

GOODHUE COUNTY ALL HAZARD MITIGATION PLAN 2016



**Goodhue County Office of Emergency Management
Goodhue County Survey - GIS Department
Goodhue County Land Use Management**



**Minnesota Division of Homeland Security and Emergency
Management**



FEMA

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Management Agency**

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Federal Emergency Management Agency
Minnesota Division of Homeland Security and Emergency Management
Minnesota Department of Health
Minnesota Department of Natural Resources
Minnesota Department of Transportation
Minnesota Geospatial Information Office

Goodhue County Departments:

Environmental Health
Information Technology
Land Use Management
Office of Emergency Management
Public Health Services
Public Works
Sheriff Office & 911 Dispatch
Health and Human Services
Surveyor—GIS Department

Goodhue County Soil and Water Conservation District
Goodhue County Historical Society
City of Zumbrota—City Hall

EXECUTIVE SUMMARY

Goodhue County All Hazard Mitigation Plan

The purpose of the Goodhue County Hazard Mitigation plan is to determine how to reduce or eliminate the loss of life and property damage resulting from natural and human-caused hazards. Goodhue County was one of the first counties in Minnesota to begin work on an all hazard mitigation plan. The plan was adopted in 2005 and 2010 and was then reviewed and updated in 2015 in preparation for re-approval by FEMA in 2016. The plan encompasses all natural, technological, and human-caused hazards rather than only focusing on one type of hazard.

For the planning process, Goodhue County followed the guidelines and handbooks that FEMA has created. Although the process laid out by FEMA seems to be in sequential order, in engaging in the all hazard planning process several of these steps were undertaken simultaneously, these included: Identifying and organizing interested members of the community as well as the technical expertise required for the planning process; identifying the characteristics and potential consequences of hazards; determining our priorities and looking at possible ways to avoid or minimize the undesired effects (mitigation projects). Goodhue County will continue to utilize the plan by implementing specific mitigation projects or changing day-to-day operations within the local government. It will also be important to conduct periodic evaluations and make revisions to the plan as needed. The plan resides with the Office of Emergency Management, who is responsible for maintenance and updates.

This project utilized a great deal of data from many different sources and in many different formats. Geographic Information Systems (GIS) was an important tool for creating more accurate and functional maps for the project as well as helping store and organize the vast amounts of data. As for the plan's ongoing implementation, GIS will help the communities and government make better decisions and update the maps more easily. It will also be utilized in public meetings as maps and other visual data will be an integral part of the ongoing hazard mitigation efforts.

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PARTICIPATION

Participants in 2016 Update of All Hazard Mitigation Plan

Participants included all local governments and other agencies and organizations that participated in the planning process by attending meetings and providing feedback during the planning process.

Cities:

City of Cannon Falls*	City of Lake City
City of Goodhue*	City of Red Wing*
City of Kenyon*	City of Wanamingo*
City of Pine Island*	City of Zumbrota*

Townships:

Cherry Grove Township*	Minneola Township*
Florence Township	Pine Island Township
Goodhue Township	Roscoe Township
Hay Creek Township*	Stanton Township*
Holden Township	Vasa Township*
Kenyon Township*	Welch Township*
Leon Township*	Zumbrota Township*

School Districts:

Cannon Falls #252*	Kenyon/Wanamingo #2172*
Goodhue #253*	Red Wing #256*
Zumbrota/Mazeppa #2805*	

Communities:

Prairie Island Tribal Community*

Organizations:

Cannon Valley Trail Joint Powers Board

Agencies:

Goodhue County Soil and Water Conservation District*
Goodhue County Cooperative Electric Association*

** Participated in 2010 Goodhue County Hazard Mitigation Plan*

Summary of Participation in 2016 Plan Update

The table below indicates how Goodhue County jurisdictions participated in the 2010 update of the Goodhue County All Hazard Mitigation Plan. ‘Y’ in a column indicates the following:

- Meeting(s): A representative attended at least one Policy Committee Meeting, Public Meeting, or met with a Technical Committee member
- Worksheet(s): A representative completed at least one of the following worksheets:
Hazard Rank Existing Document Project Status Report
- Survey: A representative completed the Review of 2005 Goals survey
- Mitigation Strategy Implementation or Cooperation: The jurisdiction submitted a mitigation strategy idea with an implementation plan or agreed to cooperate with another jurisdiction towards completion of a mitigation strategy action.

Non-Participants in the 2016 Update of All Hazard Mitigation Plan

Non-participants include all the organizations of Goodhue County that chose not to participate in the planning process.

Townships:

Belle Creek Township
Warsaw Township*
Belvidere Township
Featherstone Township
Cannon Falls Township*
Wacouta Township

**Participated in the 2010 All Hazard Mitigation Plan*

Jurisdiction	Meetings	Worksheets	Mitigation Strategy Implementation or Cooperation
City of Bellechester	Y	Y	Y
City of Cannon Falls	Y	Y	Y
City of Dennison	Y	Y	Y
City of Goodhue	Y	Y	Y
City of Kenyon	Y	Y	
City of Lake City	Y	Y	Y
City of Pine Island	Y	Y	Y
City of Red Wing	Y	Y	
City of Wanamingo		Y	Y
City of Zumbrota	Y		Y
Cannon Falls Schools			
Goodhue Schools	Y	Y	Y
Kenyon Wanamingo Schools	Y	Y	Y
Lake City Schools			
Pine Island Schools			
Red Wing Schools	Y	Y	Y
Zumbrota Mazeppa Schools	Y	Y	Y
Township, Belle Creek			
Township, Belvidere			

Township, Cannon Falls			
Township, Cherry Grove	Y	Y	
Township, Featherstone			
Township, Florence			
Township, Goodhue	Y	Y	Y
Township, Hay Creek	Y	Y	Y
Township, Holden	Y	Y	
Township, Kenyon	Y	Y	Y
Township, Leon	Y		
Township, Minneola	Y	Y	
Township, Pine Island	Y	Y	Y
Township, Roscoe	Y	Y	Y
Township, Stanton	Y	Y	Y
Township, Vasa	Y	Y	
Township, Wacouta	Y	Y	Y
Township, Wanamingo	Y	Y	Y
Township, Warsaw			
Township, Welch	Y	Y	Y
Township, Zumbrota	Y	Y	Y
Prairie Island Indian Community		Y	
Goodhue County SWCD	Y	Y	Y
Goodhue County Cooperative Electric	Y	Y	Y
Cannon Valley Trail	Y	Y	Y
Goodhue County	Y	Y	Y

Table 1: Jurisdiction Participation

Section 1: Overview and Planning Process

1.1 Definition and Legal Authority

A hazard mitigation plan identifies hazards, assesses vulnerabilities, describes hazard mitigation actions, and establishes a plan to achieve the hazard mitigation strategies identified. According to the Federal Emergency Management Agency, state, tribal, and local governments engage in hazard mitigation planning to identify natural hazards that impact them, identify strategies and activities to reduce any losses from those hazards, and establish a coordinated approach to implementing the plan, taking advantage of a wide range of resources.¹

The Disaster Mitigation Act of 2000 (US Public Law 106-390) amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act and authorized a program for pre-disaster mitigation. Section 322 requires local governments to prepare a mitigation plan in order to receive an increased Federal share for hazard mitigation actions. This local plan must (1) describe actions to mitigate hazards, risks, and vulnerabilities identified under the plan; and (2) establish a strategy to implement those actions.²

The Code of Federal Regulations Title 44 Part 201.6 requires local governments to have a FEMA-approved Local Mitigation Plan in order to be eligible to apply for funding through the following assistance programs:

- Hazard Mitigation Grant Program (HMGP)
- Pre-Disaster Mitigation (PDM)
- Flood Mitigation Assistance (FMA)

Plan Update

44 CFR 201.6 states: A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within five (5) years in order to be eligible for mitigation project grant funding.³

Governor's Executive Order 07-14

The Minnesota Governor's Executive Order 07-14 assigns overall responsibility for the creation and maintenance of the all-hazard Minnesota Emergency Operations Plan to the Minnesota Division of Homeland Security and Emergency Management. The order also directs other state agencies to assist with the planning process.⁴

Minnesota Statutes, Chapter 12

According to the 2015 Minnesota Statutes, Chapter 12, Section 9, Subdivision 7, the Division of Emergency Management shall develop and maintain a comprehensive hazard mitigation plan for this state, with the plan integrated into and coordinated with the hazard mitigation plans of the federal government to the fullest possible extent. The division shall coordinate the preparation of hazard mitigation plans by the political subdivisions, with the plans integrated into and coordinated with the hazard mitigation plan of this state to the fullest possible extent.⁵

1.2 Purpose

All hazard mitigation planning is designed to decrease the amount of damage and costs to a community in the event of a disaster. All types of hazards, categorized as natural, technological, or human, are considered in this planning process. Mitigation projects were developed in response to the perceived risk of such hazards occurring based on historical occurrence and analysis.

1.3 Goals

The goals of the Goodhue County All Hazard Mitigation Plan include:

- Protect life.
- Protect loss of life and limit damage.
- Protect emergency response personnel and resources.
- Protect property.

1.4 Objectives

The objectives of the Goodhue County All Hazard Mitigation Plan include:

- Create an Action Plan for mitigation projects.
- Articulate specific criteria used to evaluate the progress of mitigation projects.

1.5 Plan Update Process

The planning process involves four main steps, as outlined by FEMA, which were followed in creating the All Hazard Mitigation Plan for Goodhue County: Organizing resources, assessing risks, developing a mitigation plan, and implementing the plan.

Organize Resources

- Existing response/emergency plans
- Goodhue County Local Water Plan, County Comprehensive Plan, County Zoning Ordinances, Prairie Island Nuclear Power Plan Emergency Plan, Minnesota State Hazard Plan
- Local Planning Assistance Mock Hazard Plan, Goodhue County Information Booklet 2003-2004, Goodhue County Emergency Operations Plan
- Technical experts
- Interested community members

Assess risks

- Identify, characterize, and estimate impact of possible hazards
- Identify how such hazards would affect key facilities
- Estimate potential financial losses to vulnerable structures

Much of the financial information used to estimate potential loss was obtained from the Estimated Market Value of the structures themselves. Other information was obtained by studies and/or plans previously compiled.

Develop a mitigation plan

- Develop mitigation strategies and projects
- Determine priorities for mitigation projects
- Create an Action Plan

Once the risk assessment of the hazards was completed during the planning process, the mitigation projects for each hazard were given a hazard rank. This hazard rank serves as a prioritization strategy for completing the mitigation projects.

Implement the plan and monitor progress

- Emergency personnel and community members will implement the Plan.
- Use the Action Plan as a guide for which projects should be completed first. Some of the projects will be completed when funding is available.
- Efforts made will be evaluated for effectiveness
- Plans will be revisited and revised on an annual basis or as changes occur in the community or with potential hazards.
- Information collected for this Plan will be utilized by other County Plans as appropriate.

In order to implement the Plan, datasets, maps, and other information contained in the Plan will be incorporated in other County Plans as appropriate. As other plans are being created or updated, staff will review the Hazard Mitigation Plan in search of data or other information for incorporation.

Planning Process for Plan Update 2016

Goodhue County began the review and update of the Goodhue County All Hazard Mitigation Plan in September, 2015 upon receiving a Hazard Mitigation Grant from the Minnesota Division of Homeland Security and Emergency Management. Over the fall of 2015 and winter of 2016, staff engaged in organizing existing resources, reviewing and updating the County profile, reviewing and updating the hazard profiles and assessments, reviewing mitigation goals and strategies identified in the Plan adopted in 2010, identifying new mitigation strategies, and updating the action plan. The four main aspects of the update process are described in detail below.

1. Organize Resources

Personnel

Documentation of participation by jurisdictions and the public is included in Appendix A: 2016 Public Participation.

Technical Committee:

Goodhue County staff and project staff formed a Technical Committee, to oversee the compilation of information and to organize the public meetings. The Technical Committee was composed of:

- Diane Richter-Biwer - Director, Office of Emergency Management
- Leanne Knott – GIS Systems Specialist, Goodhue County
- Lisa Hanni - L.S. Director / County Surveyor, Goodhue County
- Missy Sivigny – Office of Emergency Management

- Kyle Glowa - GIS / OEM Intern, Goodhue County

Policy Committee (Jurisdiction Representatives):

Letters notifying the local jurisdictions about the update process, inviting them to participate, and asking them to designate a representative to attend Policy Committee meetings were sent to:

- City Mayors and Administrators
- Township Chairs and Clerks
- School District Representatives
- Prairie Island Indian Community
- Goodhue County Cooperative Electric Association
- Goodhue County Soil & Water Conservation District
- Cannon Valley Trail Manager

An initial Policy Committee meeting was held October 15th, 20015. After this meeting, a follow-up letter explaining the importance of participation was sent to jurisdictions that had not yet responded. This letter included all the meeting materials from the October 15th meeting. A form was also included to indicate their decision to participate in the update of the Plan and designating a representative for the Policy Committee. The members of the Policy Committee were:

Policy Committee Representatives

- Jeff McCormick, Chief of Police/Emergency Manager – City of Cannon Falls
- Lori Agre, City Clerk – City of Goodhue
- Mark Valsing, City Administrator – City of Kenyon
- Wayne King, Emergency Manager/Public Works Director – City of Pine Island
- Tony Grosso, RWPD/Emergency Management – City of Red Wing
- Laurie Hoernemann, Clerk – Zumbrota Township
- Bruce Kvitern, Supervisor – Cherry Grove Township
- Scott Halverson, Supervisor – Hay Creek Township
- Joyce Anderson, Supervisor – Kenyon Township
- Dale Dickie, Supervisor – Goodhue Township
- Bill Budensiek, Supervisor – Minneola Township
- David Arndt, Supervisor – Pine Island Township
- Jeff Ofstie, Supervisor – Goodhue Township
- Mike Demming, Health & Safety Coordinator – Zumbrota/Mazeppa #2805
- Darwin Fox, Supervisor – Welch Township
- Marvin Ehlers, Supervisor – Zumbrota Township
- Rob Keehn, City Planner – City of Lake City
- Todd Greseth, Supervisor – Roscoe Township
- Paul Clauson, Building and Grounds Supervisor – Kenyon/Wanamingo #2172
- Matthew Voxland, Supervisor – Holden Township
- Dawn Wettern, Community Education Clerk – Red Wing #256
- Scott Roepke, Trail Manager – Cannon Valley Trail Joint Powers Board
- Mike Redmond, Administrator – Goodhue Public Schools
- Jennifer Cable, Emergency Preparedness Coordinator – Prairie Island Indian Community
- Doug Fingerson, Manager – Goodhue County Cooperative Electric Association
- Neil Jensen, City Administrator – City of Zumbrota
- Keegan Quinn, Mayor – City of Bellechester
- Beau Kennedy, Water Planner – Goodhue County Soil and Water Conservation District
- John Schueller, Supervisor – Wacouta Township
- Tom Brown, Emergency Manager – Lake City Emergency Management

- George Raasch, Supervisor – Goodhue Township
- Leslie Scaling, Supervisor – Pine Island Township
- Richard Miller, Supervisor – Pine Island Township
- Dennis Benson, Supervisor – Leon Township
- Darren Pahl, Supervisor – Zumbrota Township
- Riley Budensiek, Supervisor – Minneola Township
- Sarah Pettit, Clerk – Minneola Township
- Jessica Page, Clerk – City of Dennison/Wanamingo Township
- Bob Benson, Supervisor – Stanton Township
- David Peterson, Supervisor – Stanton Township
- Michael Boulton, City Administrator – City of Wanamingo

Minutes from all Policy Committee meetings are available in Appendix A.

Public Meetings:

Public meetings were held to inform the public and neighboring communities, and other interested parties about the Plan update process and invite their feedback and ideas. The meetings were publicized through newspaper announcements and the Goodhue County website.

Existing Documents

The following documents were identified by the Technical Committee as resources for the Goodhue County All Hazard Mitigation Plan:

- Prairie Island Nuclear Power Plan Emergency Plan
- Emergency Action Plan for Byllesby Dam
- Minnesota State Hazard Plan
- Goodhue County Emergency Operations Plan
- Goodhue County Local Water Plan
- Comprehensive Plan Zoning Ordinances

Policy Committee members were asked to identify existing documents and plans in their jurisdiction that may be useful for the planning process. The following list includes existing jurisdictional plans:

Prairie Island Indian Community Comprehensive Plan	City of Pine Island Building Code
Prairie Island Indian Community Floodplain Management Plan	City of Pine Island Drainage Ordinance
Prairie Island Indian Community Flood Insurance Studies	City of Pine Island Existing Land Use maps
Prairie Island Indian Community Hazard Vulnerability Analysis	City of Lake City Comprehensive Plan
Prairie Island Indian Community Emergency Management Plan	City of Lake City Growth Management Plan
Prairie Island Indian Community Zoning Ordinance	City of Lake City Capital Improvement Plan
Prairie Island Indian Community Building Code	City of Lake City Flood Damage Prevention Ordinance
Prairie Island Indian Community Critical Facilities maps	City of Lake City Floodplain Management Plan
Prairie Island Indian Community Existing Land Use maps	City of Lake City Flood Insurance Studies
Prairie Island Indian Community Elevation Certificates	City of Lake City Hazard Vulnerability Analysis
Goodhue County Cooperative Electric Comprehensive Plan	City of Lake City Emergency Management Plan
Goodhue County Cooperative Electric Growth Management Plan	City of Lake City Zoning Ordinance
Goodhue County Cooperative Electric Capital Improvement Plan	City of Lake City Building Code
Goodhue County Cooperative Electric Emergency Management Plan	City of Lake City Critical Facilities maps
Goodhue County Cooperative Electric Critical Facilities maps	City of Lake City Existing Land Use maps

Goodhue County Cooperative Electric Existing Land Use maps	City of Lake City Elevation Certificates
Goodhue County Comprehensive Plan	City of Lake City State Plan
Goodhue County Capital Improvement Plan	City of Goodhue Flood Damage Prevention Ordinance
Goodhue County Floodplain Management Plan	City of Goodhue Floodplain Management Plan
Goodhue County Flood Insurance Studies	City of Goodhue Flood Insurance Studies
Goodhue County Emergency Management Plan	City of Goodhue Zoning Ordinance
Goodhue County Zoning Ordinance	City of Goodhue Building Code
Goodhue County Building Code	City of Goodhue Existing Land Use maps
Goodhue County Existing Land Use maps	Zumbrota Township Comprehensive Plan
Goodhue County Elevation Certificates	Zumbrota Township Zoning Ordinance
Goodhue County HAZUS	Welch Township Comprehensive Plan
Cannon Valley Trail Comprehensive Plan	Welch Township Zoning Ordinance
Cannon Valley Trail Emergency Management Plan	Pine Island Township Comprehensive Plan
Zumbrota-Mazeppa Schools Comprehensive Plan	Pine Island Township Hazard Vulnerability Analysis
Zumbrota-Mazeppa Schools Capital Improvement Plan	Pine Island Township Emergency Management Plan
Zumbrota-Mazeppa Schools Emergency Management Plan	Pine Island Drainage Ordinance
Zumbrota-Mazeppa Schools Critical Facilities maps	Hay Creek Township Comprehensive Plan
Goodhue Public Schools Comprehensive Plan	Hay Creek Township Growth Management Plan
Goodhue Public Schools Capital Improvement Plan	Hay Creek Township Zoning Ordinance
Goodhue Public Schools Flood Insurance Studies	Hay Creek Township Building Code
Goodhue Public Schools Hazard Vulnerability Analysis	Hay Creek Township Existing Land Use maps
Goodhue Public Schools Emergency Management Plan	City of Wanamingo Comprehensive Plan
Goodhue Public Schools Critical Facilities maps	City of Wanamingo Capital Improvement Plan
Goodhue Public Schools Existing Land Use maps	City of Wanamingo Flood Damage Prevention Ordinance
City of Red Wing Comprehensive Plan	City of Wanamingo Floodplain Management Plan
City of Red Wing Capital Improvement Plan	City of Wanamingo Flood Insurance Studies
City of Red Wing Floodplain Management Plan	City of Wanamingo Emergency Management Plan
City of Red Wing Flood Insurance Studies	City of Wanamingo Zoning Ordinance
City of Red Wing Zoning Ordinance	City of Wanamingo Building Code
City of Red Wing Building Code	City of Wanamingo Critical Facilities maps
City of Red Wing Critical Facilities maps	City of Wanamingo Existing Land Use maps
City of Red Wing Existing Land Use maps	City of Wanamingo Elevation Certificates
City of Red Wing Elevation Certificates	City of Bellechester Comprehensive Plan
City of Red Wing State Plan	City of Bellechester Growth Management Plan
City of Pine Island Comprehensive Plan	City of Bellechester Hazard Vulnerability Analysis
City of Pine Island Growth Management Plan	City of Bellechester Zoning Ordinance
City of Pine Island Capital Improvement Plan	City of Bellechester Building Code
City of Pine Island Flood Damage Prevention Ordinance	City of Bellechester Critical Facilities maps
City of Pine Island Floodplain Management Plan	City of Bellechester Existing Land Use maps
City of Pine Island Flood Insurance Studies	City of Bellechester Elevation Certificates
City of Pine Island Emergency Management Plan	Stanton Township Comprehensive Plan
City of Pine Island Zoning Ordinance	Stanton Township Zoning Ordinance
Holden Township Comprehensive Plan	Leon Township Zoning Ordinance
Holden Township Zoning Ordinance	

As updates are done to any of the documents listed above, staff from the individual agency will contact Goodhue County staff to get information as necessary from the All Hazard Mitigation Plan to incorporate into their documents.

The Goodhue County Soil & Water Conservation District Local Water Plan and the Goodhue County Comprehensive Plan both incorporate information, such as maps and tables, from the existing and updated All Hazard Mitigation Plan. Goodhue County administers building code for 21 townships and the cities of Cannon Falls, Dennison, Wanamingo, and Goodhue.

Federal Disaster Declarations

If a disaster is beyond the response capabilities of a State, a governor can seek a Federal Disaster Declaration by submitting a request to the President through the regional FEMA office. FEMA reviews the request and makes a recommendation to the President. After a Federal Disaster Declaration, the affected area is then able to receive funds from the Federal Government to assist in the recovery effort.

All places in Minnesota are affected by disasters. There have been 55 federal disaster declarations in Minnesota since 1957. The disaster declarations are listed in the table below.

Table 2. Minnesota Federal Disaster and Emergency Declarations Since 1995.

Date Declared	Description	FEMA Number
7/21/2014	Severe Storms, Straight-line Winds, Flooding, Landslides, and Mudslides	4182
7/25/2013	Severe Storms, Straight-line Winds, and Flooding	4131
5/3/2013	Severe Winter Storm	4113
7/6/2012	Severe Storms and Flooding	4069
7/28/2011	Severe Storms, Flooding, and Tornadoes	4009
6/7/2011	Severe Storms and Tornadoes	1990
5/10/2011	Severe Storms and Flooding	1982
10/13/2010	Severe Storms and Flooding	1941
7/2/2010	Severe Storms, Tornadoes, and Flooding	1921
4/19/2010	Flooding	1900
4/9/2009	Severe Storms and Flooding	1830
6/25/2008	Severe Storms and Flooding	1772
8/23/2007	Severe Storms and Flooding	1717
8/21/2007	Bridge Collapse	3278
6/5/2006	Flooding	1648
1/4/2006	Severe Winter Storm	1622
9/13/2005	Hurricane Katrina Evacuation	3242
10/7/2004	Severe Storms and Flooding	1569
6/14/2002	Severe Storms, Flooding and Tornadoes	1419
5/16/2001	Flooding	1370
6/27/2000	Severe Storms, Flooding And Tornadoes	1333
8/26/1999	Severe Ice Storms, Flooding and Heavy Rains	1288
7/28/1999	Severe Storms, Winds and Flooding	1283
6/23/1998	Severe Storms, Straight-Line Winds And Tornadoes	1225
4/1/1998	Tornadoes and Severe Thunderstorms	1212
8/25/1997	Flooding	1187

4/8/1997	Severe Storms/Flooding	1175
1/16/1997	Severe Winter Storms/Blizzards	1158
1/7/1997	Severe Storms/Heavy Snow	1151
6/1/1996	Flooding	1116
1/5/1996	Storms/Freezing Rain	1078

In Goodhue County, there have been ten Federal Disaster Declarations. All of these were in response to natural disasters. Flooding is a particularly prominent hazard accounting for 70 percent of the total Federal Disaster Declarations for Goodhue County.

Table 3. Goodhue County Federal Disaster Declarations Since 1965.

Date Declared	Description	FEMA Number
7/6/2012	Severe Storms and Flooding	4069
10/13/2010	Severe Storms and Flooding	1941
6/14/2002	Severe Storms, Flooding and Tornadoes	1419
6/23/1998	Severe Storms, Straight-Line Winds and Tornadoes	1225
4/8/1997	Severe Storms/Flooding	1175
6/11/1993	Flooding, Severe Storms, Tornadoes	993
12/26/1991	Ice Storm	929
7/8/1978	Severe Storms, Tornadoes, Hail, Flooding	560
4/18/1969	Flooding	255
4/11/1965	Flooding	188

Website

An announcement requesting public participation in the update process was added to the homepage of the Goodhue County website. A link was provided to a webpage for the All Hazard Mitigation Plan. This webpage was created to facilitate communication with the public and Policy Committee members. An example is included in Appendix A. This website included:

- Existing Goodhue County All Hazard Mitigation Plan
- Public and Policy Committee meeting announcements
- Meeting Materials (Agendas, Minutes, Posters, Maps, Worksheets, Completed Worksheet Examples, Presentations), Planning Resources
- Contact information
- Surveys
- Related Websites

Geographic Information Systems (GIS)

GIS software was used to update maps in the plan and to assist with risk assessment.

2. Assess Risks

Hazard Identification and Profiling

The list of hazards identified in the Plan was reviewed and compared to the Minnesota State All Hazard Mitigation Plan. A revised list of hazards was produced to add additional hazards not included in the previous plan and to better correlate to the Minnesota list of hazards. No hazards were removed from the plan, but some hazard terminology was changed to match the hazard terms used in the Minnesota State Plan. Profiles were created for hazards added to the updated Plan. Existing hazard profiles were reviewed and updated with new information if available.

Hazard Ranking

Jurisdictions were asked to complete a Hazard Rank worksheet which asked representatives to rank each hazard in terms of probability and potential damage for their area. Definitions of high, medium, and low were provided. The technical committee compiled the results of these worksheets for a hazard assessment table.

Update of Vulnerability

Maps and information indicating critical and/or vulnerable populations, buildings, infrastructure, and historic, natural, or economic resources were reviewed and updated. Much of the financial information used to estimate potential loss was obtained from the Estimated Market Value of the structures themselves. Other information was obtained by studies and/or plans previously compiled.

3. Develop a Mitigation Plan

Review of Existing Plan

The Technical Committee met to discuss the existing plan document and what would need to be updated. Each committee member was asked to review each section of the current Plan and send suggested updates/changes to the GIS intern working on updating the Plan. Each section of the Plan has been updated with new information, additional information, or updated maps, tables, and figures. The following information describes how the main sections of the plan were reviewed and updated: Goals, Status Report, Hazards, Actions, and Mitigation Strategies.

Review of Goals

An online survey was created to obtain feedback on the goals identified in the Plan adopted in 2005 (Appendix A2). Responders were asked to indicate whether or not each goal should remain in the plan or be changed. Responders were also asked to explain how a goal should be changed or why a goal should be removed. This survey was distributed to all Policy Committee members and available to the public on the Goodhue County All Hazard Mitigation webpage. Paper copies were distributed to Policy Committee members who preferred completing a paper version.

Project Status Report

Project status report worksheets were created to obtain information regarding progress towards mitigation actions identified in the Plan. These worksheets were distributed to the relevant jurisdictions or agencies. The information provided is included in the Plan and was used to determine which projects should be removed from the updated action plan and which projects should remain.

Review of Hazard Rankings

A Hazard Ranking by Jurisdiction worksheet was distributed to all Policy committee members to fill out probability and potential damage scores that were later used to rank the hazards. The results from these worksheets are shown in two tables in the Plan and assisted later with the prioritization of mitigation strategies.

Development of Goals and Actions

New ideas for mitigation goals and actions were solicited at policy committee meetings and at public meetings. There was also an opportunity on the Review of Goals survey to suggest new goals. Several resources were made available suggesting possible mitigation actions that jurisdictions could decide to pursue.

Prioritization of Strategies

Local jurisdictions were asked to complete a benefit-cost review as part of the Strategy Implementation Plan worksheet for the mitigation strategies their jurisdiction is responsible for. An alternative method for determining a priority score was developed for those projects that lacked enough information to complete the previously mentioned cost/benefit review. This alternative method still considered the cost and benefit of each action. Both methods are included in Appendix A.

Implement Action Plan

Strategy Implementation Plan Worksheet

Each local jurisdiction was asked to complete a Strategy Implementation Plan worksheet for mitigation actions their jurisdiction is responsible for. The information collected included the mitigation action, cost, completion date, whether it applied to new or existing buildings and/or infrastructure, available funding sources, and existing planning mechanisms the action could be incorporated into. The information provided is included in the Plan.

Action Plan

Emergency personnel and community members will implement the Plan. The action plan will be used as a guide for determining which projects should be completed first. Some of the projects will be completed when funding is available.

1.6 Monitoring, Evaluating, and Updating the Plan

The draft of the Goodhue County All Hazard Mitigation Plan will be reviewed by Minnesota State personnel and FEMA representatives. Upon their recommendations, changes will be made to the Plan. The revised Plan will be sent to all participating organizations for adoption before submission of the final plan in or around March 2016.

The Goodhue County All-Hazard Mitigation Plan will reside in the Goodhue County Office of Emergency Management (OEM). Maintenance and updates will be the responsibility of OEM. An annual review of the Hazard Plan's strategies and hazards will be performed by the Office of Emergency Management and the Technical Advisory Committee. If any hazard mitigation funding was obtained by the jurisdictions, staff will monitor the project outcome. The Plan will be updated every 5 years or sooner if necessary. When a revised version of the Plan is needed, public involvement will be carried out in a similar fashion as the 2016 update process. Newspaper announcements will be used to advertise public meetings for updating the Plan. A Technical Committee and a Policy Committee will be formed once again to streamline the updating process and to add their input on any updates or changes in the Plan.

Data and information about Goodhue County will be updated as needed. Specified personnel in various departments will be responsible for gathering and updating the data on an annual basis. The Goodhue County GIS Department will assist in converting the updates into GIS format and supplying OEM with a copy of that data.

Additional projects and modifications to existing projects will be added to the Plan as necessary. These modifications will be the responsibility of the Office of Emergency Management. Information collected for this Plan will be utilized by other County Plan as appropriate.

Datasets, maps, and other information contained in the Plan will be incorporated in other county and local jurisdiction plans as appropriate. Numerous maps created for the All Hazard Mitigation Plan have been adopted into the County's Comprehensive Plan Update as well as the County's Transportation Plan. Land Use and population data is being incorporated in the updates for the County's zoning ordinances as well. As other plans are being created or updated, staff will review the Hazard Mitigation Plan in search of data or other information for incorporation.

Continued Public Involvement

The Goodhue County Office of Emergency Management maintains a website that includes a page for the All Hazard Mitigation Plan. The Goodhue County website will be the main point of access for the public regarding information about the All Hazard Mitigation plan. A pdf copy of the approved plan will be available on this web page along with many of the documents used to update the plan:

- Handouts - Hazard worksheets, Mitigation strategy worksheets, Strategy Implementation methods, FEMA Assistance Program Information, and Review of 2016 Goals.
- Agendas and Minutes from public and Policy committee meetings
- Presentations – Presentation documents from past Policy committee meetings
- Other Documentation – Frequently asked questions, plan requirements, mitigation strategies, and vulnerability assessment.

Section 1 Citations

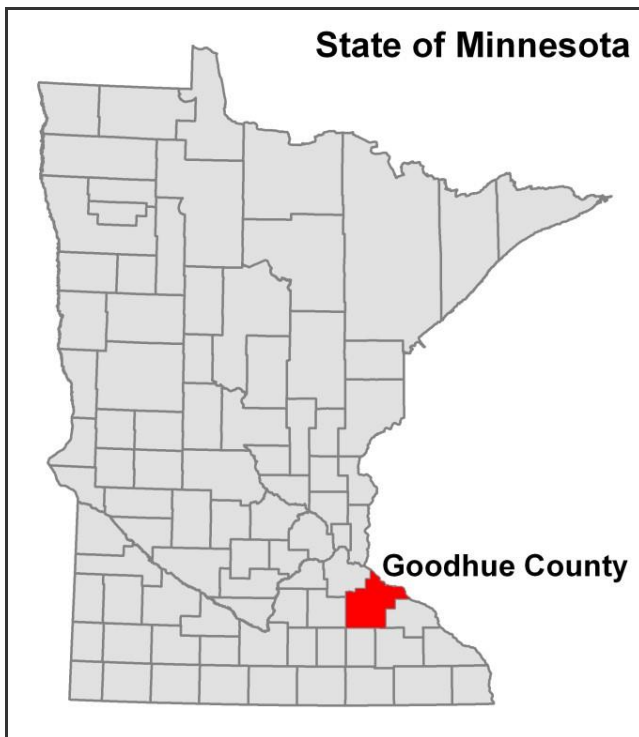
1. Hazard Mitigation Planning Overview. FEMA. Retrieved February 1, 2016 from <https://www.fema.gov/hazard-mitigation-planning>.
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4. Hazard Mitigation Planning Overview. FEMA. Retrieved February 1, 2016 from <https://www.fema.gov/hazard-mitigation-planning>.
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Section 2: Goodhue County Profile

2.1 Physical Geography

Goodhue County, Minnesota is located southeast of the Twin Cities Metropolitan area on the Minnesota/Wisconsin border. The area is characterized by rolling hills and bluffs along the Mississippi River which forms Goodhue County's northeasterly border.

Goodhue County is in the southeast triangle of Minnesota. There are several irregularities in its boundary lines, but, generally speaking, it has Dakota County on the north, Wisconsin on the northeast, Wabasha County on the east, Dodge and Olmsted Counties on the south, and Rice County on the west. The Mississippi River and its enlargement, Lake Pepin, form its northeastern border and separate it from the State of Wisconsin. The County covers approximately 764 square miles.



Map 1. State of Minnesota



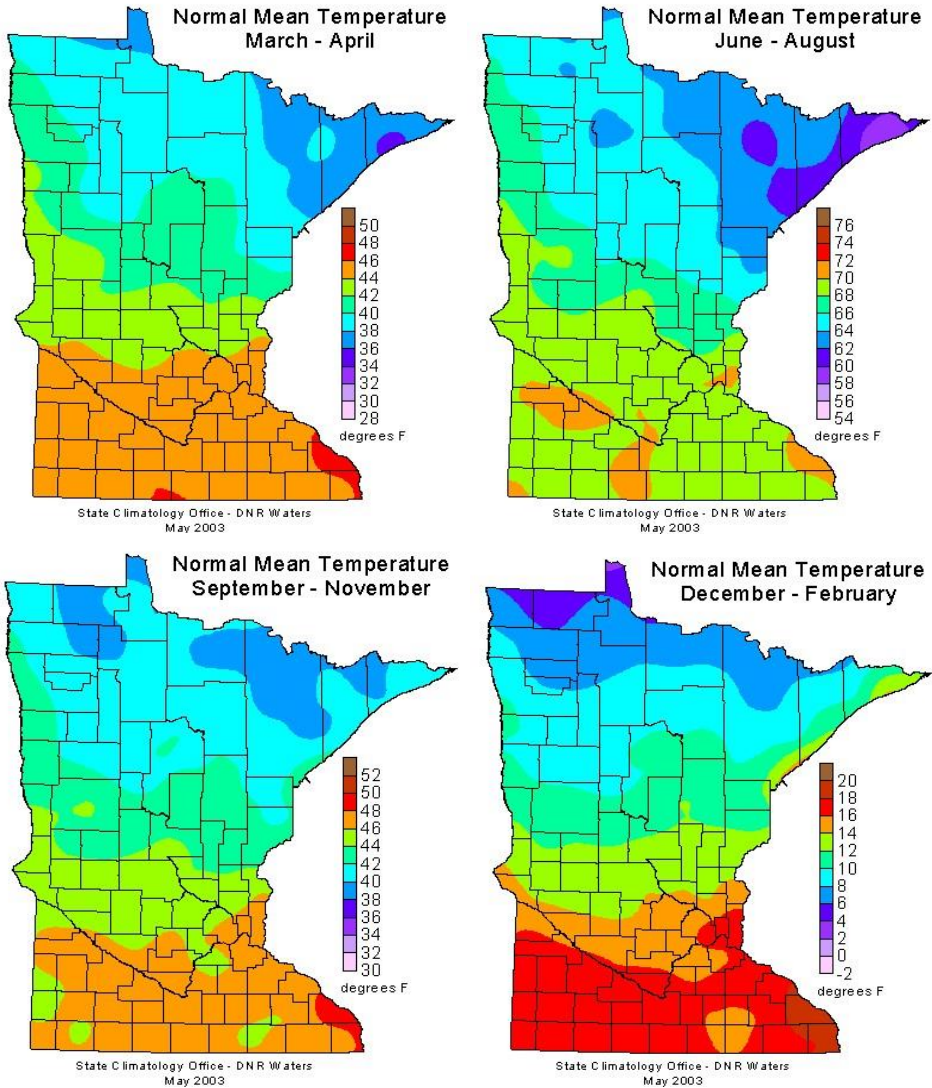
Map 2. Surrounding Counties

Climate

The State of Minnesota is situated at the intersection of three major biomes on the North American Continent, namely prairie, deciduous forest, and northern coniferous forest. The intersection of these three biomes is largely due to the three major air masses meeting over the region, bringing cold polar air, dry Pacific air, and wet air from the Gulf of Mexico. Goodhue County lies in the region of deciduous forest.¹

Temperature

In Goodhue County, the normal mean temperature by season varies from 43° Fahrenheit in the fall and spring, to 65° Fahrenheit in the summer to 11° Fahrenheit in the winter months. With these temperature changes come variation in weather. Most notable is the change in the form of precipitation. The following maps illustrate the temperature variation by season in Minnesota.



Map 3. Normal Mean Temperatures by Season ²

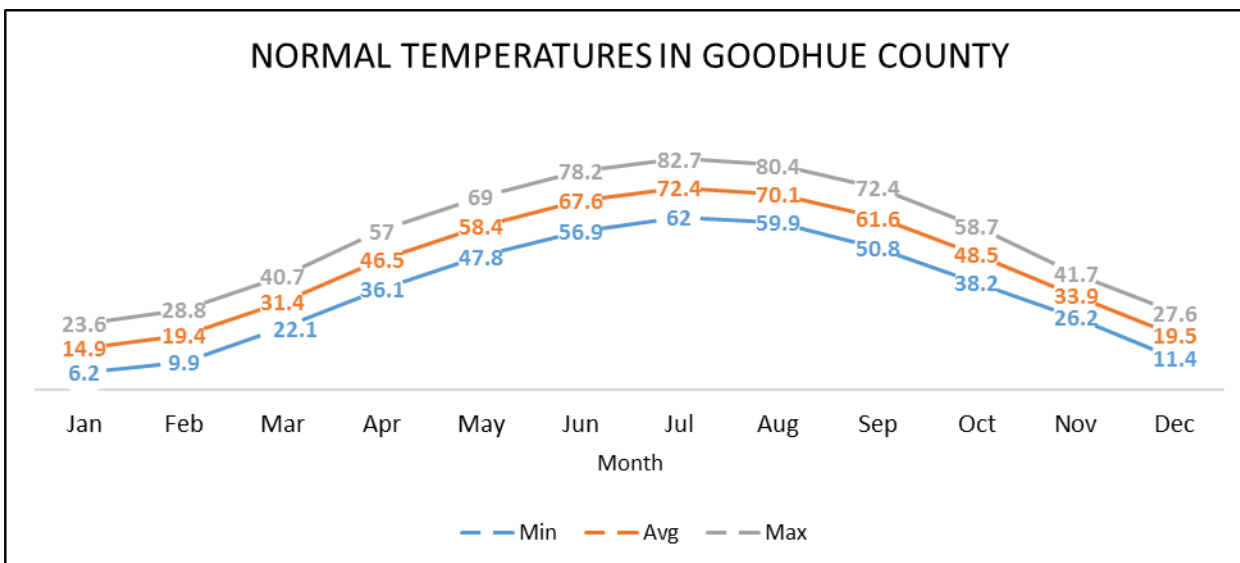


Figure 1. Average Temperatures by Month ³

Precipitation

Minnesota receives many forms of precipitation throughout the year including snow, rain, sleet, and ice. The differing forms of precipitation are due to the annual variation in temperature from month to month and season to season.

Goodhue County receives the heaviest snowfall in the month of January. The months of March, November and December have an average snowfall of over nine inches with February following behind them with an average of 7.2 inches annually. Traces of snow can also be seen in October and April. Between 1981 and 2010, Goodhue County received an average of 53.4 inches of snow each year. During the months from March leading up to June, average rainfall increases steadily. After August, average rainfall drops to average lows during the months of December, January, and February. The average annual rainfall is just above 30 inches.

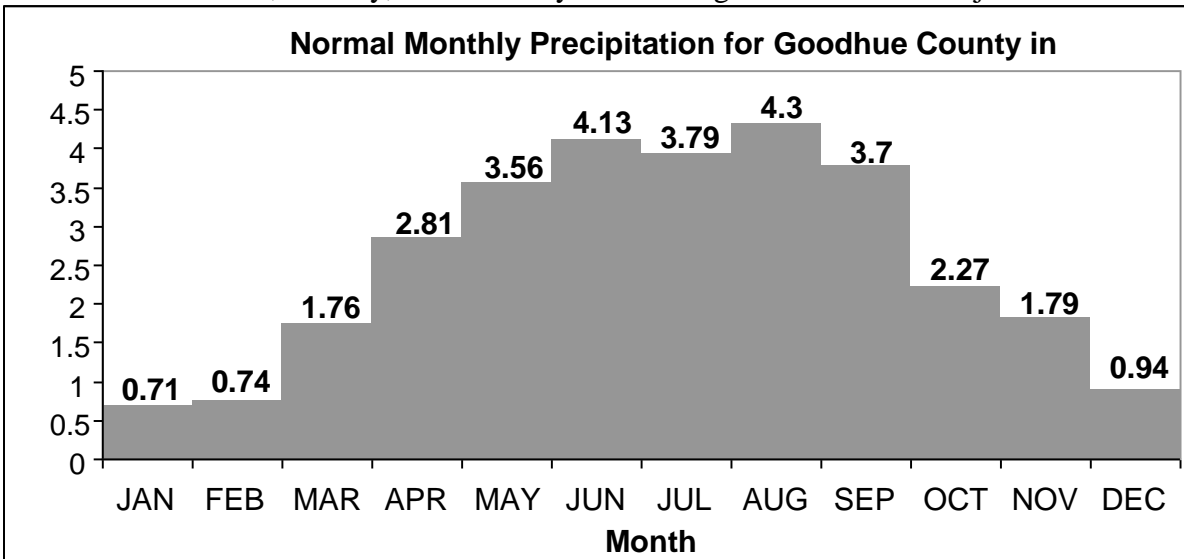


Figure 2. Normal Monthly Precipitation ⁴

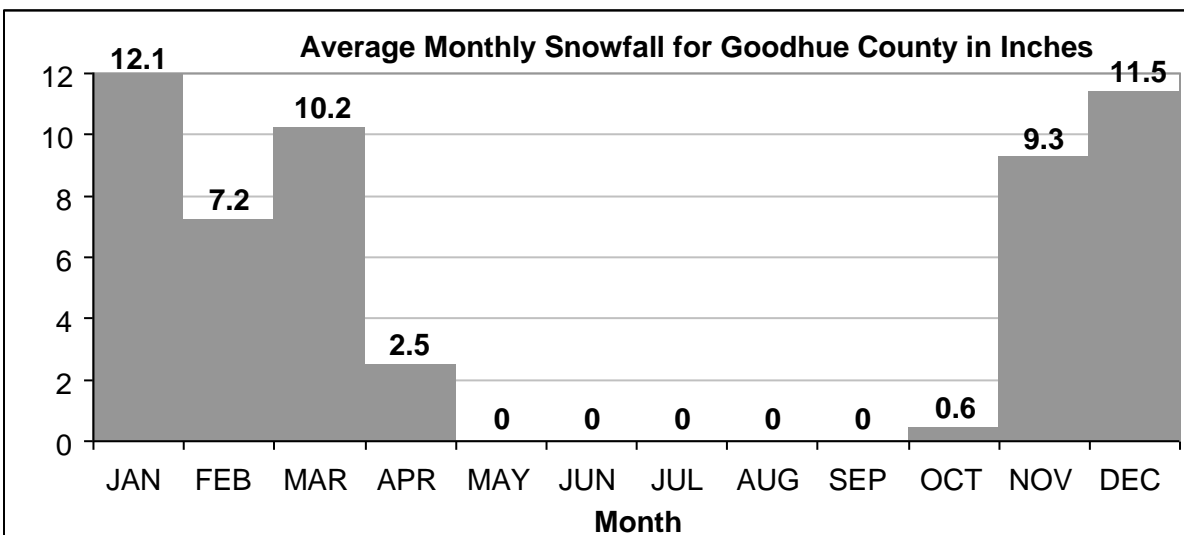


Figure 3. Average Monthly Snowfall ⁵

Land Cover

Goodhue County covers approximately 499,000 acres of land, extending southwest from the Mississippi River. The majority of the land (51.8%) is under cultivation, shown by a brown color on the map below. About fifteen percent of the land is covered by deciduous forest, composed of trees which shed their leaves seasonally, concentrated along the bluff areas near the Mississippi River and along the rivers throughout the county. Grassland covers just over a tenth of the land in the County. Areas that are developed cover a small fraction (just over two percent) of the total land area in the county. Wetlands are indicated by shades of blue on the map. In Goodhue County, wetlands are concentrated near the Mississippi River just north of Red Wing.

