facilities	Electrical Substation	5505 USH 141	Town of Stiles
Electrical Facilities	Electrical Substation	5858 Landing Rd	Town of Stiles
Energy Facilities	Ferrellgass Bulk Propane	5749 STH 22	Town of Stiles
Human Services Facilities	Cathy's Day Care	6672 Tower Drive Rd	Town of Stiles
Mobile Home Park	Wencel Murphy Park	5792 CTH I	Town of Stiles
Recreation Facilities	Pioneer Memorial Park	Pioneer Park Rd	Town of Stiles
Recycling Center	Stiles Recycling Center	5718 Watercrest Rd	Town of Stiles
School	Maranatha Seventh Day Adventist Christian School	5100 Mccarthy Rd	Town of Stiles
Administrative Building	Post Office	17912 Front St	Town of Townsend
Administrative Building	Townsend Town Hall	16564 Elm St	Town of Townsend
Boat Landing	Archibald Lake Access	Archibald Landing	Town of Townsend
Boat Landing	Horn Lake Access	Horn Lake Rd	Town of Townsend
Boat Landing	Pickereel Lake Access	Pickereel Lake Rd	Town of Townsend
Boat Landing	Reservoir Pond Access	Water Ln	Town of Townsend
Boat Landing	Reservoir Pond Access	Burnt Dam Rd	Town of Townsend
Boat Landing	Reservoir Pond Access	Meadowview Pkwy	Town of Townsend

Table C.5.2: Critical Facilities, Oconto County (cont'd)

Type	Name	Address	Municipality
Boat Landing	Suprise Lake Access	N Suprise Lake Ln	Town of Townsend
Boat Landing	Suprise Lake Access	Log Cabin Ln	Town of Townsend
Boat Landing	Townsend Flowage Access	Sunset Bay Ln	Town of Townsend
Boat Landing	Townsend Flowage Access	Flowage Pont Ln	Town of Townsend
Boat Landing	Townsend Flowage Access	Bennett Ln	Town of Townsend
Bridge	Bridge	Nicolet Rd/Townsend Flowage	Town of Townsend
Bridge	Bridge	CTH T/McMaslin Brook	Town of Townsend
Bridge	Bridge	Burnt Dam Rd E/McCaslin Brook	Town of Townsend
Bridge	Bridge	Townsend Dam Rd/McCaslin Brook	Town of Townsend
Church	St. John Lutheran Church	17963 STH 32	Town of Townsend
Communications	Telephone Switch Building	STH 32	Town of Townsend
Dams	Bluegill Dam	Unnamed Waterway	Town of Townsend
Dams	Jones Spring	Mary Creek	Town of Townsend
Dams	Pickeral Lake Dam	Pickeral Lake/Pickeral Creek	Town of Townsend
Dams	Reservoir Dam	Reservoir Pond/McCaslin Brook	Town of Townsend
Dams	Wapato Lake	Wapato Lake	Town of Townsend
Dams	Wheeler Dam	Townsend Flowage/McCaslin Brook	Town of Townsend
Energy Facilities	Gas Pipeline Facility	17798 CTH T	Town of Townsend
Fire Department	Townsend Fire Department	16564 Elm St	Town of Townsend
Mobile Home Park	Mobile Home Park	17791 Fernwood Dr	Town of Townsend
Recreation Facilities	Maple Heights Campground	16091 E Chain Lake Rd	Town of Townsend
Recreation Facilities	Oughton Park	16448 Pickerel Lake Rd	Town of Townsend
Recreation Facilities	Town Park	Dow Street	Town of Townsend
Recycling Center	Townsend Recycling Center	16230 Village View Rd	Town of Townsend
Rescue Department	Lakewood/Townsend Community Ambulance Service	16003 Village View Rd	Town of Townsend
Administrative Building	Underhill Community Center	5597 Cardinal Rd	Town of Underhill
Boat Landing	Berry Lake Access	Berry Lake Rd	Town of Underhill
Bridge	Bridge	CTH R/Linzy Creek	Town of Underhill
Bridge	Bridge	CTH H/Oconto River	Town of Underhill
Bridge	Bridge	CTH V/Oconto River	Town of Underhill
Bridge	Bridge	Klatt Rd/Unnamed Waterway	Town of Underhill
Dams	George Garrity Dam #1	Unnamed Waterway	Town of Underhill
Dams	George Garrity Dam #2	Unnamed Waterway	Town of Underhill
Dams	George Garrity Dam #3	Unnamed Waterway	Town of Underhill
Dams	George Garrity Dam #4	Unnamed Waterway	Town of Underhill
Fire Department	Underhill Fire Department	5595 Cardinal Rd	Town of Underhill
Recreation Facilities	Patzer Park	12913 CTH H	Town of Underhill
Recycling Center	Underhill Recycling Center	5350 CTH V	Town of Underhill

APPENDIX D - PUBLIC MEETING NOTICE AND SIGN-IN SHEET

NOTICE OF PUBLIC MEETING

Media Contact: Angela Pierce, Tel: (920) 448-2820

For Immediate Release

January 7, 2015

Oconto County Undertaking Hazard Mitigation Planning – Open House Scheduled and Draft Plan Available for Public Review

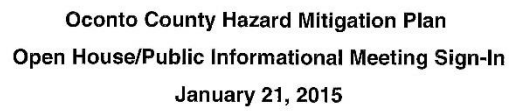
Emergency management, response, and planning personnel from the private and public sectors in Oconto County have been working together to update the County's Hazard Mitigation Plan. The original plan was developed in 2009 under funding from the Federal Emergency Management Agency (FEMA). The Bay-Lake Regional Planning Commission is facilitating the process and drafting the plan.

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

Public input is requested on the draft plan. A public informational meeting to present the draft plan, maps, and materials will be held January 21, 2015 from 6:00-7:00 PM at the Oconto County Courthouse in Building A, First Floor Room 1004 at 301 Washington St in Oconto (use the Adams Street entrance).

Alternatively, the draft plan can be viewed at <http://tinyurl.com/OCHazPlan>, and comments submitted to apierce@baylakerpc.org. Comments are being accepted now through January 30, 2015.

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APPENDIX E -RESOLUTIONS OF ADOPTIONS FROM INCORPORATED COMMUNITIES

BAY-LAKE REGIONAL PLANNING COMMISSION

www.baylakerpc.org

COMMISSION MEMBERS

Brown County

Tom Sieber

Door County

Ken Fisher

Florence County

Ed Kelley

Larry Neuens

Rich Wolosyn

Kewaunee County

Chuck Wagner

Eric Corroy

Virginia Haske

Manitowoc County

Don Markwardt, Chairperson

Dan Koski

Chuck Hoffman

Marinette County

Alice Baumgarten, Secretary/Treasurer

Mary Meyer

Nomination Pending

Oconto County

Tom Kussow

Terry Brazeau

Dennis Kroll

Sheboygan County

Mike Hotz, Vice-Chairperson

Ed Procek

Brian Yerges

STAFF

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