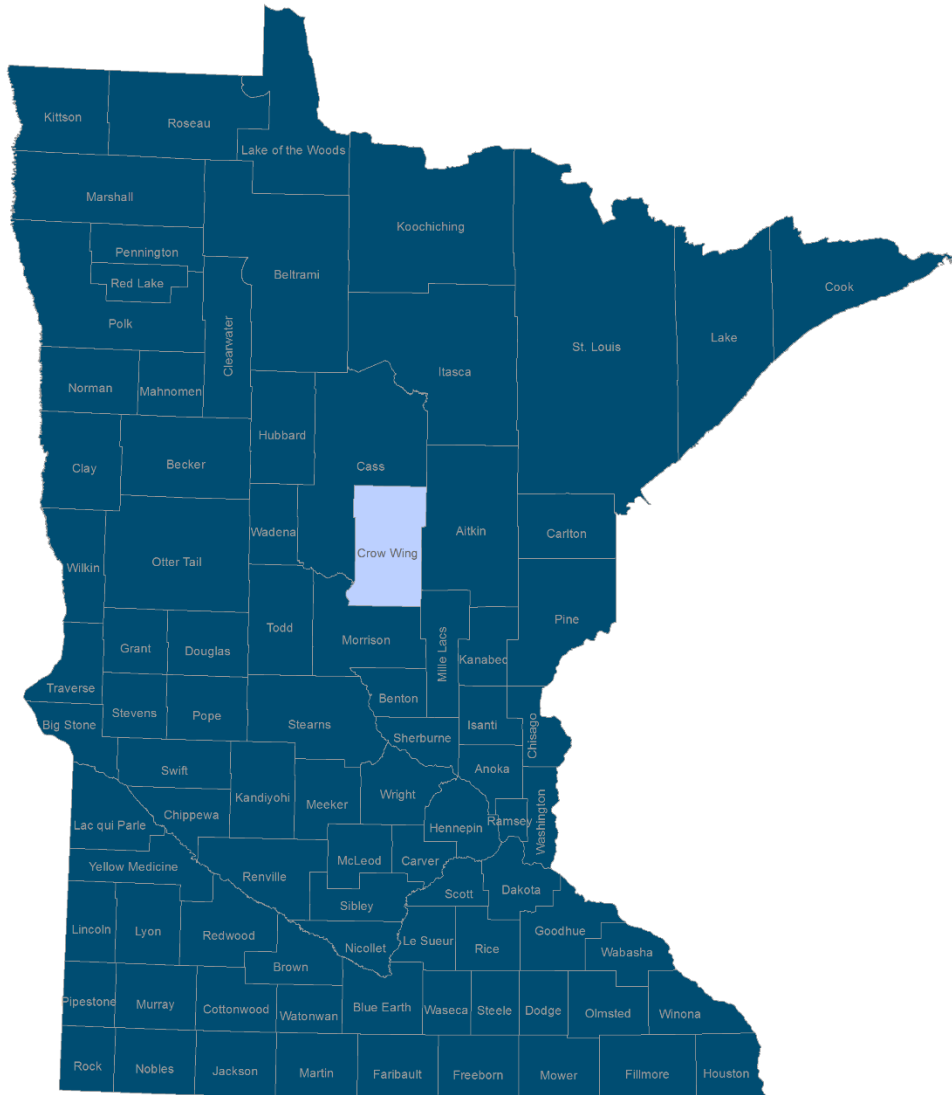


# Multi-Hazard Mitigation Plan

## Crow Wing County, Minnesota, 2017



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# Multi-Hazard Mitigation Plan

## Crow Wing County, Minnesota

2017

*Contact:*

John Bowen, Emergency Management Director  
304 Laurel Street  
Brainerd, MN 56401

218-829-4749

john.bowen@crowwing.us

<http://crowwing.us/356/Emergency-Management>

*Prepared By:*

Geospatial Analysis Center  
Swenson College of Science and Engineering  
University of Minnesota Duluth  
140 Engineering Building  
1303 Ordean Court  
Duluth, MN 55812

Stacey Stark, Director  
slstark@d.umn.edu  
(218) 726-7438

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# Section I – Introduction

## Introduction

Hazard mitigation is defined as any sustained action to reduce or eliminate long-term risk to human life and property from hazards. The Federal Emergency Management Agency (FEMA) has made reducing hazards one of its primary goals; hazard mitigation planning and the subsequent implementation of resulting projects, measures, and policies is a primary mechanism in achieving FEMA's goal.