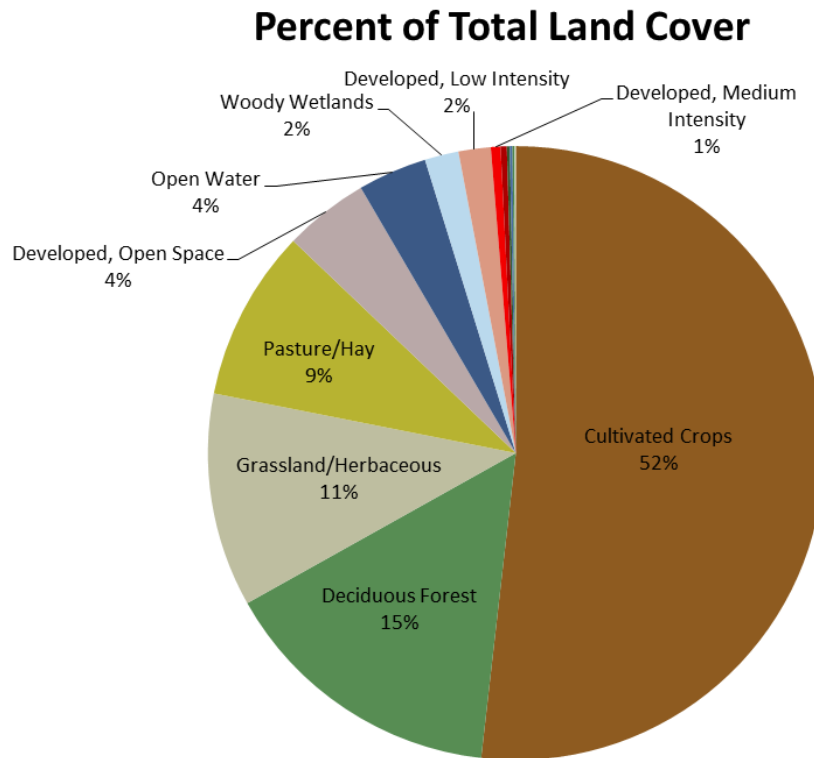
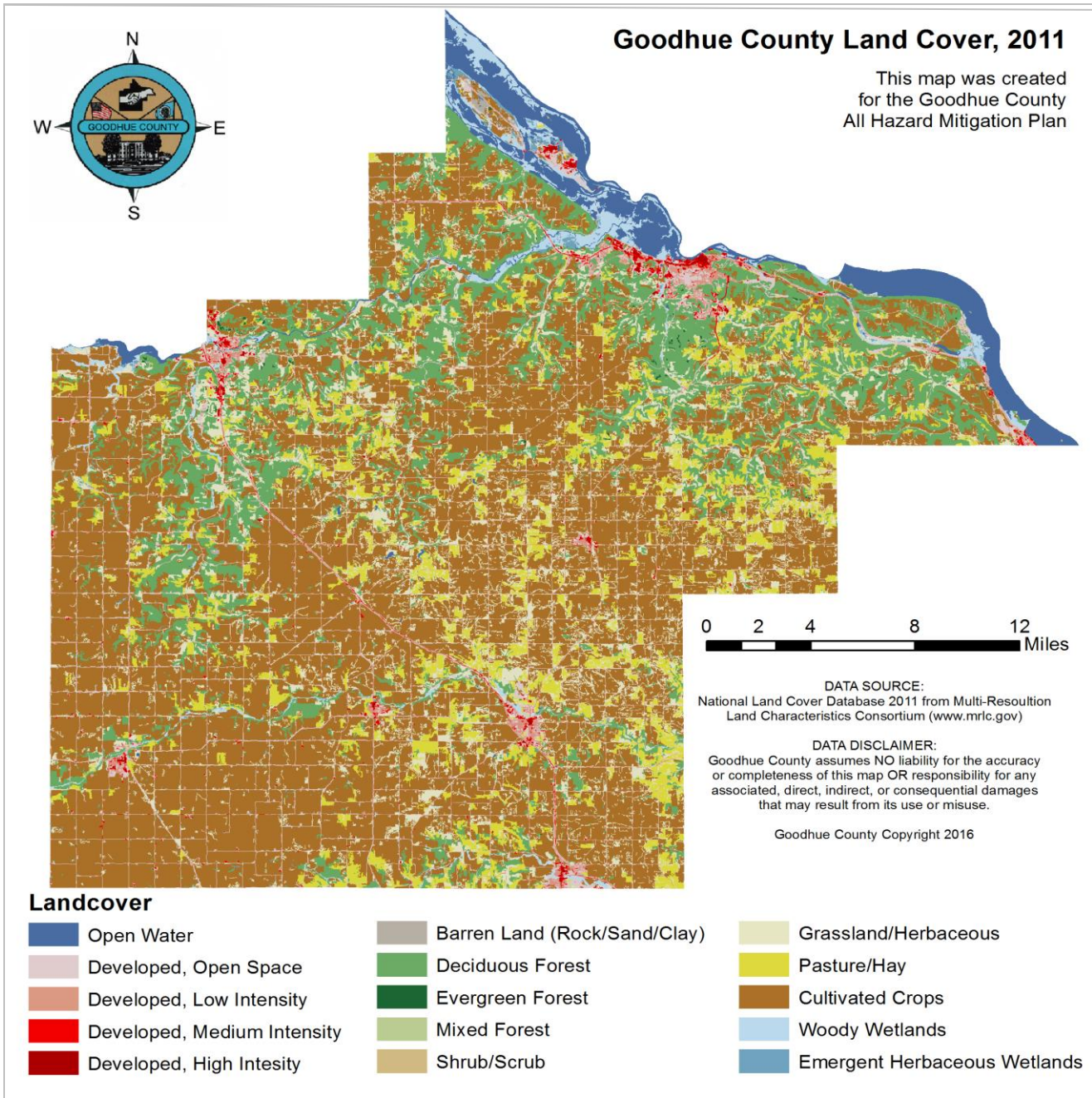


Figure 4. Land Cover in Goodhue County ⁶

Physical Features

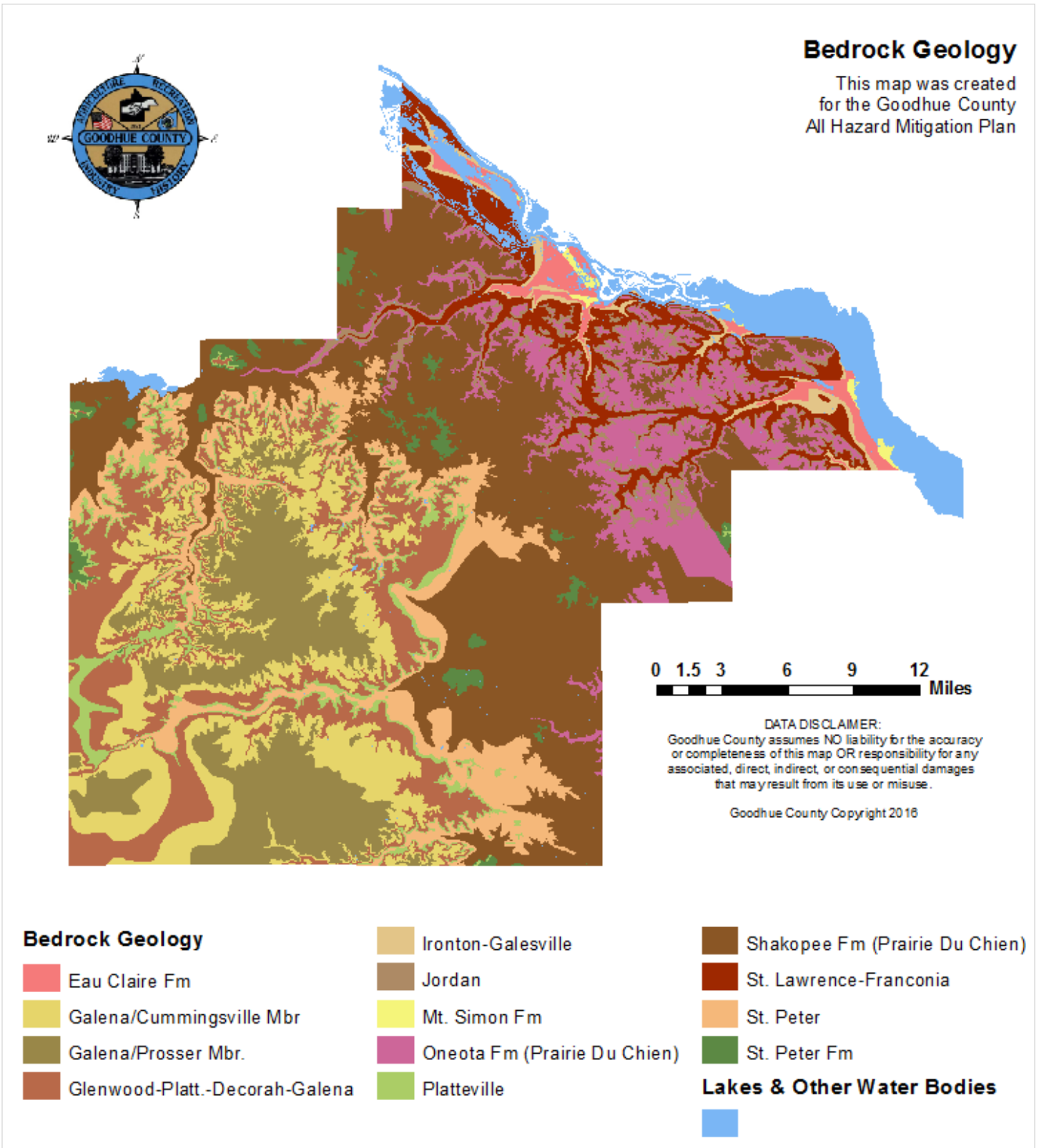
The surface of Goodhue County is mostly prairie, but it changes to bluffs along the streams, especially towards the Mississippi River. The surface drainage all reaches the Mississippi River and takes an easterly or northeasterly course along elevations varying from 1,250 feet at Kenyon to 665 feet at Lake Pepin. The chief tributary streams of the Mississippi River in this county are the Cannon River with its southern arm, the Little Cannon; Prairie Creek; the north and middle branches of the Zumbro; and Belle Creek, which is another branch of the Cannon. Spring, Hay, Bullard's, and Wells Creeks, although not large streams, are important features in forming the topography of the county. Besides these streams, the Vermillion River, after draining a large part of the county to the west, separates Prairie Island from the main land. The island formed contains the only natural lakes in the county.



Map 4. Land Cover in Goodhue County ⁷

Geology

Bedrock is consolidated sandstone, limestone and shale that lies beneath a thin cover of unconsolidated surficial deposits, or is exposed on the steep bluffs along the Mississippi River and its tributaries, in rock quarries and along road cuts in Goodhue County. The bedrock units known as the St. Peter Sandstone, Prairie du Chien Group, and underlying Jordan Sandstone, are of particular importance because they provide much of the drinking water to the county.

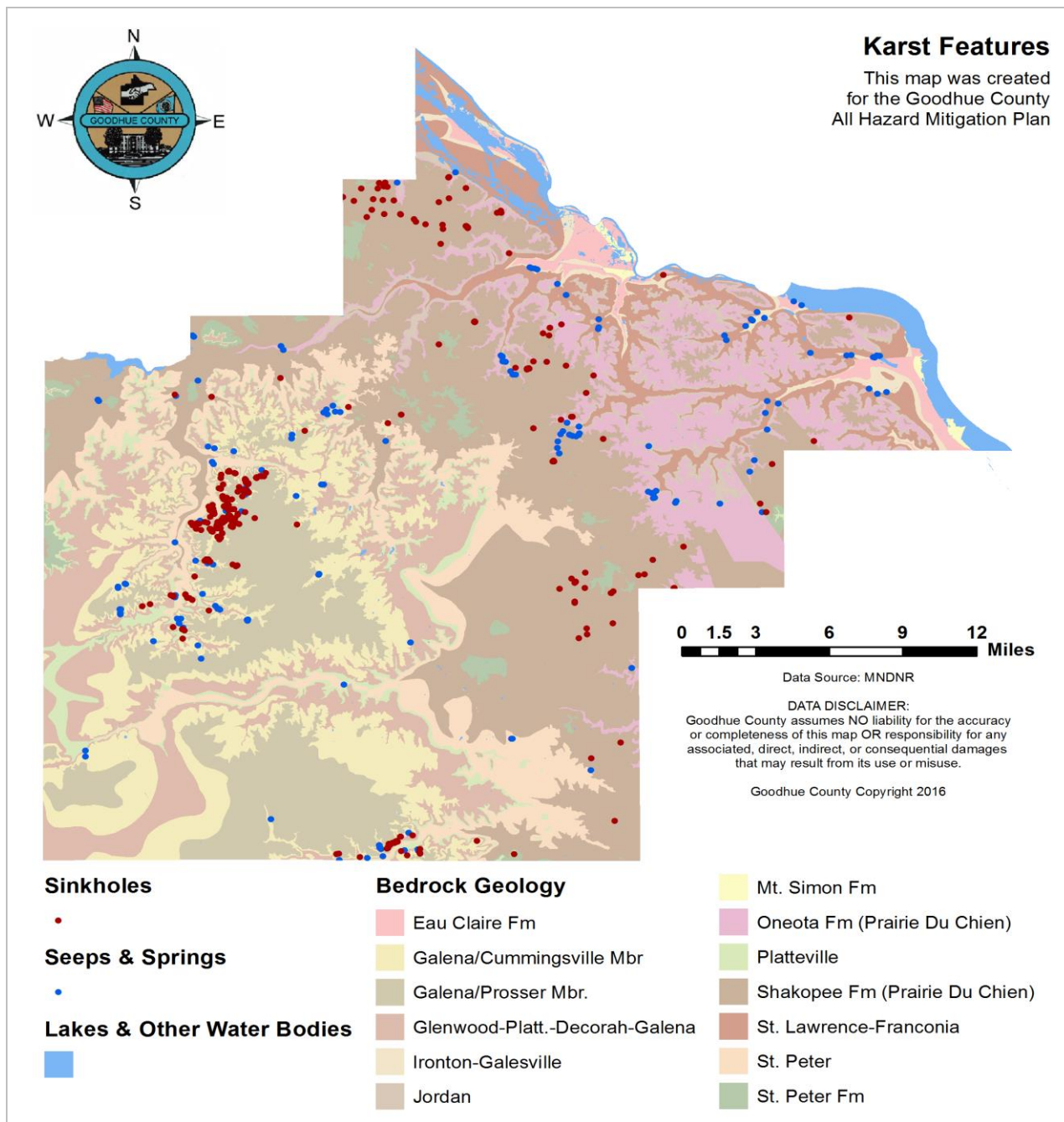


Map 5. Bedrock Geology in Goodhue County ⁸

Karst

Much of the landscape in Goodhue County is underlain by karstified bedrock. Karst is defined as “[a]n efficiently drained landscape that forms on soluble rock, typified by caves, sinkholes and other landforms.”⁹ It is mainly but not exclusively, formed on limestone. Significant sinkhole areas have been mapped in those areas where Galena limestone is the first bedrock unit. In these areas, rapid transport of surface flow to the ground water is likely occurring. Sinkholes are also found in those parts of the County where the St. Peter and Prairie

du Chien formations are the first bedrock. Known karst features in Goodhue County include 160 seeps and springs and 376 sinkholes. Much of the County is underlain by active karst as shown on the maps below, which contributes to the scenic variety of the areas.

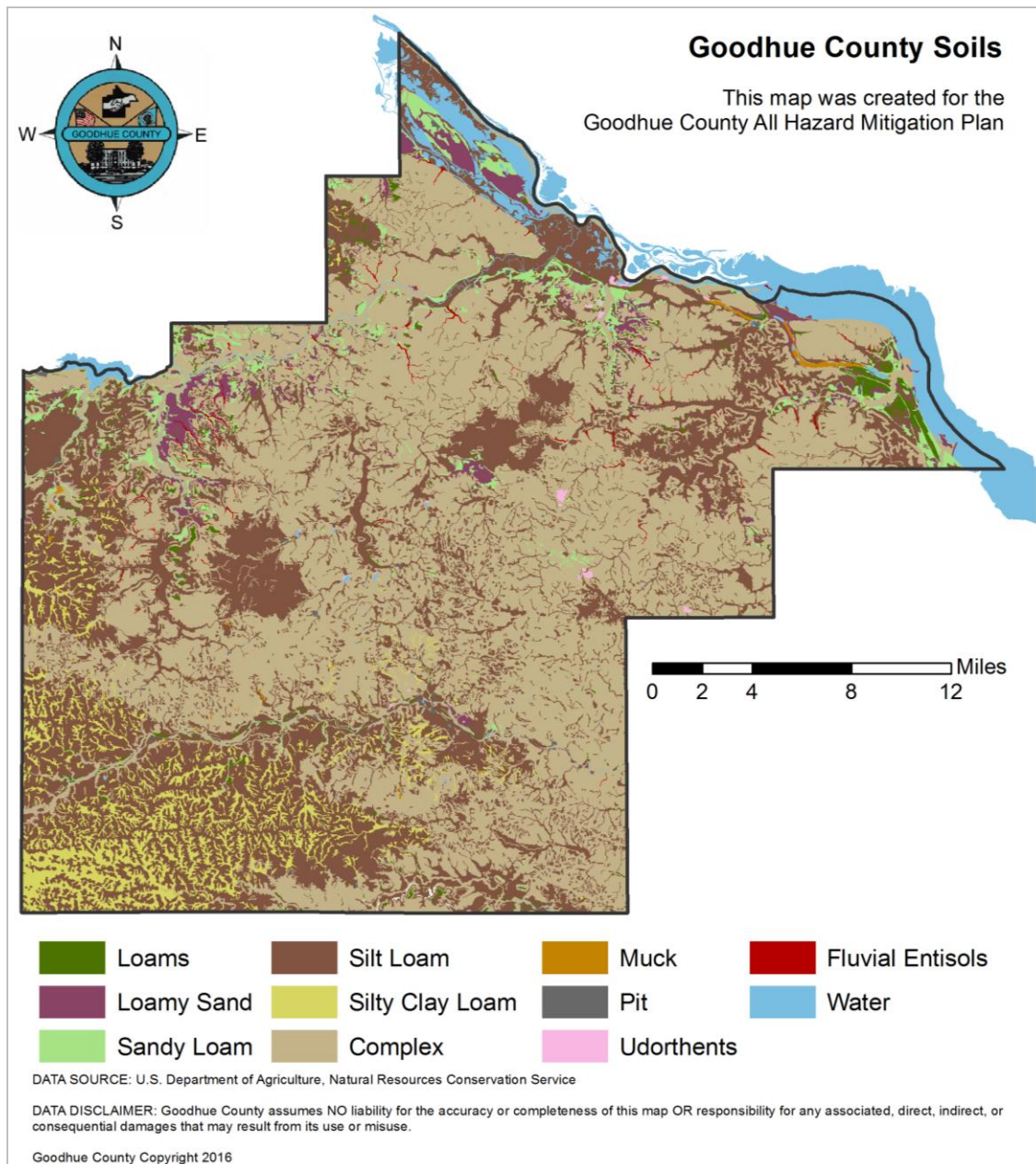


Map 6. Karst Features

Soils

Goodhue County's soil is based on clay subsoil in all places except on the terrace plains that skirt the main streams. This clay is generally fine and loamy, but in the high prairies of the western towns it is mingled with some pebbles. No matter how frequent the stones are on the surface or in the immediate subsoil, the real soil, which sustains the annual crops of the farmers, is invariably of fine grain that is usually black and is from a few inches to several feet thick. Stones in the subsoil appear in the western part of the county but gradually disappear towards the east, and they are wholly wanting in the extreme eastern part of the county. The subsoil clay, which, in the western towns seems to be a true till at no great depth, passes through an intermediate,

pebbly stage in the central part of the county and is gradually replaced by the loess-loam clay. This fine, yellowish loam, which sometimes is compact clay, constitutes the subsoil in the rolling towns of the eastern tiers. The following soil map lists the major soil types found in Goodhue County. More information regarding Goodhue County soils can be found in the Goodhue County Soil Survey Manuscript.¹⁰



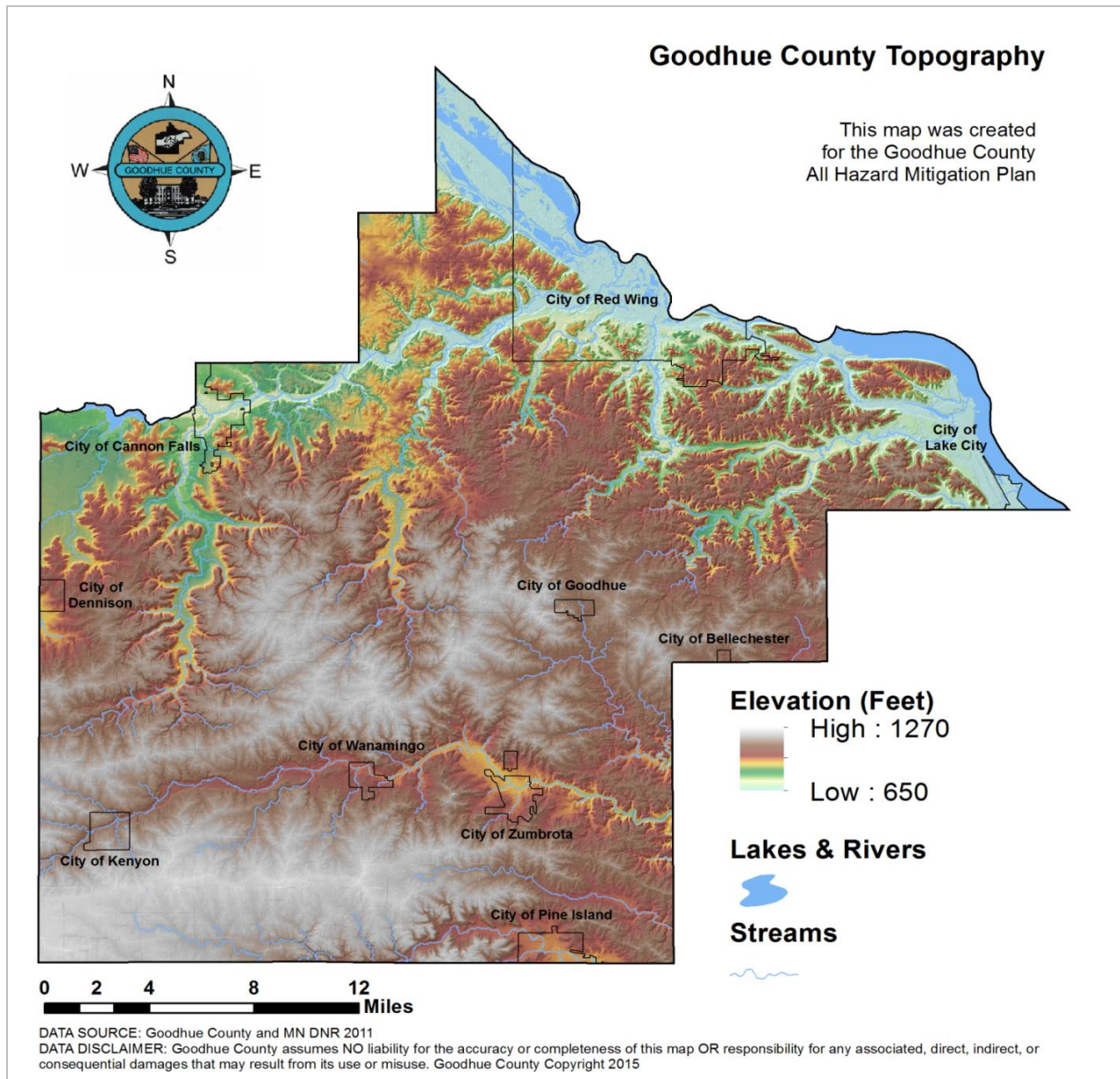
Map 7. Goodhue County Soils

Topography

Two very different topographic settings are present in Goodhue County. Steep, forested bluffs represent the eastern portion of the County with stream-cut river valleys. The western portion of the County is characterized by gentle, rolling hills with extensive cropland. The topographic elevation in Goodhue County ranges from 650 feet above sea level along the Mississippi River to 1270 feet above sea level in the center of the County for a relief of 620 feet.

A prominent feature of the landscape in this region is Barn Bluff which is close to the Mississippi River at Red Wing. The name is a translation of "La Grange", a designation given by the French because of its appearance.

The promontory is a lone, high, and nearly level-crested bluff which is quite separated from the side bluffs of the valley and conspicuously seen for many miles up and down the river.

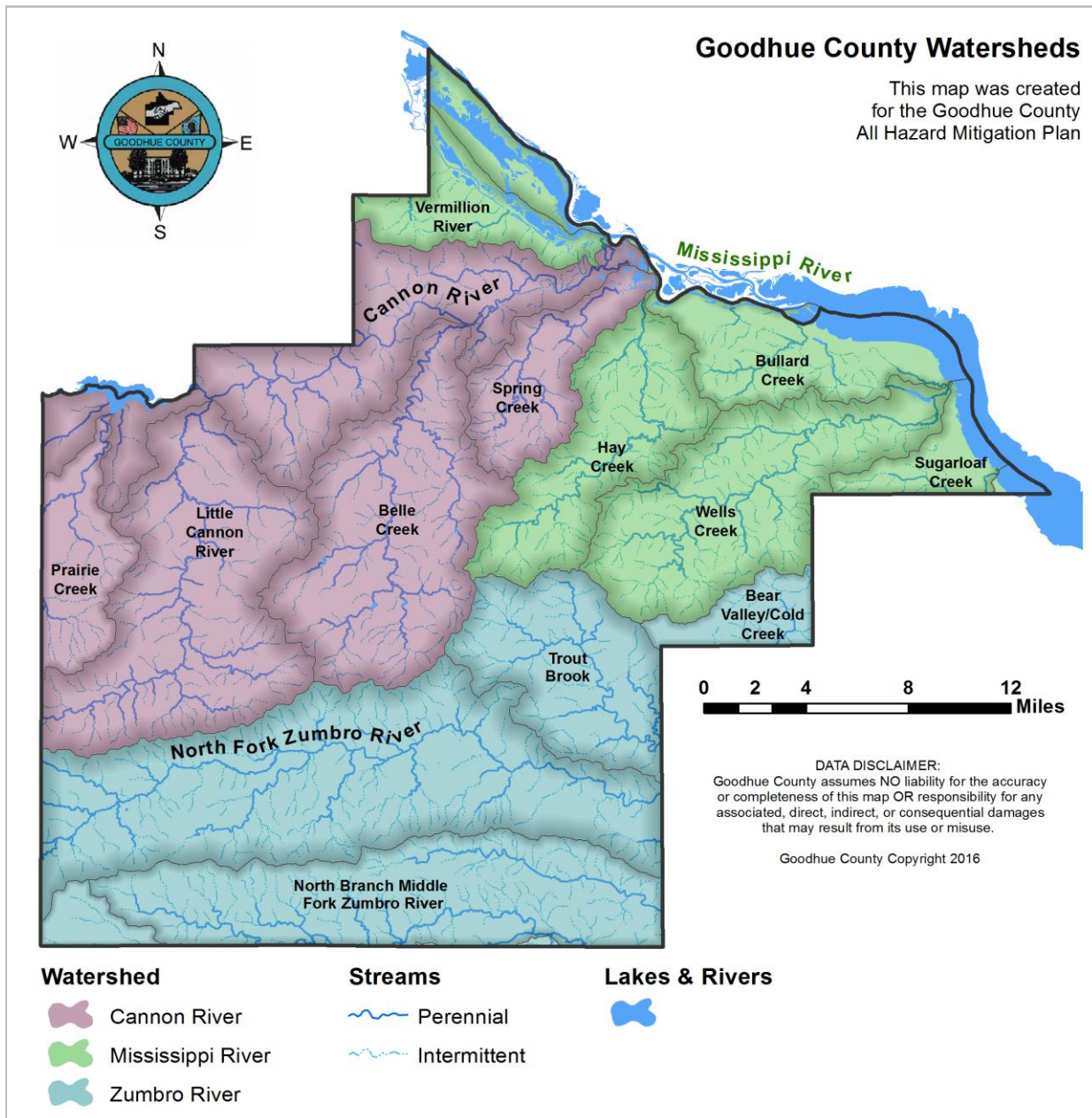


Map 8. Goodhue County Topography ¹¹

Hydrology

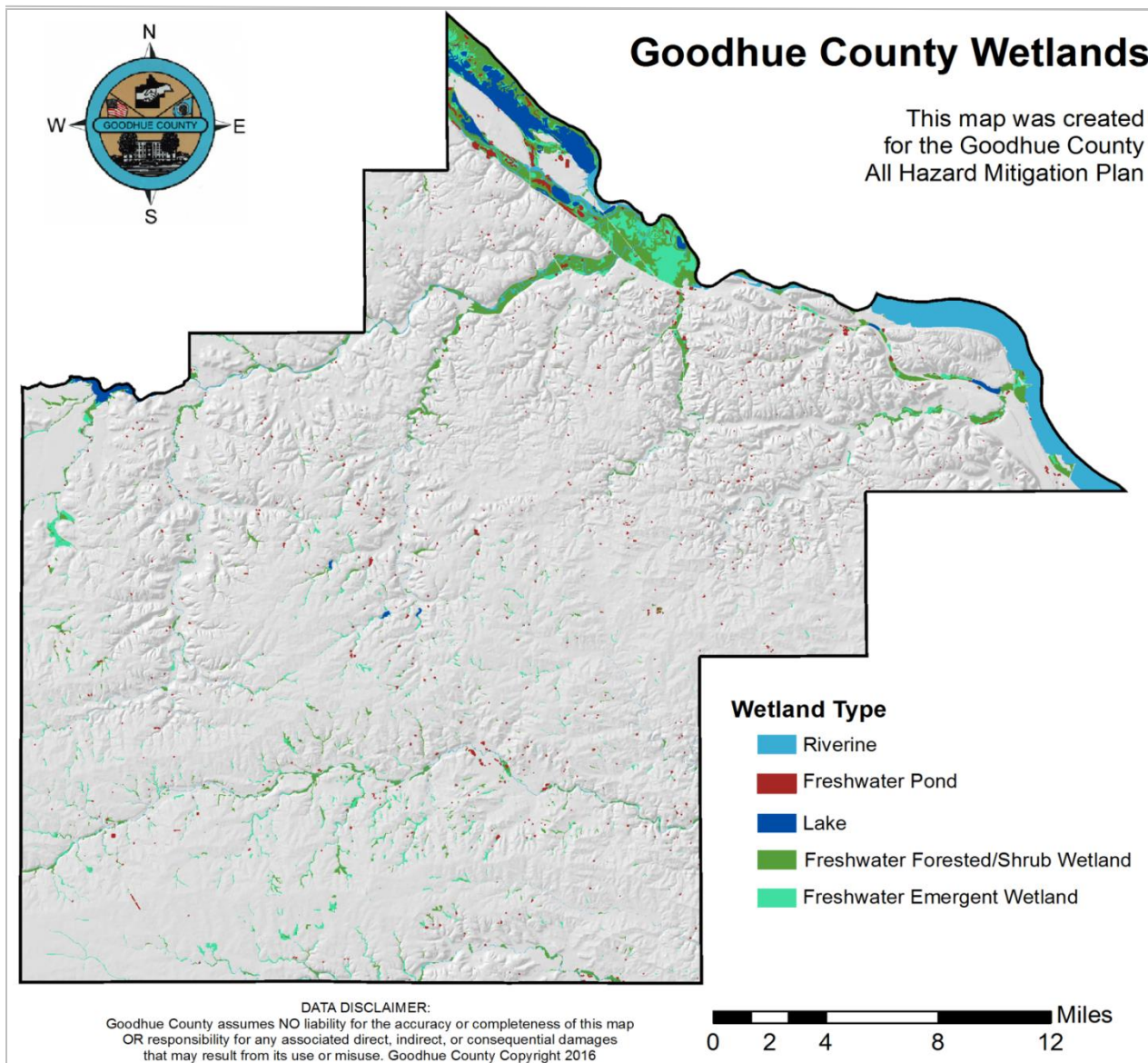
There are three major watersheds in Goodhue County. They include the Mississippi River, Cannon River and Zumbro River. The Cannon and Zumbro Rivers eventually flow to the Mississippi River. Numerous tributaries flow into each of the rivers. The Zumbro River Watershed has its starting points in Dodge and Steele Counties. It extends into Wabasha and Olmsted Counties to the southeast of the County. The major tributaries within Goodhue County are the North Fork of the Zumbro River, Trout Brook, and Mazeppa Creek.

The Cannon River Watershed begins in Rice County, flows into Le Sueur County and back to Rice County before entering Goodhue County from the north. Steele County contains the Straight River, one of the major tributaries to the Cannon River. The three major tributaries in Goodhue County are Belle Creek, Little Cannon River, and Prairie Creek.



Map 9. Goodhue County Watersheds

There are few wetlands in Goodhue County. Pockets of wetlands are common in the southern half of the County. A significant area of wetlands exists along the Mississippi River Valley. There are no natural lakes in Goodhue County. Lake Pepin and a number of other small lakes are part of the Mississippi River. Numerous perennial and intermittent streams go across the County.



Map 10. Goodhue County Wetlands

2.2 Demography

Goodhue County consists of the 21 townships, 10 cities, and one tribal community.

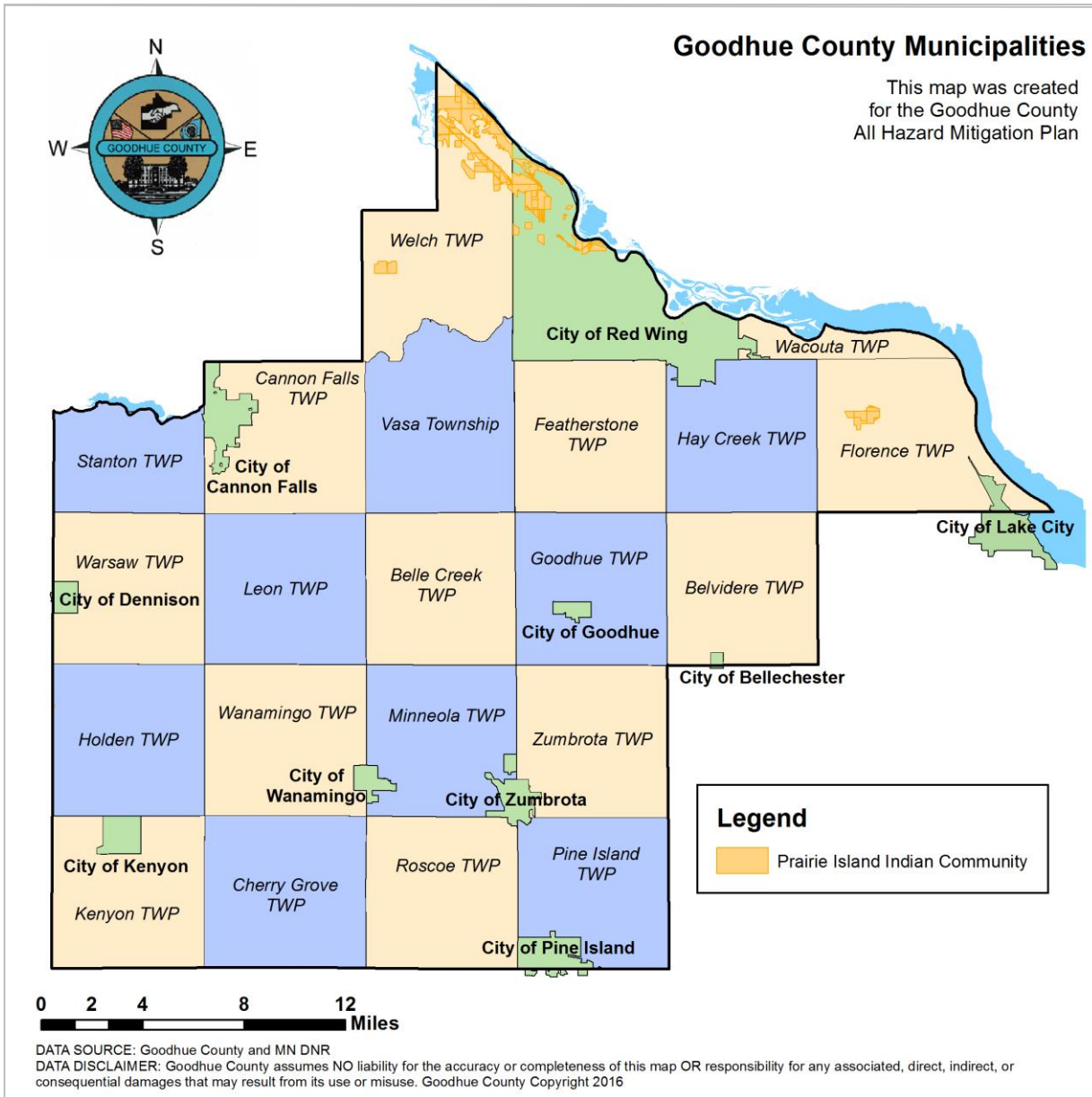
Townships

Belle Creek	Florence	Leon	Vasa	Zumbrota
Belvidere	Goodhue	Minneola	Wacouta	
Cannon Falls	Hay Creek	Pine Island	Wanamingo	
Cherry Grove	Holden	Roscoe	Warsaw	
Featherstone	Kenyon	Stanton	Welch	

Cities

Bellechester	Kenyon	Wanamingo
Cannon Falls	Lake City	Zumbrota
Dennison	Pine Island	
Goodhue	Red Wing	

Tribal Community
 Prairie Island Mdewakanton Sioux Indian Community



Map 11. Goodhue County Municipalities

Schools

The total 2014 enrollment by grade for Goodhue County is displayed in the table below:

Table 4. Goodhue County K12 Enrollment¹²

Grade	Kindergarten through Grade 12 Enrollment
KG	576
1 - 4	2,115
5 - 8	2,512
9 - 12	2,675

Total	7,878
--------------	--------------

Public Schools

Five school districts have their district offices in Goodhue County. The 2013-2014 enrollments of these districts are displayed in the table below:

Table 5. School Districts with District Office in Goodhue County¹³

School District Name	School District Number	Enrollment
Cannon Falls	0252	1,301
Goodhue	0253	666
Kenyon-Wanamingo	2172	887
Pine Island	0255	1,289
Red Wing	0256	3,308
Total Enrollment:		7,451

An additional seven school districts have their district offices in other counties, but their district includes portions of Goodhue County. The 2013-2014 enrollments of these districts are displayed in the table below:

Table 6. School Districts Including Portions of Goodhue County with District Office in Bordering County¹⁴

District Office County	School District Name	School District Number	Enrollment
Dakota	Hastings	0200	5,851
Dakota	Randolph	0195	359
Dodge	Triton	2125	1,471
Rice	Faribault	0656	5,895
Rice	Northfield	0659	3,974
Wabasha	Lake City	0813	1,243
Wabasha	Zumbrota-Mazeppa	2805	1,334
Total Enrollment:			20,127

Goodhue County is serviced by a total of 28 schools, 15 of which are public schools and the remaining 13 private. Within the Goodhue County school districts there are 5 elementary schools, 3 middle schools, 4 high schools, and 3 alternative schools.

Private Schools

Minnesota State College - Southeast Technical in Red Wing serves the adult population with technical and professional degree programs. There are also several other private schools that educate the population of Goodhue County. These schools educate not only traditional students but also serve as centers of continuing education

The list of schools within the county is as follows:

Cannon Falls

- Cannon Falls Elementary
- Cannon Falls Middle/High School

Cannon Falls Alternative Learning Center

- St Paul's Lutheran School
- Goodhue

Goodhue Elementary
Goodhue Secondary

Kenyon Wanamingo Schools

Kenyon Wanamingo Elementary School
Kenyon Wanamingo Middle/High School

Pine Island

Pine Island Elementary
Pine Island Secondary

Zumbrota

Zumbrota Mazeppa Elementary
Zumbrota Mazeppa Middle School
Zumbrota Mazeppa High School
Christ Lutheran School

Red Wing

Burnside Elementary
Sunny Side Elementary
Tower View Alternative
River Bluff Education Center
Red Wing High School
Twin Bluff Middle School
St Johns Elementary School
Colvill Family Center
St Joseph's Catholic School
SE MN Technical College

2.2 Infrastructure

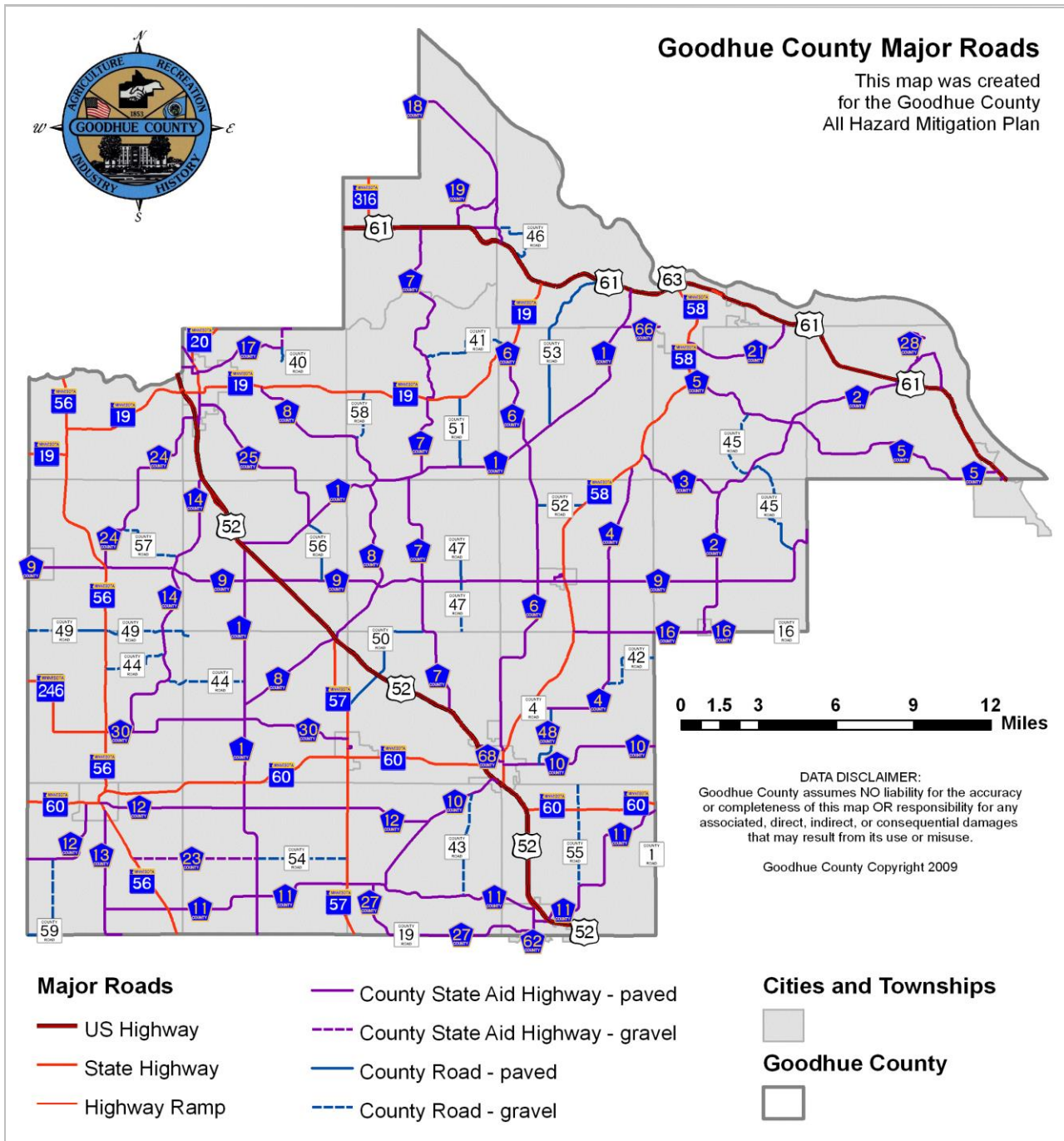
Roads and Bridges

The primary means of transportation in Goodhue County are the roads. The main routes connecting Goodhue County with the surrounding areas are US Highway 61 and US Highway 52. Other major routes connecting places both inside and outside of the county include State Highways 19, 56, 57, 58, and 60.

U.S. Highway 52 is of particular importance, serving as a main artery between the Twin Cities Metro Area and Rochester. The county, township and city authorities are responsible for the majority of the roads in the county. There are 820 miles of township roads that are maintained by the individual townships. Goodhue County Public Works is responsible for 304 miles of County State Aid Highways, 21 miles of Municipal State Aid Highways and 75 miles of County Roads. The Minnesota Department of Transportation (Mn/DOT) is responsible for the 177 miles of state and federal highways that run through the county.

Reflective of the number of rivers and streams that cross the county, there are 571 bridges. These documented bridges are ten feet or more and are maintained by Goodhue County Public Works. There are also an undocumented number of small bridges less than ten feet in length, which include culverts and cattle gates.

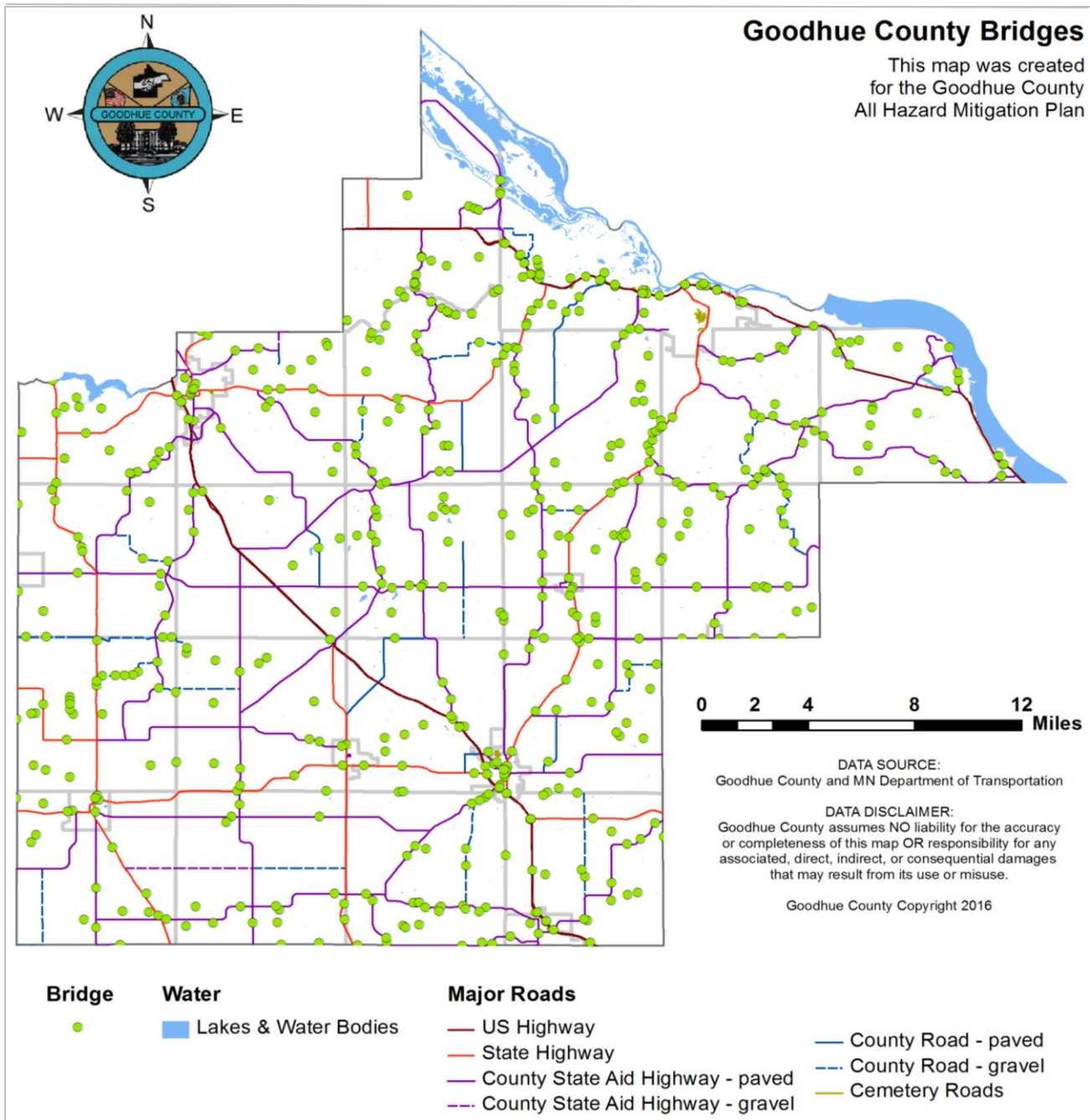
There are also many recreational paths for recreational use throughout the county. Of particular note is the Cannon Valley Trail that runs from the City of Cannon Falls to the Mississippi River, just north of Red Wing.



Map 12. Goodhue County Major Roads

Air and Rail

Goodhue County is served by two airstrips. The Red Wing Municipal Airport is located north of the City of Red Wing in Wisconsin and is the only paved airstrip in the county. The second airstrip is located in Stanton Township, serving smaller aircraft.



Map 13. Goodhue County Bridges

Within Goodhue County there are two railroads. The main railroad line passes the county along Highway 61 and the Mississippi River. This railroad is owned and operated by Union Pacific and stretches 29.7 mi. The other section of railroad track, stretching 1.4 miles and owned by Canadian Pacific Railroad, is present in Cannon Falls. The Amtrak Empire Builder Route passes through Goodhue County, stopping twice each day at Red Wing for passengers.