Between 1960 and 2014, natural hazards cost the U.S. an annual average loss of \$15.6 billion (Hazards & Vulnerability Research Institute, 2015).

Hazard mitigation planning and preparedness will be the most effective instrument to diminish losses by reducing the impact of disasters upon people and property. Although mitigation efforts will not eliminate all disasters, each county shall endeavor to be as prepared as possible for a disaster.

The Multi-Hazard Mitigation Plan (MHMP) is a requirement of the Federal Disaster Mitigation Act of 2000 (DMA 2000). The development of a local government plan is required in order to maintain eligibility for certain federal disaster assistance and hazard mitigation funding programs. In order for communities to be eligible for future mitigation funds, they must adopt an MHMP.

According to an analysis by the Multihazard Mitigation Council (a public/private partnership designed to reduce the economic and social costs of natural hazards), for every dollar spent by the federal treasury on FEMA mitigation grants, \$3.65 is saved: "The present value of potential annual savings to the federal treasury because of the FEMA grants studied is approximately \$970 million compared to an annual budget expenditure on these grants of \$265 million" (Multihazard Mitigation Council, 2005). Thus, every dollar spent on mitigation grants leads to an average of \$3.65 in avoided costs post-disaster and increased federal tax revenues.

Crow Wing County is vulnerable to a variety of potential natural disasters, which threaten the loss of life and property in the county. Such hazards as tornadoes, flooding, wildfires, blizzards, straight-line winds, ice storms and droughts have the potential for inflicting vast economic loss and personal hardship. In 2013, Minnesota had some of the highest weather-related disaster claims in the country (MN Environmental Quality Board, 2014).

This Multi-Hazard Mitigation Plan represents the efforts of Crow Wing County and its local governments to fulfill the responsibility for hazard mitigation planning. The intent of the plan is to reduce the actual threat of specific hazards by limiting the impact of damages and losses.

### 1.1.1 Scope

The Crow Wing County Emergency Management Director and the University of Minnesota Duluth Geospatial Analysis Center have combined efforts to update the 2011 Crow Wing County Multi-Hazard Mitigation Plan.

This Multi-Hazard Mitigation Plan evaluates and ranks the major natural hazards affecting Crow Wing County as determined by frequency of event, economic impact, deaths, and injuries. Mitigation

recommendations are based on input from state and local agencies, public input, and national best practices.

The University of Minnesota Duluth Geospatial Analysis Center (GAC) performed the hazard risk assessment for 100-year floods using the Hazus-MH GIS tool. In recognition of the importance of planning in mitigation activities, FEMA created **Hazards USA Multi-Hazard** (Hazus-MH), a powerful geographic information system (GIS)-based disaster risk assessment tool. This tool enables communities of all sizes to predict estimated losses from floods, hurricanes, earthquakes, and other related phenomena and to measure the impact of various mitigation practices that might help reduce those losses. The Minnesota Homeland Security and Emergency Management (HSEM) office has determined that Hazus-MH should play a critical role in Minnesota's risk assessments, and therefore the 100-year flood hazard analysis is introduced in this plan.

This is a multi-jurisdictional plan that covers Crow Wing County, including the cities of Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lake, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton and Trogmald. The Crow Wing County risks and mitigation activities identified in this plan also incorporate the concerns and needs of townships, school districts, and other entities participating in this plan.

Members from each of these jurisdictions actively participated in the planning process by attending workgroup meetings, providing information, suggesting mitigation strategies and reviewing the plan document. Each jurisdiction will adopt the plan by resolution after approval by FEMA. County and local city resolutions will be added by Crow Wing County after final approval by FEMA, in Appendix D in the back of the plan.

Crow Wing County has specified the following goals for this Multi-Hazard Mitigation Plan:

- To evaluate and rank the hazards that impact Crow Wing County.
- To determine the extent of existing mitigation programs and policy capabilities within Crow Wing County.
- To create a detailed, working document that will establish a standardized process for ensuring coordination of hazard mitigation efforts and to implement an ongoing and comprehensive hazard mitigation strategy.
- To familiarize state and local officials and the general public about comprehensive hazard mitigation in Crow Wing County and obtain their support.

### **1.1.2 Hazard Mitigation Definition**

Hazard mitigation may be defined as any action taken to eliminate or reduce the long-term risk to human life and property from natural hazards. Potential types of hazard mitigation measures include the following:

- Structural hazard control or protection projects
- Retrofitting of facilities
- Acquisition and relocation of structures
- Development of mitigation standards, regulations, policies, and programs
- Public awareness and education programs

- Development or improvement of warning systems

### ***1.1.3 Benefits of Mitigation Planning***

The benefits of hazard mitigation planning include the following:

- Saving lives, protecting the health of the public, and reducing injuries
- Preventing or reducing property damage
- Reducing economic losses
- Minimizing social dislocation and stress
- Reducing agricultural losses
- Maintaining critical facilities in functioning order
- Protecting infrastructure from damage
- Protecting mental health
- Reducing legal liability of government and public officials

## **1.2 State Administration of Mitigation Grants**

FEMA currently has 3 mitigation grant programs that are administered by the State of Minnesota: the Hazard Mitigation Grant Program (HMGP), the Pre-Disaster Mitigation program (PDM), and the Flood Mitigation Assistance (FMA) program. The HMGP, PDM and FMA are administered through the Department of Public Safety, Division of Homeland Security and Emergency Management.

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## Section 2 – Public Planning Process

### 2.1 Steering Committee Information

The Crow Wing County multi-hazard mitigation plan steering committee is headed by the Crow Wing County Emergency Management Director, who is the primary point of contact. University of Minnesota Duluth staff under contract with Crow Wing County includes Stacey Stark (GAC Director), Steve Graham (GAC Research Analyst) and Micaella Penning (GAC Research Assistant). GAC also sub-contracted with planner Bonnie Hundrieser of Hundrieser Consulting, LLC. Members of the Crow Wing County MHMP steering committee include representatives from the public, private, and governmental sectors. Table 1 identifies the steering committee individuals and the organizations they represent.

Table 1. Multi-Hazard Mitigation Steering Committee

Name	Jurisdiction/Agency/Organization	Title
Michelle Moritz	Crow Wing County Community Services	Public Health Nurse
Trent Hawkinsen	Brainerd Public Utilities	Line Supervisor
Josh Netland	Emily Consolidated Telephone Company	General Manager
Eric Quale	Crow Wing Power	Chief Operating Officer
Jim Exsted	Baxter Police Department	Chief
Kevin Merschman	Breezy Point Police Department	Chief
Rosemary Franzen	Crow Wing County Board	County Commissioner
Kara Griffin	Crow Wing County Community Services	Program Manager
Chris Lindholm	Pequot Lakes School Dist	Superintendent
Tom Blomer	City of Nisswa	Public Works Director
Tony Sailer	City of Brainerd	Parks and Rec Director
Jim Thoreen	City of Brainerd	City Administrator
Jamie Skjeveland	Crosby School Dist. 182	Superintendent
Paul Sandy	City of Brainerd	Assistant Engineer
Jeff Hulsether	City of Brainerd	City Engineer
Tim Holmes	City of Brainerd	Fire Chief
Shawn Strong	City of Brainerd	IT/GIS Coordinator
Jay Sikkink	Crow Wing County	IT Director
Deby Erickson	Crow Wing County	Admin Services Director
Reid Thiesse	Crow Wing County	Facilities Manager
Chip Lohmiller	City of Crosslake	Fire Chief
Rachel Nystrom	County Board	County Commissioner
Paul Thiede	County Board	County Commissioner
Josh Doty	City of Baxter	Community Director
Blain Johnson	AREMA	Region 2 Planner