Communications

Television, Radio, Newspapers

Goodhue County is served by several different communications companies. The county receives television broadcast from the main networks that serve the Twin Cities Metro Area. There are no television broadcasting stations associated with the County. Radio broadcasts are also picked up from the Twin Cities Metro Area. In addition, the area is served by several local radio stations including the following:

Table 7. Radio Stations in Goodhue County

Station	Frequency	Location
KCUE	AM 1250	Red Wing
KLCH	FM 94.9	Lake City
KMFX	FM 102.5	Lake City
KWNG	FM 106	Red Wing

There are five publishing companies that print the following local papers for communities in Goodhue County:

Table 8. Local Newspapers

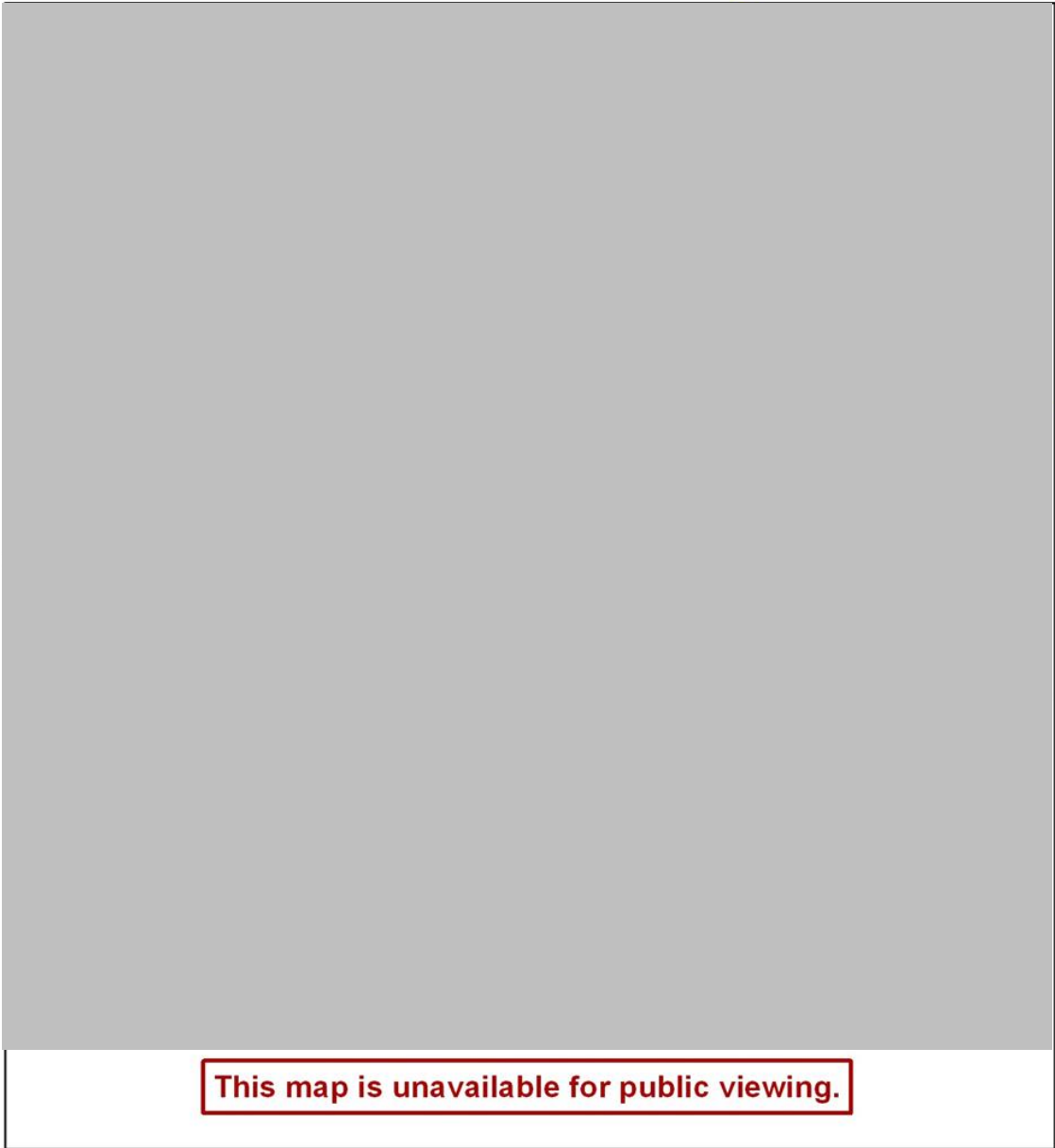
Newspaper	Coverage
Cannon Falls Beacon	Cannon Falls Area
Kenyon Leader	Kenyon Area
Red Wing Republican Eagle	Red Wing Area
The Graphic	Lake City Area
Zumbrota News Record	Zumbrota Area

In the event of severe weather or other emergency situation, various media sources are part of the Emergency Alert System (EAS) that broadcast emergency information for their listening areas. The following television and radio stations are part of the EAS that cover Goodhue County.

Media	Station	Location
Television	KTTC	Rochester
	KAAL	Austin
	KARE	Minneapolis
	WCCO	Minneapolis
	KSTP	St. Paul
FM Radio	KWWK	Rochester
	KNXR	Rochester
	Fox	Rochester
AM Radio	WCCO	Minneapolis
	KDHL	Faribault
	KCUE	Red Wing
	KWEB	Rochester
	KROC	Rochester
	KSTP	St. Paul
	KOLM	Rochester

Telecommunications

There are roughly 38 cellular towers in the county and the surrounding area. These towers are owned and operated by local, national and federal agencies. There are also many towers for other various uses such as AM and FM radio.



Map 14. Goodhue County Communication Towers

Electricity

Multiple agencies provide electrical services to residents within Goodhue County:

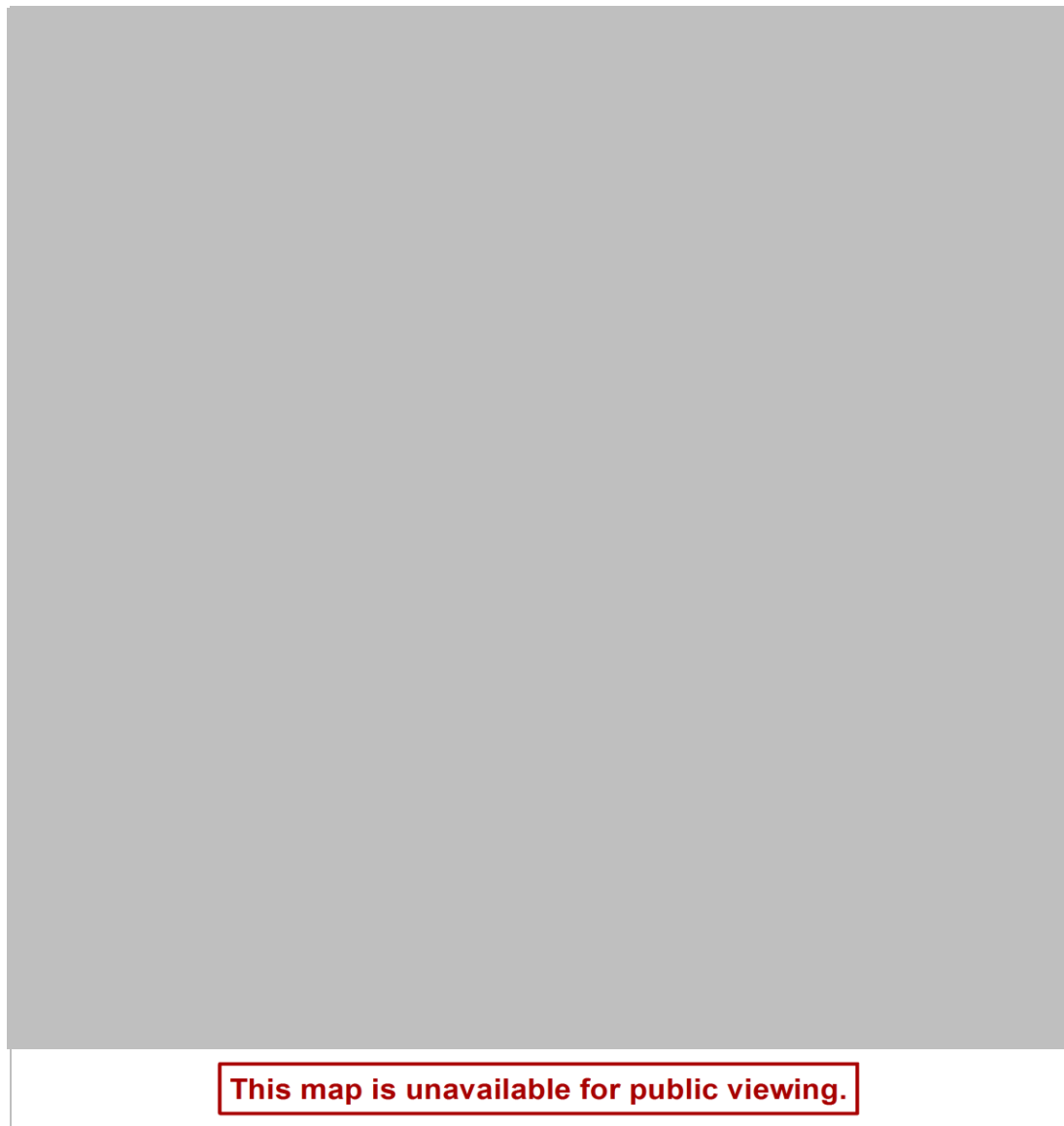
- Dakota Electric Association
- Goodhue County Electric Cooperative
- People’s Energy Cooperative
- Xcel Energy
- Lake City Utility Services
- Steele-Waseca Cooperative Electric

Natural Gas

Multiple agencies provide natural gas services to residents within Goodhue County:

- Xcel Energy
- Goodhue Gas
- Minnesota Energy Resources Corporation
- Center Point Energy
- Goodhue Gas Commission

Dakota Electric Association, Goodhue County Cooperative Electric, People’s Cooperative Services, and Steele-Waseca Cooperative electric are all cooperatives. There are also two municipality-owned utility companies in Goodhue County – Goodhue Gas and Lake City Utility Services.



Map 15. Goodhue County Infrastructure¹⁵

2.3 Demography

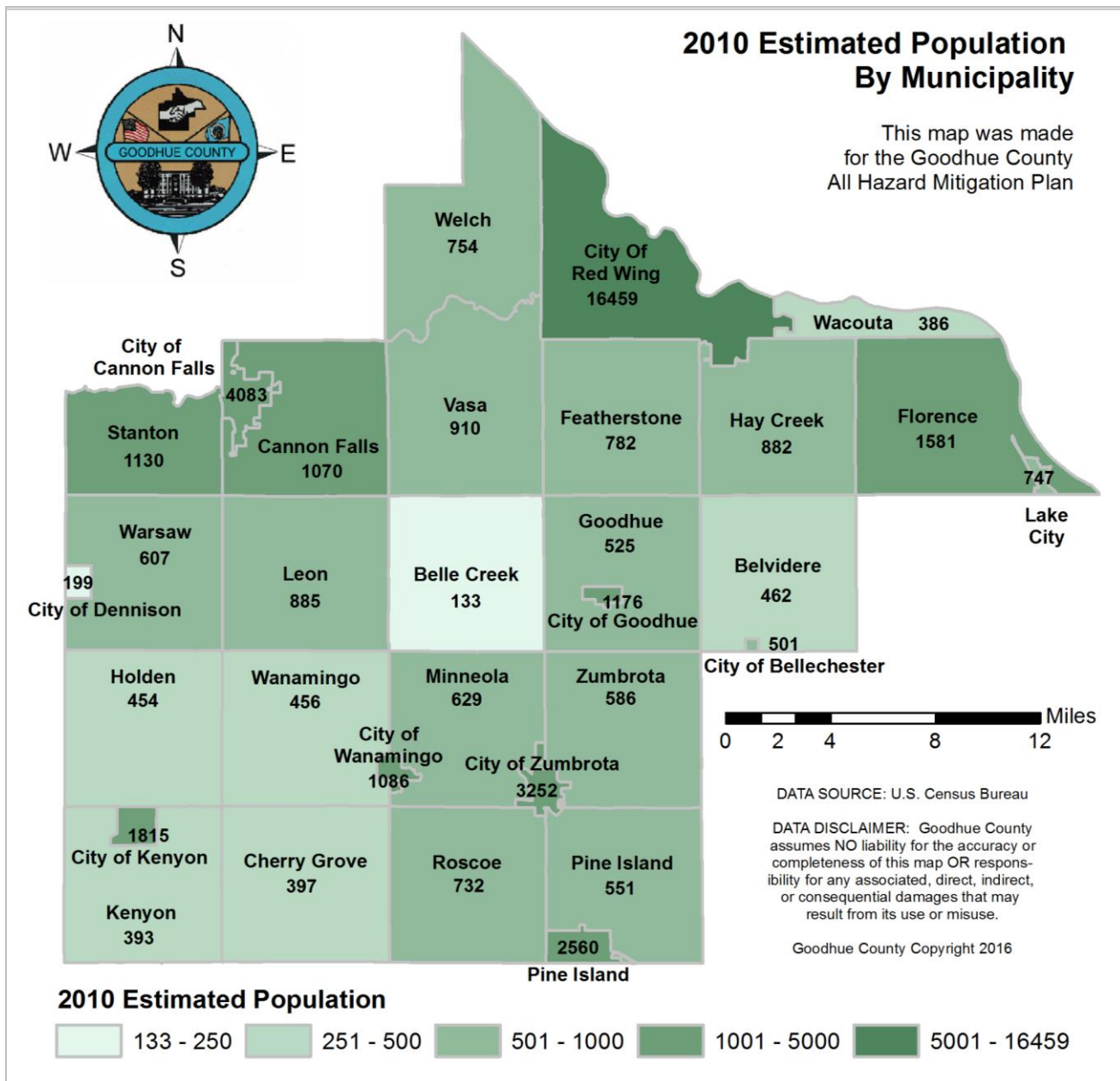
Population Statistics

The following is an overview of Goodhue County demographics. More detailed information follows.

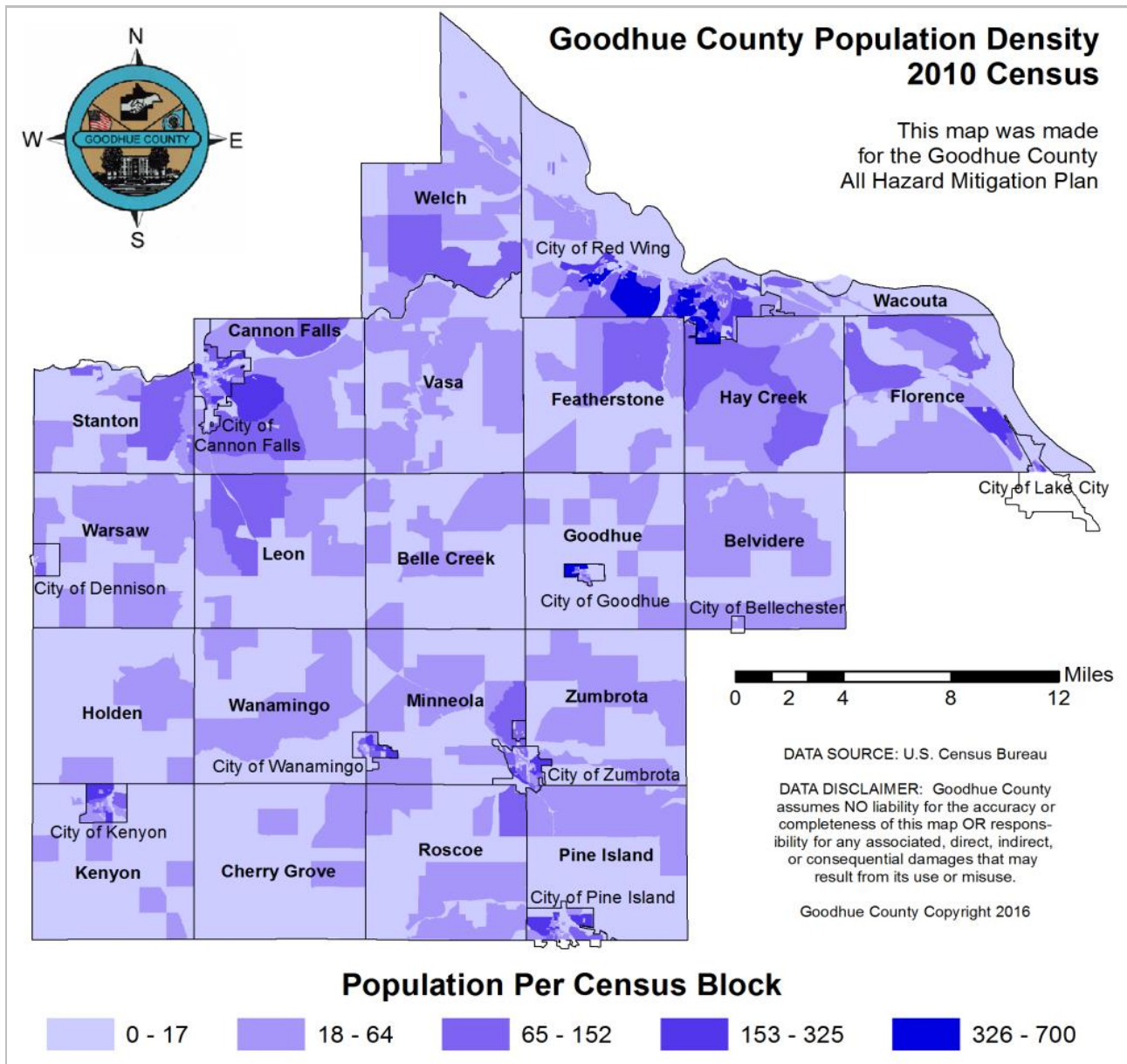
Table 9. Overview of Goodhue County¹⁶

Population	
2014 Population estimate	46,423
2010 Population	46,183
2000 Population	44,127
1990 Population	40,690
Percent change from 1990 population	12.4
2020 Population projection	52,150
2010 Total minority population	2,274
Urban population	24,604
Rural population	21,818
Median age	42
Population by Age	
Population under 18 years	10,683
Population 18 years and over	35,792
Population 65 years and over	8,588
Household	
Number of households	18,730
Number of families	12,689
Income	
1999 Median household income	\$57,229
1999 Median family income	\$73,215
Population below poverty level	4,738
Percent of population below poverty level	10.4
Housing	
Number of housing units	20,316
Number of owner-occupied housing units	14,264
Number of renter-occupied housing units	4,150
Median housing value	\$179,900
Median contract rent	\$708
Average travel time to work (minutes)	18.6

As of Census 2014, there were 46,423 people residing in Goodhue County. Over two-thirds of the population resided in one of the ten cities in the County. Red Wing, the largest urban area and the county seat, is where over one-third (35.5%) of the population resided.



Map 16. Goodhue County Estimated Population by Municipality¹⁷



Map 17. Goodhue County Population Density Per Census Block¹⁸

Population Distribution

The population is dominated by two age groups as reported by the 2014 Census. These two groups: middle-aged adults between the ages of 45 and 59 and children between the ages of 10 and 19. These age groups will continue to dominate the population as the community ages over the next several years. From the shape of the population pyramid, we are currently entering a significant shift in the population. There will be a significant increase of population in the older age groups. As the older population grows, there will be more jobs for care-givers of all types. At the same time, the population of the working age group has also increased.

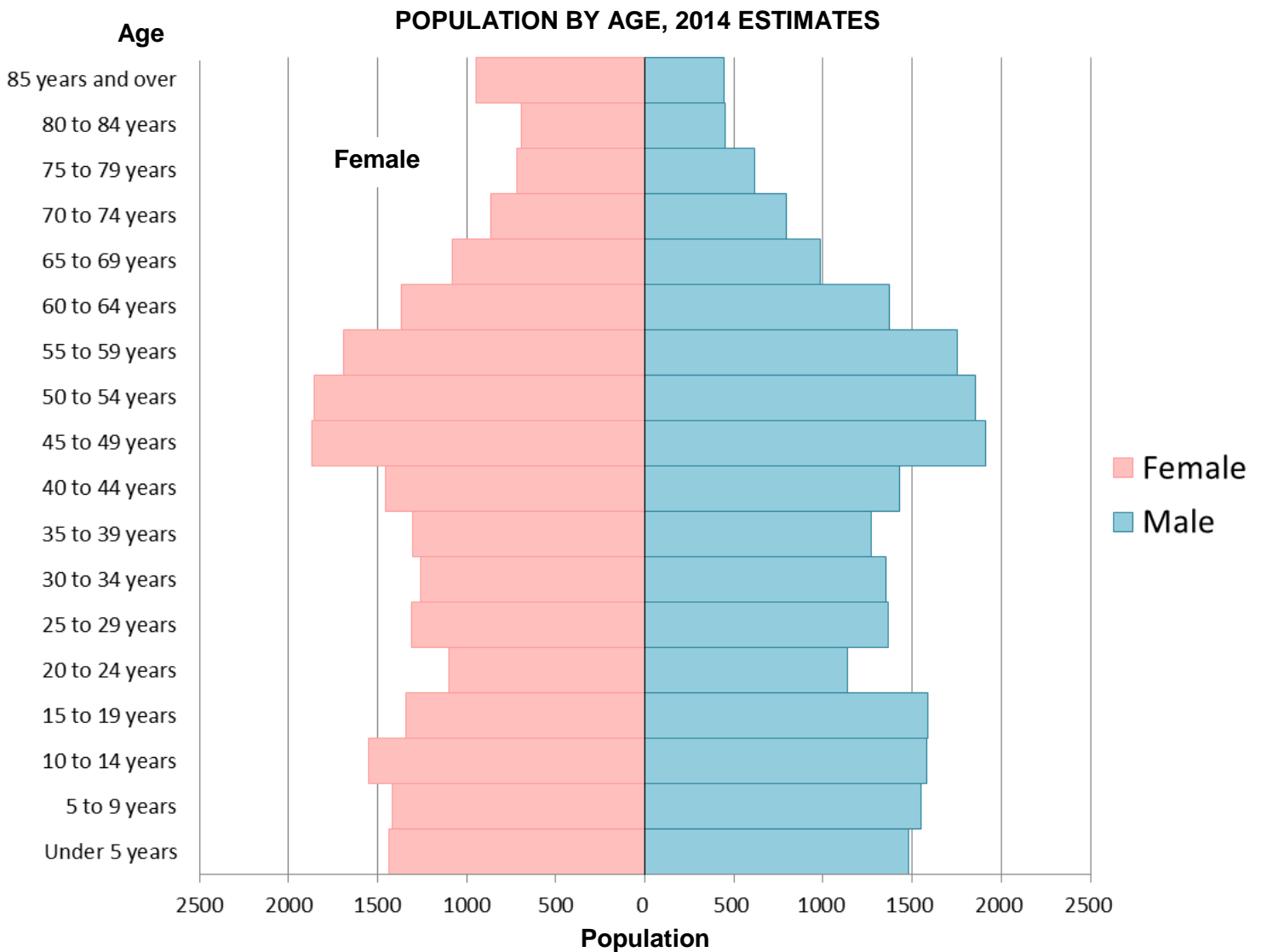
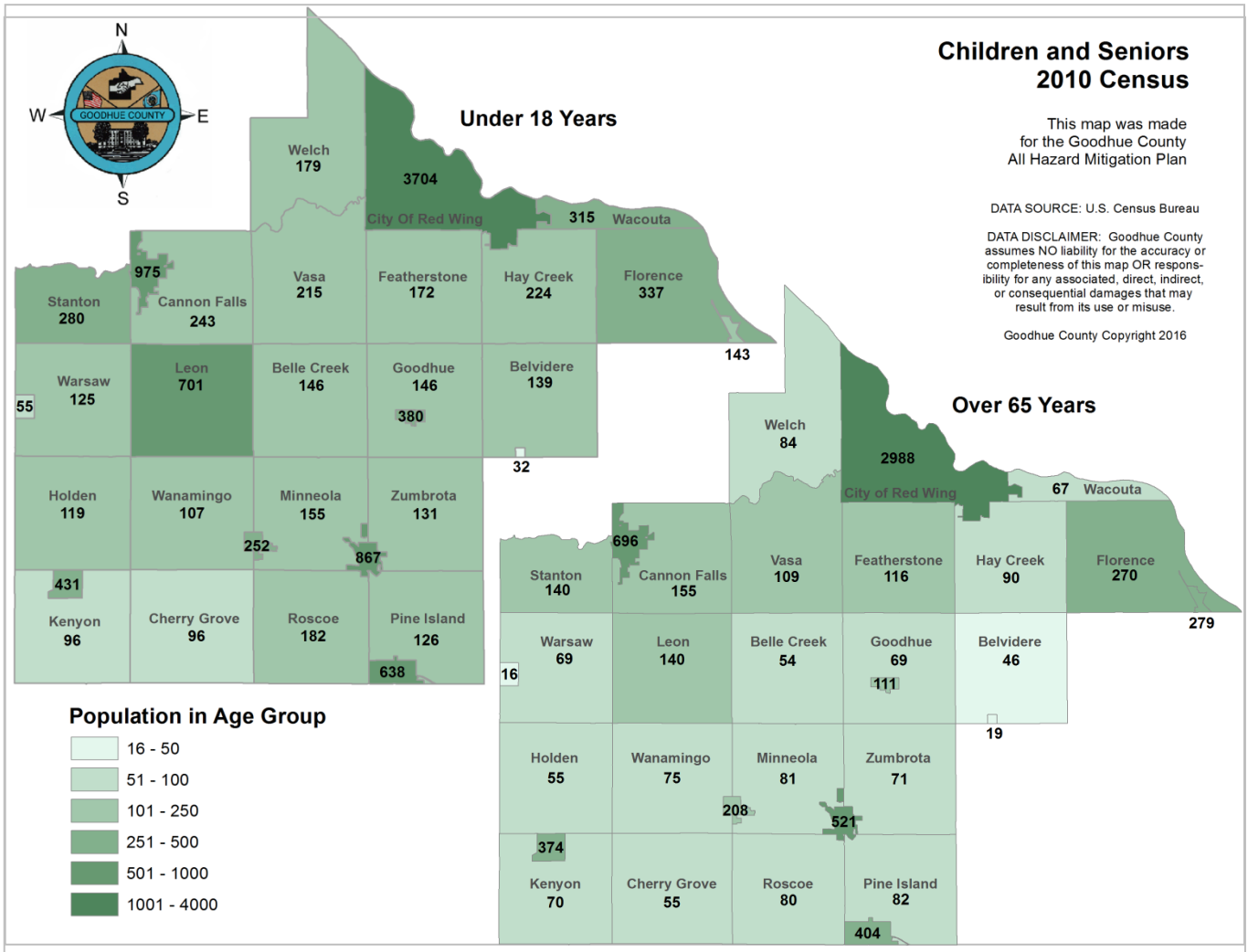


Figure 5. Population Distribution by Age for Goodhue County, 2014 Census Estimates¹⁹

Children and Seniors

Children, the population under 18 years of age, make up 23% of the total population in Goodhue County. Most children live in the cities of the County. Over half (6,408) live in the cities of Red Wing, Cannon Falls, Zumbrota, and Pine Island.

Of the total population in Goodhue County, fifteen percent are seniors (age 65 and over). The largest concentration of the elderly (35%) is living within the city of Red Wing.



Map 18. Children and Seniors, 2010 Census²⁰

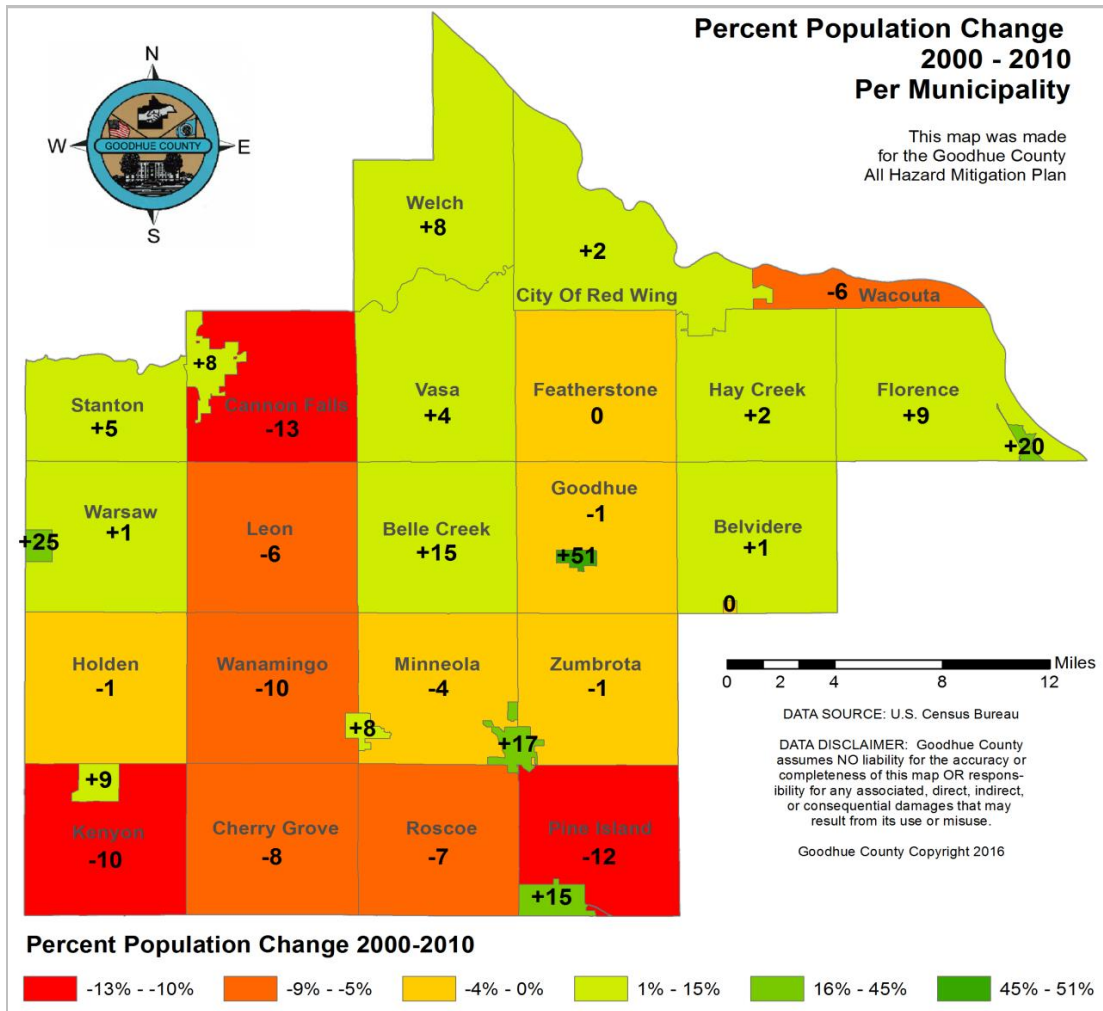
Change in Population Since 2000

Goodhue County’s population increased from 44,127 in 2000 to an estimated 46,423 in 2014, an increase of 5.2%. The largest increases were in the cities of Goodhue, Pine Island, Red Wing, and Zumbrota. Other areas with significant increases in population (greater than 15%) were Belle Creek Township and the cities of Dennison, Goodhue, Zumbrota, Pine Island, and Lake City. Only three townships (Pine Island, Goodhue, and Cannon Falls) decreased in population.

Future Growth

Goodhue County is a growing county. The increase in population seen since 1990 in Goodhue County as a whole is expected to continue into the future according to projections from the Minnesota State Demographic Center. Cities and townships along the two highway corridors, US Highway 61 and US

Highway 52, are seeing most of this growth. The overall growth is expected to continue into the future, increasing the population another 7% by 2016.



Map 18. Percent Population Change 2000-2010 ²¹

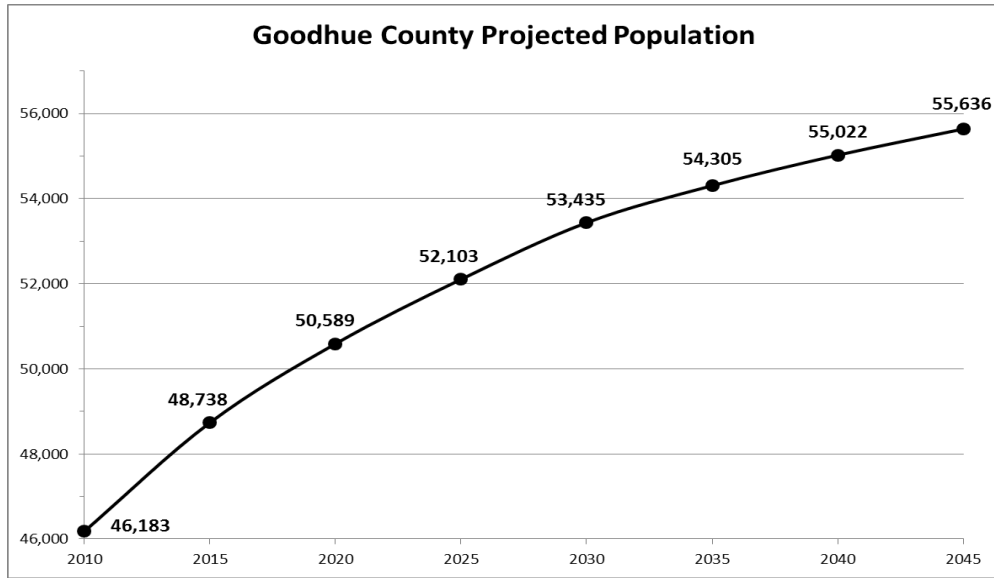
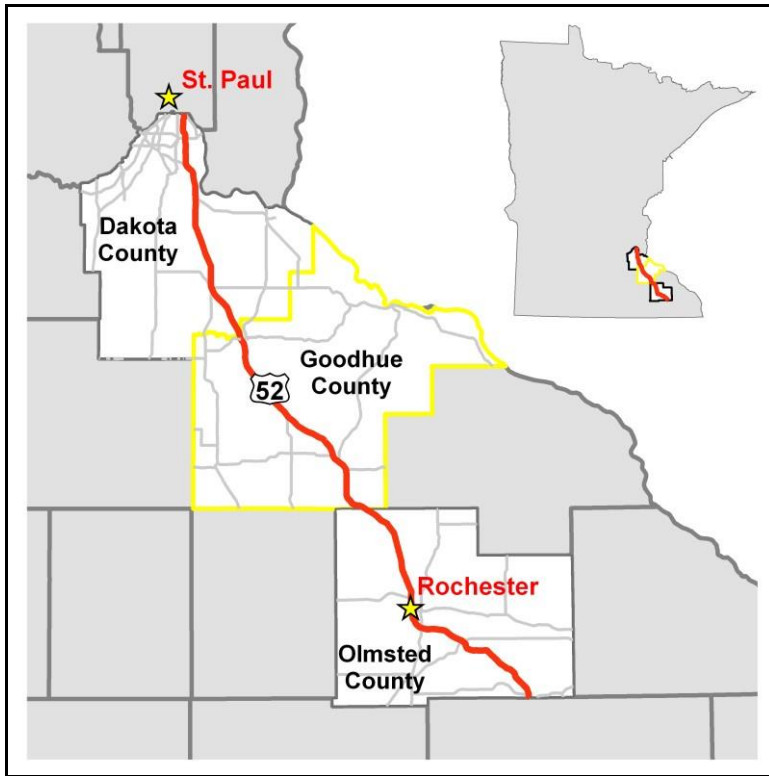


Figure 6. Goodhue County Projected Population²²



Map 20. Highway 52 Corridor

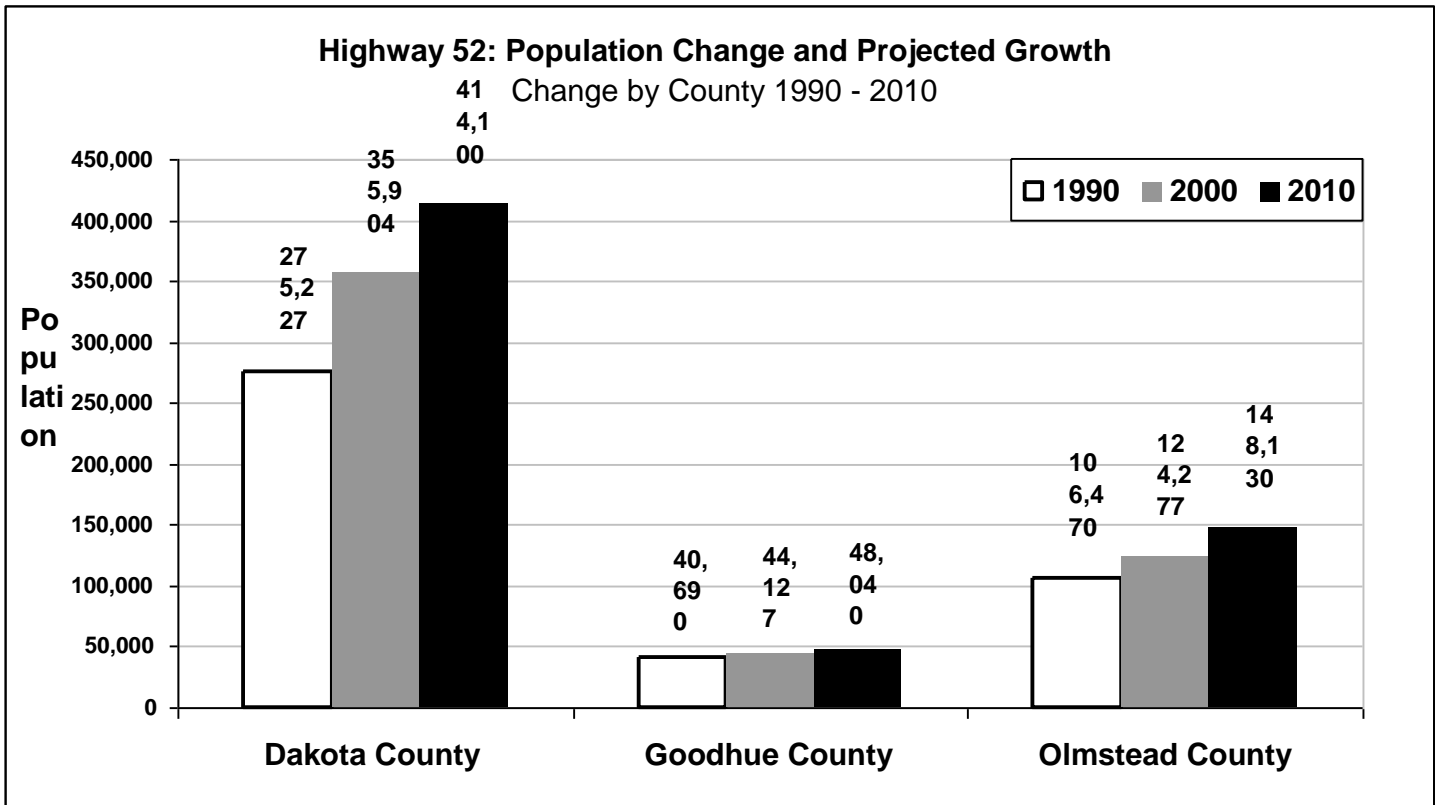
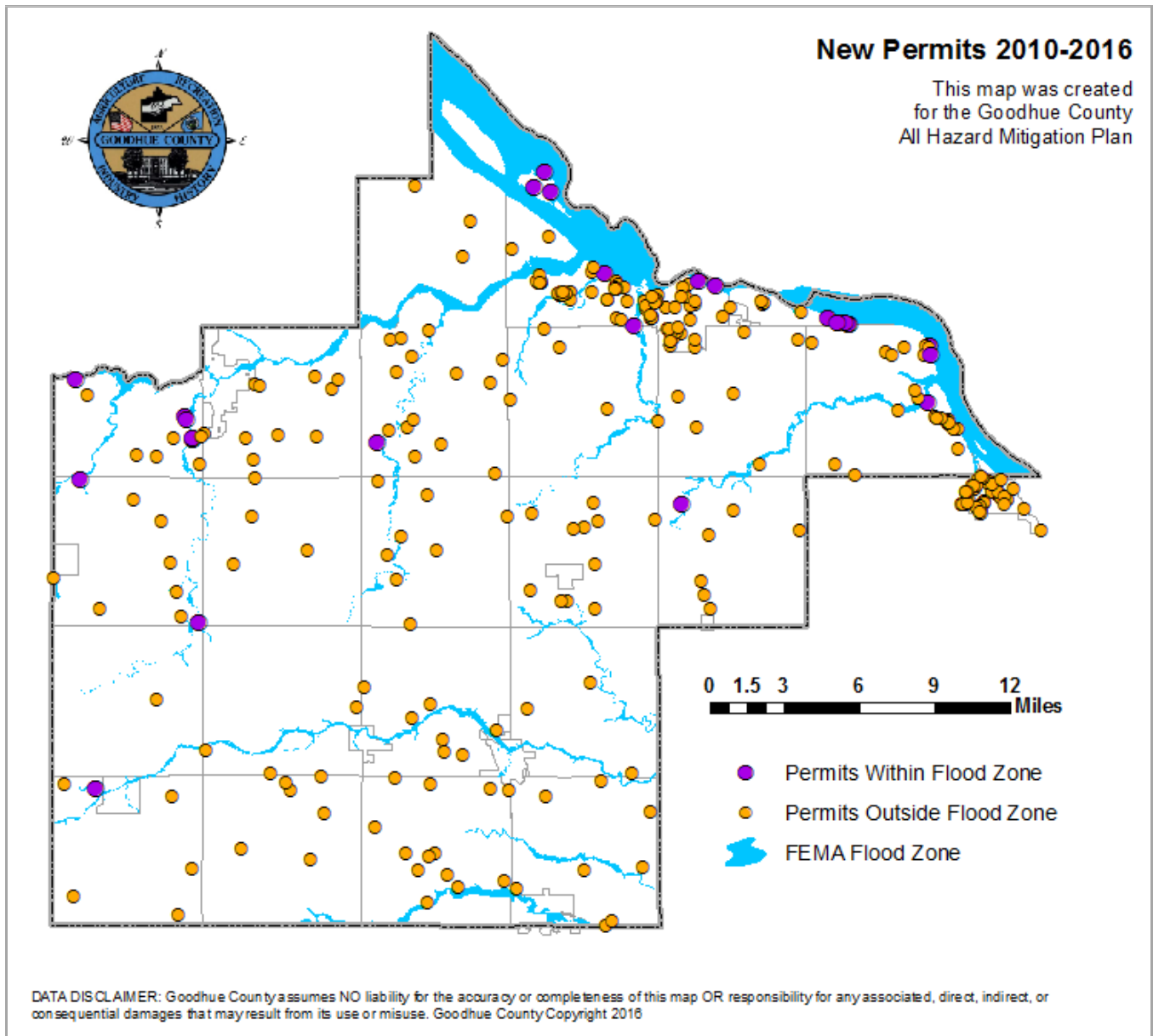


Figure 7. Highway 52 Population Change by County ²³

Changes in development that have occurred in hazard-prone areas show areas of jurisdictional vulnerability since the last plan update in 2010. The following map shows new permits since 2010 and whether they fall within FEMA flood zones. Jurisdictions with new permits which are vulnerable to flooding including City of Red Wing, Stanton Township, Warsaw Township, Vasa Township, Wacouta Township, Kenyon Township, Belvidere Township, and Florence Township.



Map 21. New Permits 2010-2016

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Section 3: Hazard Profiles

3.1 Natural Hazards

A. Flood

A flood is the overflowing of rivers, streams, and lakes due to excessive rainfall, storm surge, or rapid snowmelt.

Special Flood Hazard Areas (SFHA) are mapped by FEMA and the Minnesota Department of Resources through the National Flood Insurance Program (NFIP). The maps are used to determine what areas need flood insurance. The majority of areas of flooding have been identified by FEMA and mapped for floodplain management. The SFHA is commonly referred to as the 100 year floodplain, but this is a misleading term. The SFHA identifies areas that have a 1% chance of occurring annually. These areas may be flooded more than once every hundred years.

There are approximately 400 acres of land in the Special Flood Hazard Area in Goodhue County. A majority of the cities in Goodhue County are affected by the Special Flood Hazard Area: Red Wing, Lake City, City of Pine Island, City of Zumbrota, City of Wanamingo, City of Kenyon, City of Cannon Falls, and the City of Dennison. All of these cities, except the City of Dennison, are situated on a river. Outside of the urbanized areas of the county, the floodplain runs through forest, grassland and agricultural land. The entirety of Prairie Island lies within this floodplain area. This includes the nuclear power plant and the entire Prairie Island Indian Community.

FEMA Flood Zones¹

Moderate to Low Risk Areas: In communities that participate in the NFIP, flood insurance is available to all property owners and renters in these zones:

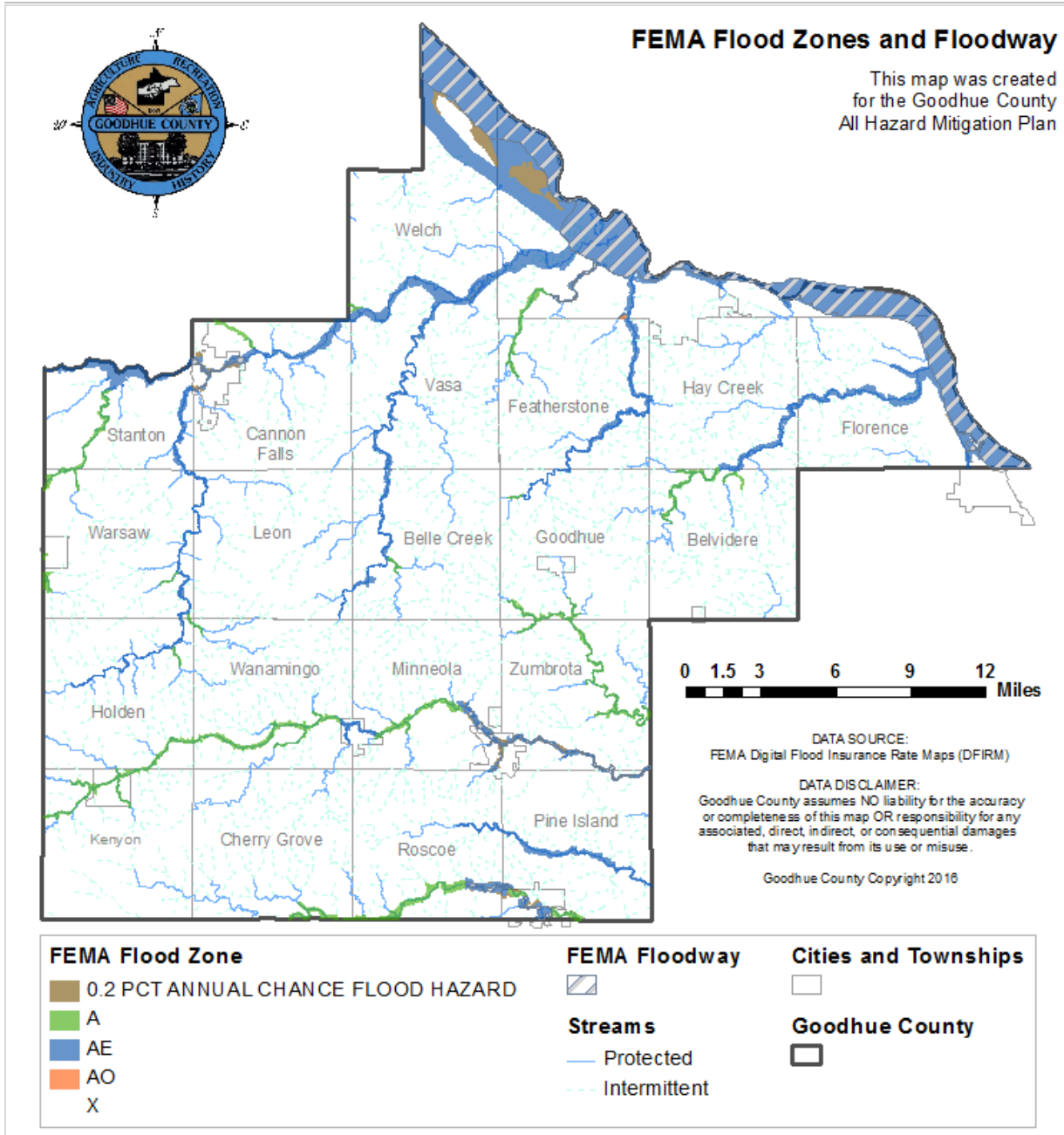
Zone	Description
B,C, and X	Areas outside the 1-percent annual chance floodplain, areas of 1% annual chance sheet flow flooding where average depths are less than 1 foot, areas of 1% annual chance stream flooding where the contributing drainage area is less than 1 square mile, or areas protected from the 1% annual chance flood by levees. No Base Flood Elevations or depths are shown within this zone. Insurance purchase is not required in these zones.

High Risk Areas: In communities that participate in the NFIP, mandatory flood insurance purchase requirements apply to all of these zones:

Zone	Description
A	Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones.

AE, A1-A30 Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. In most instances, base flood elevations derived from detailed analyses are shown at selected intervals within these zones.

AO River or stream flood hazard areas, and areas with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Average flood depths derived from detailed analyses are shown within these zones.



Map 22. FEMA Flood Zones and Floodway.

Major flooding in Minnesota took place in 1950, 1965, 1968, 1972, 1987, 1993, 1997, 2007, 2009, 2010, 2012, and 2014. These floods are considered among the most severe in Minnesota's history in terms of stream flow magnitude, extent of lands inundated, loss of life, and property damage. 2012 severe storms with heavy rain and straight line winds did damage to the entire southern part of the county. This was a 3-day event where storms kept pounding the county one right after another causing roads that had been temporarily repaired to be washed out a couple of more times.

The National Flood Insurance Program (NFIP) has three basic aspects: 1) Floodplain identification and mapping 2) Floodplain management 3) Flood insurance. Participation in the NFIP is based on an agreement between communities and FEMA.

Goodhue County enforces the Minnesota State Building Code. The Building Code sets minimum standards for the construction of buildings that minimize the effects of flooding. Code enforcement keeps flood damage claims to a minimum, thereby controlling insurance costs.

FEMA maintains Digital Flood Insurance Rate Maps (DFIRMs) for Goodhue County. These DFIRM maps and associated data were updates to the previous FEMA floodplain information for the county. The DFIRMs were created with assistance by Goodhue County through the Cooperating Technical Partners (CTP) program. The CTP is a three stage process and the County has completed all three phases. Now, the FEMA floodplain map more accurately identifies those areas which are prone to future flooding.

Goodhue County cities with potential flooding impacts include Cannon Falls, Red Wing, Lake City, Goodhue, Zumbrota, Kenyon, Wanamingo, and Pine Island. Townships with potential flooding impacts include Stanton, Warsaw, Holden, Kenyon, Cannon Falls, Leon, Wanamingo, Cherry Grove, Welch, Vasa, Belle Creek, Minneola, Roscoe, Featherstone, Goodhue, Zumbrota, Pine Island, Hay Creek, Belvidere, and Florence.