Name	Jurisdiction/Agency/Organization	Title
Scott Bowers	Crow Wing Power	Purchasing Manager
Tim Houle	Crow Wing County	County Administrator
Tim Bray	Crow Wing County	County Engineer
Denise Sundquist	Brainerd School Dist. 181	Health and Safety
John Bowen	Crow Wing County	Emergency Management Director

Jurisdictional representatives participating on the steering committee were contacted throughout the plan update process to provide feedback on the hazards of concern to their community and the mitigation actions which they would seek to implement upon plan adoption. The list of final mitigation actions was divided into jurisdiction-specific mitigation action charts so that each could see and address those actions that applied specifically to their cities (see *Appendix G: Mitigation Actions by Jurisdiction*).

## 2.2 Review of Existing Plans

Crow Wing County and its local communities utilized a variety of planning documents to direct community development. These documents include a Comprehensive/Master Plan, Capital Improvements Plan, Emergency Operations Plan, Transportation Plan, Stormwater Management Plan, etc. (see Appendix J for a full listing of plans and programs in place in Crow Wing County). The planning process also incorporated the existing natural hazard mitigation elements from previous planning efforts. Table 2 lists the plans, studies, reports, and ordinances used in the development of the plan.

Table 2. Planning Documents used for MHMP Planning Process

Author(s)	Year	Title	Description	Where Used
Minnesota Division of Homeland Security and Emergency Management	2014	Minnesota All-Hazard Mitigation Plan Update	Statewide hazard mitigation plan.	Section 4
		Emergency Operations Plan	Crow Wing County has an EOP, which includes all of the county departments as well as city officials and emergency organizations. The plan is organized to assist with the responsibilities and assignments during any type of emergency.	Section 4
Crow Wing County	2013-2023	Local Water Management Plan	This plan works to protect and enhance Crow Wing County's water resources.	Section 3

## 2.3 Planning Process Timeline and Steps

In order to update the 2011 Crow Wing County Multi-Hazard Mitigation Plan, UMD consultants worked in coordination with the Crow Wing County Emergency Management Director, State of Minnesota Hazard Mitigation officials, and members of the steering committee. The goals of the updating process were to include more recent data documenting the critical infrastructure and hazards faced by Crow Wing County, reformat and reorganize the plan to reflect definitions of hazards as expressed in

the 2008 State of Minnesota Multi-Hazard Identification and Risk Assessment Plan, and reflect current hazard mitigation priorities in Crow Wing County. Therefore, the new plan includes not only new data documenting the types of hazards faced by Crow Wing County residents and emergency planning officials, but also new thinking about how to best address these hazards.

This is a multi-jurisdictional plan that covers Crow Wing County and the cities of Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lake, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton and Trommald. The Crow Wing County risks and mitigation activities identified in this plan incorporate the concerns and needs of townships, school districts, and other entities participating in this plan.

On July 13, 2016, the Geospatial Analysis Center hosted a kickoff webinar, which was attended by the Crow Wing County Emergency Management Director. The webinar included a project overview, GAC background, the roles and responsibilities of the Emergency Management Director, contents of the Multi-Hazard Mitigation Plan, planning process and projected timeline (see Appendix E for webinar slides).

The first steering committee meeting occurred on January 1<sup>st</sup>, 2017, at the Brainerd Fire Hall, which included the Crow Wing County MHMP steering committee, UMD staff, and Bonnie Hundrieser of Hundrieser Consulting, LLC. The steering committee was provided with an overview of the purpose, process and timeline for the Crow Wing County Multi-Hazard Mitigation Plan update, as well as the role and responsibilities of steering committee members. Appendix E provides documentation of steering committee meeting summaries, including participant sign-in sheets and presentation slides.

Steering committee members were engaged in providing feedback on plans and programs in place as they relate to hazards facing the county, and they discussed potential mitigation actions to be added to the plan. This information was used to inform the development of mitigation strategies in the updated plan.

In March 2017, Crow Wing County issued a news release inviting public feedback and participation for the Crow Wing County MHMP update (for complete documentation, see *Appendix F: Public Outreach & Engagement Documentation*).

On June 22, 2017, members of the steering committee convened to conduct a review and discussion of the draft mitigation action charts developed for Crow Wing County and the city jurisdictions participating in the plan. The meeting was facilitated by Bonnie Hundrieser, a member of the University of Minnesota – Duluth Geospatial Analysis Center (GAC) planning team that is leading the update of the Crow Wing County MHMP. See Appendix E for a full meeting summary.

In order to provide opportunity for public input, Crow Wing County issued a second new release on \*\*, 2017 inviting public review and feedback on the draft plan. The news release provided information on where the plan could be viewed and comments submitted. The UMD Geospatial Analysis Center hosted a webpage to post the full draft Crow Wing County MHMP, including excerpts of the Crow Wing County Master Mitigation Action Chart, each of the jurisdictional mitigation action charts, an electronic feedback form, and an Esri Story Map that documents the history of natural hazards in Crow Wing County. Story maps combine mapping and analysis with multi-media content such as images, videos, text,

and hyperlinks. Data layers such as the 100-year floodplain and potential economic loss produced with the FEMA Hazus-MH tool were integrated with poignant imagery from past events, in the hope that the story map would serve as a helpful tool for visually ‘reminding’ residents about hazards, to encourage their participation in future mitigation (<http://arcg.is/0y05y1>).

Appendix F provides documentation of the public outreach for feedback on the draft plan by Crow Wing County and jurisdictions. The public feedback period for the draft plan was open from \*\* to \*\*, for a total of \*\* days.

*Table 3. Crow Wing County Hazard Mitigation Update Meetings and Public Outreach*

Meeting Type	Date	Location
Kickoff Webinar	7/13/2016	Online
Steering Committee Meeting	1/31/2017	Brainerd Fire Hall, Brainerd, MN
Steering Committee Meeting	6/22/2017	Brainerd Fire Hall, Brainerd, MN
Public Outreach	3/2017	News release inviting public feedback
Public Outreach	**	News release inviting public review of draft plan materials and feedback

At the close of the public outreach period, the UMD consultants worked with the Crow Wing County Emergency Management Director and members of the steering committee to incorporate comments from the public into the Multi-Hazard Mitigation Plan.

For more information on the planning process, see sections 5 and 6.



## Section 3 – Crow Wing County Profile

This section offers a general overview of Crow Wing County to provide a basic understanding of the characteristics of the community, such as the physical environment, population, and the location and distribution of services.

### 3.1 General County Description

Crow Wing County is located in north-central Minnesota, roughly a 2-hour drive from Minneapolis and Duluth. To the north and west lie Cass County, and Aitkin and Mille Lacs Counties lie on the eastern border. Morrison County touches the southern and western borders. Crow Wing County covers a total of 1,157 square miles (740,480 acres) and the county's estimated population in 2010 was 62,500. Brainerd is the county seat and the largest city in the county.

The 18 cities in Crow Wing County are Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald. The 28 townships are Bay Lake, Center, Crow Wing, Daggett Brook, Deerwood, Fairfield, Fort Ripley, Gail Lake, Garrison, Ideal, Irondale, Jenkins, Lake Edwards, Little Pine, Long Lake, Maple Grove, Mission, Nokay Kaje, Oak Lawn, Pelican, Perry Lake, Platte Lake, Rabbit Lake, Roosevelt, Ross Lake, St. Mathias, Timothy, and Wolford. There are also 2 unorganized territories, the First Assessment and Second Assessment Unorganized Territories.

The largest employment sectors in Crow Wing County are Education and Health Services (28% of the county work force) and Trade, Transportation and Utilities (21%). The percent of the county's population living below the poverty level in 2015 was 10.4%, compared to a 10.2% average for the state of Minnesota.