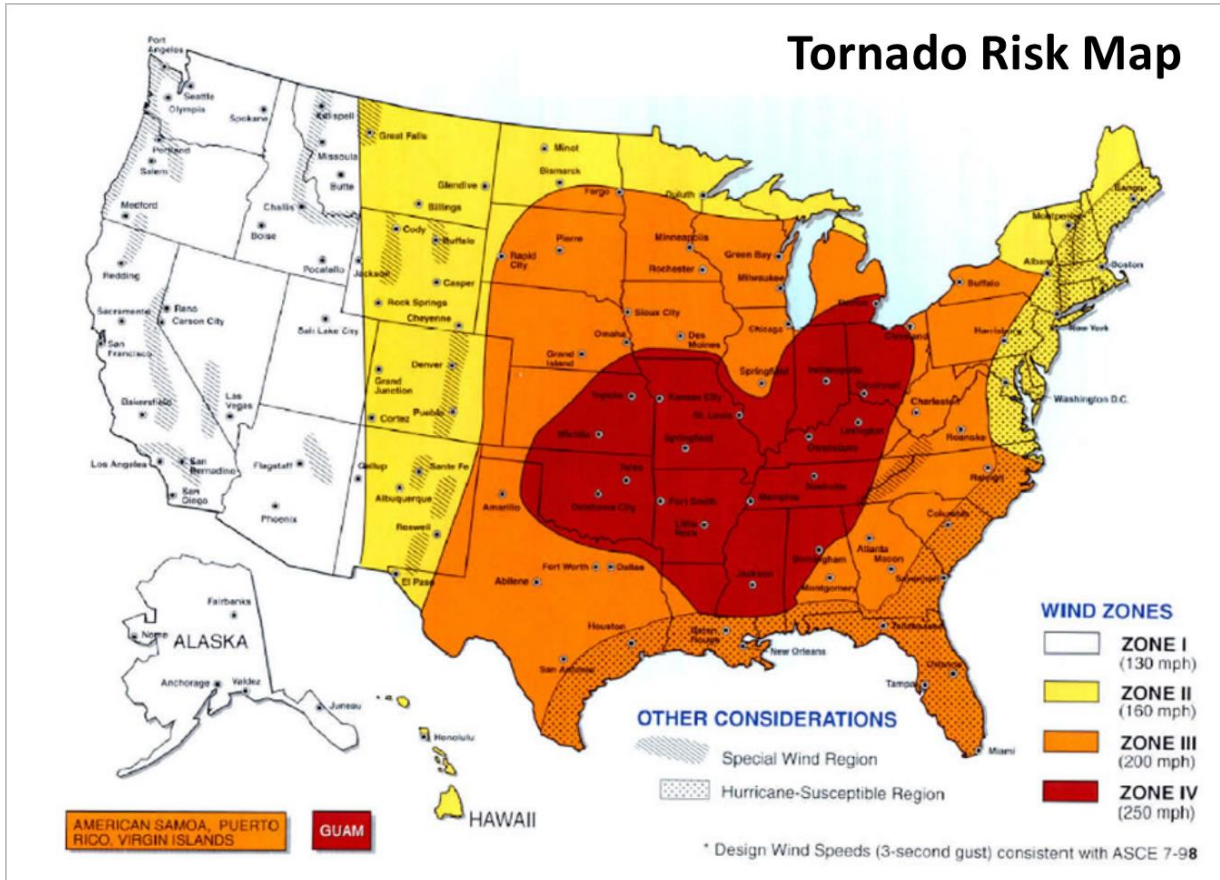
B. Tornado

A tornado is a rapidly rotating vortex or funnel of air extending groundward from a cumulonimbus cloud.

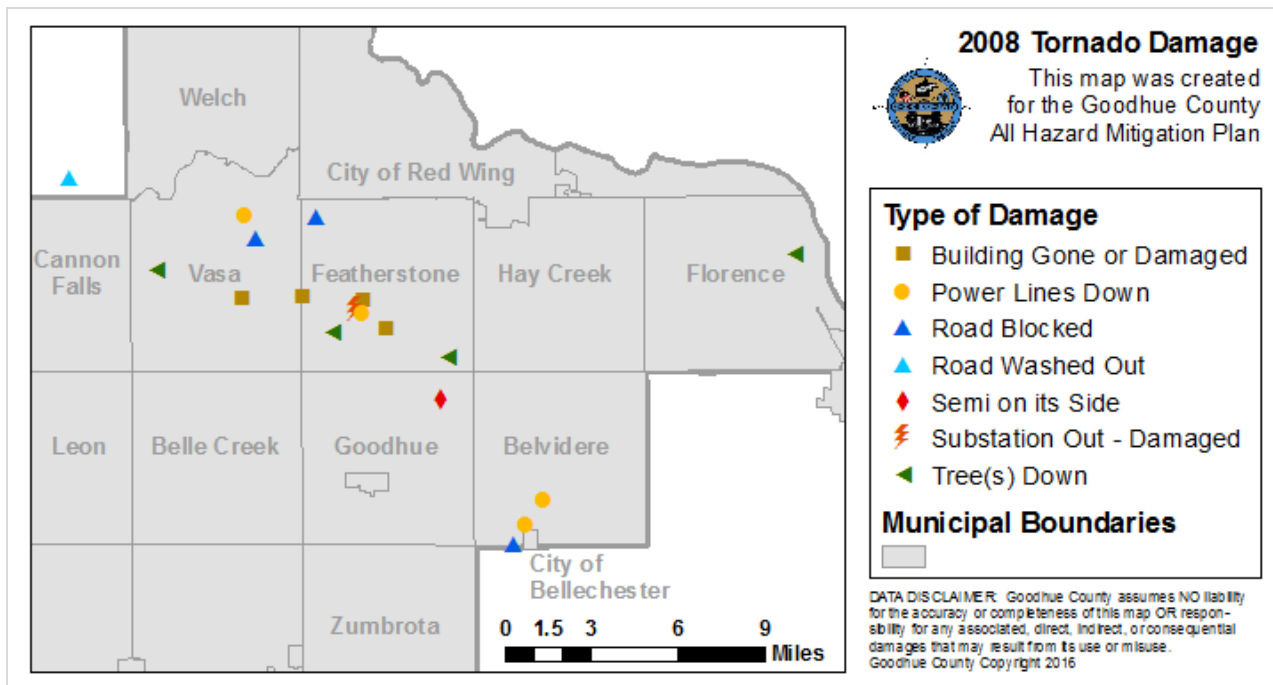
Across the United States there are regions that are more prone to tornadoes than others. Tornado Alley, located in the southern Midwest, receives the most tornadoes annually. Though Minnesota is north of this area, tornadoes occur on a regular basis. Tornadoes can damage or destroy property and crops and result in injury and even death. Damage from tornados can interrupt infrastructure, scattering debris over roads and bridges, and tearing out power lines.

Tornados are a known occurrence in Minnesota and Goodhue County. There have been 18 recorded tornado events since 1967. Of the 18 tornado events, only seven were higher than an F0 on the Fujita Tornado Scale. Even tornados with a F0 magnitude cause damage. For example, in 1984 an F0 caused \$25,000 in damage in Goodhue County. Though not as frequent, more powerful tornadoes cause significant damage. The F3 reported in July of 1987 caused \$2.5 million dollars in damage. Most recently, there was an F2 tornado in Stanton Township that caused \$4 million dollars in damage.²

Tornados can occur anywhere in Goodhue County. Tornadoes can damage or destroy property and crops and result in injury and even death. Damage from tornados can interrupt infrastructure, scattering debris over roads and bridges, and tearing out power lines. Based on historical records from NOAA, Goodhue County remains in a moderate risk zone for annual probability of a tornadic outbreak.



Map 23. Tornado Risk Map.³



Map 24. 2008 Tornado Damage.

C. Hail

Hail is precipitation in the form of balls or clumps of ice, produced by thunderstorms and may occur at any time throughout the year.

Hail forms as the result of small frozen raindrops or graupel being continuously recycled through multiple updrafts and downdrafts. They continuously accumulate new layers of ice until they become so heavy that they can no longer be supported. Hail is not to be confused with sleet, which are frozen raindrops that fall during winter storms.⁴

Hail typically accompanies thunderstorms and is a characteristic of a severe thunderstorm. A thunderstorm will be classified as a severe thunderstorm with hail that is $\frac{3}{4}$ of an inch in diameter or larger.⁵ The seasonal pattern of hail is similar to that of thunderstorms which are most likely to occur in the spring, summer in the late afternoon to early evening. However, in the Northern Plains (defined as North Dakota, South Dakota, Nebraska, Iowa, and Minnesota) a large number of storms occur during the night.

Hail can occur anywhere in Goodhue County and can cause significant damage to property and crops. According to the Minnesota All-Hazard Mitigation Plan (2014), Goodhue County's hail vulnerability assessment ranks as Medium with a building exposure \$3.5 million.⁶

Since 1963 there have been 98 instances of hail in Goodhue County penny size or greater as recorded by the National Climatic Data Center. The largest recorded hail size in Goodhue County was baseball size hail (2.75 inch) which occurred in Kenyon in 2006. This event resulted in 5 million dollars of crop damage.⁷

D. Lightning

Lightning is all of the various forms of visible electrical discharge caused by thunderstorms.

Lightning is a frequent occurrence throughout the nation and the State of Minnesota. Nationally, the trend of lighting occurrences peaks in the mid-afternoon hours. The frequency of casualties (deaths and injuries) peaks within one hour of 3pm local standard time. Damage reports peak within two hours of casualties. The Northern Plains area (defined as North Dakota, South Dakota, Nebraska, Iowa, and Minnesota) stays within the national average for damages and injuries from lightning, peaking at 3pm local standard time. However, there are a high number of casualties and damages reported from lightning occurring during the night, particularly between midnight and 6am. This is due to the number of thunderstorms that occur during the night in this area. The occurrence of lighting follows the seasonal pattern of thunderstorms, peaking during the summer months. In Minnesota, both deaths and damages peak during the summer months.⁸

Cloud-to-ground lightning can kill or injure people by direct or indirect means. The lightning current can branch off to a person from a tree, fence, pole, or other tall object. Lightning can occur anywhere in Goodhue County.

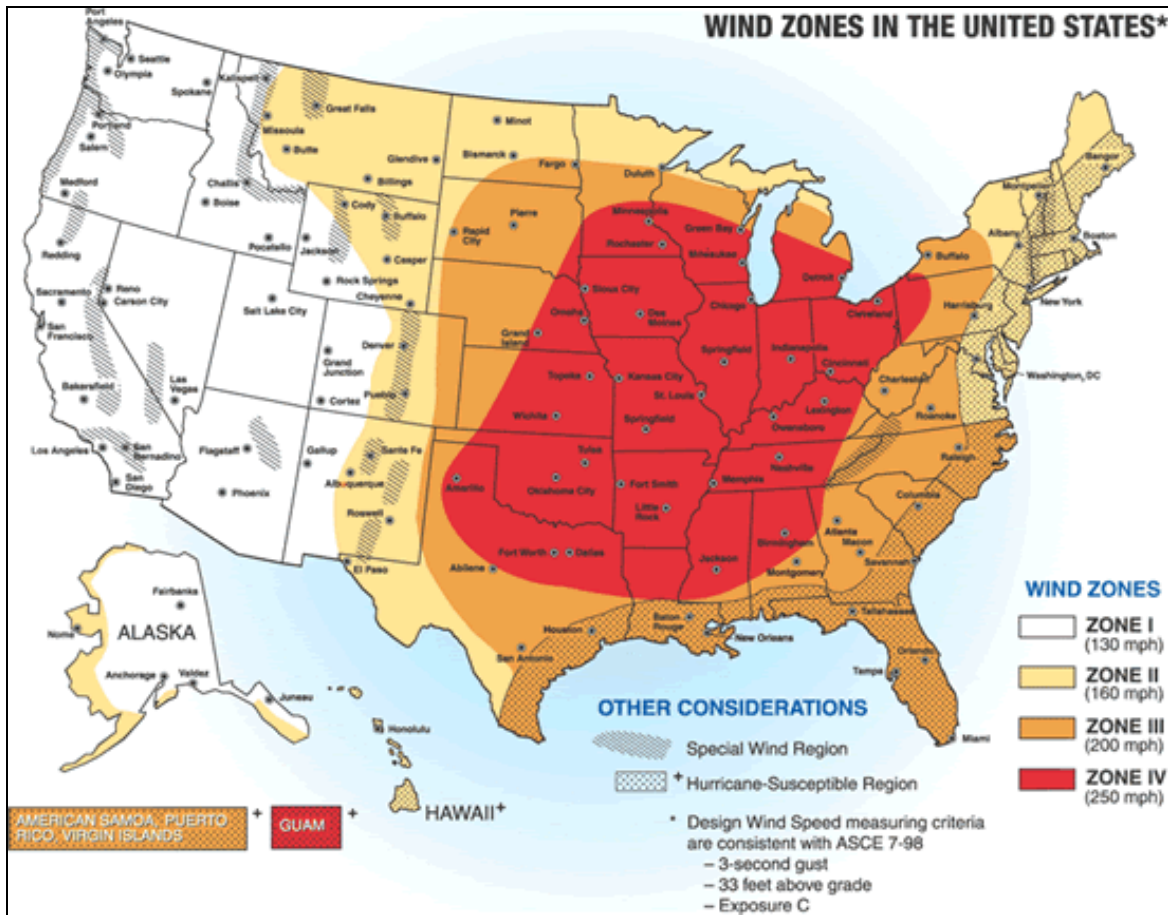
From 1/1/1990 to 9/30/2015, there were 169 lightning strikes in Minnesota with 7 fatalities and 64 injuries due to these lightning strikes, according to NOAA. Lightning caused over \$12.28 million in property damages and \$15K in crop damages.⁹

E. Severe Thunderstorm/Windstorm

Thunderstorms are localized storms, always accompanied by lightning, and often having strong wind gusts, have rain, and sometimes hail or tornadoes. A windstorm produces winds in excess of 58 miles per hour, excluding tornados. Thunderstorms can produce a strong out rush of wind known as a downburst or straight-lines winds which may exceed 120 mph.

Windstorms are among the nation's most severe natural hazards in terms of both lives lost and property damaged. The National Weather Service (NWS) notes the following effects of various wind speeds:

Wind Speed	Effects
25-31 mph	Large branches in motion, whistling in telephone wires
32-38 mph	Whole trees in motion
39-54 mph	Twigs break off of trees, wind impedes walking
55-72 mph	Damage to chimneys and TV antennas, pushes over shallow rooted trees
73-112 mph	Peels surface off roofs, windows broken, trailer houses overturned
113+	Roofs town off houses, weak buildings and trailer houses destroyed



Map 25. Wind Zones in the United States¹⁰

Severe winds can damage and destroy roofs, toss mobile homes off their pier foundations, and tear light-framed homes apart.¹¹

There have been ten strong or high wind events in Goodhue County since 1994. Southern Minnesota counties experienced \$8.0 million dollars of damage from the storm in 2001. There have been no reported deaths due to windstorms in the County.¹² The National Climactic Data Center lists 74 thunderstorm wind events since 1968. There was one reported injury in Cannon Falls in 1998. Damages from the 1998 storm and a storm event in 2001 totaled \$1 million dollars in damage in Goodhue County. Storm damage events in 2014 and 2015 totaled \$825,000.

Severe thunderstorms and windstorms can occur anywhere in Goodhue County. There is a strong probability of annual occurrence due to fluctuations in jet-stream patterns and clashing air masses April through September.

F. Severe Winter Storm

Blizzard

A blizzard is the occurrence of the following conditions lasting for three hours or longer: ¹³

- 1) Wind speeds of 35 miles per hour (mph) or more.
- 2) Considerable falling and/or blowing snow (reducing visibility frequently to less than 1/4 mile).
- 3) Generally temperatures of 20 degrees Fahrenheit (F) or lower.

Snow can make road travel hazardous, which can result in accidents and delay of emergency services. Build-up of snow and strong winds can result in downed power lines leaving people without power. Minnesota is a place of extreme weather. Winter storms are an expected event by many people. The more extreme storms occur less frequently.

There have been six blizzard events recorded for Goodhue County since 1980. Blizzards can occur anywhere in Goodhue County. One blizzard occurred in January of 1996. Wind gusted up to 40 miles per hour accompanied by two to five inches of snow. Much of western and southern Minnesota was affected. Some roads were closed as visibility was near zero. Several school districts also closed schools. Another blizzard occurred in February of 2014. Wind frequently gusted up to 40 or 50 miles per hour with 2" of snowfall. ¹⁴

Ice & Sleet

An ice and/or sleet storm is a storm that generates sufficient quantities of ice or sleet to result in hazardous conditions and/or property damage.

Ice Storm: Describes occasions when damaging accumulation of ice are expected during a freezing rain situation. In an ice storm rain or drizzle falls in liquid form but freezes upon impact to form a coating of ice (glaze) upon the ground and/or any exposed surfaces.

Sleet Storm: Describes a storm with pellets of ice composed of frozen or mostly frozen raindrops or refrozen partially melted snowflakes.

As raindrops fall from clouds, they pass through layers of air at different temperatures. If they pass through a layer with a temperature below the freezing point, they turn into sleet. Snowflakes that have melted by passing through a warm layer will turn into sleet if they then pass through a freezing layer. Sleet often falls together with snow and rain, and may deposit an icy coating on exposed surfaces. Sleet occurs only during the winter, while hail, a different form of icy precipitation may fall at any time of the year. ¹⁵

Ice and sleet storms occur between October and April when the temperatures are near or below freezing. These storms will last from hours to days with effects being felt for several days after the storm occurrence. Ice and sleet can occur anywhere in Goodhue County.

Ice and sleet can make vehicle and pedestrian travel hazardous, which can result in accidents and delay of emergency services and commerce. Build-up of ice and sleet can damage trees and down

power and telephone lines leaving people without electricity or telephone service. Heavy ice loads can even collapse roofs.¹⁶

Since 1980, there were only two ice storms affecting Goodhue County reported to the National Weather Service. Both of these storms occurred in 1996 and 1998. No death, injuries, or damages were reported for these events.¹⁷

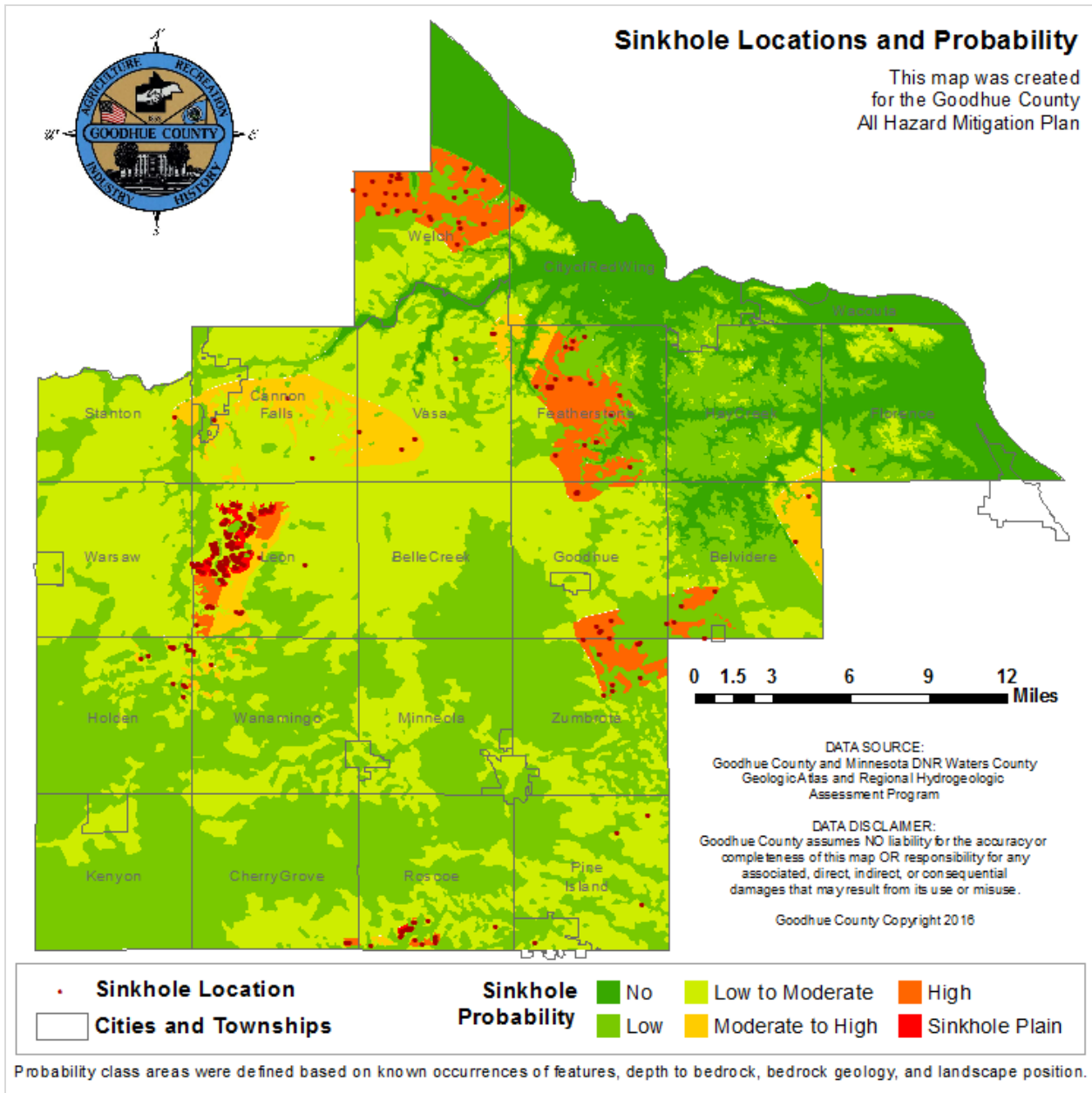
G. Sinkholes & Land Subsidence (Karst)

A sinkhole is a closed depression caused by a collapse of soil or overlying formation above fractured or cavernous bedrock. Land subsidence is a gradual settling or sudden sinking of the Earth's surface owing to subsurface movement of earth materials.¹⁸

The primary natural cause of land subsidence in Minnesota is karst.¹⁹ Karst is defined as an efficiently drained landscape that forms on soluble rock. Karst is characterized by caves, sinkholes, a lack of surface drainage and other climatically controlled features, and is mainly, but not exclusively, formed on limestone.²⁰ The unique landforms that typify karst lands make the area scenic but also present a hazard to the people and resources in the region. When water seeps through the soil, it can become acidic enough to dissolve soluble carbonate rocks that it comes into contact with. This dissolution can widen pre-existing fractures and other conduits of water, and in some cases leads to formation of caves and sinkholes. The speed at which water can travel through karst formations makes it difficult to protect groundwater from pollution originating at the ground surface.²¹

Changes in water levels or flow are the primary triggering events for subsidence and sinkholes. These include:²²

- Water level decline
- Changes in groundwater flow
- Increased loading
- Deterioration (abandoned coalmines) Some causes of these changes are:
 - Pumping of water from wells
 - Localized drainage from construction
 - Dewatering
 - Drought
 - Increased groundwater movement velocity
 - Increased variation in water table levels
 - Increased or reduced recharge



Map 26. Sinkhole Probability in Goodhue County²³

Rapid flow of water through karst features such as sinkholes can be indicative of little filtration. Polluted surface water can quickly move into a groundwater aquifer or well. Besides affecting drinking water for humans, water pollution can travel further more quickly underground. When the polluted water emerges as a spring, stream, or lake, the pollution can endanger aquatic plants and animals. Dissolved bedrock can also lead to a collapse of the earth's surface. If this occurs beneath a sewage lagoon, waste water can be released into the groundwater system. Erosion can not only degrade streams, wetland, ponds, and rivers but can also cause damage to structures such as home, roads, and bridges.

Sinkhole probability is high in Leon Township, Welch Township, Featherstone Township, Belvidere Township, Goodhue Township, and Zumbrota Township. Sinkhole probability is Moderate to High for

Leon Township, Cannon Falls Township, Cannon Falls, Vasa Township, Featherstone Township and Belvidere Township.

Rapid flow of water through karst features such as sinkholes can be indicative of little filtration. Polluted surface water can quickly move into a groundwater aquifer or well. Besides affecting drinking water for humans, water pollution can travel further more quickly underground. When this polluted water emerges as a spring, stream, or lake, the pollution can endanger aquatic plants and animals. Dissolved bedrock can also lead to a collapse of the earth's surface. If this occurs beneath a sewage lagoon, waste water can be released into the groundwater system.²⁴

Dissolved bedrock caused the collapse of three municipal sewage lagoons since 1976 in southeastern Minnesota. One of these was in Bellechester on the eastern border of the County. In April of 1992 several sinkholes were discovered in the lagoon. This released nearly 2 million gallons of waste water into the ground. Because the path and destination of the sewage release was unknown, 200 wells within a three mile radius of the lagoon were tested. There was not conclusive evidence that the few wells that tested high were contaminated from the release.

The location of all new wells is collected by the Environmental Health Department. This information is used in the case of a disaster to contact the population that is at risk in the event of contamination. In addition, Minnesota property owners are required to disclose the wells, if any, on their property at the time of sale, in accord with the Well Disclosure Act. All wells drilled since 1976 are to be registered in the County Well Index through the Minnesota Pollution Control Agency.

Not all wells in Goodhue County are accounted for in the County Well Index. Wells that are unused pose a potential threat as sources of pollution to the ground water. Karst is a natural landform that will continue to pose a risk to the quality of groundwater in Goodhue County.

H. Erosion/Landslide

Erosion can be defined as a condition in which the earth's surface is worn away by the action of water and wind. A landslide includes a wide range of ground movement, such as rock falls, deep failure of slopes, and shallow debris flows.

The geology of some areas in Goodhue County consists of many rolling, steep hills with a wide variety of streams and rivers. In these areas, erosion does occur naturally, however with the addition of human influence on the land, i.e. crops, tilling, impervious surfaces, etc., the rate at which erosion occurs increases dramatically (Goodhue County Soil & Water Conservation District Water Plan).

Erosion can occur anywhere within the county but is more likely in areas of steep slope and along river and stream banks. Erosion can not only degrade streams, wetlands, ponds, and rivers, which can affect the local surface and groundwater, but can also cause damage to structures such as homes, roads, and bridges. There has been no erosion-related disaster event on record for Goodhue County.

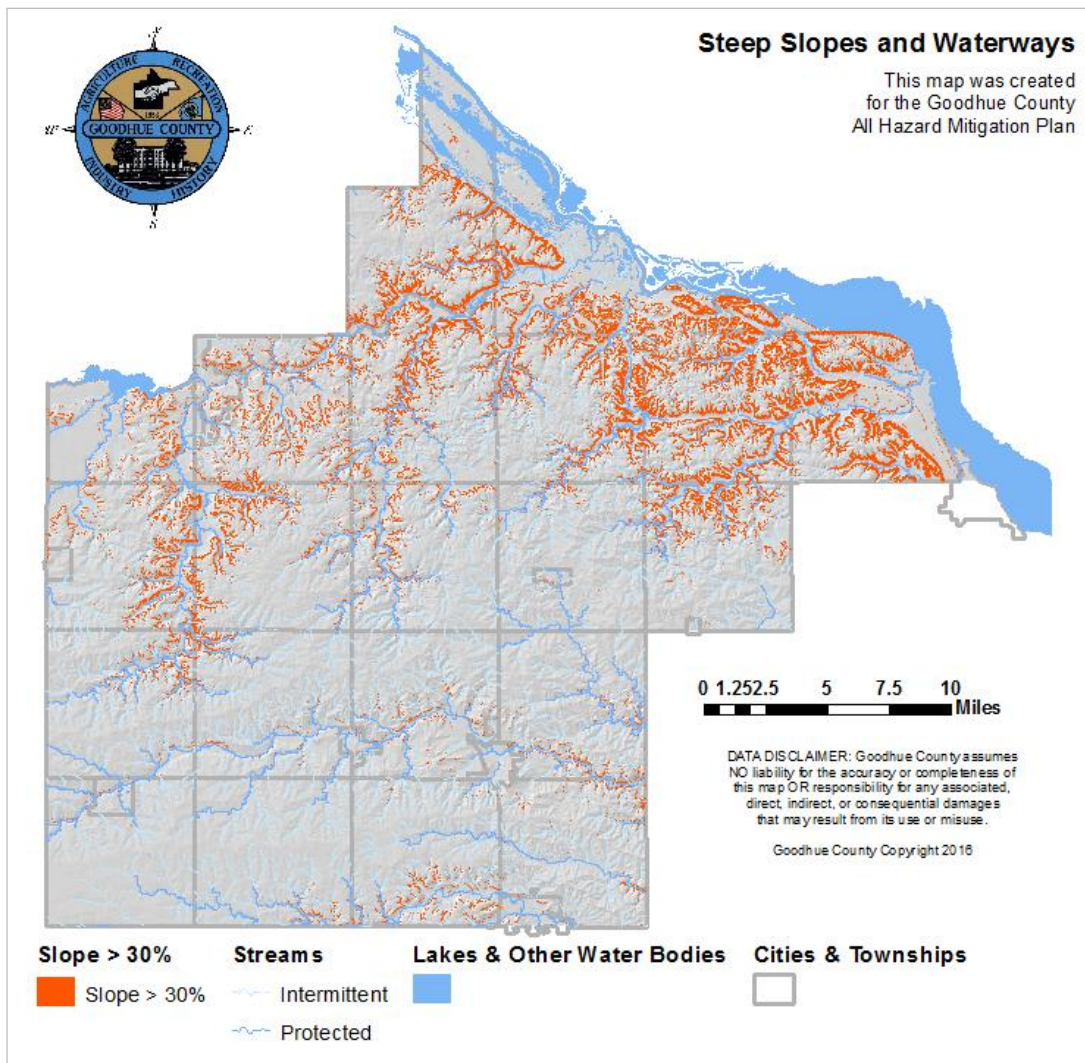
Almost any steep or rugged terrain is susceptible to landslides under the right conditions. The most hazardous areas are steep slopes on ridges, hill, and mountains; incised stream channels; and slope excavated for buildings and roads. Slide potentials are enhanced where slopes are destabilized by

construction or river erosion. There is a higher probability of erosion and landslides in areas identified as steep slope areas (areas with slope greater than 30%).

The Goodhue County Zoning Ordinance includes regulations for designated shoreland districts. This includes regulating changes to vegetation and topography in order to prevent erosion into public waters. Erosion control and storm water management plans must be developed for planned unit developments in these districts.

The Goodhue County Soil & Water Conservation District (SWCD) helps manage erosion issues in the county by working with landowners on Best Management Practices with their land.

The Minnesota Pollution Control Agency (MPCA) regulates erosion control concerns through its National Pollution Discharge Elimination System (NPDES). Recently the MPCA put into effect a one acre or more size limit which requires a NPDES permit. This insures that the property erosion control measures are taken to minimize the amount of sediment and other pollutants leaving the site (SWCD Water Plan).

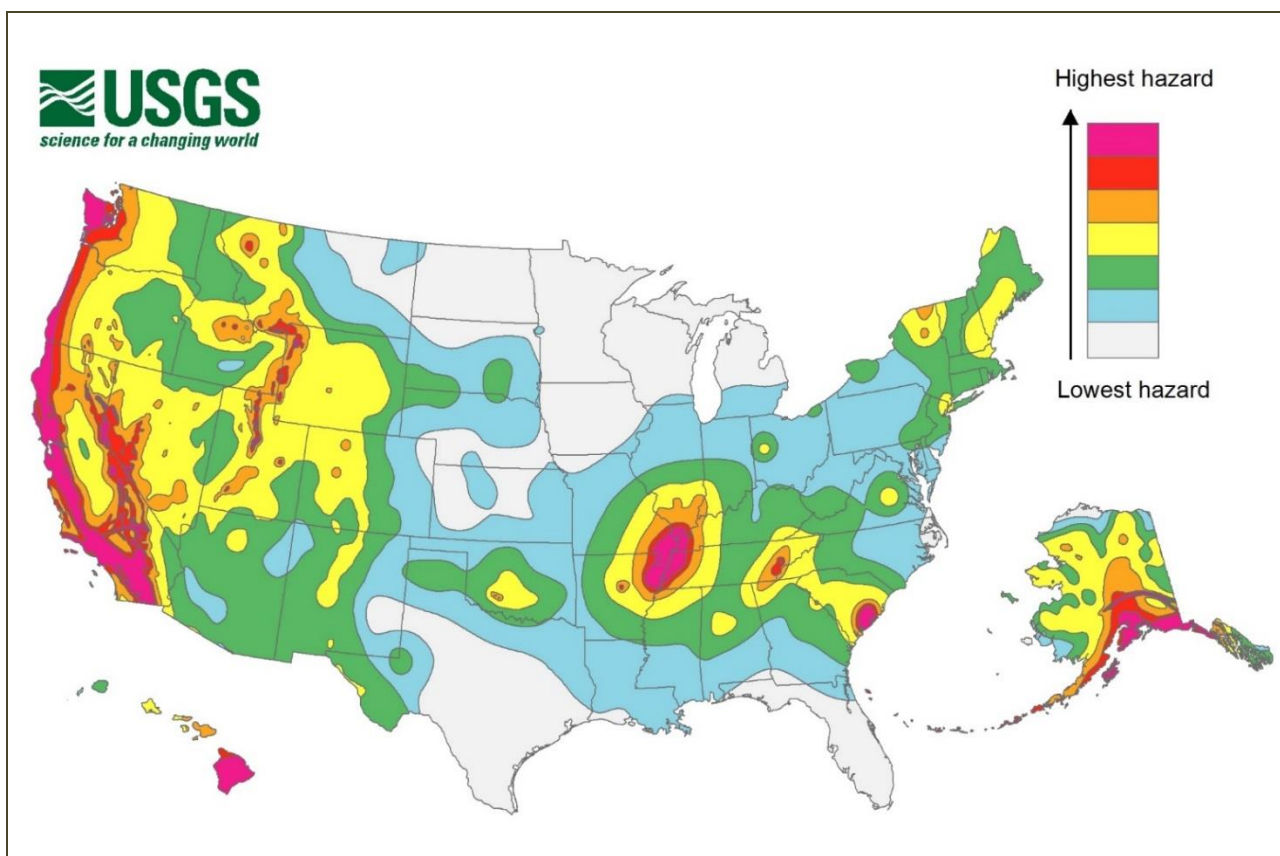


Map 27. Steep Slopes & Waterways

I. Earthquake

An earthquake is a shaking or trembling of the crust of the earth caused by underground volcanic forces or by breaking and shifting of rock beneath the surface.

Continental plates either are grinding, constantly moving against each other, the strain builds up over time, producing a sizeable earthquake when the pressure is released. Some faults adjust to the constant movement of the plates by creep which results in numerous tiny shocks and a few tremors. The New Madrid fault is the nearest major fault line located in the central, mid-continental states south of Minnesota. The activity of the New Madrid fault is currently being monitored by major universities in cooperation with the USGS (United States Geologic Survey). Goodhue County falls into the area of peak acceleration 0-1% with a ten percent chance of being exceeded in 50 years. The peak acceleration is the largest acceleration recorded by a station during an earthquake.²⁵



Map 28. U.S. Earthquake Hazard Probability.²⁶

There has never been an earthquake recorded in Goodhue County and a future occurrence is highly unlikely in any area within the county. Both the probability and the peak acceleration are so low that earthquakes are not a hazard that justifies mitigation activities.

According to the Minnesota Hazard Mitigation Plan, Minnesota has one of the lowest occurrence levels of earthquakes in the United States, but a total of 19 small to moderate earthquakes have been documented since 1860. Minnesota earthquakes, like those elsewhere in the Midwest, are attributed to minor reactivation of ancient faults in response to modern stresses. Although the two earliest

earthquakes may have had magnitudes of 4.7 to 5.0, the 1917 Staples and 1975 Morris earthquakes with magnitudes of 4.3 and 4.6 to 4.8, respectively, are the largest that are well documented. None of the cities closest to the epicenters of the Minnesota earthquakes were located in Goodhue County.²⁷

J. Extreme Temperatures

According to the National Weather Service (NWS), extreme temperatures in Minnesota are characterized by the issuance of Wind Chill Warnings or Advisories in the winter months, and by the issuance of Excessive Heat Warnings or Heat Advisories in the summer months.

Excessive Cold

- The NWS issues a Wind Chill Advisory for Minnesota when widespread wind chills of 40 degrees below zero or lower with winds at least 10 miles per hour (mph) are expected. In some parts of southern Minnesota, the threshold may be 35 degrees below zero.
- A Wind Chill Warning is issued when widespread wind chills of 60 degrees below zero or lower with winds greater than 10 mph are expected. In some parts of southern Minnesota, the threshold may be 50 degrees below zero.

Excessive Heat

- The NWS issues a Heat Advisory for Minnesota when, during a 24-hour period, the Heat Index ranges from 105 to 114 degrees during the day, and remains at or above 80 degrees at night.
- An Excessive Heat Warning is issued when, during a 24-hour period, the Heat Index reaches 115 degrees or more during the day, and remains at or above 80 degrees at night. An Excessive Heat Watch may precede a Warning.

Extreme Heat

- Heatstroke: Considered a medical emergency, heatstroke is often fatal. It occurs when the body's responses to heat stress are insufficient to prevent a substantial rise in the body's core temperature. While no standard diagnosis exists, a medical heatstroke condition is usually diagnosed when the body's temperature exceeds 105°F due to environmental temperatures. Rapid cooling is necessary to prevent death, with an average fatality rate of 15 percent even with treatment.
- Heat Exhaustion: While much less serious than heatstroke, heat exhaustion victims may complain of dizziness, weakness, or fatigue. Body temperatures may be normal or slightly to moderately elevated. The prognosis is usually good with fluid treatment.
- Heat Syncope: This refers to sudden loss of consciousness and is typically associated with people exercising who are not acclimated to warm temperatures. Causes little or no harm to the individual.
- Heat Cramps: May occur in people unaccustomed to exercising in the heat and generally ceases to be a problem after acclimatization.

Heat can also stress plants and animals, potentially reducing crop yields or even destroying crops. Heat stress on cows can reduce milk production and cause other problems.²⁸

Extreme Cold

Extreme cold temperatures can cause hypothermia, frost bite, and even death.

Extreme temperatures are not unusual in the State of Minnesota. With the state located in the middle of the North American continent, it experiences the extremes of both temperature and weather. Located in the southeastern portion of Minnesota with open plains to the west, the wind can make the extreme winter temperatures colder in Goodhue County.

In Goodhue County, the majority of extreme temperature events occurred since 1990. The highest one day maximum temperature of 103 degrees Fahrenheit occurred in July of 1995. January and February both have the lowest minimum temperature of –36 degrees Fahrenheit, in 1970 and 1996 respectively.²⁹

Extreme temperatures can occur anywhere in Goodhue County.

K. Drought

A drought is a period of abnormally dry weather that persists long enough to produce a serious hydrologic imbalance (for example crop damage, water supply shortage, etc.). There are four different ways that drought can be defined:

Meteorological: A measure of departure of precipitation from normal. Due to climactic differences what is considered a drought in one location may not be a drought in another location.

Agricultural: Situation when the amount of moisture in the soil no longer meets the needs of a particular crop.

Hydrological: When surface and subsurface water supplies are below normal.

Socioeconomic: The situation that occurs when physical water shortage begins to affect people.

Depending on the water requirements, the definition of a drought will vary. For crops, drought begins when the soil is lacking the water needed for a particular stage of growth. For the urban population, it sets in when water restrictions are put in place. Currently, there is no means for predicting drought.

The effects of drought are easy to see but hard to define. In Goodhue County, the effects of drought are most evident driving through the County's farmlands during a dry spell. Typically green with growing crops, as drought sets in the field will turn brown as crops dry up.

Drought has a history of occurring every one to two decades since the early 1900s. In more recent decades, drought is occurring more frequently, once per decade since the 1970s. Precipitation levels during dry months are generally an inch or more below the normal amount. This is particularly seen in the dry summer months, when precipitation amounts were three or more inches below normal.³⁰

L. Wildfire

As defined in the Minnesota State Hazard Mitigation Plan, a wildfire is any fire on wildland (including forest, brush, range, grass, etc.) that is not a prescribed natural fire (by the U.S.

Department of Agriculture (USDA) Forest Service) and, thus, requires a suppression response. These fires are not controlled as they spread through vegetative fuels, exposing and possibly consuming structures. They often begin unnoticed and spread quickly and are usually signaled by dense smoke that fills the area for miles around. Naturally occurring and non-native species of grasses, brush, and trees fuel wildfires.

Due to increasing development near wild or open lands, there is the distinction made between types of wildfires. A wildland fire is a wildfire in an area in which development is essentially nonexistent, except for roads, railroads, power lines and similar facilities. An urban-wildland interface fire is a wildfire in a geographical area where structures and other human development meet or intermingle with wildland or vegetative fuels.³¹

The risk of wildfire depends on the interactions of several factors during the year. The three main factors include fuel, topography, and weather. Both fuel and topography will not change dramatically from year to year. However, the risk of wildfire can fluctuate on a daily basis depending on the weather. Up to the minute wildfire risk and burning restrictions for the State of Minnesota are available on the Minnesota DNR's Wildfire Information Center.³²

Using the National Wildfire Hazard information data and the wildfire danger model, and considering factors of fuel, critical fire weather frequency (annually), and slope, the general wildfire severity for Goodhue County is moderate to low, depending on current weather conditions. Wildfire hazard severity is difficult to estimate because weather, which changes daily, plays a significant part in the degree of risk from wildfires. The wildfire hazard in Goodhue County, as rated by the Minnesota DNR's Fire Danger Rating is Low.

If not promptly controlled, wildfires may grow into an emergency or disaster. It is also important to note that in addition to affecting people, the wildfires may severely affect livestock and pets. Such events may require the emergency watering/feeding, shelter, evacuation, and even burying of animals.³³

The indirect effects of wildfires can also be catastrophic. In addition to stripping the land of vegetation and destroying forest resources, large, intense fires can harm the soil and waterways. Soil exposed to intense heat may lose its capability to absorb moisture and support life. Exposed soils erode quickly and enhance siltation of rivers and streams thereby enhancing flood potential, harming aquatic life and degrading water quality. Lands stripped of vegetation are also subject to increased landslide hazards.³⁴

The number of grass/wildfires in Goodhue County shows a decreasing trend between 1999 and 2002. Dollar losses were at a high in 1999 of \$1,700. The dollar losses and the number of fires significantly decreased in the following years. In 2002, there was an increase in the number of fires, however dollar losses were minimal. The Minnesota Department of Natural Resources Wildfire site (interactive wildfire map), reports in the State of Minnesota, there were 1,897 wildfires in 2003 as of July 31, 2003. These fires burned 79,749 acres thus far. For this same time period, there were no reported wildfires in Goodhue County.

Wildfires can occur anywhere in Goodhue County (see Goodhue County Landcover Map on p. 23).

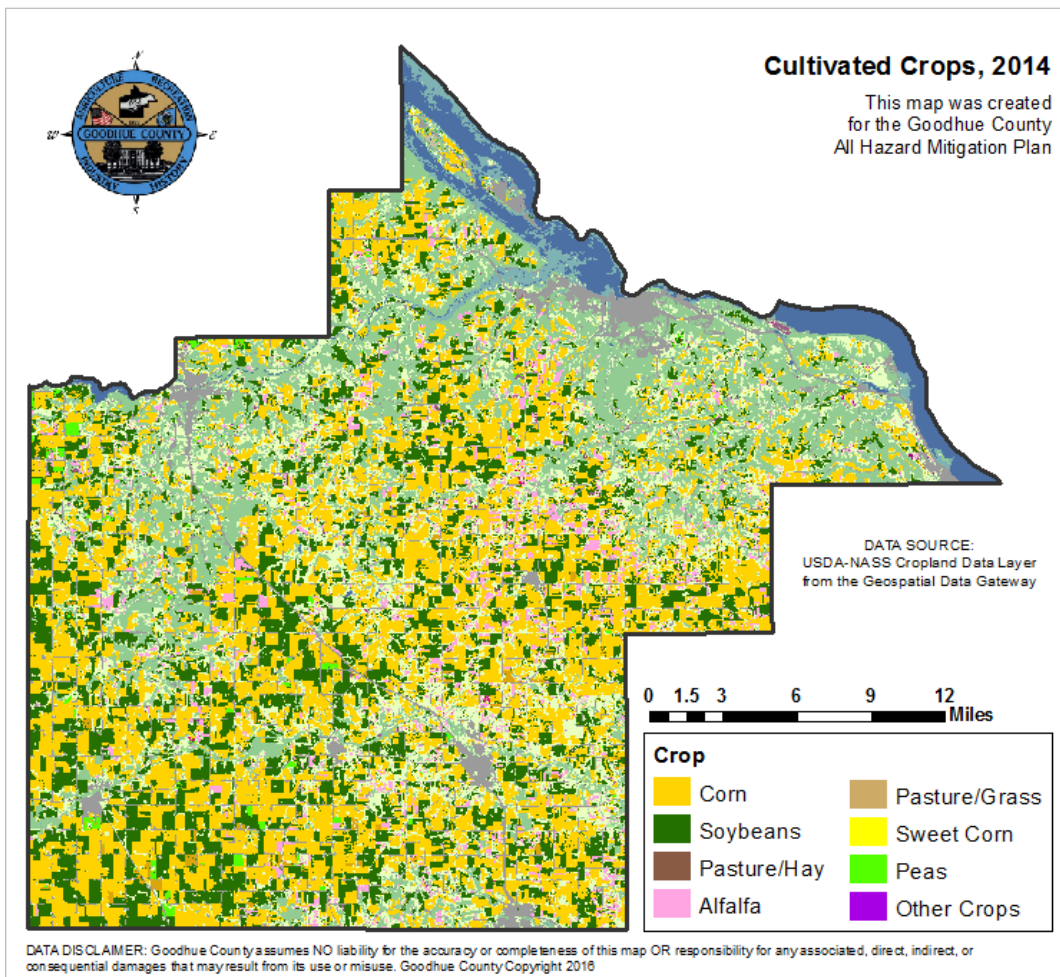
Goodhue County townships with potential wildfire impacts include Stanton, Warsaw, Holden, Cannon Falls, Leon, Wanamingo, Welch, Vasa, Belle Creek, Minneola, Roscoe, Featherstone, Goodhue, Zumbrota, Pine Island, Hay Creek, Belvidere, and Florence.

M. Crop Disaster

A crop disaster is the destruction of crops through natural events (i.e. storms) or intentional tampering.

Farming is a primary use of the lands in Goodhue County with over 300,000 acres under cultivation. Farmers produce a wide variety of crops, primarily for sale. Compared with the average size and yields on Minnesota farms, Goodhue County’s farms are highly productive. The average acreage of a farm in Minnesota is 354 acres, nearly 100 acres larger than the average family in the County (254 acres). Among crop yields, Goodhue County ranked among the top ten counties in Minnesota for production of oats and hay, according to the Minnesota Agricultural Stats Report for 2002.

Crop disasters are typically a secondary consequence of natural events. Damage to crops is often due to severe weather such as rain, hail and drought. To date there is no record of a crop disaster from intentional tampering.



Map 29. Goodhue County Cultivated Crops by Type ³⁵

Crop disasters are typically a secondary consequences of natural events. Damage to crops is often due to severe weather such as rain, hail, and drought. The following are the latest disasters for which funding was received.

- 2003—Application submitted for Drought
- 2002—Flooding
- 2001—Severe winter storms

For the disasters in 2001-2002, over \$200,000 were paid out by the Farm Service Agency in Goodhue County as of September 2003. This aid to farmers was distributed under the Crop Disaster Program established in the Agricultural Assistance Act of 2003. Under this program, farmers receive payments based on the amount of crops lost over 35% and are capped at \$80,000. Payment amounts are based on average historical (past three to five years) crop price.

Because the majority of crop disasters occur due to natural weather events, the future incidence of crop disaster is highly unpredictable, and may also be localized, making it difficult to determine probability with any accuracy.

The probability ranking for crop disasters is high and is ranked as having a low mitigation potential.

N. Solar Storm

Solar flares and other related eruptions from the sun blast energy and energy-charged material through interplanetary space at more than 600,000 mph. As this energy impacts the Earth's protective upper atmosphere, magnetic storms are produced that affect our climate and occasionally result in temporary damages to some our most critical technological systems.

The following earth-space activities are disrupted by solar and geomagnetic events: ³⁶

- Satellite operations
- Navigation
- Space Shuttle and Space Station activities
- High-altitude polar flights
- Electric power distribution
- Long-line telephone communication
- HF radio communication
- Pipeline operations
- Geophysical exploration

In 1989, electrical transmission equipment was knocked out by a geomagnetic storm in Montreal leaving six million people without power for up to nine hours. Portions of the United States were also affected by this storm. Solar storms disrupt the work of the Goodhue County surveyors and any others who use global positioning systems (GPS) technology.

There are no current programs in place addressing the effects of solar storms in Goodhue County. Concurring with the State, there is no necessary or appropriate mitigating strategy needed. Technical and scientific experts are responding to the hazard with respect to their professional responsibilities.

O. Climate Change

Earth's average temperature has risen by 1.5°F over the past century, and is projected to rise another 0.5 to 8.6°F over the next hundred years. Small changes in the average temperature of the planet can translate to large and potentially dangerous shifts in climate and weather.³⁷ This hazard was included in the 2016 hazard list due to the increasing incidence of hazardous threats related to widespread observations of atmospheric events tied to climate change.

Every four years, the United States Global Change Research Program publishes a National Climate Assessment Report (2016). The report highlights likely impacts to the Midwest due to climate change (www.health2016.globalchange.gov). The key messages related to the All Hazard Mitigation Plan are summarized here:³⁸

1. Increased heat wave intensity and frequency, degraded air quality, reduced water quality and more flooding events will increase public health risks.
2. Extreme rainfall events and flooding have increased during the last century, and these trends are expected to continue, causing erosion, declining water quality, and negative impacts on transportation, agriculture, human health, and infrastructure.
3. In the next few decades, longer growing seasons and rising carbon dioxide levels may increase yields of some crops, though those benefits will be increasingly offset by the occurrence of extreme events.
4. Climate change will exacerbate a range of risks to the Great Lakes region, including changes in the range and distribution of important commercial and recreational fish species, increased invasive species, declining beach health, and harmful blooms of algae. Declines in ice cover will continue to lengthen the commercial navigation season (but also lead to increased danger in ice-based recreation activities.)

Figure 8 shows Upper Midwest annual extremes in 1-day precipitation trends (% of land mass with 1-day rain events with amounts in the upper 10th percentile) based on the U.S. Climate Extremes Index (CEI). The curved red line is a nine-point binomial filter which shows the decadal-scale variations. Extreme precipitation events are clearly increasing over past decades.

The effects of climate change can occur anywhere in Goodhue County.

According to the State 2014 All Hazard Mitigation Plan, climate change adaptation planning may be daunting, especially considering the far-reaching consequences of increased severe weather and changing weather patterns to everything from electricity to clean water supplies to mosquito populations. However, advance planning and preparation to the extent possible will help prevent loss of life or greater challenges in the future.

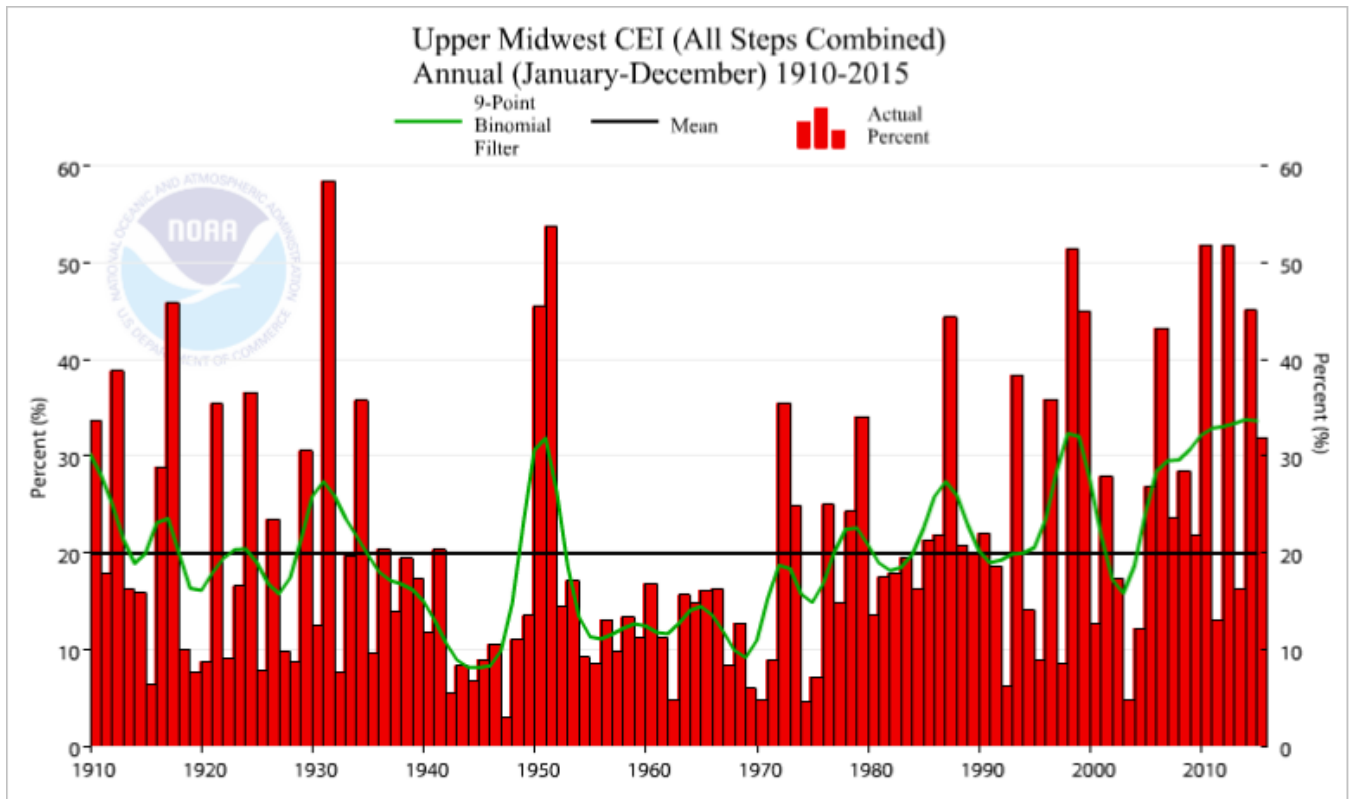


Figure 8. Upper Midwest Precipitation Extremes, 1910-2015³⁹

It is likely that climate change will have different effects in different parts of the country or even within the state of Minnesota. Some areas may see higher increases in relative temperature or larger changes in precipitation trends. Models tend to show predictions for larger geographical areas than one state or a region of a state, but there is recent effort by researchers to downscale modeling to provide more specific predictions.⁴⁰

P. Invasive Species

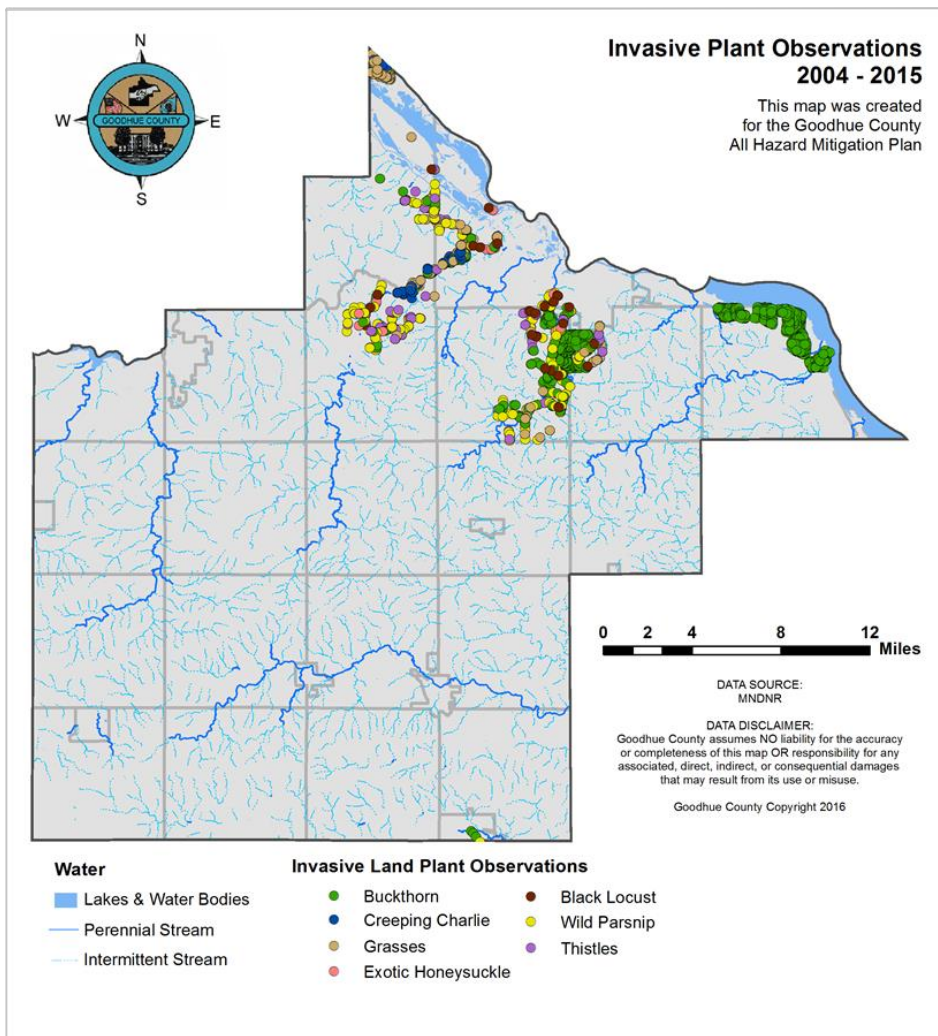
Invasive species are defined as “species that are not native to Minnesota *and* cause economic or environmental harm or harm to human health.” This hazard was included in the 2016 hazard list due to the material threat and economic impact of observable terrestrial invasive species such as Emerald Ash Borer (EAB) and Buckthorn along with aquatic invasive species such as Zebra Mussels and Asian Carp. As of summer 2016 there had not been any officially reported sightings of EAB infected trees in Goodhue County but EAB had been reported in neighboring Dakota and Wabasha counties.

Risks to communities from invasive species include the cost of ash tree removal and replacement to mitigate the spread of Emerald Ash borer and costs associated with invasive plant species removal from local bluff land areas. Human health and economies are also at risk from invasive species. The global impacts of invasive species on natural ecosystems and economy cost billions of dollars each year. Many commercial, agricultural, and recreational activities depend on healthy native ecosystems.

Within Goodhue County there have been 2,785 observations of invasive species made; 2,759 sightings of invasive terrestrial plants and 26 aquatic plants and animals. These sightings are heavily clustered in the northern part of the county along the Belle Creek, Hay Creek and Mississippi River waterways as well as within Frontenac State Park and along major highways. The rest of the county has received no reports of invasive species; however, this does not mean that the areas have not been invaded. The areas where reports have been made are areas under management and used by the public frequently which explains why it would be known that invasive species are there.⁴¹

In a newly invaded region, invasive species can progress through the stages of introduction, establishment and dispersal to a full range. Many invasive species spread along common routes (roads, trails, and paths of water are the most common corridors for dispersal of invasive species). While some invasive spread is unpredictable, spread along these routes is highly predictable and easily mapped.

Goodhue County is at high risk for continued dispersal of invasive species along roads, trails, and waterways.



Map 30. Goodhue County Invasive Plant Observations⁴²

3.1 Other Hazards

A. Terrorism

Terrorism is the use of force or violence against persons or property in violation of the criminal laws of the United States for purposes of intimidation, coercion or ransom. Terrorists often use threats to create fear among the public, to try to convince citizens that their government is powerless to prevent terrorism, and to get immediate publicity for their causes.⁴³

U.S. Code 18 U.S.C. § 2331 defines Domestic Terrorism activities as acts that:

- Involve acts dangerous to human life that violate federal or state law;
- Appear intended (i) to intimidate or coerce a civilian population; (ii) to influence the policy of a government by intimidation or coercion; or (iii) to affect the conduct of a government by mass destruction, assassination, or kidnapping; and
- Occur primarily within the territorial jurisdiction of the U.S

U.S. Code 18 U.S.C. § 2331 defines International Terrorism activities as acts that: • Involve violent acts or acts dangerous to human life that violate federal or state law;

- Appear to be intended (i) to intimidate or coerce a civilian population; (ii) to influence the policy of a government by intimidation or coercion; or (iii) to affect the conduct of a government by mass destruction, assassination, or kidnapping; and
- Occur primarily outside the territorial jurisdiction of the U.S., or transcend national boundaries in terms of the means by which they are accomplished, the persons they appear intended to intimidate or coerce, or the locale in which their perpetrators operate or seek asylum U.S. Code 18 U.S.C. § 2331 defines the term "federal crime of terrorism" as an offense that:
 - Is calculated to influence or affect the conduct of government by intimidation or coercion, or to retaliate against government conduct; and
 - Is a violation of one of several listed statutes, including § 930(c) (relating to killing or attempted killing during an attack on a federal facility with a dangerous weapon): and § 1114 (relating to killing or attempted killing of officers and employees of the U.S.)

Table 10, Event Profiles for Terrorism and Technological Hazards, is intended to help guide understanding of some of the ways in which these hazards can interact with the built environment. For each type of hazard, the following factors are addressed:⁴⁴

Event Profiles for Terrorism and Technological Hazards

Hazard	Application Mode	Hazard Duration	Extent of Effects; Static/Dynamic	Mitigating and Exacerbating Conditions
Conventional Bomb	Detonation of explosive device on or near target; delivery via person, vehicle, or projectile.	Instantaneous; additional secondary devices* may be used, lengthening the time duration of the hazard until the attack site is determined to be clear.	Extent of damage is determined by type and quantity of explosive. Effects generally static other than cascading consequences, incremental structural failure, etc.	Energy decreases logarithmically as a function of distance from seat of blast. Terrain, forestation, structures, etc. can provide shielding by absorbing and/or deflecting energy and debris. Exacerbating conditions include ease of access to target; lack of barriers/shielding; poor construction; and ease of concealment of device.
Chemical Agent *	Liquid/aerosol contaminants can be dispersed using sprayers or other aerosol generators; liquids vaporizing from puddles/containers; or munitions.	Chemical agents may pose viable threats for hours to weeks depending on the agent and the conditions in which it exists.	Contamination can be carried out of the initial target area by persons, vehicles, water and wind. Chemicals may be corrosive or otherwise damaging over time if not remediated.	Air temperature can affect evaporation of aerosols. Ground temperature affects evaporation of liquids. Humidity can enlarge aerosol particles, reducing inhalation hazard. Precipitation can dilute and disperse agents but can spread contamination. Wind can disperse vapors but also cause target area to be dynamic. The micro-meteorological effects of buildings and terrain can alter travel and duration of agents. Shielding in the form of sheltering in place can protect people and property from harmful effects.
Arson/ Incendiary Attack	Initiation of fire or explosion on or near target via direct contact or remotely via projectile.	Generally minutes to hours.	Extent of damage is determined by type and quantity of device/accelerant and materials present at or near target. Effects generally static other than cascading consequences, incremental structural failure, etc.	Mitigation factors include built-in fire detection and protection systems and fire-resistive construction techniques. Inadequate security can allow easy access to target, easy concealment of an incendiary device and undetected initiation of a fire. Non-compliance with fire and building codes as well as failure to maintain existing fire protection systems can substantially increase the effectiveness of a fire weapon.
Armed Attack	Tactical assault or sniping from remote location.	Generally minutes to days.	Varies based upon the perpetrators' intent and capabilities.	Inadequate security can allow easy access to target, easy concealment of weapons and undetected initiation of an attack.
Biological Agent *	Liquid or solid contaminants can be dispersed using sprayers/aerosol generators or by point or line sources such as munitions, covert deposits and moving sprayers.	Biological agents may pose viable threats for hours to years depending on the agent and the conditions in which it exists.	Depending on the agent used and the effectiveness with which it is deployed, contamination can be spread via wind and water. Infection can be spread via human or animal vectors.	Altitude of release above ground can affect dispersion; sunlight is destructive to many bacteria and viruses; light to moderate wind will disperse agents but higher winds can break up aerosol clouds; the micro-meteorological effects of buildings and terrain can influence aerosolization and travel of agents.

Event Profiles for Terrorism and Technological Hazards (continued)

Hazard	Application Mode	Hazard Duration	Extent of Effects; Static/Dynamic	Mitigating and Exacerbating Conditions
Cyber-terror	Electronic attack using one computer system against another.	Minutes to days.	Generally no direct effects on built environment.	Inadequate security can facilitate access to critical computer systems, allowing them to be used to conduct attacks.
Agriterrorism	Direct, generally covert contamination of food supplies or introduction of pests and/or disease agents to crops and livestock.	Days to months.	Varies by type of incident. Food contamination events may be limited to discrete distribution sites, whereas pests and diseases may spread widely. Generally no effects on built environment.	Inadequate security can facilitate adulteration of food and introduction of pests and disease agents to crops and livestock.
Radiological Agent **	Radioactive contaminants can be dispersed using sprayers/aerosol generators, or by point or line sources such as munitions, covert deposits and moving sprayers.	Contaminants may remain hazardous for seconds to years depending on material used.	Initial effects will be localized to site of attack; depending on meteorological conditions, subsequent behavior of radioactive contaminants may be dynamic.	Duration of exposure, distance from source of radiation, and the amount of shielding between source and target determine exposure to radiation.
Nuclear Bomb **	Detonation of nuclear device underground, at the surface, in the air or at high altitude.	Light/heat flash and blast/shock wave last for seconds; nuclear radiation and fallout hazards can persist for years. Electromagnetic pulse from a high-altitude detonation lasts for seconds and affects only unprotected electronic systems.	Initial light, heat and blast effects of a subsurface, ground or air burst are static and are determined by the device's characteristics and employment; fallout of radioactive contaminants may be dynamic, depending on meteorological conditions.	Harmful effects of radiation can be reduced by minimizing the time of exposure. Light, heat and blast energy decrease logarithmically as a function of distance from seat of blast. Terrain, forestation, structures, etc. can provide shielding by absorbing and/or deflecting radiation and radioactive contaminants.
Hazardous Material Release (fixed facility or transportation)	Solid, liquid and/or gaseous contaminants may be released from fixed or mobile containers.	Hours to days.	Chemicals may be corrosive or otherwise damaging over time. Explosion and/or fire may be subsequent. Contamination may be carried out of the incident area by persons, vehicles, water and wind.	As with chemical weapons, weather conditions will directly affect how the hazard develops. The micro-meteorological effects of buildings and terrain can alter travel and duration of agents. Shielding in the form of sheltering in place can protect people and property from harmful effects. Non-compliance with fire and building codes as well as failure to maintain existing fire protection and containment features can substantially increase the damage from a hazardous materials release.

Minnesota is at an increased risk from terrorism as a target of economic strategic value with financial centers, agribusiness, and an international airport located in our borders.⁴⁵ Goodhue County is home to several company headquarters and a nuclear power plant and threat assessments at those facilities will be ongoing.

B. Dam & Levee Failure

Dams and levees are man-made structures that can, if not properly constructed or maintained, result in increased flooding due to a failure. Dams can also cause flooding either upstream, or downstream, if improperly operated.

Dams were originally built to provide power to grind grain or store water for logging operations. Later, dams were constructed or modified to generate electricity and for recreational purposes. Dams have been an integral part of Minnesota's landscape for over 100 years, and many are in need of repair or removal.⁴⁶ Causes of dam failure include:

- 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 of embankment dams.
- Piping and internal erosion of soil in embankment dams.
- Inadequate maintenance and upkeep.

Dams were a part of the river system in Goodhue County since the earliest settlements. There is one hydroelectric dam, one lock and dam, and numerous small, earthen dams in the County.

The Byllesby dam was built in 1915. It is located on the Cannon River that creates part of the boundary between Dakota County and Goodhue County. Due to its location on the border of these two counties, the operations and administration is shared. The responsibilities are split 60 – 40 according to the share of hydropower used with Dakota County coordinating administration of the dam and Goodhue County providing financial support. After fifty-one years of use, the dam was decommissioned in 1966. Byllesby Dam was recommissioned in the early 1980s for hydroelectric power. It functions according to the DNR's Run of the River operation guides that stipulate that the water that comes in goes out.

Lock and Dam #3 on the Mississippi River is part of the US Army Corps of Engineers (USACE) series of thirteen locks and dams on the river that make navigation possible. It is located just outside of Red Wing. The dam was constructed and placed in operation in 1938. Between 1988 and 1991, the dam site underwent major rehabilitation (US Army Corp of Engineers, St. Paul District, www.mvp.usace.army.mil).

There are fifty-one dams in Goodhue County included in the Minnesota Department of Natural Resources inventory. The dams are classified into three hazard groups based on potential hazard to people and property in the event of a disaster.⁴⁷



This map is unavailable for public viewing.

Map 31. Goodhue County Dams and Hazard Rank. ⁴⁸

Byllesby Dam

In January 2003, the improvement of the security plan was initiated in response to new standards from the Federal Energy Regulatory Commission (FERC). Implementation steps include installation of a security system that was completed and additional fencing that is to be installed.

The Federal Energy Regulatory Commission sets a high standard for public safety around hydroelectric dams. The following programs are part of on-going procedures Byllesby Dam. The FERC Part 12

Study, a comprehensive study completed by an independent consultant every five years; recommendations are typically proactive. One will commence at Byllesby dam in October 2003. Each year FERC engineers inspect the dams and make recommendations on what needs maintenance and/or improvement. In regard to security and emergency situations, there is the Emergency Action Plan (EAP) that is updated annually and accompanied by an annual test of readiness. Every five years there is a functional exercise in which the EAP is initiated at a higher level than during the annual exercise, involving numerous agencies and local decision makers.

Lock and Dam #3

In response to the events of September 11, 2001 the Visitor Centers were closed. Half were re-opened to the public in May of 2002.

These projects are part of the USACE Operations and Maintenance (O & M) Program through which the USACE fulfills its mission of providing navigation, recreation, environmental, and flood damage and readiness services. All Federal flood control projects are inspected annually for proper maintenance, safety, effectiveness, and environmental concerns. In April of 2000, the Lock and Dam 3 Planning Team was formed. The team was established to reevaluate navigation safety and embankments. The draft report and draft Environmental Impact Statement (EIS) will be completed in 2004. Improvement projects may be underway as soon as 2005. Repair work on several other sites was completed. All other projects are on hold until a comprehensive plan is developed.

The USACE St. Paul District along with two other USACE districts are collaborating with Federal Agencies, several states and non-governmental agencies to produce the Upper Mississippi River Comprehensive Plan. The plan will develop a systemic, integrated strategy and implementation plan for the improved management of the river. (US Army Corp of Engineers, St. Paul District, www.mvp.usace.army.mil).

There are 58 dams in Goodhue County included in the Minnesota Department of Natural Resources inventory. The dams are classified into three hazard groups based on potential hazard to people and property in the event of a disaster.

The release of water from a dam or levee failure may endanger human life or downstream property.

Goodhue County cities with potential dam and levee failure impacts include Cannon Falls, Red Wing and Cannon Falls. Townships with potential dam and levee failure impacts include Stanton, Cannon Falls, Welch, Vasa, Leon, Belle Creek, Minneola, and Featherstone.

C. Structural Fire

Fire is a rapid, persistent chemical reaction that releases heat and light, especially the exothermic combination of a combustible substance with oxygen. A fire is categorized as both a natural hazard and a technological hazard that occurs in both the outside and non-outside environments.

The types of technological fires include the following:

Structure Fires

Public and Mercantile: stores, restaurants, grocery stores, institutions, churches, public facilities, education, industrial, manufacturing, storage, residential garages, vacant buildings.

Vehicle Fires

Mobile Property – aircraft, automobiles, trucks, trains, buses, boats.

There are many causes of fire as a technological hazard including heating equipment, cooking, careless smoking, industrial accidents, and transportation collisions among others (Minnesota State Hazard Mitigation Plan). The proportion of fires in the Twin Cities Metro and the rest of the State remained the same between 1999 and 2001. The dollar losses from fires increased 25% during this time and the majority of these losses shifted from the Metro Area to rest of Minnesota. (“Fire in Minnesota,” State Fire Marshall Division, 1999).

The table below details structural fire runs, total cost, average cost, and related deaths for 2010-2014. ⁴⁹

Table 11. Fires in Goodhue County, 2010-2014

Year	Total Fire Runs	Total County \$ Loss	Average Dollar Loss/Fire	Fire Deaths
2010	123	\$1,524,760	\$13,259	
2011	157	\$1,163,900	\$7,759	1
2012	164	\$1,307,399	\$8,490	
2013	129	\$1,691,449	\$14,214	1
2014	129	\$4,123,956	\$42,081	1

Structural fires are mainly unpredictable and mostly localized, make it difficult to determine probability with any accuracy.

In Goodhue County, the single leading type was grass/leaf fire followed by structure fires. Among structure fires, single-dwelling fires are the most prevalent with fifteen to thirty incidents each year in the last five years.

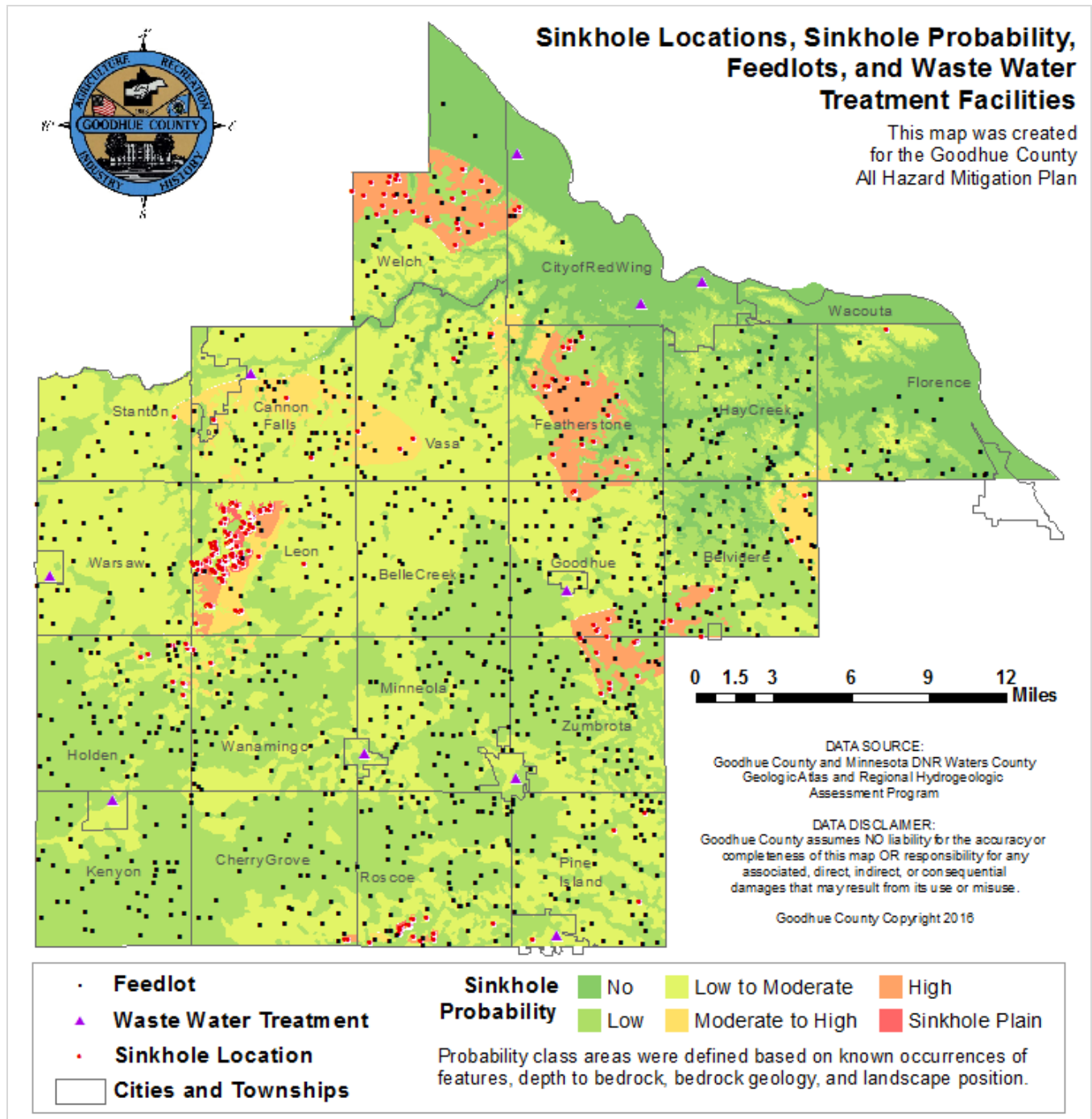
B. Water Supply Contamination

Water supply contamination is the introduction of non-point source pollutants into public groundwater and/or surface water supplies.

Contamination of the water supply is the result of a number of different causes. Among these are the accidental release of hazardous materials and natural events such as sinkholes and the flooding of water treatment plants.

In Goodhue County the water supply is drawn mainly from groundwater. There are numerous private wells throughout the County, which is the sole source (aside from bottled water) of water to the population in townships. All of the cities and the tribal community provide their populations with water through municipal facilities. There are also some private wells within city limits.

One notable incident of groundwater contamination occurred in the City of Bellechester in 1992. A sinkhole formed in one of the sewage lagoons, releasing close to 2 million gallons of sewage. The Goodhue County Environmental Health Department tested all wells that were known within a three mile radius for potential contamination. Of the wells that were tested, only a few had elevated chemical levels. It could not be confirmed that the contamination of these wells was caused by the sewage release.



Map 32. Sinkhole Locations, Sinkhole Probability, Feedlots, and Waste Water Treatment Facilities. ⁵⁰



This map is unavailable for public viewing.

Map 33. Groundwater Sensitivity to Pollution ⁵¹

E. Hazardous Waste Generators

Hazardous materials are chemical substance, which if released or misused can pose a threat to the environment or health of a community.

This map is unavailable for public viewing.

Map 34. Hazardous Waste Generators ⁵²

The State of Minnesota set in law that hazardous waste generators register for a permit allowing the use of hazardous substances. Through the permitting process, the State assures that hazardous materials are handled properly and do not pollute the surrounding environment, built or natural.

All sites that generate hazardous materials are required by law to register for a permit. The sites are classified by the volume of hazardous materials that are generated.⁵³ All sites are required to possess and maintain emergency equipment that will prove adequate in the event of an incident with one of the hazardous substances on sites. They are also required to make arrangements with local authorities for emergencies. The U.S. Environmental Protection Agency requires that producers of specified quantities of hazardous materials of some hazardous materials prepare and file Risk Management Plans. The Risk Management Plans are required under the Clean Air Act (CAA) and are an analysis of off-site consequences of accidental releases of regulated substances.⁵⁴

Goodhue County is part of the Tri-State Hazmat Group. Its mission is to facilitate cooperation, coordination, planning, exercising and training in hazardous materials between federal, state, and local responders along the Mississippi River corridor from Prescott, WI south to Dubuque, IA.⁵⁵

F. Nuclear Generating Plant Incidents

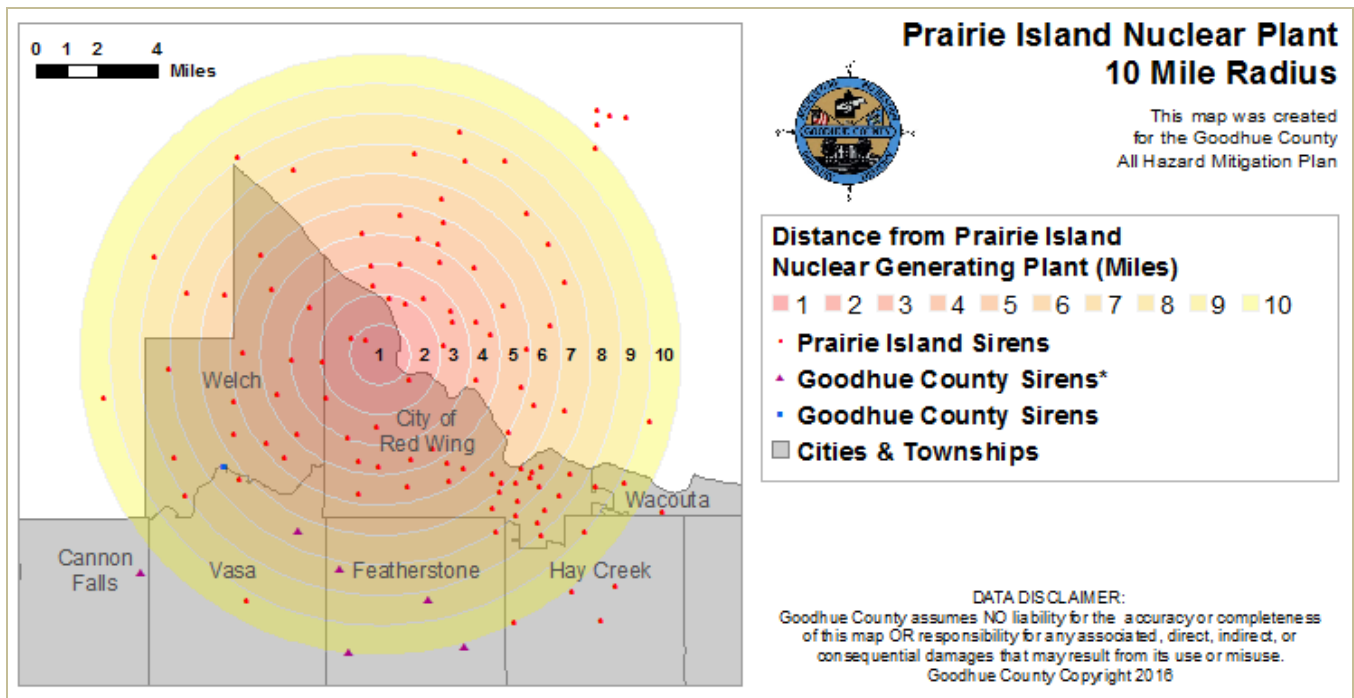
Nuclear generating plants use the heat from nuclear fission in a contained environment to convert water to steam, which powers generators to produce electricity. The potential danger from an accident at a nuclear generating plant is exposure to radiation. This exposure would most probably come from the release of radioactive material from the plant to the environment. The release may be characterized by a plume (cloud-like formation) of radioactive gasses and particles.⁵⁶

Prairie Island 1 & 2 Nuclear Generating Plants are located in Red Wing, Minnesota and are owned by Xcel Energy Inc. Both units are pressurized water reactors rated at 538 (550 for a total of 1,100) megawatts electric and began operation in 1973 and 1974. In 2011, the NRC renewed for 20 years the plant's original operating licenses, authorizing the Prairie Island units to continue generating electricity to 2033 and 2034. Storage of spent nuclear fuel in dry casks at PINGP began in 1995. Currently there are 40 casks of spent fuel being stored in the owner controlled area. The dry casks will be shipped to a depository when one opens.⁵⁷

An accident at the Prairie Island Nuclear Plant could impact a large area, but a ten mile radius has been identified as an area of particular concern for emergency planning purposes. The ten mile radius covers all of Red Wing and Welch Township, as well as parts of Cannon Falls, Featherstone, Hay Creek, Vasa, and Wacouta Townships.

The major hazards to the people in the vicinity of the plume are radiation exposure to the body from the cloud and particles deposited on the ground, inhalation of radioactive materials, and ingestion of radioactive materials.

In 1979 there was a steam generator rupture at the Prairie Island Nuclear Power Plant due to cracks in the pipes. There were minimal consequences from this incident. There have been no major radiological incidents in Minnesota or Goodhue County.



Map 35. Prairie Island Nuclear Plant, 10 Mile Radius.

The City of Red Wing/Goodhue County Emergency Response Plan for the Prairie Island Nuclear Generating Plant is a full emergency response plan and manual for the Prairie Island Facility. These plans are scheduled to be updated for 2016 functional exercise. There is a warning system in place to notify the affected populations. It was determined that in the event of an incident at the power plant, the maximum affected area is contained in a ten mile radius of the plant. Sirens are in place covering this area.

G. Train Derailment

A train derailment occurs when one or more wheels of a train go off the track.

There are currently 4,481 miles of railway in Minnesota whose use is divided between freight, passenger, and light rail commuter services.⁵⁸ Plans for commuter trains and light rail lines are in various phases of implementation. There are approximately 32 miles of railway in Goodhue County.

Goods between Chicago and ports in the northwest are hauled through Minnesota on railroads. Grain and lumber are also transported between the Midwest and the rest of the nation. A growing line of commodities to be hauled by rail are bio fuels. Iron ore and coal are raw materials transported through Minnesota to other parts of the country and the world via rail. Minnesota is sixth in the nation in total tons of commodities originating in the state and eleventh in total tons of commodities terminating in the state.

There are only two main railroad lines that travel within Goodhue County – Union Pacific in the City of Cannon Falls and the Canadian Pacific Railroad along the northeastern part of Goodhue County.

Potential impact communities include Prairie Island Indian Community, Red Wing, Frontenac, and Lake City.

Train derailments can result in injuries and deaths to train passengers, train operators, and bystanders. Hazardous material spills can contaminate the land and water. Damage to tracks or railroad locomotives and cars can also occur, and train service can be disrupted temporarily.

There have been no train derailments between 1999 and 2016.⁵⁹

Q. Infectious Disease Outbreak

Emerging infectious diseases are infections that have newly appeared in a population or have existed but are rapidly increasing in incidence or geographic range.

In the mid-twentieth century, antibiotics cured many of the diseases that were life-threatening. Eradicating the specter of debilitating and fatal diseases, people were optimistic about a world without infectious diseases. Since then new diseases emerged that temper that optimism, such as AIDS and new strains of influenza. In recent years, the increasing mobility of people throughout the world brought the recurrence of diseases that were thought to be eradicated such as avian flu, swine flu, Zika virus, and Ebola.

There were no major outbreaks of disease in Goodhue County in recent years. The Public Health Department monitors and reports to the Minnesota Department of Health on forty diseases each year. In 2001, there was only one outbreak of a disease that was non-foodborne/non-waterborne. There were a total of 3,947 cases of selected diseases that were reported on in 2002 including salmonellosis and tuberculosis. Cases in Goodhue County (31), accounted for less than one percent of the total.⁶⁰

According to the Goodhue County Public Health Department, the population in the County is at low risk for disease. Typically, half of the cases reported are sexually transmitted diseases. Foodborne disease makes up another large portion. Infectious diseases make up a handful of cases in the County each year. The low incidence is largely due to the size of the population.

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Section 4: Vulnerability/Probability Assessment

4.1 Overview

Vulnerability can be defined as to the extent to which people will experience harm and property will be damaged from a hazard. Vulnerability is the susceptibility of people to injury as the result of a hazardous event and the susceptibility of the things people value to damage as the result of a hazardous event. Some add the concept of resilience to the definition of vulnerability (Buckle, 1999). Buckle identifies potential social, economic, and environmental effects and introduces the notion that vulnerability is associated with an ability to recover.¹ County Land Use Management staff examines the surrounding land uses and built infrastructure utilizing permitting processes to assess how new projects will be impacted by environmental conditions and hazards.

Policy Committee members were asked to rank hazards as high, medium, and low according to how much potential damage each hazard could cause in their jurisdiction.

Damage Risk	Criteria
High	Major damage potential; Destructive damage to more than 10% of the jurisdiction
Medium	Moderate damage potential; Causing partial damage to 5-10% of the jurisdiction
Low	Little damage potential; Minor damage to less than 5% of the jurisdiction

Potential Damage by	Goodhue County	City of Bellemeester	City of Dennison	City of Goodhue	City of Kenyon	City of Lake City	City of Pine Island	City of Red Wing	City of Wamamingo	Cherry Grove Township	Goodhue Township	Hay Creek Township	Holden Township	Kenyon Township	Leon Township	Minneola Township	Pine Island Township	Rosee Township	Stanton Township	Vasa Township	Wascola Township	Wanamingo Township	Welch Township	Zumbrota Township	Goodhue Public Schools	Red Wing Schools	Zumbrota/Mazeppa Schools	Cannon Valley Trail	OCCEA	Goodhue County SWCD	Prairie Island Indian Community
Hazard																															
Flood	M	M	L	L	L	H	L	L	L	L	M	H	H	M	H	H	M	H	M	M	H	L	M	H	H	H	H	L	L	H	H
Tornado	M	H	M	L	H	H	M	M	M	M	M	H	M	M	L	L	M	H	M	M	H	L	L	H	H	H	M	H	H	M	
Hail	L	H	H	M	M	M	L	M	M	M	M	H	M	M	L	L	M	M	M	L	M	H	M	L	L	M	L	L	L	H	M
Lightning	L	L	H	L	L	M	L	M	L	M	M	M	L	L	L	L	L	M	L	L	L	H	M	L	L	M	M	L	M	L	L
Windstorm	L	M	H	M	H	H	L	H	M	M	M	H	M	M	L	H	M	M	M	M	L	H	M	L	M	M	L	H	H	M	
Thunderstorm (Severe Storm)	L	L	H	M	M	M	L	H	L	M	M	H	H	M	L	H	M	H	L	L	L	H	M	L	L	L	L	H	H	L	M
Blizzard	L	L	H	M	L	L	L	M	M	M	M	H	H	M	L	L	M	M	L	L	L	H	L	H	L	L	L	L	H	L	M
Ice & Sleet	M	L	H	M	M	M	L	M	L	M	M	H	H	M	L	L	M	H	L	L	L	H	L	H	L	L	M	H	H	L	M
Sinkholes & Land Subsidence	L	L	L	L	L	L	L	M	L	L	L	M	L	L	L	L	L	H	L	L	L	L	L	L	L	L	H	L	M	L	L
Erosion	L	L	M	L	L	H	L	M	L	L	M	M	M	L	L	L	M	H	L	L	L	L	M	H	L	L	L	H	L	M	M
Landslide	L	N/A	L	L	N/A	H	L	M	L	L	L	L	L	N/A	L	L	M	L	L	L	L	L	L	L	L	L	L	H	L	H	L
Earthquake	L	N/A	L	L	N/A	L	L	L	H	L	L	L	L	N/A	L	L	L	L	L	L	L	L	L	L	H	H	L	L	L	L	L
Extreme Temperatures	L	L	L	M	L	L	L	H	L	L	M	M	H	L	L	L	M	M	L	L	L	L	L	L	L	L	L	L	M	L	L
Drought	L	L	L	L	L	L	L	H	L	M	M	H	H	M	L	L	M	L	M	L	L	L	L	L	L	L	L	L	L	H	L
Wildfire	L	M	L	L	L	L	L	M	L	L	L	L	L	N/A	L	L	M	L	M	L	M	L	L	L	L	L	M	L	H	L	M
Crop Disaster	H	L	M	L	N/A	L	L	L	L	M	M	M	H	M	L	L	M	M	H	L	L	L	L	L	L	L	H	L	L	L	L
Infectious Disease	H	L	L	L	H	H	L	H	H	L	M	L	L	L	L	L	L	M	M	L	M	L	L	L	H	H	M	L	L	H	L
Solar Storm	H	L	L	L	L	H	L	M	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L	L	L	L
Invasive Species	L	L	M	L	L	L	H	M	L	L	H	H	M	L	L	M	H	M	L	M	L	L	L	M	L	L	L	H	L	M	L
Climate Change	L	L	M	M	L	L	M	L	L	M	M	H	M	L	L	M	L	M	L	M	L	L	L	L	L	L	L	M	L	L	L
Dam & Levee Failure	H	N/A	L	L	N/A	L	L	H	L	L	L	L	L	N/A	L	L	L	L	M	L	L	L	L	L	L	L	H	L	L	H	H
Structural Fire	L	M	L	L	H	M	L	H	M	M	L	M	L	L	L	L	M	L	L	L	L	L	L	L	H	H	L	H	M	H	H
Water Supply Contamination	H	H	L	L	H	N/A	L	H	H	L	M	M	L	L	L	L	L	H	L	L	L	L	L	M	H	M	L	L	L	H	H
Hazardous Materials	M	L	L	M	M	H	L	H	H	L	M	L	H	L	L	L	M	H	L	L	M	L	L	M	H	M	L	L	L	M	H

Potential Damage by	Goodhue County	City of Bellechester	City of Dennison	City of Goodhue	City of Kenyon	City of Lake City	City of Pine Island	City of Red Wing	City of Wainnango	Cherry Grove Township	Goodhue Township	Hay Creek Township	Holden Township	Kenyon Township	Leon Township	Mirneola Township	Pine Island Township	Rosecoe Township	Stanton Township	Vasa Township	Wacouta Township	Wainnango Township	Walch Township	Zumbrota Township	Goodhue Public Schools	KW Schools	Red Wing Schools	Zumbrota/Mazeppa Schools	Cannon Valley Trail	GCCCA	Goodhue County SWCD	Prarie Island Indian Community
Hazard																																
Nuclear / Radiological Accidents	H	N/A	L	L	H	H	L	H	H	L	L	H	N/A	N/A	L	L	H	L	L	H	L	L	L	L	H	H	L	H	L	M	H	
Infrastructure Failure	H	H	L	L	M	H	L	H	M	L	L	M	H	L	L	L	M	M	M	M	M	L	L	L	H	H	L	H	M	L	H	
Train Derailment	H	N/A	L	L	N/A	H	L	H	L	L	L	M	L	N/A	L	L	N/A	L	L	L	L	L	L	L	L	L	L	L	L	M	H	
Meth Labs	L	L	L	L	L	M	L	M	L	L	L	L	L	L	L	L	L	L	L	L	L	L	M	L	L	H	L	M	L	M	M	
Arson	L	L	L	H	L	M	L	M	L	L	M	L	L	L	L	L	L	L	M	L	L	L	L	L	H	H	M	H	M	L	M	
School Violence	M	N/A	L	L	H	M	L	H	M	L	L	L	N/A	N/A	L	L	L	L	L	L	L	N/A	L	M	L	M	H	H	L	L	L	
WMD Terrorism	M	M	L	L	L	H	L	H	M	L	L	L	N/A	H	L	L	L	L	H	L	L	N/A	L	H	H	L	L	L	L	H	M	
Explosives	L	L	L	L	M	H	L	H	L	L	L	L	N/A	M	L	L	L	L	M	L	L	L	M	H	H	L	M	L	H	L		
Biological	M	L	L	L	L	H	L	H	M	L	L	L	N/A	M	L	L	L	M	L	L	L	N/A	L	H	H	L	M	L	M	L		
Chemical	L	L	L	L	L	H	L	H	M	L	L	L	L	M	L	L	L	M	L	L	L	L	L	H	H	L	M	L	M	L		
Agricultural / Economic Attack	H	M	L	L	L	H	L	H	M	L	M	L	H	H	L	L	L	L	H	L	L	L	L	L	L	H	L	L	L	M	L	
Hostage / Barricade	L	L	L	L	L	L	L	H	L	L	L	L	N/A	L	L	L	L	L	L	L	L	L	L	L	H	H	M	L	L	L	H	
Sabotage	L	L	L	L	L	L	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L	N/A	L	H	H	L	M	M	L	L		
Extortion / Threats	L	L	L	L	L	L	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L	N/A	L	M	H	L	L	L	L	H		
Civil Unrest	H	L	L	L	L	L	L	H	M	L	L	L	N/A	L	L	L	L	L	L	L	L	N/A	L	M	H	L	L	L	L	L	H	
Community Violence (Extremist)	M	L	L	L	L	L	L	H	L	L	L	L	N/A	L	L	L	L	M	L	L	L	N/A	L	M	H	L	L	L	M	L		
Cyber Attack	H	L	L	L	H	M	L	H	M	L	L	L	L	M	L	L	M	M	M	L	L	L	L	M	H	M	M	M	L	H		
Infrastructure Disruption	H	L	L	L	M	M	L	H	M	L	L	M	L	L	L	L	L	M	L	L	L	N/A	L	M	H	L	M	M	L	H		
Food-Water Contamination	H	H	L	L	L	M	L	H	L	L	L	L	L	L	L	L	L	M	L	L	L	N/A	L	H	H	L	L	L	M	H		
Explosive Devices (Bombs)	H	L	L	L	L	M	L	H	H	L	L	L	L	L	L	L	L	M	L	L	L	L	L	H	H	M	L	L	M	H		
Workplace Violence	H	L	L	L	L	M	L	H	M	L	L	L	L	L	L	L	L	M	L	L	L	N/A	L	H	H	L	M	L	L	H		
Intentional HAZMAT Incident	H	L	L	L	L	H	L	H	M	L	L	L	M	L	L	L	L	M	L	L	L	N/A	L	H	H	L	L	L	M	H		

Table 12: Hazard Vulnerability

4.2 Repetitive Loss Structures

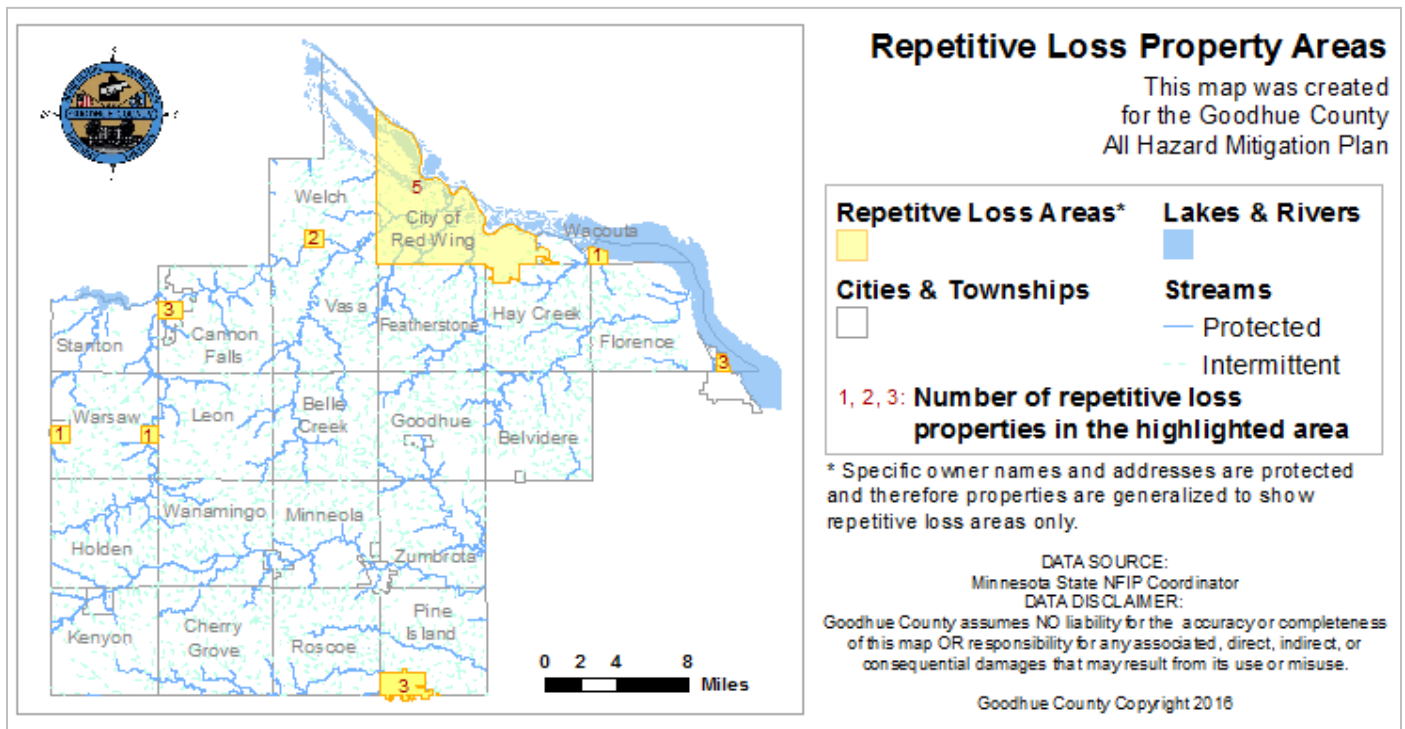
There are twenty repetitive loss structures in Goodhue County. A repetitive loss structure, as defined by the National Flood Insurance Program (NFIP), is a structure that is covered by flood insurance by NFIP that has suffered flood damage twice over a 10 year period in which the average cost of repair is over 25% of the market value of the structure at the time of the event.