### 3.2 Environmental Characteristics

Sedimentary rocks of Cretaceous age were deposited roughly 65 to 100 million years ago over a broad area of Minnesota that extended as far north as the western end of the Mesabi Iron Range. Subsequent erosion has removed most of these strata, leaving only scattered outliers, which in Crow Wing County have been identified locally by drill hole data. The Cretaceous rocks were deposited on top of weathered Precambrian bedrock. Sloan (1964) suggested that the Cretaceous strata in Crow Wing County are related to the Colerain Formation, which was exposed by mining operations along the western Mesabi Iron Range, northeast of Crow Wing County. Bolin's (1956) study of Cretaceous strata from a drill core in Crow Wing County described gray shale, sandy shale, and sand with micro fauna of Foraminifera and fish teeth, scales, and bone fragments. Based on this fossil assemblage, Bolin interpreted the Cretaceous strata to be of Cenomanian age.

Most of Crow Wing County is underlain by Precambrian bedrock that varies in age from Achaean (approximately 2,700 million years of age, or Ma) to Paleoproterozoic (approximately 2,200 to 1,800 Ma). The Achaean rocks that underlie the northwest portion of the county are poorly understood due to lack of drill hole or outcrop data. However, this part of the county is thought to be similar to typical Achaean "greenstone-granite" terrains that are well exposed in northeastern Minnesota and can be extended into the county by the use of geophysical imagery. In Crow Wing County, these include

greenstone belts made up predominantly of metamorphosed mafic volcanic rocks, but include metamorphosed gabbro recognized in drill core and iron-formations inferred from linear aeromagnetic data. The greenstone belts are separated by belts of metamorphosed sedimentary rocks.

Paleoproterozoic rocks in Crow Wing County are part of the Penokean orogeny, a term that refers to a belt of deformed rocks that can be traced discontinuously east from central Minnesota to the Grenville Front in eastern Canada. Rocks of the Penokean orogeny were deformed to varying degrees between roughly 1,900 and 1,760 Ma, during a protracted episode of deformation referred to as the Penokean orogeny (Southwick and others, 1988). In east-central Minnesota, the Penokean orogeny is divided into two sub-terrains—the fold-and-thrust belt, and the younger foreland basin that contains the Animikie Group.

Two kinds of glacial till, of slightly different age and markedly different composition, have been deposited in Crow Wing County. Brown sandy till with sand and loam texture occurs in the southern part of the county, south and east of Brainerd and in the northern part, near the Whitefish Chain of lakes. The other type of till, termed 'red clay till', occurs in the eastern part of the county along the northern and southern shores of Mille Lacs Lake. To the West, gravel and sand outwash occur in the county and includes large areas along the Mississippi River.

### **3.3 Hydrography**

Crow Wing County has an area of 740,000 acres and approximately 102,000 acres, or 14%, is covered by lakes, rivers, and streams. An additional 26% is covered by wetlands. This abundance of surface water makes Crow Wing County a destination area. The county lies within the Upper Mississippi River Basin.

Impaired waters are an increasing problem as Crow Wing County has many lakes, creeks and rivers that are on the Minnesota Pollution Control Agency Impaired Waters lists, including Whitefish Lake, Pelican Lake, Edward Lake, North Long Lake, Round Lake, Serpent Lake, Ruth Lake, Upper Dean Lake, Bay Lake, Clearwater Lake, Sebie Lake, Platte Lake, Mille Lacs, the Mississippi River and Buffalo Creek (Minnesota Pollution Control Agency, 2017). Impaired waters have become a priority issue because they do not meet state water quality standards, they affect growth and health of communities and economies, and the Clean Water Act has a mandate requiring every state to address impairments. Impairments found in Crow Wing County waters include mercury in fish tissue and eutrophication.

Basic hydrography is mapped in Figure A - I in Appendix A.

#### **3.3.1 Groundwater**

Most groundwater supplies in Crow Wing County are pumped from the surficial sand aquifer and several buried sand aquifers. The Quaternary sediments, which formed these aquifers, were deposited by several glaciers that entered and receded from the county. Sediments deposited during the most recent glacial period, the Late Wisconsinan, are better understood than those from previous glaciations.