Below is a table listing the addresses of the Repetitive Loss structures within Goodhue County as of February 2016.

Prop Locater	City	Zip Code
0093212	CANNON FALLS	55009
0096287	CANNON FALLS	55009
0042040	CANNON FALLS	55009
0041976	DENNISON	55018
0240131	WACOUTA	55066
0113495	REDWING	55066
0113496	REDWING	55066

0090149	REDWING	55437
0112513	REDWING	55066
0239271	FRONTENAC	55026
0114878	LAKE CITY	55041
0213754	WELCH	55089
0095581	WELCH	55089
0096285	GOODHUE COUNTY	55018
0112510	LAKE CITY	55041
0112632	LAKE CITY	55041
0196325	PINE ISLAND	55963
0063269	PINE ISLAND	55963
0118571	PINE ISLAND	55963
0116353	REDWING	55066

Table 13: Repetitive Loss Structures in Goodhue County



Map 36. Repetitive Loss Property Areas.

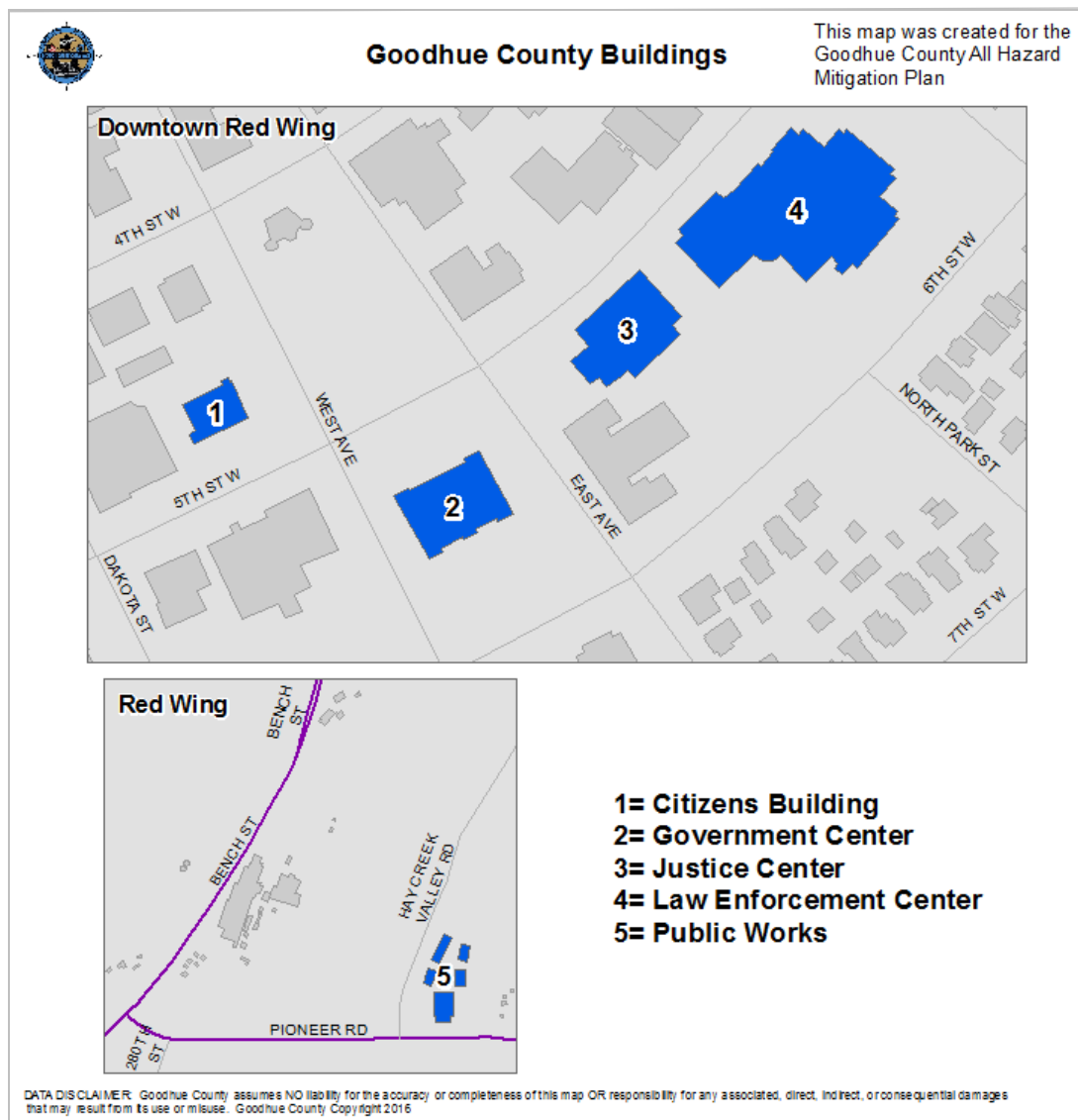
Some of the details regarding repetitive loss structures are considered to be sensitive information and as such cannot be made available publicly within this Plan update. Building types include 16 single family homes, 2 multi-family homes and 2 non-residential properties. County staff will continue to work with The Minnesota State NFIP Coordinator to collect additional information for these properties.

4.3 Goodhue County Structures & Critical Facilities

There are 4 Goodhue County Public Works garages throughout the county. There are also six other main county-utilized buildings within the City of Red Wing. As of 2016, there are approximately 332 county employees: 30 in the Justice Center building, 72 in the Citizens building, 84 in the Government Center, 33 in the Public Works facilities, and 113 in the Law Enforcement Center. Within the Law Enforcement Center Building is also the Goodhue County Jail.

Building	Estimated Market Value	# of Employees
Justice Center, Law Enforcement Center	\$23,084,000	143
Citizen Building	\$2,167,900	72
Government Center	\$4,215,900	84
Public Works	\$271,900	33

Table 14. Estimated Market Value and Total Number of Employees



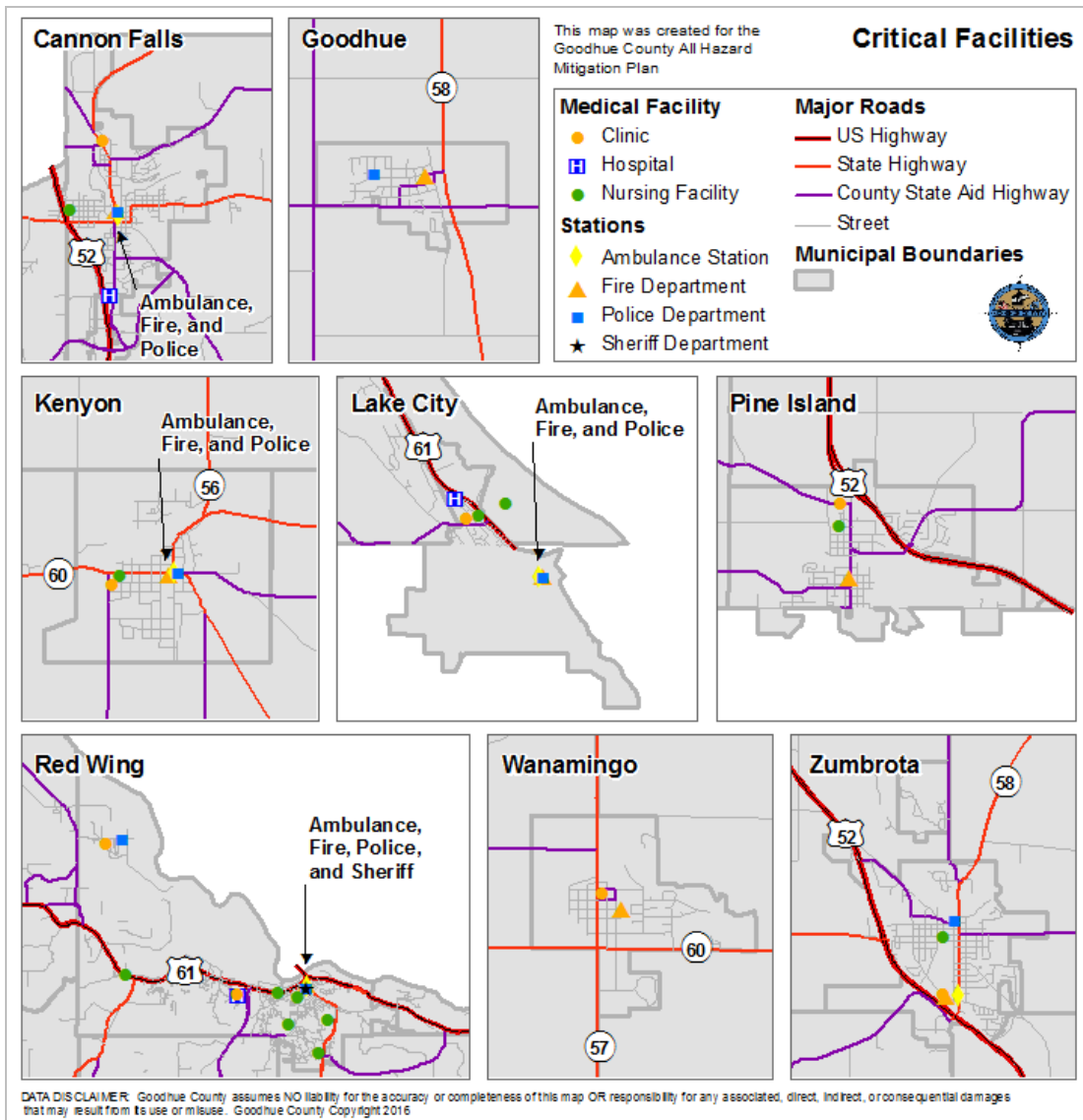
Map 37. Goodhue County Buildings.

Critical facilities include hospitals, clinics, nursing facilities, ambulance stations, fire stations, police departments, and sheriff departments.

There are currently 11 clinics located within Goodhue County. There are also 3 Hospitals and an estimated 8 nursing facilities. Although the majority of these facilities are located within the City of Red Wing, there are other major concentrations of Hospital and Clinic facilities in the cities of Cannon Falls and Lake City.

There are 7 local police departments within Goodhue County – Cannon Falls, Goodhue, Kenyon, Lake City, Prairie Island Indian Community, Red Wing, and Zumbrota. The Goodhue County Sheriff’s Office patrols the cities of Wanamingo, Bellechester, Dennison and Pine Island.

Information regarding potential dollar losses to these vulnerable structures was not available in time for the publication of this document.



Map 38. Critical Facilities in Goodhue County

Information regarding bridges was provided by the Goodhue County Public Works Department. Information for all county-maintained bridges was available but detailed information for township-maintained bridges was not available in time for the publication of this plan.

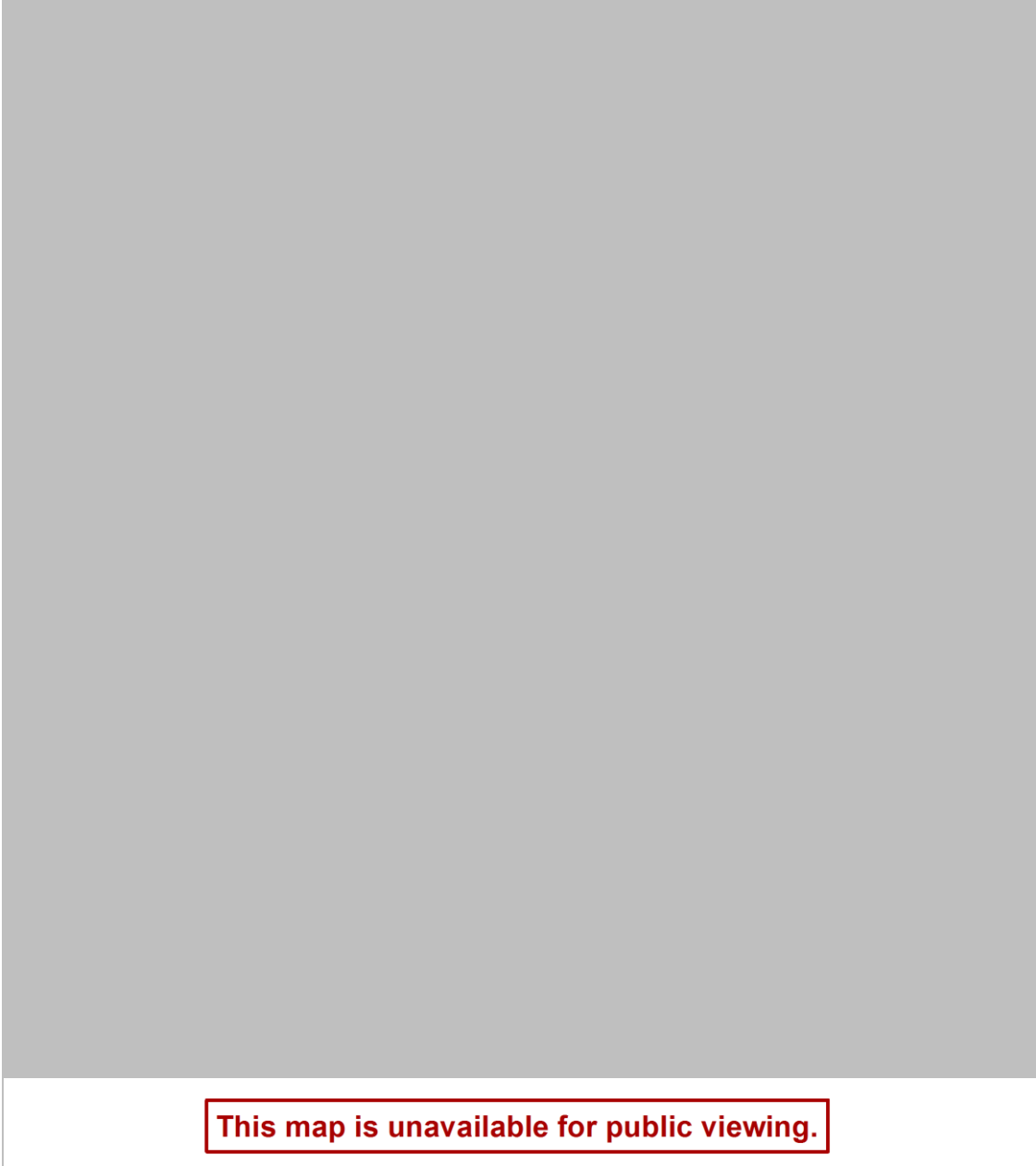
There are 545 bridges in Goodhue County. The ownership of these structures is divided among the State of Minnesota, the various Townships and Cities, and the County. 203 of these are County-owned bridges located throughout its highway system, though many are concentrated in the center and east.

A bridge's structural sufficiency is not the principle variable when considering hazard mitigation. As important, especially in places like Goodhue County with varying topographic relief, are things like flooding, substantial rain events, and the high rates of flow which accompany them. The washing-out of both road approaches to bridges, and the foundation embankments under, them can cause catastrophic failures in otherwise sound structures. As a result, bridges of special concern in the County are at crossings where rapid flow through larger streams and rivers often occurs: Belle Creek and the Cannon River in the north; Wells Creek, Bullard Creek and Hay Creek in the east; the Little Cannon River in the west; and Pine Island Creek and the various forks of the Zumbro River in the south.

Despite identifying these areas, to determine a bridge's risk of susceptibility to flooding hazard is not an exact science. With the ever-increasing frequency of 100 and 500 year flood events, coupled with seemingly little pattern to where they occur, previously accepted weather norms are quickly being replaced by what might be termed as "unforeseeable variability". Goodhue County will continue its efforts to analyze and study these changes in an effort to mitigate those variables. Unfortunately, due to limited funding the County is forced to design bridges and culverts for 100 year flood events even though it appears that larger events occur more frequently now than in the past.

Currently there are 10 Water Treatment Plants within Goodhue County and 29 Water Supply Facilities. Three of those Water Treatment Plants, and 15 of those Water Supply Facilities, are located within the City of Red Wing. There are 3 main gas pipelines in the county and they are all run by the Northern Natural Gas Company. There are also 2 main liquid pipelines in the county. The pipeline running northwest to southeast is owned and maintained by the Williams Brothers Pipeline Company. The pipeline that runs north and south is owned and operated by the Amoco Pipeline Company.

Currently, there are 21 emergency sirens around the county that are either owned by cities or other entities and they are maintained by the owners. There are also roughly 105 emergency sirens operated and maintained by the Xcel Energy Nuclear Power Plant that are within the 10 mile Emergency Planning Zone (EPZ) for the plant and they are located in both MN and WI. There are a total of 58 sirens that are in Goodhue County, 26 of those sirens are in the city limits of Red Wing, and 32 are located in the County. The siren coverage for the Nuclear Plant's EPZ at this time is sufficient and all sirens have been FEMA approved.



Map 39. Goodhue County Infrastructure – Water, Electric, and Pipelines ²

Earthen dams are regulated by the State of Minnesota and are classified into three hazard classes according to the damages incurred in the event of a disaster. Of the 46 earthen dams in Goodhue County, 36 are Class III, 9 are Class II, and 1 is a Class I. The dams in Classes 1 & 2 are of slightly higher priority to fix or replace because if damaged, the impact will affect a large number of people and a more wide-spread area. There are programs currently underway to monitor the status of the Lake Byllesby Dam.

The Prairie Island Nuclear Power Plant, owned and operated by Xcel Energy, is located within the City of Red Wing and is one of only two nuclear plants in Minnesota. There are only 100 total nuclear plants

in the United States. This plant is a two-unit pressurized water reactor (PWR) of Westinghouse design. Unit 1 reactor began operating in December 1973 and the Unit 2 reactor in December 1974. Each reactor has a capacity of about 550 megawatts (Mw), for a total plant output of about 1,100 Mw.

When first removed from the reactor, the used fuel is stored in a pool inside the plant. Once used fuel has cooled sufficiently, it is transferred to dry storage containers on site – in an Independent Spent Fuel Storage Installation (ISFSI). There it is temporarily stored until the federal government removes it to be reprocessed or stored at a government facility. As of 2016, Prairie Island’s ISFSI housed 40 dry-storage containers, which hold a total of approximately 920 spent fuel assemblies.

The license has an expiration date of Oct. 31, 2053.³ The initial 20-year license would have expired Oct. 31, 2013, but Northern States Power submitted a request to renew it in 2011. Unit 2 steam generators were replaced in 2013 at a cost of \$280 million.⁴ Unit 1 steam generators were replaced in the fall of 2004. Reactor heads also have been replaced on both Unit 1 and Unit 2.

Section 4 Citations

1. 2014 Minnesota State Hazard Mitigation Plan pg. 46, retrieved 2/3/2016 (<https://dps.mn.gov/divisions/hsem/hazard-mitigation/Documents/State%20Plan%20Final%202014.pdf>)
2. Transmission Lines and Substations dataset received February 8, 2016 from Minnesota Geospatial Commons. Pipeline dataset received February 8, 2016 from Pipeline and Hazardous Materials Safety Administration.
3. NRC News, Dec. 18, 2015. Retrieved February 8, 2016 (<http://www.nrc.gov/reading-rm/doc-collections/news/2015/15-088.pdf>).
4. Utilities Service Alliance, January 23rd, 2014. Retrieved February 8, 2016 (<https://www.usainc.org/news-and-events/steam-generator-replacement-project-takes-center-stage-during-prairie-islands-outage.html>).

Section 5: Mitigation Goals, Strategies, and Implementation

5.1 Status of 2010 Mitigation Action Plan

Mitigation Strategy	Hazards	Goal	Ranking	Cost	Jurisdiction	Status	Completion
Remove sediment buildup that has created an island that impedes water flow during high water levels on the Little Cannon River.	Flood, Erosion, Infrastructure failure	Ensure that waterway can flow smoothly within riverbanks during high water periods without overflowing or causing erosion.	18	\$75,000	City of Cannon Falls	Never Started	
Remove sewer bridge that crosses the Cannon River and buy new sewer line under river.	Flood, Erosion, Infrastructure failure	Increase water flow during high water level events.	14	\$500,000	City of Cannon Falls	Studied but not started	If / When 70% funds become available
Apply for floodplain mapping with FEMA	Flood	Protect homeowners from floods	11	\$5,000	City of Goodhue	Completed	8/26/2010
Relocate Archer Daniel Midland (ADM) away from downtown Red Wing to a less-densely populated area.	Technological, Terrorism	Reduce the loss of life or property damage in the event of an explosive fire event.			City of Redwing	Never Started	
Purchase cell boosters or a new two-way radio system with repeater	Domestic Preparedness	Increase the cell reception quality and two-way radio capability.	6	\$10,000	Kenyon Wanamingo School District	Started but incomplete	
Purchase backup generators	Severe Weather	Keep communication systems in schools running in the event of a power outage.	5	\$35,000 - \$50,000	Zumbrota Mazeppa School District	Never Started	
Add sirens in the area surrounding Byllesby dam depending on the new flood inundation delineations.	Technological Hazard, Flood	Warning notification	8		Goodhue County/Dakota County	Started/Ongoing	
Upgrade all city and county sirens to be "narrowbanded" by 2013	All Hazards	Ensure proper functionality of sirens during emergency events.	10	\$2,000 per siren	Office of Emergency Management	Completed	2013
Encourage county citizen participation and support of Storm Ready.	All Hazards	Increase awareness among county citizens about emergency preparedness.	5		Office of Emergency Management	Never Started	
Purchase backup generator for the Red Wing local radio station, KCUE/KWNG and their satellite office in Lake City, for use in the event of a power outage due to severe storms.	Severe Storms	Warning and Notification. Keep the radio station online after the event of a power interruption.	8		Office of Emergency Management	Never Started	
Identify emergency shelters in the area of the county fairgrounds	Severe Storms		5		Goodhue County	Never Started	
Purchase or obtain easements over empty lots located in Special Flood Hazard Areas.	Flood	Decrease the impact of future floods.	7	\$600,000 - \$1,000,000	Goodhue County	Ongoing	
Purchase/mitigate repetitive loss properties	Flood	Decrease the impact of future floods.	7	\$1,000,000	Goodhue County	Ongoing	
Evaluate the location and numbers of stream monitoring stations throughout the County, and coordinate and/or purchase additional monitoring	Flood	Improve the readiness of the county in the event of flooding.	10		Goodhue County	Never Started	
Purchase NOAA weather radio citizens in areas	Severe Storms	Early warning notification	10		Goodhue County	Completed	2012
Replace or rebuild the electric lines to ensure electric power will be delivered during severe weather events. Economic impact on electric customers can be very substantial with a loss of power for extended periods of time.	Severe Summer Storm, Severe Winter Storm, Flood, Tornado, Wind Storm, Infrastructure Failure	Reduce the possibility of extended periods without electric power to consumers, thus reducing negative economic impacts.	11	\$564,000	Goodhue County Cooperative Electric Association	Ongoing	Unkown

The Action Plan outlined in the All Hazard Mitigation Plan adopted in 2010 was designed to be a general guide for city and county staff. All individual strategies were assigned a responsible party to ensure implementation. Overall responsibility, oversight, and general monitoring of the action plan, however, were assigned to the Goodhue County Emergency Manager.

The planning process used by Goodhue County in 2010 involved first prioritizing their goals and respective objectives developed in the draft plan as the ones most urgent to address. County staff involved the public as well as the Technical and Policy Committees. Staff used Hazard Worksheets to collect prioritizing information from the public and the committees. The results from these Hazard Worksheets helped assign a “Hazard Rank” to each mitigation project. The hazard worksheets were handed out at the first public and policy meetings and were filled out by attendees. Each hazard was given a rank regarding the likelihood of its occurrence and another number regarding the amount of impact the hazard would have on the community. County staff combined those numbers, and created a hazard rank for each mitigation project. The hazard rank numbers range from 5-18. A project with a rank of 5 would mean its hazard is a serious threat to the community and its effects would cover a large area. Therefore, that hazard’s mitigation project’s would be listed as a high priority to be completed. On the opposite end of the scale, a hazard with a rank of 18 would be listed as a lower-risk event and so its corresponding mitigation project/s would have a lower priority level of being completed. As seen in the table above, all of the mitigation projects fit into a hazard rank between 5 and 18.

5.2 Participation and Compliance with National Flood Insurance Program (NFIP)

Participation in the NFIP is based on an agreement between communities and FEMA. The NFIP has three basic aspects:

- 1) Floodplain identification and mapping
- 2) Floodplain management
- 3) Flood insurance.

The following table summarizes participation for Goodhue County in the NFIP as of February 8, 2016: ¹ Goodhue County administers Building Code and Zoning for all the 21 townships, whereby all building and zoning permits are reviewed for any floodplain location issues. The zoning department also reviews requests for map updates. The County attends floodplain training and meetings, along with regular communication with Minnesota’s Floodplain manager and the local DNR Hydrologist to answer any citizen questions, and to monitor permitted projects in floodplain areas.

CID	Jurisdiction	Participation	Init FHBM Identified	Init FIRM Identified	Curr Eff Map Date	Reg-Emer Date
	City of Bellechester	No				
270141	City of Cannon Falls	Yes	5/24/1974	1/2/1981	9/25/2009	1/2/1981
270713	City of Dennison	Yes	8/10/1979	9/18/1985	4/3/2012	9/18/1985
270142	City of Goodhue	Yes	5/24/1974	9/25/2009	(NSFHA)	8/30/2010
270143	City of Kenyon	Yes	5/24/1974	9/25/2009	9/25/2009	8/5/2010
270486	City of Lake City	Yes	3/15/1974	2/18/1981	9/25/2009	2/18/1981
270145	City of Pine Island	Yes	12/28/1973	12/1/1981	4/3/2012	12/1/1981
270146	City of Red Wing	Yes	3/8/1974	9/29/1978	9/25/2009	9/29/1978
270147	City of Wanamingo	Yes	5/10/1974	6/15/1981	9/25/2009	6/15/1981
270148	City of Zumbrota	Yes	5/24/1974	9/3/1980	9/25/2009	9/3/1980
270903	Prairie Island Indian Community	Yes		9/25/2009	9/25/2009	2/22/2011
270140	Goodhue County	Yes		4/17/1978	9/25/2009	4/17/1978

5.3 2016 Mitigation Action Plan

Goodhue County began the review and update of the Goodhue County All Hazard Mitigation Plan in September, 2015 upon receiving a Hazard Mitigation Grant from the Minnesota Division of Homeland Security and Emergency Management. Over the fall of 2015 and winter of 2016, staff engaged in organizing existing resources, reviewing and updating the County profile, reviewing and updating the hazard profiles and assessments, reviewing mitigation goals and strategies identified in the Plan adopted in 2010, identifying new mitigation strategies, and updating the action plan.

New ideas for mitigation goals and actions were solicited at policy committee meetings and at public meetings. Several resources were made available suggesting possible mitigation actions that jurisdictions could decide to pursue. Local jurisdictions were asked to complete a benefit-cost review as part of the Strategy Implementation Plan worksheet for the mitigation strategies their jurisdiction is responsible for.

Each local jurisdiction was asked to complete a Strategy Implementation Plan worksheet for mitigation actions their jurisdiction is responsible for. The information collected included the mitigation action, cost, completion date, whether it applied to new or existing buildings and/or infrastructure, available funding sources, and existing planning mechanisms the action could be incorporated into.

Mitigation Action Plan Goals table immediately follows the Mitigation Action Plan and includes general hazard mitigation goals that represent what the jurisdictions seek to accomplish through mitigation plan implementation.

Hazard	Strategy	Priority Score	Target Completion Date	Cost	Funding Sources	Jurisdiction	Goal Number
Fire, Explosion, Radiological Disaster, Terrorism	Purchase a bus and a building for storage.	3	1 Year from funding	\$200,000	FEMA Public Assistance 406, Mitigation Funds	City of Bellechester	1
Natural Hazards, Terrorism, Solar Storms	Purchase enough Hamm Radio equipment to establish two mobile communications stations.	2	1 Year from funding	\$20,000	FEMA Public Assistance 406, Mitigation Funds	City of Bellechester	2
Blizzard	Purchase payloador with snowblower attachment of adequate size to facilitate snow removal for the city and surrounding area.	5	1 Year from funding	\$250,000	FEMA Public Assistance 406, Mitigation Funds	City of Bellechester	3
Terrorism, Infrastructure Disruption	Install cameras, motion detectors, upgrade fencing and door locks to pumphouses and waste water building.	14	6 Months from funding	\$15,000	FEMA Public Assistance 406, Mitigation Funds	City of Bellechester	4
Infrastructure Failure	Install a mechanical water treatment plant.	10	1 Year from funding	\$10,000,000	FEMA Public Assistance 406, Mitigation Funds	City of Bellechester	5
Water Supply Contamination, Infrastructure Failure, Fire	Install water storage tower and update water lines.	10	1 Year from funding	\$2,000,000	FEMA Public Assistance 406, Mitigation Funds	City of Bellechester	6
Infrastructure Failure, Sabatoge, Solar Storm	Purchase a generator of adequate size and design to power our pumphouses.	11	1 Year from funding	\$50,000	FEMA Public Assistance 406, Mitigation Funds	City of Bellechester	7
Water Contamination, Drought, Sabatoge, Infrastructure Disruption, Infrastructure Failure, Solar Storm	Drill a backup well and building a pumphouse which would be secure, heated, and available to run on generator power. The pumphouse should be adequate to supply water to the entire community.	3	1 Year from funding	\$150,000	FEMA Public Assistance 406, Mitigation Funds	City of Bellechester	8
Severe Storms, Structural Fire	Fortify the community center (ie. Generator and necessary hoochups, handicap bathrooms and showers, cots, blankets, pillows, first aid supplies, etc.).	14	1 Year from funding	\$100,000	FEMA Public Assistance 406, Mitigation Funds	City of Bellechester	9
Tomado, Sever Storms, Structure Fire, Wildfire	Construction of a storm shelter equipped to handle the temporary housing and safety of the community. (Include cots, blankets, first aid station, showers, etc.).	5	2 Years from funding	\$500,000	FEMA Public Assistance 406, Mitigation Funds	City of Bellechester	10
Wildfire	Purchase a tanker truck equipped with necessary equipment to hold and transport water, as well as sypress fires.	4	1 Year from funding	\$150,000	FEMA Public Assistance 406, Mitigation Funds	City of Bellechester	11
Dam Failure, Flood	Bury the sewer and water lines that cross the Cannon River under the river.			\$800,000	FEMA, State Grants, City Matching Funds	City of Cannon Falls	12
Dam Failure, Flood	Cty 24 and Hwy 19 going across the river and connecting with Cty 17.			Over \$1,000,000	FEMA, State & Federal Road Funds with some local cost share	City of Cannon Falls	13
Dam Failure, Flood	Relocate city hall/Police Department to area outside the flood and dam inundation area.			\$4,000,000	FEMA, State and City Funds	City of Cannon Falls	14
Tomado, Hail, Windstorm, Thunderstorm (Severe Storm)	Install safe room shelters at both school building locations (High/Middle School and Elementary School) to provide safety for occupants in tomados.			\$2,000,000	FEMA, State Grants	City of Cannon Falls	15

Hazard	Strategy	Priority Score	Target Completion Date	Cost	Funding Sources	Jurisdiction	Goal Number
Dam Failure, Flood	Turn all property along River Road into green space to prevent loss of life and property in flooding if dam failed.	3		\$2,870,000	FEMA	City of Cannon Falls	16
Tornado	Cooperative wishes to replace current storm shelter.	8			FEMA, Private Funds	City of Cannon Falls/Sunrise Villa Cooperative	17
Flood, Erosion, Infrastructure failure	Remove sewer bridge that crosses the Cannon River and buy new sewer line under river.	14	If / When 70% funds become available	\$500,000		City of Cannon Falls	18
Infrastructure Failure, Sabotage, Solar Storm	Purchase a generator of adequate size and design to power our pumphouses.	11				City of Dennison	19
Severe Storms, Infrastructure Failure, Attack, Accident	Set up a back up server for city files at the public works building.	8				City of Dennison	20
Severe Storms, Infrastructure Failure, Attack, Accident	Install a UPS (battery back-up system) in city hall for critical computer equipment.	12				City of Dennison	21
Human Caused Accident	Install sidewalks, crosswalks and complete walking trail for safe student travel.	7		Up to \$300,000	Federal Grant (80% Federal/20% School & City)	City of Goodhue	22
Flooding, Erosion and Landslide	Rip rapping along highway 61 and reinforcement of rail grade along 61.					City of Lake City	23
Train Derailment	Additional/More intense training.	9	Open Ended		Grants, State Funding	City of Lake City	24
Flood	Purchase/ Buy out of properties within the flood plain. Added river gauges to monitor river levels.	13	Ongoing		FEMA Funding / Grants	City of Pine Island	25
Severe Storms, Infrastructure Failure, Attack, Accident	Set up a back up server for city files at the public works building.	8	3 Years from funding	\$100,000	State & Federal Grants	City of Red Wing	26
Severe Storms, Infrastructure Failure, Attack, Accident	Install a UPS (battery back-up system) in city hall for critical computer equipment.	12	2 Years from funding	\$200,000	State & Federal Grants	City of Red Wing	27
Severe Storms, Infrastructure Failure, Attack, Accident	Add a second back-up gerator to city hall to maintain servers in the event of a power outage.	11	4 Years from funding	\$150,000	State & Federal Grants	City of Red Wing	28
Tornado, Severe Storms	Build storm shelter for 500 people at Baypoint and Colvill Parks.	6	4 Years from funding	\$10,000,000	State & Federal Grants	City of Red Wing	29
Tornado, Severe Storm, Tourboat Accident, Hostage/Barricade, Sabotage, Attack, Explosive	Build port terminal building/emergency shelter at Levee Park.	3	4 Years from funding	\$10,000,000-15,000,000	State & Federal Grants	City of Red Wing	30
Attack, Explosive Devices, Community Violence	Install security vehical barriers (pops & fixed) at Levee Park port facilities.	1	4 Years from funding	\$6,000,000	State & Federal Grants	City of Red Wing	31
Community Violence, Explosive Devices, Attack, Sabotage, Infrastructure Disruption	Place web-based CCTV security cameras at Levee Park and along proposed bike trails on river front.	8	4 Years from funding	\$1,000,000	State & Federal Grants, partnerships with stakeholders	City of Red Wing	32
Community Violence, Explosive Devices, Attack, Sabotage, Infrastructure Disruption, Intentional HAZMAT Incident	Improve lighting at Levee Park Boat Landing and add lighting on proposed bike trail to Bay Point and Colvill Parks.	12	4 Years from funding	\$3,000,000	State, Local & Federal Grants, Partnering with local businesses	City of Red Wing	33
Tour Boat Accident	Build improved mooring system for large tour boatsat Levee Park.	9	4 Years from funding	\$2,000,000	State & Federal Grants	City of Red Wing	34
Train Derailment	Build overpass at railroad crossing on Sturgeon Lake Road.	10	4 Years from funding	\$4,000,000	State & Federal Grants	City of Red Wing	35

Hazard	Strategy	Priority Score	Target Completion Date	Cost	Funding Sources	Jurisdiction	Goal Number
Flood, Landslide, Erosion	Secure funding for bridging equipment. Specifically for the causeway between County Road 18 and NSP Road.	2	4 Years from funding	\$849,000	10-33 Program, FEMA Public Assistance Mitigation Funds	City of Red Wing	36
Tornado, Thunderstorm, Terrorism	New Sirens to increase the area of the community that can hear the emergency Sirens.	6	6/1/2016	\$25,000	City Tax Dollars, Possible Grant	City of Wanamingo	37
Water Supply Contamination	Monitor contamination movement.				EPA, County, State	Goodhue Township	38
LP Storage, Diesel Fuel, Electricity	Retaining Walls and sprinkler heads that are remotely supplied water.	8	1 Year after Funding			Goodhue Township	39
Flood	Raise the road.					Goodhue Township	40
Accidents, Infrastructure Failure	Road maintenance.					Township	41
Infrastructure Failure, Pipeline Break	Find a way to protect existing pipes from breaking and implement it.					Leon Township	42
Flood	Replace/maintain the road and culverts on 357th St.	3		Under \$5,000		Leon Township	43
Flood	Repair road and repair/replace culverts on Shady Lane Trail.	1		Under \$5,000		Leon Township	44
Flood	Repair/replace culverts and bridges on Skunk Hollow Trail when Bather Creek Floods.	3		\$5,000 - \$25,000		Leon Township	45
Flood	Replace/repair culverts on 360th St.	2		Under \$5,000		Leon Township	46
Flood, Windstorm, Thunder Storm, Blizzard, Ice, Invasive Species, Hazardous Materials	Develop plans to deal with those areas that we do not have strategies to address.		End of 2016	Minimal	General Fund	Pine Island Township	47
Flood	Bridge removal.					Roscoe Township	48
Flooding	Raise grade of 310th St, 325th St, 330th St., 23rd Ave and Oxford Mill Road at creek crossing bridges and culverts.	3	18 months after funding			Stanton Township	49
Flooding	Elevate road and provide for additional culverts as necessary.					Wacouta Township	50
Train Derailment	Realign roads to eliminate crossings.					Wacouta Township	51
Severe Storms, Infrastructure Failure, Attack, Accident	Set up a back up server for city files at the public works building.	8				Wanamingo Township	52
Flood, Infrastructure Failure, Erosion	Install new culverts, raise height of the roads, reinforce river/stream banks, etc.					Wanamingo Township	53
Flooding	Raise 1.5 miles of Welch Trail to stop flooding and add 2 culverts to Welch Short Cut.	2		\$35,000	Tax Base	Welch Township	54
Flood, Tornado, Blizzard	Restore roads and bridges to original condition after a disaster.	3	ASAP		FEMA	Zumbrota Township	55
Flood	Install a new culvert.					Zumbrota Township	56
Blizzard, Infrastructure Failure, Crop Disaster, Windstorm, Erosion	Plant a "living fence" along roadways.					Zumbrota Township	57
Structural Fire, Hazardous Materials, Arson, School Violence, Explosives, Hostage/Barricade, Workplace Violence	Improve communication and coordination of emergency responses to the Goodhue School.	14	June 2017	\$1000 - \$20,000	Schools District, Local Government, State & Federal Grants	Goodhue Public Schools ISD 253	58
Arson, School Violence, Explosive Devices, Hostage/Barricade, Workplace Violence	Improve security camera coverage in school and school zone.	7	June 2018			Goodhue Public Schools ISD 253	59

Hazard	Strategy	Priority Score	Target Completion Date	Cost	Funding Sources	Jurisdiction	Goal Number
School Violence, Explosive Devices, Hostage/Barricade, Civil Unrest, Community Violence, Workplace Violence	Remodel main entrance of school building to create a vestibule-type secure entrance.	21	ASAP	\$52,000		Goodhue Public Schools ISD 253	60
Terrorism (All Categories)	Install Sally port entries on both schools.	21	August 2019	\$300,000	Capital Funding	Kenyon-Wanamingo Schools ISD 2172	61
Tornado, Windstorms, Thunderstorms	Hire an engineer to assess the buildings for safe area to shelter during a tornado or storm.	20	June 2016	\$3,000	Health and Safety, General Budget	Kenyon-Wanamingo Schools ISD 2172	62
Invasive Species	Remove the ash trees at the middle/high school. Replace them with a suitable replacement.	4	ASAP	\$25,000	Grants, Capital	Kenyon-Wanamingo Schools ISD 2172	63
Tornado, Hail, Windstorm, Thunderstorm (Severe Storm)	Build safe rooms at the middle/high school and elementary.	3	ASAP	\$2,000,000	Grants, Bonds, Capital	Kenyon-Wanamingo Schools ISD 2172	64
Domestic Preparedness	Purchase cell boosters or a new two-way radio system with repeater.	6		\$10,000		Kenyon Wanamingo School District ISD 2172	65
Terrorism (All Categories)	Security systems upgrade.		ASAP			Red Wing Public Schools ISD 256	66
Technological, Natural, Terrorism	Upgrade the electrical backup systems.					Red Wing Public Schools ISD 256	67
Technological, Natural, Terrorism	Communication and network systems upgrade.					Red Wing Public Schools ISD 256	68
Natural, Terrorism	Safe rooms in all district buildings.					Red Wing Public Schools ISD 256	69
Terrorism (All categories)	Attain a more secure entrance into High School.	8	2017	\$30,000	Deferred Maintenance	Zumbrota-Mazeppa Schools ISD 2805	70
Flood	Raise the Trail Elevation and add culverts to mile 9 washout area as well as two additional washout areas nearby.	4	ASAP	\$40-\$50,000	Pre-disaster Mitigation, Flooding Mitigation Assistance	Cannon Valley Trail	71
Flood	Construct a new maintenance facility above flood elevation to help protect the building and equipment from flooding.	10	ASAP	\$500,000	Pre-disaster Mitigation	Cannon Valley Trail	72
Flood	Use best management practices to control Cannon River erosion near mile 9.	4	ASAP	\$20,000	Flood Mitigation Assistance, Pre-disaster Mitigation	Cannon Valley Trail	73
Flood	Add additional and/or a large culvert to mile 15.9 washout area.	4	ASAP	\$4,000	Pre-disaster Mitigation, Flood Mitigation Assistance	Cannon Valley Trail	74
Invasive Species	Eliminate invasive species such as buckthorn, wild parsnip and oriental bittersweet.	12	ASAP	\$20,000	Pre-Disaster Mitigation	Cannon Valley Trail	75
Tornado, Hail, Lightning, Windstorm, Severe Storm	Construct two storm shelters. One at mile 4 and the other at mile 14. These stormshelter would also be used as vault toilets.	3	ASAP	\$40-\$45,000	Pre-Disaster Mitigation	Cannon Valley Trail	76
Flood	Add additional culverts from mile 14 through mile 15.	12	ASAP	\$10-\$14,000	Flood Mitigation Assistance	Cannon Valley Trail	77
Train Derailment, Spill on the Mississippi, Boating Accident, Disaster Recovery	Purchase portable light towers.	4	1 Year from funding			Goodhue County	78
Flood	Purchase a sandbag machine.	1	1 Year from Funding			Goodhue County	79

Hazard	Strategy	Priority Score	Target Completion Date	Cost	Funding Sources	Jurisdiction	Goal Number
Locate Drowning Victims/Vehicles	Purchase/Upgrade equipment for the county dive team. Purchase Teledyne Blue View ZD imaging sonar equipment and additional equipment. Training for dive team.	7	1 Year from funding	\$60,000		Goodhue County	80
Dam Failure, Flood	Develop an evacuation plan for Goodhue County's Cannon Falls residents that reside in the Bylesby Dam inundation area.	5	1 Year after Funding	\$30,000	Dakota & Goodhue County, City of Cannon Falls	Goodhue County	81
Severe Storms	Identify emergency shelters in the area of the county fairgrounds.	5				Goodhue County	82
Flood	Purchase or obtain easements over empty lots located in Special Flood Hazard Areas.	7		\$600,000 to \$1,000,000		Goodhue County	83
Flood	Purchase/mitigate repetitive loss properties.	7		\$1,000,000		Goodhue County	84
Flood	Evaluate the location and numbers of stream monitoring stations throughout the County, and coordinate and/or purchase additional monitoring equipment if necessary.	10				Goodhue County	85
Severe Storms	Purchase NOAA weather radio citizens in areas without siren coverage.	10	2012			Goodhue County	86
Technological Hazard, Flood	Add sirens in the area surrounding Bylesby dam depending on the new flood inundation delineations.	8				Goodhue County/Dakota County	87
All Hazards	Upgrade all city and county sirens to be "narrowbanded" by 2013.	10	2013	\$2,000 per siren		Office of Emergency Management	88
Severe Storms	Purchase backup generator for the Red Wing local radio station, KCUE/KWNG and their satellite office in Lake City, for use in the event of a power outage due to severe storms.	8				Goodhue County Office of Emergency Management	89
Severe Weather, Flooding, Tornado, Heavy Winds, Infrastructure Disruption, Infrastructure Failure	Replacing or rebuilding the electric lines to ensure power will be delivered during severe weather events.	11	Ongoing	\$500,000	Rate increase to cooperative members	Goodhue County Cooperative Electric Association	90
Severe Summer Storm, Severe Winter Storm, Flood, Tornado, Wind Storm, Infrastructure Failure	Replace or rebuild the electric lines to ensure electric power will be delivered during severe weather events.	11	Unkown (2020?)	\$564,000	Part of existing cooperative work plan - Divided among minor projects	Goodhue County Cooperative Electric Association	91
Flooding, Streambank Erosion	Armor streambanks along township roads.	7			FEMA following flooding events or State disaster relief dollars, Local govt. unit	Goodhue County Soil and Water Conservation District	92
Flooding, Streambank Erosion and Soil Erosion	Design and install water retention basins on the landscape to reduce peak flow of runoff discharge.	3			State Clean Water Legacy Funding, Federal Programs (NRCS,USDA, and FEMA following flood events), State disaster relief dollars, local government unit	Goodhue County Soil and Water Conservation District	93

Goal Number	Jurisdiction Mitigation Goals
1	To provide a method of transportation in the event that citizens need to be evacuated from the city.
2	To maintain effective communication with emergency services, as well as surrounding communities during emergency situations.
3	To maintain open routes of ingress and egress for city during inclement weather.
4	Maintain secure buildings to prevent destruction or contamination of water/wastewater infrastructure.
5	Maintain Proper waste water processing, prevent failure of wastewater ponds due to sinkhole.
6	Store and supply 30,000+ gallons of water for the town in order to include fire hydrants. Ensure water supply remains safe and readily available.
7	To power our water pumps should the current power/generators be disabled.
8	To supply safe, clean water to the citizens of our community.
9	Provide community the necessary shelter and resources to survive and prosper during and immediately after an emergency incident
10	To provide the community with necessary shelter during and immediately after storms
11	For city to be equipped to suppress possible wildfires should they erupt in the fields surrounding the city
12	Provide an underground connect to provide water/sewer service to community located on the north side of the river.
13	Provide a bridge significantly downstream from the current bridges that are expected to be lost in the event of dam failure and have been closed with flooding.
14	To provide a building outside the inundation area for continuous operations.
15	Preserve life during tornado
16	Eliminate occupied structures along river corridor for fast location of residential/office property.
17	Replace the current storm shelter to provide a safe room to protect life during a tornado.
18	Hold runoff water on the landscape to reduce soil erosion, reduce flooding potential/loss of infrastructure and increase stream habitat and improve water quality.
19	To power our water pumps should the current power/generators be disabled.
20	To have a back up system in the event the city's main server is corrupted, damaged, or destroyed to ensure the continuation of government
21	maintain power to critical computer equipment long enough to shut down and prevent data corruption and avoid severe disruption in business continuity
22	Improve walking surfaces and install non-existing paths of safe pedestrian travel.
23	The hazard of extreme flooding of the Mississippi River eroding the existing Rip Rap, the highway and possible erosion of the railbed between milemarkers 75-77.
24	To have better response capabilities
25	Reduce economic loss due to a significant flood event
26	To have a back up system in the event the city's main server is corrupted, damaged, or destroyed to ensure the continuation of government
27	maintain power to critical computer equipment long enough to shut down and prevent data corruption and avoid severe disruption in business continuity
28	maintain critical computer systems and protect stored data for continuity of government
29	To provide shelter for people attending events at the parks.
30	To create a security checkpoint for the tour ships and provide shelter in severe weather (excluding flood)
31	Prevent ubied from harming large moored tour ships and refueling operations
32	To provide monitoring capabilities of Levee Park, bike trails and critical infrastructure to police, fire department, and the City of Redwing.
33	To improve lighting on river front to increase visibility and protection of Levee, Red Wing Grain, Adm, city water treatment plant and new public bike trails.
34	To implement sound permanent structure to securely moor large vesseles and prevent accidents. (Current practice is to use a large tree)
35	To provide access for evacuation and emergency services to the Prairie Island power plant and community in the event of a rail accident
36	Provide emergency access in the event of a structural failure of existing causeway.
37	To increase the number of residents that can hear and respond/avoid disasters
38	Eliminate ground water contamination possibility (old county dump)
39	LP tank leaking and/or fire (Buildings refers to the tanks, 2 residential homes and a hog barn) Located on 370th Street due north of Goodhue
40	Eliminate flooding of the road, specifically 400th street
41	Make roads safer for residents
42	Protect the existing infrastructure.
43	Protect the existing infrastructure.
44	Protect and Maintain existing infrastructure
45	Protect and Maintain existing infrastructure due to flooding
46	Protect and Maintain existing infrastructure
47	Reduce the possibility of extended power outages to consumers as well as reducing the risk of equipment failure by improving system reliability.
48	Possibly change the road to redirect traffic from the potentially hazardous flood area
49	Mitigate flooding of low lying township roads
50	Keep roadway passable
51	Keeping access to residents
52	To have a back up system in the event the city's main server is corrupted, damaged, or destroyed to ensure the continuation of government
53	Use flood mitigation methods to prevent floods in areas which roads and bridges are commonly washed out and flooded to prevent future damage and danger for the public.
54	Prevent further flooding
55	Allows for proper use by residents with the least amount of disruption
56	Prevent flooding of the roads

Goal Number	Jurisdiction Mitigation Goals
57	Utilize plants to provide a natural method for stopping the pile up of snow on roadways as well as cut down blowing snow. Might also slow the wind and prevent crop damage.
58	Improved preparation for responses to Goodhue Schools by emergency personnel
59	Complete the installation of security cameras in school and school zone. (Ongoing)
60	Secure the main building entrance.
61	Reduce the risk of attack
62	Do our best to locate staff and students in as safe a spot as possible during a storm event.
63	Remove the trees to help prevent infestation of the area / Remove them before they are killed by infestation
64	To provide safe harbor during a severe weather event
65	Protect people from terrorism.
66	Measure to minimize the impact of terrorism on the students, staff and property of the school district.
67	Measure to minimize the impact of power outages on the students, staff, and property of the school district.
68	Precaution, property protection, emergency service measures to reduce hazard losses, protect/preserve/restore school communications.
69	Construction of structures to reduce the impact of hazards on students, staff, and property.
70	Channel entrance through the office before entering through locked doors. This will provide more security to students and staff.
71	Keep the trail open and safe for trail users by eliminating flood debris from settling on the trail.
72	After a flood event has occurred and areas of the trail are damaged, it is important to have an operational maintenance facility to repair flood damage safely and in a timely manner.
73	Control erosion so a portion of the trail is not washed away by flood waters.
74	Keep the trail open and safe for trail users by eliminating flood debris from settling on the trail.
75	Eliminate these invasive species in order to protect and promote species native to Minnesota.
76	Protect people from hazardous weather.
77	Protect this section of the Cannon Valley Trail from flood water damage.
78	Light towers would provide assistance to emergency responders
79	Having a sand bagging machine readily available would help with sand bagging efforts to help prevent flooding to critical infrastructure and key resources and residential structures.
80	Respond to emergencies rapidly and more efficiently and allow the dive team to assist others.
81	Using a contractor develop an emergency evacuation plan that will help to protect citizens of Cannon Falls and Goodhue County if Byllesby Dam fails.
82	Reduce the possibility of extended power outages to consumers as well as reducing the risk of equipment failure by improving system reliability.
83	Protect TWP roads from streambank erosion during flooding events by armoring banks along most erosion prone areas.
84	Hold runoff water on the landscape to reduce soil erosion, reduce flooding potential/loss of infrastructure and increase stream habitat and improve water quality.
85	Protection from flood damage.
86	Protect people from hazardous weather.
87	Construction of structures to reduce the impact of hazards on staff and property.
88	Protect people from hazards.
89	Protect people from hazardous weather.
90	Reduce the possibility of extended power outages to consumers as well as reducing the risk of equipment failure by improving system reliability.
91	Reduce the possibility of extended power outages to consumers as well as reducing the risk of equipment failure by improving system reliability.
92	Hold runoff water on the landscape to reduce soil erosion, reduce flooding potential/loss of infrastructure and increase stream habitat and improve water quality.
93	Hold runoff water on the landscape to reduce soil erosion, reduce flooding potential/loss of infrastructure and increase stream habitat and improve water quality.