More than 99% of wells in the county are completed in Quaternary sediments; less than 1% of the wells are completed in bedrock. Of the wells in Quaternary sediments, 72% are completed in buried sand aquifers, 24% are completed in surficial sands as watertable wells, and 3% are completed in buried sands under unconfined conditions. The surficial sand aquifer comprises outwash from the Brainerd

assemblage and Mille Lacs deposits, fine sand from Glacial Lakes Brainerd and Aitkin, and terrace sediments.

The surficial sand aquifer is widely used in western and central Crow Wing County. Quaternary buried artesian sand aquifers are the most important groundwater source where till is at the surface. However, the buried artesian aquifers are also heavily used in areas where the surficial sand aquifer is present. A small number of wells completed in bedrock exist in the county. About half of them are near the Mississippi River, and the rest are scattered throughout the county.

Water table aquifer vulnerability (using 2011 data from the Minnesota Department of Agriculture) and public and municipal wells are mapped in Figure A - 14.

### **3.3.2 Lakes**

Crow Wing County has over 400 lakes. Some of the county's largest lakes are Pelican Lake, North Long Lake, Lake Edward and Lower Whitefish Lake. Mille Lacs Lake serves as the border for a small portion of southeastern Crow Wing County.

### **3.3.3 Rivers**

The Mississippi River is the fourth longest river in the world, flowing from Lake Itasca, through Crow Wing County, all the way to the Gulf of Mexico. The river enters the county on the eastern border, flowing across the county and through Brainerd to eventually form the border with Morrison County in the southwest.

The Pine River originates in Cass County to the west and flows into Crow Wing County where it joins the Mississippi River.

### **3.3.4 Wetlands**

Wetlands are a valuable resource in Crow Wing County, which contains all 8 main types of wetlands. Activities in a wetland are regulated by the Minnesota Wetland Conservation Act (WCA). The WCA is administered locally by Crow Wing County Environmental Services in county jurisdictional areas and by the Crow Wing Soil and Water Conservation District (SWCD) in many municipalities.

According to the Local Water Plan, approximately 26% of the county is covered by wetlands. Important benefits of wetlands include storage area for excess water during flooding; filtering of sediments and nutrients before they enter lakes, rivers and streams; and fish and wildlife habitat.

According to the National Land Cover Dataset of 2011, there are 111,936 acres of woody wetlands in Crow Wing County (Forest or shrub land vegetation that accounts for greater than 20% of vegetative cover and the soil or substrate that is periodically saturated with or covered with water). In addition, there are 78,446 acres emergent herbaceous wetlands, which the NLCD defines as "Areas where perennial herbaceous vegetation accounts for greater than 80% of vegetative cover and the soil or substrate is periodically saturated with or covered with water."

Aquatic invasive species have invaded many wetlands in Minnesota. These plants can take over entire native communities and threaten native wetland ecosystems. According to the MN DNR infested waters list, there were over 60 infested water bodies in Crow Wing County as of August 2017. The most common species recorded in the county are Eurasian watermilfoil and zebra mussels (MN DNR, 2017).

### 3.4 Climate

The climate of Crow Wing County is classified as continental, characterized by wide variations in temperature from summer to winter. Although the climate is essentially uniform throughout the county, variations in microclimate may occur as a result of differences in vegetation, soil and relief.

The average annual precipitation in Brainerd is 28 inches. The average high temperature in July is 81° F and the average low in January is -7° F (Intellicast, 2017).

#### 3.4.1 Climate Change

Minnesota's climate is currently changing in ways that affect the environment, economy and everyday life. Historical weather data show changing trends in some weather phenomenon over the past few decades, and future changes are likely. Definite predictions are difficult to make, as changes may vary depending on geographical location, even within Minnesota. Intense study of these topics is ongoing.