5.4 Plan Maintenance

Plan Adoption

The All Hazard Mitigation Plan must satisfy all prerequisites as defined by FEMA before it can receive approval. Each agency participating in the Goodhue County plan shall adopt the plan update after it has been approved by FEMA. The official approval date is indicated on the signed FEMA approval letter. As well as providing the approval date, it also indicates the expiration date of the plan.

Update Process

After reviewing the completed Action Plan, County staff has concluded that it needs further analysis to include additional factors when considering project prioritization. Currently, there are too many projects with the same hazard rank and county staff was unable to collect cost information for the majority of the projects. The mitigation projects need to be assessed further to create a more detailed hazard ranking. In doing so, a more informative and workable Action Plan will be created. The first step for the next update of the Action Plan is to consider additional factors for each hazard and mitigation project such as:

- The project cost
- Availability of financial resources
- Staff resources
- Does it reflect the goals and objectives
- Does it effectively mitigate risk for the riskiest hazard event
- Effect on county or city departments
- How long the project will take

After the AHMP is adopted, it will be reviewed to identify any areas in the current plans such as the Zoning and Subdivision Ordinances need to be updated to reflect the adopted strategies. In addition, the County is in the process of updating their Comprehensive Plan. A common theme throughout the Plan is to protect the Agricultural and Natural Resources in the County. This includes using best management practices, and preserving our Natural areas and water resources. Limiting the built environment in sensitive areas (flood prone areas, buffer strips, bluffs) will limit the potential hazards caused by environmental disasters.

One aspect of mitigating disasters is through the building, zoning, and septic permit review processes. The County administers both the Building Code and Zoning throughout the 21 townships. Building staff review building requests according to the current adopted building code. Zoning staff review requests in light of neighborhood and the environmental impacts. In 2015, the County reviewed 52 zoning permit requests and 15 septic permits requests in the shore land district.

Any updates to the Action Plan will involve the Goodhue County Emergency Manager and the Technical Committee. Annual meetings will be scheduled where the Action Plan and entire All-Hazard Mitigation Plan will be reviewed. If changes are needed, staff will then update the information. If more input is necessary public meetings will be set up and the Policy Committee will be involved as well. Plan maintenance will be on an as-needed basis but will be reviewed annually.

Section 5 Citations

1. FEMA, Communities Participating in the National Flood Program. Retrieved February 8, 2016 (<https://www.fema.gov/cis/MN.pdf>)

APPENDICES

Appendix A: 2016 Jurisdiction and Public Participation

Resolutions of Support and Adoption

Goodhue County

GOODHUE COUNTY ALL-HAZARD MITIGATION PLAN

RESOLUTION TO ADOPT THE GOODHUE COUNTY ALL-HAZARD MITIGATION PLAN

WHEREAS, Goodhue County has participated in the hazard mitigation planning process as established under the Disaster Mitigation Act of 2000; and
WHEREAS, the Act establishes a framework for the development of a County Hazard Mitigation Plan; and
WHEREAS, the Act as part of the planning process requires public involvement and local coordination among neighboring local units of government and businesses; and
WHEREAS, the Goodhue County Plan includes a risk assessment including past hazards, hazards that threaten the County, an estimate of structures at risk, a general description of land uses and development trends; and
WHEREAS, the Goodhue County Plan includes a mitigation strategy including goals and objectives and an action plan identifying specific mitigation projects and costs; and
WHEREAS, the Goodhue County Plan includes a maintenance or implementation process including plan updates, integration of the plan into other planning documents and how Goodhue County will maintain public participation and coordination; and
WHEREAS, the Plan has been shared with the Minnesota Division of Homeland Security and Emergency Management and the Federal Emergency Management Agency for review and comment; and
WHEREAS, the Goodhue County All-Hazard Mitigation Plan will make the County and participating jurisdictions eligible to receive FEMA hazard mitigation assistance grants; and
WHEREAS, this is a multi-jurisdictional Plan and cities that participated in the planning process may choose to also adopt the County Plan;

NOW THEREFORE BE IT RESOLVED that Goodhue County Board of Commissioners supports the hazard mitigation planning effort and wishes to adopt the Goodhue County All-Hazard Mitigation Plan.

CERTIFICATION

I hereby certify that the foregoing resolution is a true and correct copy of the resolution adopted by the Goodhue County Board of Commissioners, **December 8, 2016**:

SIGNED:



Dan Rechtzigel, County Board Chair

WITNESSED:



Scott Arneson, County Administrator

GOODHUE COUNTY ALL-HAZARD MITIGATION PLAN

RESOLUTION TO ADOPT THE GOODHUE COUNTY
ALL-HAZARD MITIGATION PLAN

WHEREAS, Goodhue County has participated in the hazard mitigation planning process as established under the Disaster Mitigation Act of 2000, and

WHEREAS, the Act establishes a framework for the development of a County Hazard Mitigation Plan; and

WHEREAS, the Act as part of the planning process requires public involvement and local coordination among neighboring local units of government and businesses; and

WHEREAS, the Goodhue County Plan includes a risk assessment including past hazards, hazards that threaten the County, an estimate of structures at risk, a general description of land uses and development trends; and

WHEREAS, the Goodhue County Plan includes a mitigation strategy including goals and objectives and an action plan identifying specific mitigation projects and costs; and

WHEREAS, the Goodhue County Plan includes a maintenance or implementation process including plan updates, integration of the plan into other planning documents and how Goodhue County will maintain public participation and coordination; and

WHEREAS, the Plan has been shared with the Minnesota Division of Homeland Security and Emergency Management and the Federal Emergency Management Agency for review and comment; and

WHEREAS, the Goodhue County All-Hazard Mitigation Plan will make the county and participating jurisdictions eligible to receive FEMA hazard mitigation assistance grants; and

WHEREAS, this is a multi-jurisdictional Plan and cities that participated in the planning process may choose to also adopt the County Plan.

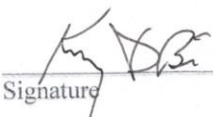
NOW THEREFORE BE IT RESOLVED that Goodhue County Board of Commissioners supports the hazard mitigation planning effort and wishes to adopt the Goodhue County All-Hazard Mitigation Plan.

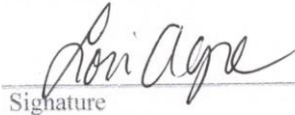
CERTIFICATION

I hereby certify that the foregoing resolution is a true and correct copy of a resolution adopted by:

SIGNED

WITNESSED


Signature _____ Date 12-14-16


Signature _____ Date 12/14/16

Kerry A. Bion Mayor
Printed name and title

Lori Agre, City Clerk
Printed name and title

N-H

CITY OF WANAMINGO
GOODHUE COUNTY
STATE OF MINNESOTA

RESOLUTION 16-068

A RESOLUTION TO ADOPT THE GOODHUE COUNTY ALL-HAZARD MITIGATION PLAN

WHEREAS: Goodhue County has participated in the hazard mitigation planning process as established under the Disaster Mitigation Act of 2000; and

WHEREAS: the Act establishes a framework for the development of a County Hazard Mitigation Plan; and

WHEREAS: the Act as part of the planning process requires public involvement and local coordination among neighboring local units of government and businesses; and

WHEREAS: the Goodhue County Plan includes a risk assessment including past hazards, hazards that threaten the County, an estimate of structures at risk, a general description of land uses and development trends; and

WHEREAS: the Goodhue County Plan includes a mitigation strategy including goals and objectives and an action plan identifying specific mitigation projects and costs; and

WHEREAS: the Goodhue County Plan includes a maintenance or implementation process including plan updates, integration of the plan into other planning documents and how Goodhue County will maintain public participation and coordination; and

WHEREAS: the Plan has been shared with the Minnesota Division of Homeland Security and Emergency Management and the Federal Emergency Management Agency for review and comment; and

WHEREAS: the Goodhue County All-Hazard Mitigation Plan will make the county and participating jurisdictions eligible to receive FEMA hazard mitigation assistance grants; and

WHEREAS: this is a multi-jurisdictional Plan and cities that participated in the planning process may choose to also adopt the County Plan.


NOW THEREFORE BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF WANAMINGO: that the Wanamingo City Council supports the hazard mitigation planning effort and wishes to adopt the Goodhue County All-Hazard Mitigation Plan.

Adopted this 12th day of December 2016.

SIGNED:


Ryan Holmes, Mayor

ATTEST:


Michael Boulton, City Administrator

Motion: *Flottonud*

Second: *Dierkes*

**RESOLUTION NO. 2016-33
CITY OF KENYON
COUNTY OF GOODHUE
STATE OF MINNESOTA**

**RESOLUTION TO ADOPT THE GOODHUE COUNTY
ALL-HAZARD MITIGATION PLAN**

WHEREAS, Goodhue County has participated in the hazard mitigation planning process as established under the Disaster Mitigation Act of 2000, and

WHEREAS, the Act establishes a framework for the development of a County Hazard Mitigation Plan; and

WHEREAS, the Act as part of the planning process requires public involvement and local coordination among neighboring local units of government and businesses; and

WHEREAS, the Goodhue County Plan includes a risk assessment including past hazards, hazards that threaten the County, an estimate of structures at risk, a general description of land uses and development trends; and

WHEREAS, the Goodhue County Plan includes a mitigation strategy including goals and objectives and an action plan identifying specific mitigation projects and costs; and

WHEREAS, the Goodhue County Plan includes a maintenance or implementation process including plan updates, integration of the plan into other planning documents and how Goodhue County will maintain public participation and coordination; and

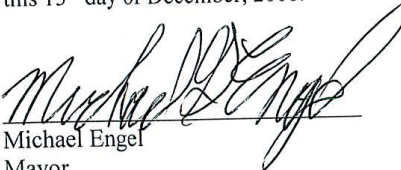
WHEREAS, the Plan has been shared with the Minnesota Division of Homeland Security and Emergency Management and the Federal Emergency Management Agency for review and comment; and

WHEREAS, the Goodhue County All-Hazard Mitigation Plan will make the county and participating jurisdictions eligible to receive FEMA hazard mitigation assistance grants; and


WHEREAS, this is a multi-jurisdictional Plan and cities that participated in the planning process may choose to also adopt the County Plan.

NOW THEREFORE BE IT RESOLVED that the Kenyon City Council supports the hazard mitigation planning effort and wishes to adopt the Goodhue County All-Hazard Mitigation Plan.

Adopted by the City Council of the City of Kenyon on this 13th day of December, 2016.


Michael Engel
Mayor

ATTEST:


Mark R. Vahlsing
City Administrator

RESOLUTION No. 7047

A Resolution to Adopt the Goodhue County All-Hazards Mitigation Plan

WHEREAS, the County of Goodhue has completed an All-Hazard Mitigation Plan as established under the Hazard Mitigation Act of 2000; and

WHEREAS, the Act establishes a framework for the development of a county all-hazard mitigation plan; and

WHEREAS, the Act, as part of the planning process, required public involvement and local coordination among neighboring local units of government and businesses; and

WHEREAS, the plan includes a risk assessment including past hazards, hazards that threaten the county, maps of hazards, an estimate of structures at risk, estimate of potential dollar losses for each hazard, a general description of land uses and development trends; and

WHEREAS, the plan includes a mitigation strategy including goals and objectives and an action plan identifying specific mitigation projects and costs; and

WHEREAS, the plan includes a maintenance or implementation process including plan updates, integration of the plan into other planning documents and how the county will maintain public participation and coordination; and

WHEREAS, the draft plan was shared with Minnesota Division of Homeland Security & Emergency Management for coordination of state agency review, comment, and approval and

WHEREAS, this resolution does not preclude the township or city from preparing its own plan sometime in the future should it desire to do so.

NOW THEREFORE BE IT RESOLVED, that the City of Red Wing adopts the Goodhue County All-Hazard Mitigation Plan update and recognizes that the plan will apply within the city.

Adopted this 9th day of January, 2017.



Kim P. Beise, Council President

GOODHUE COUNTY ALL-HAZARD MITIGATION PLAN

RESOLUTION TO ADOPT THE GOODHUE COUNTY
ALL-HAZARD MITIGATION PLAN

WHEREAS, Goodhue County has participated in the hazard mitigation planning process as established under the Disaster Mitigation Act of 2000, and

WHEREAS, the Act establishes a framework for the development of a County Hazard Mitigation Plan; and

WHEREAS, the Act as part of the planning process requires public involvement and local coordination among neighboring local units of government and businesses; and

WHEREAS, the Goodhue County Plan includes a risk assessment including past hazards, hazards that threaten the County, an estimate of structures at risk, a general description of land uses and development trends; and

WHEREAS, the Goodhue County Plan includes a mitigation strategy including goals and objectives and an action plan identifying specific mitigation projects and costs; and

WHEREAS, the Goodhue County Plan includes a maintenance or implementation process including plan updates, integration of the plan into other planning documents and how Goodhue County will maintain public participation and coordination; and

WHEREAS, the Plan has been shared with the Minnesota Division of Homeland Security and Emergency Management and the Federal Emergency Management Agency for review and comment; and

WHEREAS, the Goodhue County All-Hazard Mitigation Plan will make the county and participating jurisdictions eligible to receive FEMA hazard mitigation assistance grants; and

WHEREAS, this is a multi-jurisdictional Plan and cities that participated in the planning process may choose to also adopt the County Plan.

NOW THEREFORE BE IT RESOLVED that Goodhue County Board of Commissioners supports the hazard mitigation planning effort and wishes to adopt the Goodhue County All-Hazard Mitigation Plan.

CERTIFICATION

I hereby certify that the foregoing resolution is a true and correct copy of a resolution adopted by:

SIGNED

WITNESSED

Jeff W. Flaten 1-5-17
Signature Date

Jessica Page 1-5-17
Signature Date

Jeffrey W. Flaten, Mayor
Printed name and title

Jessica Page Clerk/Treasurer
Printed name and title

RESOLUTION 17-018

CITY OF LAKE CITY MINNESOTA

**A RESOLUTION TO ADOPT THE GOODHUE COUNTY
ALL-HAZARD MITIGATION PLAN**

WHEREAS, Goodhue County has participated in the hazard mitigation planning process as established under the Disaster Mitigation Act of 2000, and

WHEREAS, the Act establishes a framework for the development of a County Hazard Mitigation Plan; and

WHEREAS, the Act as part of the planning process requires public involvement and local coordination among neighboring local units of government and businesses; and

WHEREAS, the Goodhue County Plan includes a risk assessment including past hazards, hazards that threaten the County, an estimate of structures at risk, a general description of land uses and development trends; and

WHEREAS, the Goodhue County Plan includes a mitigation strategy including goals and objectives and an action plan identifying specific mitigation projects and costs; and

WHEREAS, the Goodhue County Plan includes a maintenance or implementation process including plan updates, integration of the plan into other planning documents and how Goodhue County will maintain public participation and coordination; and

WHEREAS, the Plan has been shared with the Minnesota Division of Homeland Security and Emergency Management and the Federal Emergency Management Agency for review and comment; and

WHEREAS, the Goodhue County All-Hazard Mitigation Plan will make the county and participating jurisdictions eligible to receive FEMA hazard mitigation assistance grants; and

WHEREAS, this is a multi-jurisdictional Plan and cities that participated in the planning process may choose to also adopt the County Plan.

NOW THEREFORE BE IT RESOLVED that City of Lake City, City Council supports the hazard mitigation planning effort and wishes to adopt the Goodhue County All-Hazard Mitigation Plan.

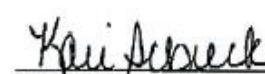
CERTIFICATION

I hereby certify that the foregoing resolution is a true and correct copy of a resolution adopted by:

BY:

Attested by:

 2/13/17
Signature Date

 2/13/17
Signature Date

Mark Nichols, Mayor

Kari Schreck, City Clerk

**Resolution 2017-06
GOODHUE COUNTY ALL-HAZARD MITIGATION PLAN**

**RESOLUTION TO ADOPT THE GOODHUE COUNTY
ALL-HAZARD MITIGATION PLAN**

WHEREAS, Goodhue County has participated in the hazard mitigation planning process as established under the Disaster Mitigation Act of 2000, and

WHEREAS, the Act establishes a framework for the development of a County Hazard Mitigation Plan; and

WHEREAS, the Act as part of the planning process requires public involvement and local coordination among neighboring local units of government and businesses; and

WHEREAS, the Goodhue County Plan includes a risk assessment including past hazards, hazards that threaten the County, an estimate of structures at risk, a general description of land uses and development trends; and

WHEREAS, the Goodhue County Plan includes a mitigation strategy including goals and objectives and an action plan identifying specific mitigation projects and costs; and

WHEREAS, the Goodhue County Plan includes a maintenance or implementation process including plan updates, integration of the plan into other planning documents and how Goodhue County will maintain public participation and coordination; and

WHEREAS, the Plan has been shared with the Minnesota Division of Homeland Security and Emergency Management and the Federal Emergency Management Agency for review and comment; and

WHEREAS, the Goodhue County All-Hazard Mitigation Plan will make the county and participating jurisdictions eligible to receive FEMA hazard mitigation assistance grants; and

WHEREAS, this is a multi-jurisdictional Plan and cities that participated in the planning process may choose to also adopt the County Plan.

NOW THEREFORE BE IT RESOLVED that City of Zumbrota supports the hazard mitigation planning effort and wishes to adopt the Goodhue County All-Hazard Mitigation Plan.

CERTIFICATION


I hereby certify that the foregoing resolution is a true and correct copy of a resolution adopted by:

SIGNED

WITNESSED


Signature Date


Signature Date


Printed name and title


Printed name and title

GOODHUE COUNTY ALL-HAZARD MITIGATION PLAN

RESOLUTION TO ADOPT THE GOODHUE COUNTY
ALL-HAZARD MITIGATION PLAN

WHEREAS, Goodhue County has participated in the hazard mitigation planning process as established under the Disaster Mitigation Act of 2000, and

WHEREAS, the Act establishes a framework for the development of a County Hazard Mitigation Plan; and

WHEREAS, the Act as part of the planning process requires public involvement and local coordination among neighboring local units of government and businesses; and

WHEREAS, the Goodhue County Plan includes a risk assessment including past hazards, hazards that threaten the County, an estimate of structures at risk, a general description of land uses and development trends; and

WHEREAS, the Goodhue County Plan includes a mitigation strategy including goals and objectives and an action plan identifying specific mitigation projects and costs; and

WHEREAS, the Goodhue County Plan includes a maintenance or implementation process including plan updates, integration of the plan into other planning documents and how Goodhue County will maintain public participation and coordination; and

WHEREAS, the Plan has been shared with the Minnesota Division of Homeland Security and Emergency Management and the Federal Emergency Management Agency for review and comment; and

WHEREAS, the Goodhue County All-Hazard Mitigation Plan will make the county and participating jurisdictions eligible to receive FEMA hazard mitigation assistance grants; and

WHEREAS, this is a multi-jurisdictional Plan and cities that participated in the planning process may choose to also adopt the County Plan.

NOW THEREFORE BE IT RESOLVED that Goodhue County Board of Commissioners supports the hazard mitigation planning effort and wishes to adopt the Goodhue County All-Hazard Mitigation Plan.

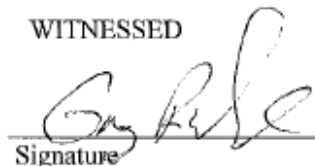
CERTIFICATION

I hereby certify that the foregoing resolution is a true and correct copy of a resolution adopted by:

SIGNED

WITNESSED


 07/12/17
Signature Date

 7/12/17
Signature Date

Keegan D. Quilan, Mayor
Printed name and title


Greg Ruel city clerk
Printed name and title

Webpage



GOODHUE COUNTY MINNESOTA

TO EFFECTIVELY PROMOTE THE SAFETY, HEALTH, AND WELL-BEING OF OUR RESIDENTS



All Hazard Mitigation Plan

Community Emergency Contacts

Firefighter Mutual Aid Agreement

CodeRED

Minnesota Winter Hazard Awareness Week

FACILITIES & HOURS

PROPERTY & TAXES

MAPS

PUBLIC NOTICES

EMPLOYMENT

MEETING VIDEOS

NOTIFY ME

You Are Here: [Home](#) > [Government](#) > [Departments](#) > [Sheriff's Office](#) > [Office of Emergency Management](#) > [All Hazard Mitigation Plan](#)

All Hazard Mitigation Plan

Preparation & Protection

The purpose of the Hazard Mitigation plan is to determine how to reduce or eliminate the loss of life and property damage resulting from natural, technological, and human-caused hazards. The Federal Emergency Management Agency (FEMA) initiated all hazard mitigation planning in light of the increasing number and harm of disasters in recent years.

Nationally Adopted

Goodhue County was one of the first counties in Minnesota to have their plan approved and adopted by FEMA and the Office of Homeland Security and Emergency Management. The final plan was approved on February 1st, 2005 and was adopted by the Goodhue County Board of Commissioners on March 15th, 2005. FEMA approved the Plan on March 28th, 2005.

All Hazard Mitigation Plan

The Plan resides in the Goodhue County Office of Emergency Management, which is responsible for maintenance and updates. The plan is currently being updated, and your input is requested. [Read the Existing All Hazard Mitigation Plan.](#)

We encourage you to participate and help make Goodhue County a safer place!
Please take a few minutes to complete this short survey.

Meeting Materials

Posters <ul style="list-style-type: none">• Frequently Asked Questions• Hazards• Mitigation Strategies• Requirements• Strategy Implementation• Vulnerability Assessment	Maps
Handouts <ul style="list-style-type: none">• FEMA Assistance Program Information• Hazards• Mitigation Strategies• Strategy Implementation Methods• Vulnerability Assessment	Presentations <ul style="list-style-type: none">• Policy Committee Meeting - October 10, 2015
Agendas <ul style="list-style-type: none">• Policy Committee Meeting - October 15, 2015	Project Ideas <ul style="list-style-type: none">• Project Ideas for Cities• Project Ideas for School Districts• Project Ideas for Townships
Announcements <ul style="list-style-type: none">• Announce Public Meeting	Minutes

Policy Committee Materials

Worksheets <ul style="list-style-type: none">• Alternative Priority Rank Method• Existing Document Worksheet - Jurisdiction Copy• Hazard Rank Worksheet• Strategy Implementation Plan with (blue)	Completed Example Worksheets <ul style="list-style-type: none">• Example Completed Project Status Form• Example Existing Document Worksheet - Jurisdiction Copy• Example Hazard Rank Worksheet• Example Strategy Implementation Plan
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PUBLIC MEETING

Goodhue County All Hazard Mitigation Plan *Update*

The purpose of the All Hazard Mitigation Plan is to determine how to reduce or eliminate the loss of life and property damage resulting from natural, technological, and human-caused hazards. This plan was initially adopted in 2005, last updated in 2010, and it is now time to update the Goodhue County All Hazard Mitigation Plan again.

Everyone is encouraged to participate in the update of the plan. Here are two upcoming opportunities for you to get involved:

November 10th, 2015

Public Meeting
6:30-8:00pm
Zumbrota City Hall
Community Room
175 West Avenue
Zumbrota, MN 55992

January 14th, 2016

Policy Committee Meeting
6:00-7:00pm
Public Meeting
7:00-8:00pm
Zumbrota City Hall
Community Room
175 West Avenue
Zumbrota, MN 55992

Please come and find out about the plan and contribute your ideas on how to make Goodhue County a safer place!

Find more information and take our surveys at:

<http://www.co.goodhue.mn.us/385/All-Hazard-Mitigation-Plan>



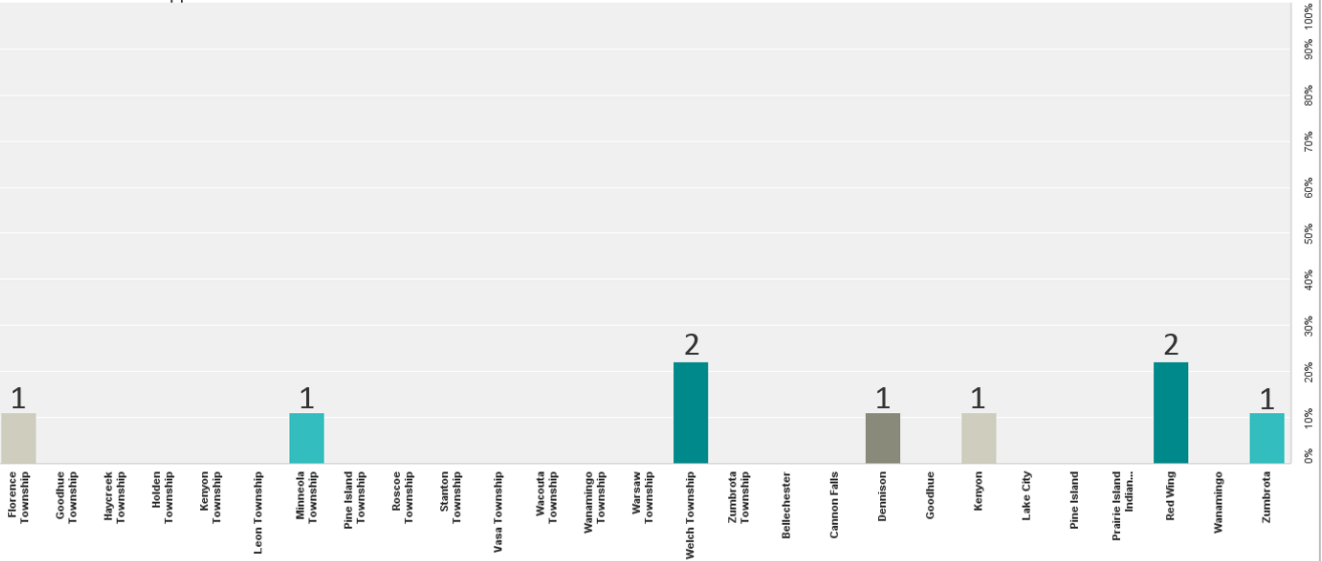
FEMA



Public Survey Results

Q1: I reside within the _____ community in Goodhue County.

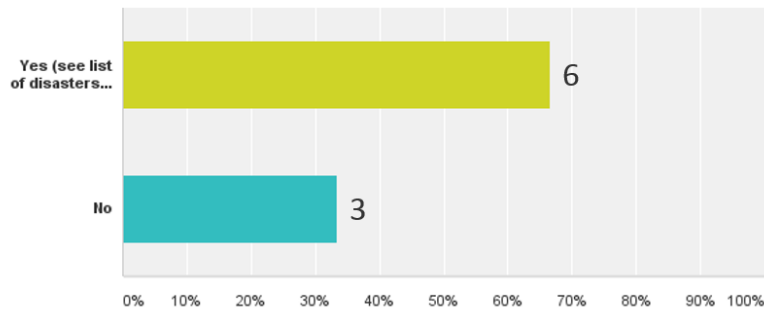
Answered: 9 Skipped: 0



Powered by SurveyMonkey

Q2: During the past 5 years, have you had your life or property within Goodhue County threatened or affected by a natural, technological, or human-caused disaster?

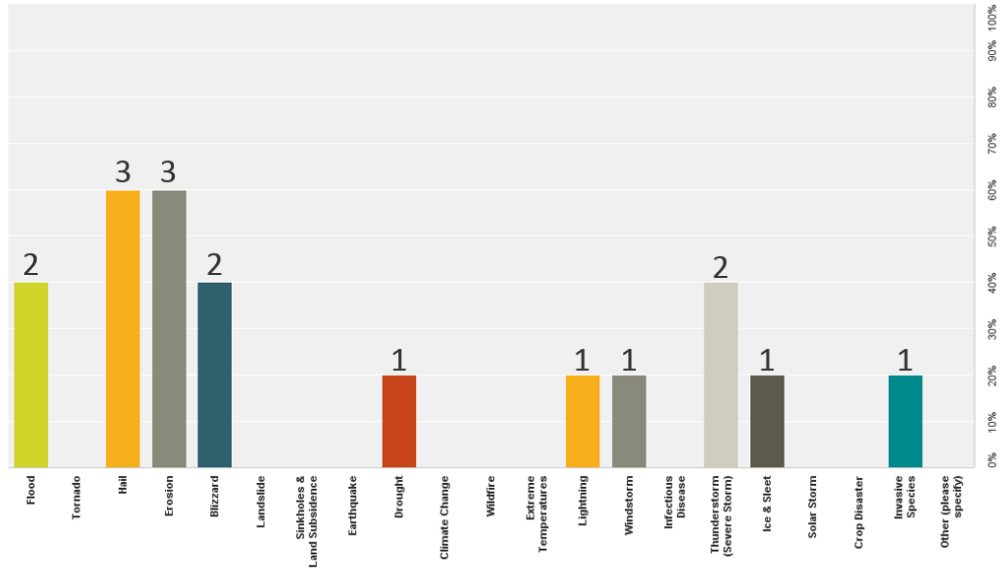
Answered: 9 Skipped: 0



Powered by SurveyMonkey

Q3: Natural Hazards:

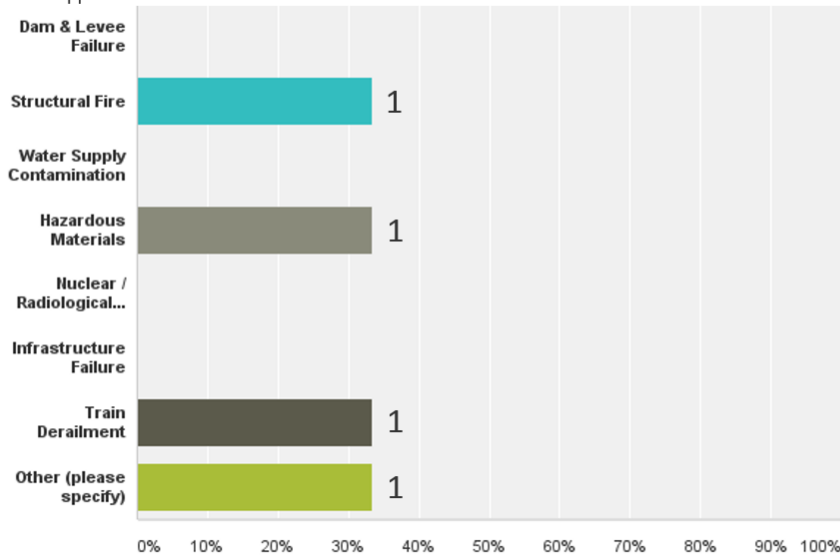
Answered: 5 Skipped: 4



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Q4: Technological Hazards:

Answered: 3 Skipped: 6

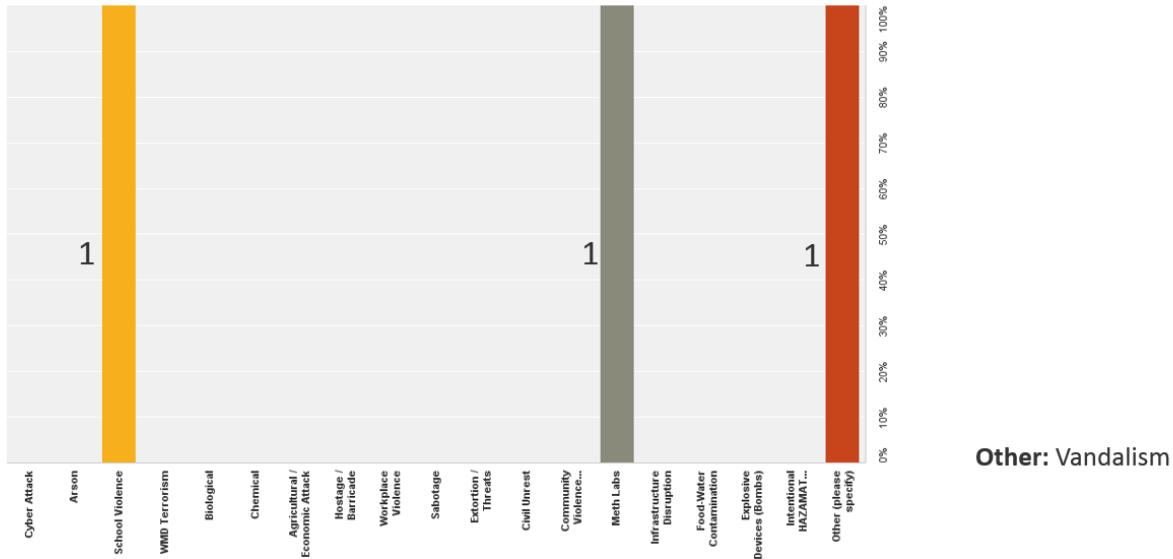


Other: Hwy 56, CR 9 intersection after the warning lights were put in.

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Q5: Human-Caused Hazards:

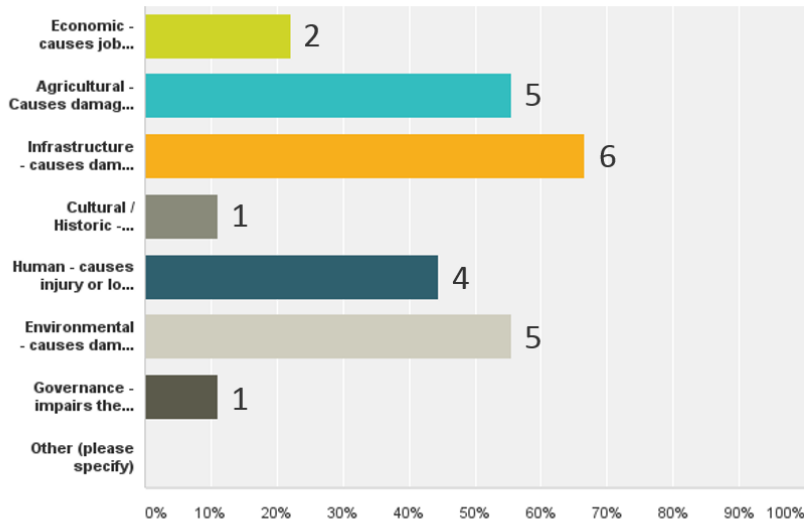
Answered: 1 Skipped: 8



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Q6: These hazards can cause damage or majorly impact different aspects of life and property. Within your township, city, or community, which of these do you believe to be most vulnerable? (Choose up to 3)

Answered: 9 Skipped: 0



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Policy Committee Meeting Minutes

Goodhue County All Hazard Mitigation Plan Update Policy Committee Meeting

October 15, 2015

Emergency Operations Center, Goodhue County Law Enforcement Building

Attending:

Diane Richter-Biwer - Office of Emergency Management

Missy Sivigny – Office of Emergency Management

Lisa Hanni – Goodhue County GIS Department

Leanne Knott – Goodhue County GIS Department

Kyle Glowa – GIS/OEM Intern, Hazard Mitigation Plan

Marvin Ehlers – Zumbrota Township

Bill Budensiek – Minneola Township

Bruce Kvitten – Cherry Grove Township

Tony Grosso – City of Red Wing

Dale Dicke – Goodhue Township

Jeff Ofstie – Goodhue Township

Wayne King – City of Pine Island

Scott Halverson – Hay Creek Town

Mike Deming – Zumbrota-Mazeppa Schools

Rob Keehn – Lake City

Doug Fingerson – Goodhue Co Cooperative Electric

Lori Agre – City of Goodhue

Dawn Wettern – Red Wing Public Schools

Laurie Hoernemann – Zumbrota Township

Todd Greseth – Roscoe Township

Matthew Voxland – Holden Township

Mike Redmond – Goodhue Public Schools

David Arndt – Pine Island Township

Mark Vahlsing – Kenyon

Keegan Quinn – City of Bellechester

Jeff McCormick – City of Cannon Falls

9am – Welcome and Introductions (Leanne Knott)

Overview of Plan (Kyle Glowa)

- Reasons for creating the plan, requirements of the plan, and the planning process are reviewed. Jurisdictions are notified of their role as participating jurisdictions. Participation must be documented in the plan, which would include attending meetings, completing worksheets, and assisting with research.
- The purpose of the Goodhue County plan is stated. It was adopted in 2010 and needs to be updated every five years.

Explanation of Update Process

- Requirements of update – The update must report progress made on commitments made in previous plan. Each section needs to be reviewed and updated. It is meant to be a stand alone plan, not an addition to the old plan.
- Timeline for update reviewed
 - o Fall 2015: Update and review of plan
 - o Winter 2016: Submission of draft to FEMA and state for approval pending adoption
 - o March 2016: Adoption of plan by local jurisdictions
 - o Late Spring 2016: Final approval of plan by FEMA
- Technical and Policy Committees explained

Resources Available for Planning

- Explanation of existing documents worksheet
- Demonstration of webpage
- Explanation of hazard rank worksheet
- Review of hazard types, including new threats from train derailment (Bakken oil), cyber attacks, invasive species, and climate change

Break to complete worksheets, view posters, and discuss with other committee members

Goals suggested:

- Grant funding for ‘safe room’ for school district officials
- New culverts for areas prone to flooding
- ‘Living Fence’ treelines to mitigate drifting snow
- Feedlot manure storage mitigation
- Funding to replace at-risk bridges in township jurisdiction
- Inventory of aging housing stock within jurisdiction

Note: Goodhue County provided all jurisdictions participating in the formation of the 2010 plan with a paper copy of the finalized plan.

Discussion of mitigation strategies

- Explanation of project status forms
- Explanation of strategy implementation forms – reminder that each participating jurisdiction must be responsible for at least one strategy

Reminder of public meetings on November 10th and December 17th. Staff will also plan an additional Policy Committee Meeting for January 2016.

10:30 Meeting adjourns.

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**Goodhue County All Hazard Mitigation Plan Update
Policy and Public Meeting**

January 14th 2016

Zumbrota City Hall – Zumbrota, MN

Attending:

Diane Richter-Biwer – Goodhue County OEM

Missy Sivigny – Goodhue County OEM

Lisa Hanni – Goodhue County Survey/GIS/LUM
Leanne Knott – Goodhue County GIS
Kyle Glowa – Goodhue County GIS Intern
Barb Kvittum – Cherry Grove Township
Bruce Kvittum – Cherry Grove Township
John Schueller – Wacouta Township
Bill Budensiek – Minneola Township
Tom Brown – Lake City
Jeff Ofstie – Goodhue Township
Marvin Ehlers – Zumbrota Township
Darwin Fox – Welch Township
Paul Clauson – Kenyon/Wanamingo Schools
George Raasch – Goodhue Township
Leslie Scaling – Pine Island Township
Richard Miller – Pine Island Township
Dennis Benson – Leon Township
Beau Kennedy – Goodhue County Soil & Water Conservation District
Darren Pahl – Zumbrota Township
Riley Budensiek – Minneola Township
Sarah Pettit – Minneola Township
Jessica Page – City of Dennison/Wanamingo Township
David Pederson – Stanton Township
Bob Benson – Stanton Township

6:00pm Policy Meeting – Welcome and Introductions (Leanne Knott)

Overview of Plan

- Brief review of the plan, what has been received and the plan moving forward.

Status of each section

- Kyle discussed some of the map changes and updates. He showed examples of these for everyone to see and make comments on.

Explanation of available resources listing project ideas

- Reviewed all the project ideas and action items. We had 57 new strategies and 46 of them had cost benefits completed. Showed that most townships and the public are concerned with the natural hazards being ranked the highest.
- Reviewed the list of goals and action items. Asked everyone to look at them and if there were items that they wished to add to their jurisdictions to please add their name to the list we provided and we would add them to their strategies.

Timeline

- Discussed the timeline on reviewing the mitigation plan, submitting, approval and adoption of the new plan.
- We will accept additional worksheets until January 30th 2015.

6:30pm: Review resources, complete worksheets for those who need to yet, ask individual questions, and discuss with other committee members regarding mitigation goals and project ideas

- Townships asked to put new charts up online so they can view the hazard strategies and what was turned seeing it was hard to read at the meeting.
- Soil and Water offered to put together a list for the townships of the roads where they were having stream preservation issues with. This will help the townships mitigate those areas.
- Worksheets were hard to read and understand so if we could make them easier and streamline a little bit more for next time.

7:00pm: Policy Meeting Ended



Public Meeting

**Goodhue County All Hazard Mitigation Plan Update
Public Meeting**

November 10, 2015

Zumbrota City Hall – Zumbrota, MN

Attending:

- Diane Richter-Biwer - Office of Emergency Management
- Lisa Hanni – Goodhue County Survey/LUM Department
- Leanne Knott – Goodhue County GIS
- Missy Svigney – OEM
- Kyle Glowa – GIS Intern
- Paul Klassen – Kenyon-Wanamingo Schools
- Bill Budensiek – Minneola Township
- Neil Jensen – City of Zumbrota
- Brad Anderson – County Commissioner
- Darwin Fox - Welch Township
- George Raasch – Goodhue Township
- Joyce Anderson – Kenyon Township
- Scott Roepke – Cannon Valley Trail
- Dan Retchzigel – County Commissioner

6:30pm – Welcome and Introductions (Leanne Knott)

Overview of Plan

- Brief review of Plan purpose, planning process, and timeline

Status of each section

- Updated maps are on display
- Results of hazard rank worksheet

FEMA Grant information

- FEMA mitigation assistance programs listed and importance of including the project in the Plan emphasized
- List of FEMA eligible projects displayed and discussed
- Documenting damage from hazards is important for completing the cost/benefit review required when applying for FEMA money.

Explanation of available resources listing project ideas

- Individual lists of project ideas pertaining to cities, school districts, and townships are available. These lists incorporate ideas suggested in the survey, at the open house, and by jurisdictions.
- List of alternative funding sources

Upcoming Policy Committee/Public Open House Meeting

- The next Policy Committee Meeting/Public Open House will be held on Thursday, January 14th at Zumbrota City Hall. The Policy Committee meeting will be held 6:00-7:00 pm and the Public Open House meeting will be held 7:00-8:00 pm.

Explanation of Online Public Survey for AHMP

- Kyle Glowa reviewed the online public input survey and explained each section. The survey is available as a link on the Goodhue County All Hazard Mitigation Plan web page. Kyle also provided written copies for attendees to take and fill out.

7:15pm: Time to review resources, complete worksheets, ask individual questions, and discuss with other committee members regarding mitigation goals and project ideas

- Fire Departments, should they be included in the plan?
- Discussion on why Cannon Valley Trail will be included in this plan update but no others.
- Strategies for Townships: Manure storage, Anhydrous, bridges
- Request to send out updates regarding strategies by cities and townships – Townships need ideas for strategies.
- Discussion on adding safe rooms to school for school districts.
- Review of slideshow of previous flooding and tornado damage.
- Review of new mitigation strategies suggested by jurisdictions for the 2015 update, including adding a storm shelter, security cameras and other amenities to Levee Park in preparation for large tour boats, installing a back-up server and battery systems for emergency computer equipment, raising roads to prevent flooding and improving groundwater contamination monitoring

8:00pm: Meeting ended

Appendix B: Maps, Tables, & Figures

Maps

1. State of Minnesota (p. 20)
2. Surrounding Counties (p. 20)
3. Normal Mean Temperatures by Season (p. 21)
4. Land Cover in Goodhue County (p. 24)
5. Bedrock Geology (p.25)
6. Karst Features (p. 26)
7. Goodhue County Soils (p. 27)
8. Goodhue County Topography (p. 28)
9. Goodhue County Watersheds (p. 29)
10. Goodhue County Wetlands (p. 30)
11. Goodhue County Municipalities (p.31)
12. Goodhue County Major Roads (p. 34)
13. Goodhue County Bridges (p. 35)
14. Goodhue County Communication Towers (p. 37)
15. Goodhue County Infrastructure (p. 38)
16. Goodhue County Estimated Population by Municipality (p. 40)
17. Goodhue County Population Density Per Census Block (p. 41)
18. Children and Seniors, 2010 Census (p. 43)
19. Percent Population Change 2000-2010 (p. 44)
20. Highway 52 Corridor (p. 45)
21. New Permits 2010-2016 (p. 46)
22. FEMA Flood Zones and Floodway (p. 49)
23. Tornado Risk Map (p. 51)
24. 2008 Tornado Damage (p. 46)
25. Wind Zones in the United States (p. 54)
26. Sinkhole Probability in Goodhue County (p. 57)
27. Steep Slopes & Waterways (p. 59)
28. U.S. Earthquake Hazard Probability (p. 60)
29. Goodhue County Cultivated Crops by Type (p. 64)
30. Goodhue County Invasive Plant Observations (p. 68)
31. Goodhue County Dams and Hazard Rank (p. 73)
32. Sinkhole Locations, Probability, Feedlots & Waste Water Treatment Facilities (p. 76)
33. Groundwater Sensitivity to Pollution (p. 77)
34. Hazardous Waste Generators (p. 78)
35. Prairie Island Nuclear Plant, 10 Mile Radius (p. 80)
36. Repetitive Loss Property Areas (p. 86)
37. Goodhue County Buildings (p. 87)
38. Critical Facilities in Goodhue County (p. 88)

39. Goodhue County Infrastructure - Water, Electric, and Pipelines (p. 90)

Tables

1. Jurisdiction Participation (p. 7)
2. Minnesota Federal Disaster Declarations Since 1995 (p.15)
3. Goodhue County Federal Disaster Declarations Since 1965 (p. 16)
4. Goodhue County K12 Enrollment (p. 31)
5. School Districts with District Office in Goodhue County (p.32)
6. Districts Including Portions of Goodhue County with District Office in Bordering County (p. 32)
7. Radio Stations in Goodhue County (p. 36)
8. Local Newspapers (p. 36)
9. Overview of Goodhue County (p. 39)
10. Event Profiles for Terrorism and Technological Hazards (p. 71)
11. Fires in Goodhue County, 2010-2014 (p. 76)
12. Hazard Vulnerability (p. 85)
13. Repetitive Loss Structures in Goodhue County (p. 86)
14. Estimated Market Value and Total Number of Employees (p. 88)

Figures

1. Average Temperatures by Month (p. 21)
2. Normal Monthly Precipitation (p. 22)
3. Average Monthly Snowfall (p.22)
4. Land Cover in Goodhue County (p. 23)
5. Population Distribution by Age for Goodhue County, 2014 Census Estimates (p. 42)
6. Goodhue County Projected Population (p. 44)
7. Population Change and Projected Growth (p. 45)
8. Upper Midwest Precipitation Extremes, 1910-2012 (p. 67)

Appendix C: Prairie Island Indian Community All Hazard Mitigation Plan

INTRODUCTION / PURPOSE FOR THE PLAN

The purpose of the Prairie Island Indian Community All Hazard Mitigation Plan is to determine how to reduce or eliminate the loss of life and property damage resulting from natural and human-caused hazards. The original plan was first adopted in 2005 and was reviewed and updated in 2012 and 2013 for approval by FEMA in 2013. The plan encompasses all natural, technological, and human-caused hazards rather than only focusing on one type of hazard.

For the planning process, Prairie Island followed the guidelines and handbooks that FEMA has created. Although the process laid out by FEMA seems to be in sequential order, in engaging in the all hazard planning process several of these steps were undertaken simultaneously due to the fact that the plan was not being created from scratch but the previous plan was being updated. Prairie Island will continue to utilize the plan by implementing specific mitigation projects or by changing some operational procedures within the local government. It will also be important to conduct periodic evaluations and make revisions to the plan as needed the plan resides within the office of emergency management, which is responsible for the updates and maintenance of the plan itself.

This project utilized a great deal of data from various sources and in many formats. Many of the maps used in this plan and historical data that corresponds with those maps will pertain to Goodhue County as a whole due to historical data being recorded for the County only and not for the Prairie Island Indian Reservation only.

DEFINITION

A hazard mitigation plan identifies hazards, assesses vulnerabilities, describes hazard mitigation actions, and establishes a plan to achieve the hazard mitigation strategies identified. According to FEMA, hazard mitigation is “any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards”^[1]

LEGAL BASIS FOR THE PLAN

The Disaster Mitigation Act of 2000 (U.S. Public Law 106-390) amended the Robert T. Stafford Act and authorized a program for pre-disaster mitigation. Section 322 requires local governments to prepare a mitigation plan in order to receive an increased Federal share for hazard mitigation actions. This local plan must “(1) describe actions to mitigate hazards, risks and vulnerabilities identified under the plan; and (2) establish a strategy to implement those actions.”^[2]

^[1] Local Multi-Hazard Mitigation Planning Guidance. FEMA July 1, 2008. page 3.

^[2] FEMA website: <http://www.fema.gov/library/viewRecord.do?id=1935>

44 CFR § 201.6

The code of federal regulations title 44 part 201.6 requires local governments to have a FEMA approved Local Mitigation Plan in order to be eligible to apply for funding through the following assistance programs:

Hazard Mitigation Grant Program (HMPG); Pre-Disaster Mitigation (PDM); Flood Mitigation Assistance (FMA); Severe Repetitive Loss (SRL)

Plan update

44 CFR § 201.6 states:

“A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within five (5) years in order to be eligible for mitigation project grant funding.”^[3]

PLANNING PROCESS

As outlined by FEMA the planning process involves four main steps: organizing resources, assessing risks, developing mitigation plans, and implementing the plan.

Organizing Resources

- Existing Emergency Plans
 - Prairie Island Indian Community Emergency Operations Plan updated 2013 ,
 - Prairie Island Hazard Analysis Plan, 2004,
 - Treasure Island Resort and Casino Emergency Operations Plan,
 - Goodhue County Emergency Operations Plan,
 - Prairie Island Nuclear Generating Facility Emergency Operations Plan,
 - State of Minnesota All-Hazard Mitigation Plan

Assess Risks

- Identify, characterize, and estimate the impact of possible hazards
- Identify how hazards would affect key facilities
- Estimate the financial losses to the community

Develop a Mitigation Plan

- Develop mitigation strategies and projects
- Determine mitigation priorities
- Create an action plan

^[3] National Archives and Records Administration website: <http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=6c5d75d55be0a57c0e29dc2fed754865&rgn=div8&view=text&node=44:1.0.1.4.57.1.18.1&idno=44>

Implement the Plan, Monitor Progress, and Update Plan

- PIIC Tribal Council and PIIC Emergency Planning will work with federal agencies to develop possible plans to address community concerns.
- Use the Risk Assessment Matrix as a guide to determine in what order projects will be addressed. (some projects will be completed when funding is available)
- Projects that have been completed will be evaluated for their effectiveness and the plan will be updated to reflect those evaluations.
- The PIIC Emergency Planner has the overall authority and responsibility for the creation of the initial plan. The plan will be reviewed on an annual basis; and every three to five years before it will be resubmitted to FEMA as required by the DMA 2000 planning guidelines. The PIIC Emergency Planning will amend the plan as necessary to reflect any changes to state or federal laws and statutes, or as changes occur in the Community, and projects are completed.

Plan Distribution

- A draft of the PIIC Hazard Mitigation Plan will be submitted for review to the Federal Emergency Management Agency (FEMA) - Mitigation Division. Recommended changes will be considered and/or completed. Because the PIIC is a sovereign nation, the community will work directly with FEMA.
- The revised and approved Plan will be submitted to the State of Minnesota for addition to their plans.
- The PIIC All-Hazard Mitigation Plan will reside in the office of the PIIC Emergency Planner. The plan will be available to view onsite to other PIIC departments and outside agencies if needed.

Process Timeline

The PIIC Emergency Planner is the individual responsible for the coordination and the development of the plan. The Emergency Preparedness department for the Community consists of one (1) full-time employee that splits time with the tribal police department. The plan was originally completed in approximately 8 ½ months. The plan update was completed in late 2012 into early 2013.

August 2004

- Community was made aware of the Mitigation Plan submission deadline by their attendance at a Tribal Program at the Emergency Management Institute (EMI).
- During this time the EP began reviewing the FEMA “*State and Local Hazard Mitigation, how-to-guides*”, and collecting current data for the plan via the Internet and PIIC files.
- HAZUS was ordered to implement flood information, however, computer applications caused problems requiring additional equipment be ordered and added to the EP computer system. This caused serious delays.
- In an effort to work with local jurisdictions, the PIIC EP contacted the Goodhue County Land-Use Department and arranged a meeting to find out if the tribe had provided the county with any GIS data for the Goodhue County Mitigation Plan. It was determined that little to no information had been provided. Maps and historical data would have to be researched, and maps would need to be created by hand or by some other means. GIS Mapping capabilities for the tribe are limited and have not been done in the past for hazard events.

September 2004

- First community meeting was held to discuss the ongoing mitigation project for an overpass on Sturgeon Lake Rd to eliminate an at-grade crossing of Sturgeon Lake Rd and the CPR crossing. (*see announcement, page 108*)

October 2004

- It was evident that the Emergency Preparedness Department would be unable to meet the November 1, 2004 deadline. The Tribe respectfully requested an extension until May 1, 2005. On November 1, 2004,

David Maurstad, Acting Director, FEMA Mitigation Division, granted the Prairie Island Indian Community an extension in accordance to the provisions of 44 Code of Federal Regulations, Sections 2201.3 (c) (7) and 201.4(a)(2). (*Letter included at the end of this plan, pg 117*)

- Research and basic plan development continued.

December 2004

- EP attended the EMI sponsored Tribal Mitigation course in Emmitsburg, MD. To learn more about the development of the Mitigation Plan and the federal grants associated with the plan.
- Research and basic plan development continued.

January 2005 – February 2005

- Research and basic plan development continued.
- Met with Tribal Attorney, Tribal Engineer, Tribal Grants Manager to discuss Community Plan in comparison to the Goodhue County Plan.

Late February 2005

- Contacted FEMA to obtain clarification regarding the specific difference between “State” and “Local” plan development and submission.
- Using the FEMA Multi-Hazard Mitigation Planning Guidance Under the Disaster Mitigation Act of 2000 to verify all critical areas of the plan had been addressed.

March 2005

- PIIC Community members were asked to participate in an Emergency Preparedness and Community Hazard Questionnaire. This questionnaire would be used to verify/quantify the Community’s thoughts and feedback on the hazards in the community and assess their needs/wants for additional Emergency Preparedness/Hazard information and education. (*see copy of announcement, pg 109, and copy of online survey, pg. 110-114*)
- Submit the Community Hazard Mitigation Plan to Tribal Attorney, Tribal Engineer, and Tribal Grants Manager for review and feedback. Make any noted suggestions.
- Submit to Tribal Council for final approval.

April 2005

- Tally the community responses from the Questionnaire and incorporate into the Community Plan.
- Announce Plan completion, through the Community Newsletter, and allow public access to review the plan and comment. Recommended changes will be considered and/or completed. (*see announcement pg. 116*)
- Submit to Tribal Council for adoption. (*see Resolution, pg. 4*)
- Submit the Plan to FEMA for review and approval.

Plan Update Timeline

No hazards that affect where the Tribal Community is located were removed from the plan, however; under the recommendation of FEMA some hazards such as Hurricanes, Tsunamis, and Earthquakes were removed due to those hazards not pertaining to our area and it taking up space in the plan that wasn’t necessary . All hazards were reviewed and updated with new information if available, as well as incorporating new Tribal maps.

Old maps were updated by our Tribal Land and Environment/GIS department are included and are much clearer to read and are more accurate with the data they contain. Also included some new maps that we felt were important documents to have in this plan, all maps are in the back of the plan in the maps section. All data that

contains charts and historical facts and figures was also updated to be accurate and include incidents that have occurred since the previous plan was created. This was done by using the internet and manually updating those areas.

A review of our mitigation goals and projects was also completed. Any projects that were completed were noted and new projects were also incorporated into the plan. This was completed by the emergency manager along with other members of our Crisis Management Team when available. Review of hazard rankings was conducted by the emergency manager and the police chief. Although many hazard rankings didn't change, some did and it was due to the increase of historical occurrence of the threat taking place that changed the rank.

New mitigation goals and projects were developed as a result of other projects completion as well as the growth of the Tribal Community and the needs changing for the residents, employees and guests. We determined the priority of the projects, by the severity of the hazard and the consequences that could result from a disaster. The Tribal Emergency Planner, Police Department along with other staff from both Prairie Island Indian Community Administration and Treasure Island Resort and Casino continually add new mitigation projects to a list to be added to future plan updates.

December 2011

While in Chicago for the annual REP Scheduling Conference in 2011, the Tribal Emergency Coordinator met with members from the FEMA All Hazard Mitigation branch and discussed the plan update process and what areas to change, remove and improve on.

February 2012

Additional progress was made in the updating of the plan, with input received from Tribal Land Env./DNR staff and other Tribal government employees.

-Plan updating continued from March through July of 2012 with additional input coming in.

August 2012

A review was done by Prairie Island Emergency Management prior to getting Tribal Member feedback in September. A week long review was scheduled September 10th -14th 2012. The plan was available for Tribal Members to come and review and give their feedback and suggestions for mitigation projects pertaining to disasters occurring on the reservation lands.

September 2012

A community open house was held the week of September 10-14, 2012 for all community members to come in and take a look at the plan. This gave them the opportunity to provide feedback on its contents as well as possible mitigation projects for the tribal community. An announcement was put in the community newsletter to notify all tribal members (which is attached in the back of the plan.) *No community members have reviewed the plan prior to submission.*

December 2012

Final touches were put on the plan for the final draft to be sent to FEMA for their input. The maps were obtained by our Tribal Land Env./GIS department and inserted into the plan document. A final review was completed by the Emergency Management Department and the Prairie Island Police Department. The plan was sent to FEMA for their suggestions however suggested improvements were delayed until January of 2013 due to FEMA's response to Hurricane Sandy.

February 2013

During a trip to Chicago the PIIC Emergency Planner met with the FEMA team for the All Hazard Mitigation Plan and went over their suggested changes and reviews to officially complete and submit the plan for approval.

August 2013

Due to a very busy exercise and planning year for both Tribal Council and the Police Department the final updates were put on hold until this time. Ongoing communication took place with FEMA staff regarding the delay, and they were assured the plan would be submitted prior to the end of the year. A final meeting was set up for November of 2013 while in Chicago for another REP Scheduling conference to complete the submitting process.

Community Participation

In *September 2004*, the first community meeting was held. The PIIC Tribal Engineer hosted a Community Meeting to discuss plans regarding the possibility of building a bridge/overpass at the intersection of Sturgeon Lake Road and the Canadian Pacific Railway. An ongoing mitigation effort PIIC has been working on to eliminate the evacuation hazard of a blocked intersection due to a train derailment or other incident blocking this intersection. Community members attended and gave their feedback regarding the overpass. (See announcement on page 108)

In *March 2005*, the Community was offered a second opportunity to participate in the hazard mitigation planning process by providing their thoughts, and feedback through an Emergency Preparedness and Community Hazard Awareness Questionnaire. The questionnaire was announced in the Community newsletter, and was available through the Community website. Questionnaire results were emailed directly to the Community EP. The Community Computer Lab was opened for those who did not have access to a computer at their home or work. (see copy of announcement, pg 109, and copy of online survey, pg. 110-114)

Paper copies of the survey were also made available if computer access was unavailable.

In *April 2005*, the Community was given a third opportunity to participate in the planning process when the PIIC Hazard Mitigation Plan had been completed and was made available for public review and comment prior to it being sent to FEMA for approval. (see announcement pg. 116)

Plan Update Community Participation

In addition to Community involvement for the update, various departments within PIIC government structure have contributed to the Hazard Mitigation Plan, PIIC departments included; Finance, Tribal Engineer, Grants Management, and Tribal Attorneys. The PIIC EP also worked with the business entity of Prairie Island, the Treasure Island Resort and Casino Crisis Management Team and Risk Manager. Each department has information detailing past plans that have been presented to federal agencies and community members.

The PIIC EP also made contact with the County Land-Use Department and reviewed the Goodhue and Dakota Counties and the Minnesota State plans for guidance in developing the Tribal plan.

Tribal Capability Assessment

The Prairie Island Indian Community currently supports pre and post disaster mitigation through resolutions, plans and project programs. Tribal Mitigation planning includes developing and updating existing ordinances. Current ordinances include: PIIC Animal ordinance, Drug and gang free community ordinance, and the PIIC Flood plan which includes a flood plain ordinance to ensure the tribal community can participate in NFIP, and renewing mutual aid agreements with Goodhue County, City of Red Wing and Miesville Fire. We also annually update our Tribal Emergency Operations Plan and have recently obtained a reverse 911 phone calling system to contact all staff and tribal members to make emergency notifications much faster. The Prairie Island Indian Community also participates in bi annual planning with the Prairie Island Nuclear Generating Plant, as well as other in state tabletop planning situations with the above mentioned mutual aid agencies and the CP railroad personnel.

The Prairie Island Indian Community has coordinated development of mitigation projects in the past with various departments from the PIIC Administration as well as the Treasure Island Resort and Casino Crisis Management Team. For example, during spring flooding mitigation, meetings developing flood mitigation procedures were discussed and then implemented to protect the Casino and Community properties from projected flood water damage. The Prairie Island Indian Community does have staff in place to plan and implement any mitigation projects listed in the document, as well as finance staff dedicated solely to grants management to oversee the paperwork process and documentation needed for a federal grant.

Ongoing Mitigation planning has been completed and detailed planning is included in the Tribal Emergency Operations plan. Some items include: Community Shelter will be set up in the Prairie Island Community Center. Within the 170,000 square foot building are two sets of locker rooms for males and females, a commercial kitchen, the community health clinic, as well as a large gymnasium and conference room for creating sleeping quarters. There are also other meeting areas that could be used for recreational spaces until families can return to their property. In the event that the Community Center cannot be used, the Treasure Island Casino and Hotel would be used as a temporary shelter for Community Members. It has been used in a smaller capacity after residential fires have destroyed a family's home or a home was flooded during spring flood season and the family needs housing for a longer time frame. There are also evacuation routes and procedures listed in our emergency operations plan (EOP) along with debris removal, how to get the tribe back up and running after a disaster and security/scene protection during a disaster all outlined in the EOP.

HISTORY OF THE PRAIRIE ISLAND INDIAN COMMUNITY

How the Prairie Island Indian Community Came To Be

The Prairie Island Indian Community members are descendants of the Mdewakanton Band of Eastern Dakota, also known as the Mississippi or Minnesota Sioux, who were parties to treaties with the United States from 1805 to 1863.

In the treaty of October 15, 1851, the tribe ceded much of their Minnesota lands to the US government, keeping for themselves a 10-mile wide strip of land on either side of the Minnesota River from Little Rock to Yellow

Medicine River. However, the Treaty of June 19, 1858, allotted this land in 80-acre plots to each family head. The surplus land was sold for 10 cents an acre. Reduced to starvation, the Dakota were forced to fight for their survival.

In August 1862, fighting erupted between Dakota and white settlers because the Dakota were not receiving annuity payments for selling their lands and were struggling to survive. This was known as the Dakota Conflict, resulting in the deaths of many Dakotas and whites. Thirty-Eight Dakota were hanged in Mankato in December of 1862 upon the order of President Abraham Lincoln.

The creation of the Prairie Island Reservation

The Prairie Island Reservation was created when the Secretary of the Interior purchased land and placed it into trust. About 120 acres was purchased at Prairie Island for the landless Mdewakanton residing in Minnesota on May 20, 1886. Subsequent purchases by the Secretary under congressional appropriations and later the Indian Reorganization Act expanded the Reservation's borders. Under the Indian Reorganization Act of 1934, an additional 414 acres was purchased for other Indian residents whose name appeared on the Minnesota Sioux rolls.

The Tribe has a limited land base. The United States U.S. Army Corps of Engineers built Lock and Dam Number 3, which flooded Community Land, including burial mounds, and created a larger floodplain, leaving the tribe with only 300 livable acres. More recently Xcel Energy (formerly Northern States Power) placed a nuclear generating plant on the island and now stores spent nuclear fuel in dry cask storage containers only 600 yards from the Community buildings and some Tribal Members homes.

Prairie Island's Government System

The Prairie Island Indian Community is a federally recognized Indian Tribe organized under the Indian Reorganization Act. It is governed under the terms of the Prairie Island Indian Community's Constitution and By-Laws adopted by the tribal members on May 23, 1936, and approved by the Secretary of the Interior on June 20, 1936. The Constitution and By-Laws provide the Community Council (referred to as the Tribal Council) shall be the governing body for the Community. The Community's conduct, and the decision of the Tribal Council are based upon the United States Constitution, the Community's Constitution and By-Laws, and existing Tribal Ordinances. The five member Tribal Council consists of a president, vice president, secretary, treasurer, and assistant secretary/treasurer. The Community's Election Ordinance governs all aspects of Tribal Council elections including the nomination process, voting, and confirmation process. A new Tribal Council is elected every 2 years.

Location

The island itself is about one mile wide and eight miles long and is located within the Mississippi River Valley about 35 miles south of Minneapolis and St. Paul. The island abuts the eastern border of Minnesota and lies between the cities of Hastings and Red Wing. The oval-shaped Prairie Island is located at the confluence of the Mississippi and Vermillion Rivers in Goodhue County in southeastern Minnesota and lies on the west bank of the Mississippi River. Its north and east border is formed by the Mississippi River's backwater lakes and wetlands. Its south and west border is formed by the Vermillion River and its backwater lakes and wetlands. The 360-foot high limestone and sandstone bluffs that form the boundaries of the Mississippi River Valley reinforce the island-like sense of enclosure.

PIIC Locator Map can be found on page 118.

Population

As of January 2013 there were over 800 enrolled Tribal members of the PIIC. Approximately half of enrolled members live on or near the Tribal Reservation.

Around the year 2000 the Tribe had purchased roughly 700 additional acres at the north end of Prairie Island for home sites, and development plans for possible businesses are progressing. Tribal members are living on some of the land, additional home and commercial business sites are available there.

Transient Population

The casino employs roughly 1,550 people year round, which swells to more than 1,950 during the summer months. Treasure Island Resort and Casino is the largest employer in Goodhue County. Few of the employees live on or near the reservation; many of the employees travel from the Twin Cities and surrounding communities in southern Minnesota and Wisconsin.

Visitors to the Casino can also vary, from 15,000 (+/-) during the winter months to 25,000 (+/-) during summer months. During a busy weekend during the summer months the population of Prairie Island can easily swell to over 60,000 people.

The PIIC employs approximately 105 people during normal business hours, 25 temporary employees are often added during peak summer months.

Daycare Facility

There is one daycare facility located in/at TIRC. In 2011 the day care serviced 11,904 children, with an average of 33 children per day. In 2013 that number increased to 28,133. They cannot service more than 30 children at one time. The daycare is owned and operated by Kids Quest Child Care and is not affiliated with the Casino or the PIIC.

Evacuations

During the last Evacuation Time Estimate Study, conducted by an independent contractor for the nuclear power plant, it has been estimated that it would take approximately 4.5 to 6.6 hours to evacuate the 10-mile EPZ surrounding the nuclear power plant. Prairie Island alone could take 3 to 4 hours depending on season and current weather conditions. During the update of this plan in 2012 the nearby nuclear power plant was conducting a new evacuation time estimate study. That information will be included in the plan if completed prior to submission.

Physical Features

Prairie Island is a low-lying, fluvial landform within the Mississippi River Valley; actually a massive sandbar, Prairie Island was created during the outflow of Glacial Lake Warren following the last Glacial period. The landscape is flat or gently rolling with level or slightly sloping prairie plains and floodplain forest bottomlands. The topography of the island slopes toward the Mississippi River's backwater lakes with elevations ranging from approximately 680-772 feet. A significant portion of the topography is in the 100-year floodplain of the Mississippi and Vermillion Rivers. Local relief northeast of County 18 is only 20 feet as the land slopes toward the shore of North Lake. Since much of the land is so low at 690 feet it is only two feet about the 100-year flood elevation, many land assignments are not constructed with basements.

Soils

Prairie Island's general soil characteristics include a shallow water table, high permeability, and erosion. These factors affect land uses such as parking areas, parks and playgrounds, streets and roads, septic tanks and basements. As stated before the water table is generally shallow, permeability is generally rapid because of the Island's coarse sandy soils facilitate infiltration and minimize runoff. Sandy soils can easily be eroded. There are more than 35 soil-types that have been documented on the Lower Island alone. Soil Map can be found on page 120

The two main soils associated with Prairie Island are:

Esterville-Wakegan-Alluvial association is coarse, loamy sandy soil overlaying gravelly, coarse sand with high permeability. These soils are outside the floodplain and are generally favorable for development.

Marsh-McPaul-Radford association is coarse fine-silty soils that are poorly – to well drained and overlay silt loam. These floodplain soils are generally not suitable for development due to its flooding hazard and because access roads are hard to maintain.

Vegetation

Historically, PIIC Trust Land was estimated to be 65% prairie with the remainder in bottomland forest types and wetland communities.

1192 Acres Estimated Trust Land Use and Habitat Distribution.

Forested acres	179 acres 15 %
Non-forested/farm/grass/brush	775 acres 65 %
Interface/developed types	238 acres 20 %

Additional lands proposed for trust acquisition have a similar ratio of forest/non-forest with the potential for housing development.

Wetlands and Watersheds

Prairie Island is highly influenced by the surround riverine ecosystems. The Mississippi River and its associated backwater lakes and marshes are dynamic hydrologic systems the hydrology is influenced by season and precipitation and can fluctuate every year. There are also several small wetlands and fragile organic soils associated with these wetlands. The wetlands on Prairie Island perform ecological functions such as flood control, water purification, and biodiversity preservation. Small lakes, ponds and sloughs are present throughout Prairie Island. The wetlands on Prairie Island were ground-truthed in 1997 by a USACE biologist.

Wetlands Map can be found on page 123.

Cultural Resources

The PIIC reservation has had extensive cultural resource surveys. Twenty-one archeological sites have been recorded on PIIC trust lands. These sites include eight mound sites, which contain numerous mounds, they were first surveyed in 1884-85. A total of 112+ mounds were observed at these eight sites at that time. As of 2012, these eight sites contain about 94 mounds. Many of these mounds are no longer observable, but contain burials or other sub-surface features. Many of these mounds have a heavy degree of disturbance and make surface visibility difficult, but remain in place and therefore remain important for preservation. Thirteen other archeological sites recorded on trust lands are one of the following: structural or standing ruin, artifact or lithic scatter and foundations.

Maps have been created identifying these archeological sites; however, they are not available for public viewing.

Wildlife, Fisheries, and Threatened or Endangered Species

There is a diverse array of wildlife on the Prairie Island reservation. There is a diverse representation of mammals: 38 mammal species (includes no less than 1 opossum, 1 mole, 2 shrews, 6 bats, 3 mice, 3 voles, 3 ground squirrels, 1 flying squirrel, 3 tree squirrels, 1 pocket gopher, 1 beaver, 1 rabbit, 10 carnivores/weasels, and 1 deer).

Birds are well represented on Prairie Island for residents, migrants and breeders. The diversity of bird species on the reservation is due to the Mississippi Flyway, one of the most important bird migration routes in North America: 197 bird species (includes no less than 1 loon, 4 grebes, 26 swan/duck/geese, 1 pelican, 1 cormorant, 4 gulls, 3 terns, 2 plovers, 6 sandpipers, 3 coots/rails, 1 crane, 4 herons, 1 ibis, 1 vulture, 1 eagle, 12 other raptors, 5 owls, 3 game birds, 2 doves, 1 nightjar, 1 kingfisher, 1 hummingbird, 1 swift, 7 woodpeckers, 2 cuckoos, and 103 passerines (passerines include 8 flycatchers, 1 lark, 1 pipit, 6 swallows, 8 blackbirds, 1 starling, 2 crow/jays, 2 mimics, 6 thrushes, 2 shrikes, 1 waxwing, 2 chickadee/titmouse, 1 nuthatch, 1 creeper, 3 wrens, 2 kinglets, 1 gnatcatcher, 4 vireos, 25 wood warblers, 17 sparrows, 1 weaver finch, 3 finches, and 5 bunting/grosbeak/tanagers).

The Mississippi River and its backwaters- currently support the production of numerous fish species: 3 lamprey and 77 fish species no less than 17 gamefish, 25 rough fish, and 35 baitfish. Amphibians include 5 species (5 frogs, 1 toad and 0 salamanders) and reptiles include 1 species (0 lizards, 5 snakes and 5 turtle) Mussels are the last main group of wildlife and are important in terms of their diversity and vulnerability within the Mississippi River; 27 mussel species (no less than 25 pearly mussels, 1 bysall mussel and 1 pea clam).

There are no Federally Threatened or Endangered species that have been documented on reservation trust lands; however, the Higgins Eye mussel (*Lampsilis higginsii*) is a federally endangered mussel that occurs within Sturgeon Lake, adjacent to Tribal Lands; 4 other listed mussels (2 endangered and 2 federal candidates) have been extirpated from the area. Gray wolves (*Canis lupus*) are a federally threatened species that will be delisted in 2012; however, they have not been documented on Tribal lands in recent history. Bald Eagles (*Haliaeetus leucocephalus*) were federally threatened until delisting in 2007: they are the most iconic cultural animals of the Tribe. There has been as many as four active eagle nests known to occur on Prairie Island Trust lands within a nesting year. In addition to nesting, the river corridor is also an important wintering site for eagles.

An Eagle Nest Location Map was created by the BIA as well as Prairie Island DNR maps have been created; however, they are not available for public viewing.

Land Use, Planning, Zoning, and Ordinances

An important distinction for land use is trust status. Land that has been successfully transferred into trust is under the jurisdiction of the tribe; non-trust land remains under the jurisdiction of Goodhue County and the State of Minnesota. Currently, the PIIC owns approximately 1681 acres of land. The land is commonly known as the Upper and Lower Island; the Middle Island is considered part of the Upper Island.

Currently, the Tribe does not have an active Land Use Department. The land use maps that had been created for the Prairie Island Indian Community by the former Land Use Planner had identified and classified areas on the Island for Commercial, Residential, and Recreational uses. Because of the age of the maps and lack of written support for those maps those were not included in this plan. Currently, development has been limited to residential homes on current land assignments and most recent additions commercially include a convenience store just off the Casino property build in 2004. A Tribal Police Department built adjacent to the convenience store in 2010 and construction of a water treatment facility near the community center began in late 2011.

In 2004, the PIIC Tribal Council signed a cooperative agreement and launched their first Tribal Police Department. This Department worked aggressively to develop ordinances to help protect the safety and security of the community and its guests. One of the mitigation projects noted that was completed under the original plan was the development of an ordinance regarding stray or loose animals.

Housing

Living arrangements on the existing Lower Island 585 acres reflects Prairie Island community connections. In 1971 when Lower Island land assignments were initially made there were 50, 1-acre parcels, each with one housing unit. Since that time, 20 of the original 50 land assignments have been subdivided to allow the placement of an additional housing unit(s), generally a trailer or manufactured type home.

As a result, the original 50 land assignments have now grown to approximately 70. Approximately, 160 tribal members reside in these 70 residences on Lower Island.

The structural ages of the homes varies from a few months old to 20+ years old. Many of the original HUD homes are slowly being removed and replaced with newer, more modern, manufactured homes and trailers. Very few of the homes on Prairie Island trust lands have been built with basements due to our location.

In the spring of 2005, Prairie Island Tribal council began to establish land assignments on the Upper Island. 29 one-acre lots are being assigned to enrolled Tribal Members wanting to live on the reservation. Another __ lots were opened for assignment in 2013. Housing types are single-family dwellings; structure types are similar to those on the original land assignments on the Lower Island.

Roads and Bridges

The road system on Prairie Island is fairly limited – it is comprised of essentially 10 reservation roads and Sturgeon Lake Road, which is a City of Red Wing road. Sturgeon Lake Road is the primary entrance and egress for the reservation. Prior to 1997 this road was subject to flooding, the road was raised to approximately 687 feet before the flood of 1997. The major highway running parallel to Prairie Island is County Highway 18; it is the only major county road leading to and from the Island.

Goodhue County maintains county roads, Sturgeon Lake Road is maintained by the City of Red Wing, and the Tribal Public Works Department maintains the tribal roads.

Air and Rail

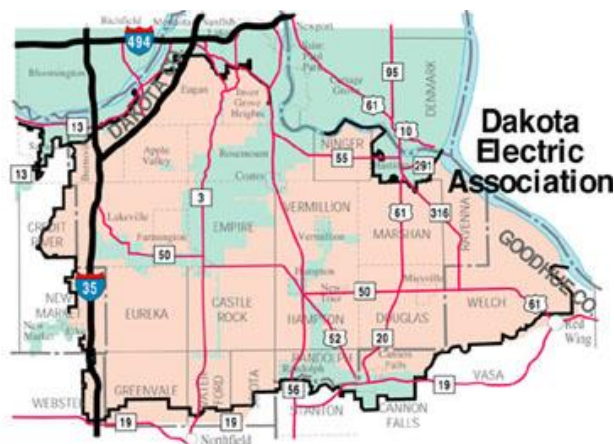
Prairie Island has one major rail line which runs through the community, Canadian Pacific Railway (CPR). At this time, CPR does not have scheduled stops in Prairie Island. The railroad crossing at Sturgeon Lake Road has been designated a “sensitive” crossing due to the nearby nuclear power plant, and thus cannot be blocked for lengthy periods of time. According to CPR, the railroad crossing will be blocked an average of twenty times per day. Blocking of this crossing can last anywhere from 1.25 minutes to 10 minutes. There is no minimum amount of time that the rail will be unblocked for between trains, usually it is approximately 10 minutes, however it can be a few as 8 minutes. Under emergency conditions a one to two minute wait could severely hamper efforts to safely evacuate residents and casino patrons. Or get emergency services to Tribal Members or the Casino guests.

Prairie Island does not have any airstrips located on the reservation. The nearest airstrip is the Red Wing Regional Airport located in Bay City, Wisconsin. Mayo Clinic Medical Center in Red Wing also has a helipad on site for medical helicopter transports, and the Prairie Island Nuclear Generating Plant has one private helipad on their property.

Electricity

Dakota Electric Association is a member-owned, nonprofit electric utility serving parts of Dakota, Goodhue, Scott, and Rice counties, south of the Twin Cities. Serving more than 100,000 members, Dakota Electric is the second-largest electric cooperative in Minnesota and is ranked among the 25 electric distribution cooperatives nationally.

(Dakota Electric website)



of
just
largest

Large aerial high voltage power lines run along the east side of the reservation, these lines are under the ownership of Xcel Energy.

Communications

Television

The Prairie Island Indian Community is served by several different communications companies. The reservation receives broadcast from the main networks that serve the twin cities metro area. There are no television broadcasting stations associated with the Prairie Island Indian Community or Goodhue County. Radio broadcasts are also picked up from the twin cities metro area. In addition the area is served by several local radio stations including the following:

KCUE AM 1250 – Red Wing

KWNG 106 FM – Red Wing

KLCH 94.9 FM – Lake City

KMFX – 102.5 FM – Lake City

Newspaper

There are five publishing companies that print papers for the local communities, however, the local community papers, which service Prairie Island, include:

Republic Eagle – Red Wing

Cannon Falls Beacon – Cannon Falls

Hastings Star Gazette- Hastings

Star Tribune- Minneapolis/St. Paul

Pioneer Press- Minneapolis/St. Paul

In the event of severe weather or other emergency situations, various media sources participate in the Emergency Alert System (EAS) that broadcast emergency information for their listening areas. The following television and radio stations are part of the EAS that cover Goodhue County.

Television

KTTC - Rochester

KAAL - Austin

KARE - Minneapolis

WCCO - Minneapolis

KSTP – St. Paul

AM Radio

WCCO – Minneapolis

KDHL – Faribault

KCUE – Red Wing

KWEB - Rochester

KROC - Rochester

FM Radio

KWWK - Rochester

KNXR - Rochester

FOX – Rochester

KOLM - Rochester

KSTP – St. Paul

In addition to media alerts there are also emergency sirens in each of the cities and a few townships. Currently, there are 21 sirens in the county that are owned and maintained by the city or township they are located in, and are activated by the Sheriff's Department Dispatch. There are also 105 emergency sirens that are maintained by Xcel Energy (nearby nuclear power plant) and can be operated by Xcel or the Sheriff's Department Dispatch for the county they are in.

Prairie Island has five sirens located throughout the reservation. There is one near the PIIC community baseball fields; it is a multi-use siren, which can be activated by both Goodhue County and Xcel Energy, depending on the situation.

Cell Phone Towers

There are 38 cellular towers, which service Goodhue County and surrounding areas. These towers are owned and operated by local, national, and federal agencies.

Currently, there is one cell phone tower located on Prairie Island. Due to our location in between bluffs on the east and west side, cell phone coverage is often very poor with many "dead spots". This can present a problem for the Prairie Island PD trying to communicate with other agencies, or for citizens trying to call 911 and report emergencies.

EMERGENCY SERVICES

Prairie Island is serviced by a full range of emergency services, primarily through verbal mutual aid agreements with neighboring communities.

Law Enforcement

The Community established the Prairie Island Indian Community Police Department in 2003. In March 2004, Prairie Island signed a cooperative agreement, with the City of Red Wing and Goodhue County, the Prairie Island Police Department is a fully recognized state law enforcement agency staffed by state and federally certified law enforcement officers.

Minnesota is a Public Law 280 state, which allows the state and counties to assume concurrent jurisdiction with the Tribes. Under this law, tribal governments retain the inherent sovereign authority to establish and operate their own police force. The Tribal Police Department has jurisdiction over the PIIC, including the casino owned by the Tribe.

The County Sheriff and the City of Red Wing have jurisdiction over most areas near the Prairie Island

Reservation and serve as back up to local police. Dispatch is operated by the County Sheriff and is located in the City of Red Wing.

Prairie Island Tribal Police Department

- (1) Chief of Police (1) Captain
- (8) Sworn Officers
- (2) Non-sworn administrative staff

Vehicles

- (3) Administrative Vehicles (4) Marked SUV's
- (1) Marked ATV (3) Marked Squad Cars
- (1) Command Vehicle (1) Marked Snowmobile
- (1) Fire Brush Truck

Fire and Ambulance Service

In 2010 a resolution was passed by the Tribal Council to establish a volunteer Tribal Fire Department. In 2013 the first piece of apparatus was purchased, a custom built 2014 Grass Brush Truck with a 500 gallon tank with foam capability. An effort to train additional volunteers and cross train employees to use this equipment has been ongoing since taking delivery of the truck in November of 2013.

Fire Departments in Goodhue County provide service to multiple jurisdictions through mutual aid agreements. Prairie Island is a community located within the jurisdiction of the City of Red Wing Emergency Medical personnel are dispatched from Red Wing. The following is a list of services available to Prairie Island.

Red Wing Fire and EMS

- (22) Paid personnel (22 paramedic trained) (7) with Basic Life Support Training
- (14) with Advanced Life Support Training (18) Paid on call Fire Fighters (18 first responder trained)

Vehicles

- (4) Ambulances (1) Suburban with cot and backboard
- (4) Engine (1) Brush Truck (1) 100 foot Ladder Truck

Special Equipment

- (6) Defibrillators; (4) backboards on each ambulance with 4 reserves

Each ambulance is equipped to provide advanced life support with I.V. drugs and airways. Extrication spreaders and cutters on 3 ambulances; 46 portable hand held 800 MHz radios; 1 portable floating pump; 1 fire boat with pump; Ice rescue and rope rescue equipment.

Miesville - Volunteer Fire Department

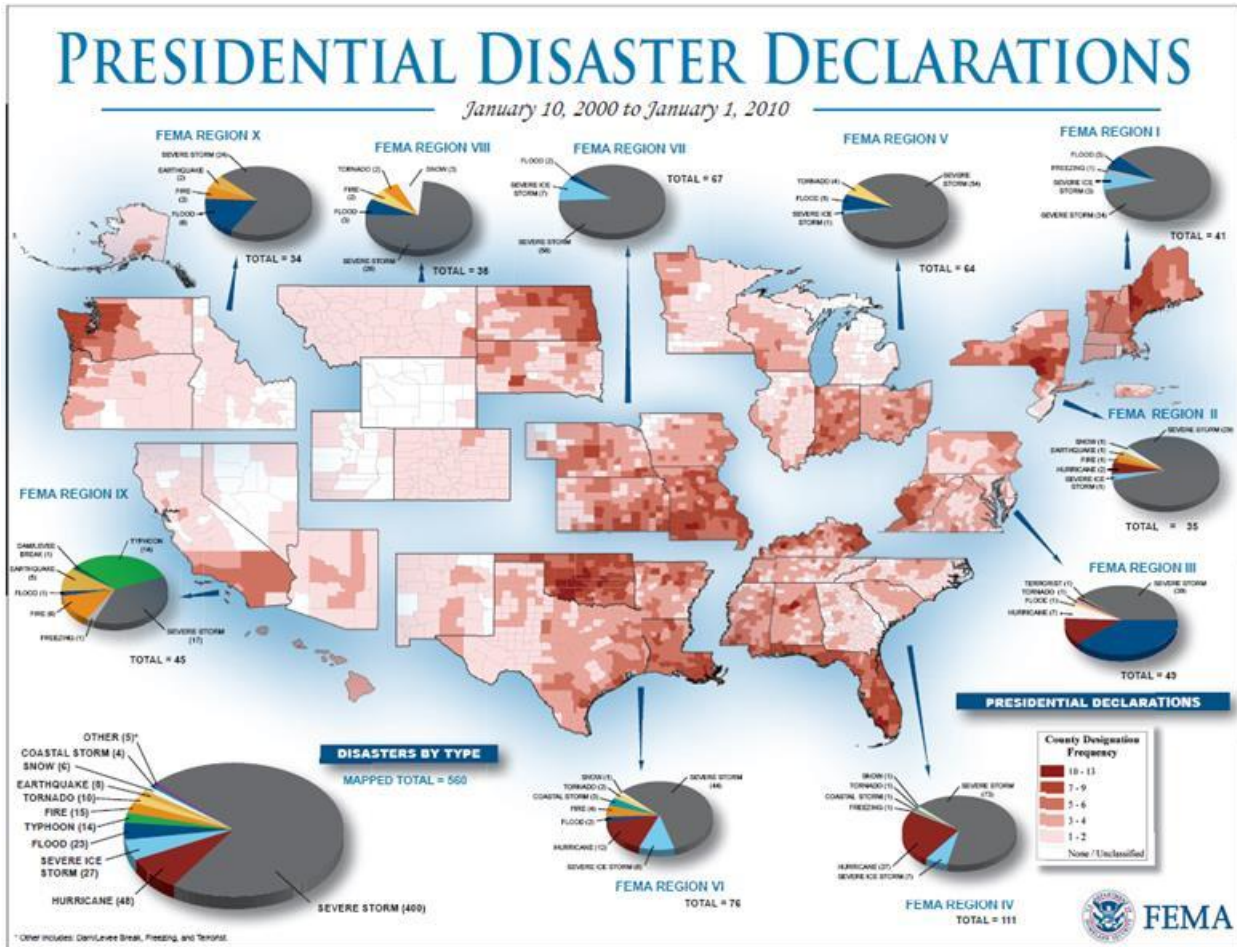
Information regarding the equipment list owned by the Miesville FD was unavailable at the time of submission. Prairie Island has a current mutual aid agreement with the Miesville FD to assist in the event of a fire situation at the PIIC Upper Island, just north of the current reservation on County Highway 18.

Medical Facilities

Prairie Island Indian Community- As of late 2013 the Prairie Island Indian Community Medical Clinic was reopened to Tribal members and employees of the Treasure Island Casino as well as the Prairie Island Indian Community. In addition to the employees at the clinic, two administration personnel and a Community Health Representative will also be on staff at the PIIC Administration Building to assist with home visits and follow up care. *Treasure Island Resort and Casino-* Medical Services Facility – This facility is primarily used for guests and employees of the Casino, handling emergency injuries. The EMT's at this facility are available to assist in any emergency medical situations outside of the Casino grounds if requested.

Goodhue County- All of the medical facilities are within the corporate limits of various cities. There are 3 hospitals, 9 clinics, and 10 group or nursing facilities in Goodhue County. According to a report from the Minnesota Department of Health in 2009, there are the following state licensed beds in Goodhue County. 89 hospital beds, 16 infant bassinets, 649 nursing home beds, and 50 supervised living facility class B beds.

PRESIDENTIAL DISASTER DECLARATIONS



Above map courtesy of the FEMA website.

If a disaster is beyond the response capabilities of a State, a governor can seek a Federal Disaster Declaration by submitting a request to the President of the United States through the regional FEMA office. FEMA will review the requests and makes a recommendation to the President. After the Federal Disaster Declaration the affected area is then able to receive funds from the Federal Government to assist in the recovery effort. The Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 (Stafford Act) is the law that authorizes federal assistance when the President declares a State to be a disaster area. All places in Minnesota can be affected by disasters. There have been 29 federal disaster declarations since 1996.

The extent of major disaster declarations can be seen, above, on the Presidential Disaster Declarations in United States from January 10, 2000 thru January 1, 2010.

In addition to the map is a detailed table listing the major disaster declarations in Minnesota which is up to date.

MINNESOTA DISASTER HISTORY

Major Disaster Declarations

YEAR	DATE	TYPE OF DISASTER	DISASTER NUMBER
2014	6/11	Severe Storms, Flooding, Winds	4182
2013			
2013	6/20	Severe Storms, Flooding, Winds	4131
2012			
2011	4/9	Severe Winter Storms	4113
2011	6/14	Severe Storms, Flooding	4069
2010			
2010	7/28	Severe Storms, Flooding & Tornadoes	4009
2010			
2010	6/07	Severe Storms and Tornadoes	1990
2010			
2009	5/10	Severe Storms and Flooding	1982
2009			
2009	10/13	Severe Storms and Flooding	1941
2008			
2007	07/02	Severe Storms, Tornadoes, Flooding	1921
2007			
2007	04/19	Flooding	1900
2006			
2006	03/19	Flooding	3310
2005			
2004	04/09	Severe Storms and Flooding	1830
	03/26	Severe Storms and Flooding	3304
	06/25	Severe Storms and Flooding	1772
	08/23	Severe Storms and Flooding	1717
	08/21	Bridge Collapse	3278
	06/05	Flooding	1648
	01/04	Severe Winter Storm	1622
	09/13	Hurricane Katrina Evacuation	3242
	10/7	Severe Storms, Flooding	1569
2002			
2002	6/14	Severe Storms, Flooding	1419
2001			
2001	5/16	Flooding	1370
2000			
2000	6/27	Flooding, Severe Storm, Tornado	1333
1999			
1999	8/26	Flooding, Heavy Rain, Ice Storm	1288
1999			
1999	7/28	Flooding, High Winds, Severe Storm	1283
1998			
1998	6/23	High Winds, Severe Storm, Tornado	1225
1998			
1998	4/01	Thunderstorms, Tornado	1212
1997			
1997	8/25	Flooding	1187

1997	4/08	Severe Storm, Flooding	1175
1997	1/16	Winter Storm, Severe Storm	1158
1997	1/07	Winter Storm, Severe Storm	1151
1996	6/01	Flooding	1116
1996	1/05	Ice Storm	1078

In Goodhue County, where the Prairie Island Indian Community is located, there have been 13 Presidential Disaster Declarations. All of these declarations were in response to a natural disaster. Flooding is a prominent hazard, for Prairie Island and Goodhue County, and accounts for three-quarters of the total Presidential Declarations for Goodhue County.

#188 April 1965, Flooding;

#255 April 1969, Flooding;

#560 July 1978, Severe Storms, Flooding, Hail and Tornadoes;

#929 December 1991, Ice Storm;

#993 June 1993, Severe Storms, Tornadoes, and Flooding;

#1175 April 1997, Severe Winter Storms, Flooding, High Winds;

#1225 July 1998, Severe Storms, Straight Line Winds, Tornadoes;

#1370 May 2001, Flooding; #1419 June 2009, Severe Storms, Tornadoes, Flooding;

#1900 April 2010, Flooding (included PIIC only, not Goodhue County);

#1941 October 2010, Severe Storms, Tornadoes, Flooding;

#4069 June 2012 Severe Storms and Flooding.

#4182 June 2014, Severe Storms and Flooding.

There have been numerous, smaller disasters, that have occurred since 1996 but were never a Presidential Declaration.