According to the 2015 Minnesota Weather Almanac,

*During the three most recent decades, the Minnesota climate has shown some very significant trends, all of which have had many observable impacts... Among the detectable measured quantity changes are: (1) warmer temperatures, especially daily minimum temperatures, more weighted to winter than any other season; (2) increased frequency of high dew points, especially notable in mid- to late summer as they push the Heat Index values beyond 100°F; and (3) greater annual precipitation, with a profound increase in the contribution from intense thunderstorms (Seeley M. , 2015).*

Winter temperatures in Minnesota have been warming nearly twice as fast as annual average temperatures, a trend that has been noticed throughout the Midwest. There has also been a distinct spread of warmer lows into the northern portion of the state, and 7 of the top 10 warmest years in Minnesota since record-keeping began in 1895 have occurred within the last 15 years (Minnesota Department of Health, 2015). Various studies have also concluded that the frequency and intensity of precipitation in the Midwest has increased, with more storm events leading to flooding.

Rural communities are particularly vulnerable to climate change, due to their dependence upon natural resources, physical isolation, limited economic diversity, higher poverty rates and aging populations. According to *Climate Change Impacts in the United States: The Third National Climate Assessment*,

*Warming trends, climate volatility, extreme weather events, and environmental change are already affecting the economies and cultures of rural areas. Many rural communities face considerable risk to their infrastructure, livelihoods, and quality of life from observed and projected climate shifts... These changes will progressively increase volatility in food commodity markets, shift the ranges of plant and animal species, and, depending on the region, increase water scarcity, exacerbate flooding and coastal erosion, and increase the intensity and frequency of wildfires across the rural landscape (Hales, et al., 2014).*

The Assessment also notes that transportation systems in rural areas are more vulnerable to risks such as flooding, since there are typically fewer transportation options and infrastructure redundancies. In addition, power and communication outages due to severe weather events typically take longer to repair in rural areas, which can increase the vulnerability of elderly populations. Rural areas are also

more vulnerable since they typically have more limited financial resources to deal with the effects of climate change.

The composition of the region's forests are expected to change as increasing temperatures shift tree habitats northward. While forests in the Midwest are currently acting as a net absorber of carbon, this could change in the future due to projected increases in insect outbreaks, forest fires, and drought, which will result in greater tree mortality and carbon emissions (Pryor, et al., 2014).

The National Climate Assessment suggests that infrastructure planning (particularly water resources infrastructure) should "be improved by incorporating climate change as a factor in new design standards and asset management and rehabilitation of critical and aging facilities, emphasizing flexibility, redundancy, and resiliency" (Georgakakos, et al., 2014).

Federal, state, and tribal governments are increasingly integrating climate change adaptation into existing decision-making, planning, or infrastructure-improvement processes (Georgakakos, et al., 2014).

### 3.5 Demographics

Brainerd is the largest city in Crow Wing County (pop. 13,590) and the designated county seat. There are 18 cities, 28 townships and 2 unorganized territories within the county.

Table 4 summarizes population by community according to the 2010 U.S. Census. Figure 1 shows Crow Wing County population density by census block.

Table 4. Crow Wing County Population by Community, 2010

Community	2010 Population	% of County	Community	2010 Population	% of County
Baxter	7,610	12.18%	Riverton	117	0.19%
Brainerd	13,590	21.74%	Trommald	98	0.16%
Breezy Point	2,346	3.75%	Bay Lake Township	929	1.49%
Crosby	2,386	3.82%	Center Township	910	1.46%
Crosslake	2,141	3.43%	Crow Wing Township	1,966	3.15%
Cuyuna	332	0.53%	Daggett Brook Township	554	0.89%
Deerwood	532	0.85%	Deerwood Township	1,306	2.09%
Emily	813	1.30%	Fairfield township	345	0.55%
Fifty Lakes	387	0.62%	Fort Ripley Township	883	1.41%
Fort Ripley	69	0.11%	Gail Lake Township	97	0.16%
Garrison	210	0.34%	Garrison Township	754	1.21%
Ironton	572	0.92%	Ideal Township	1,069	1.71%
Jenkins	430	0.69%	Irondale Township	1,134	1.81%
Manhattan Beach	57	0.09%	Jenkins Township	359	0.57%
Nisswa	1,971	3.15%	Lake Edwards Township	2,085	3.34%
Pequot Lakes	2,162	3.46%			

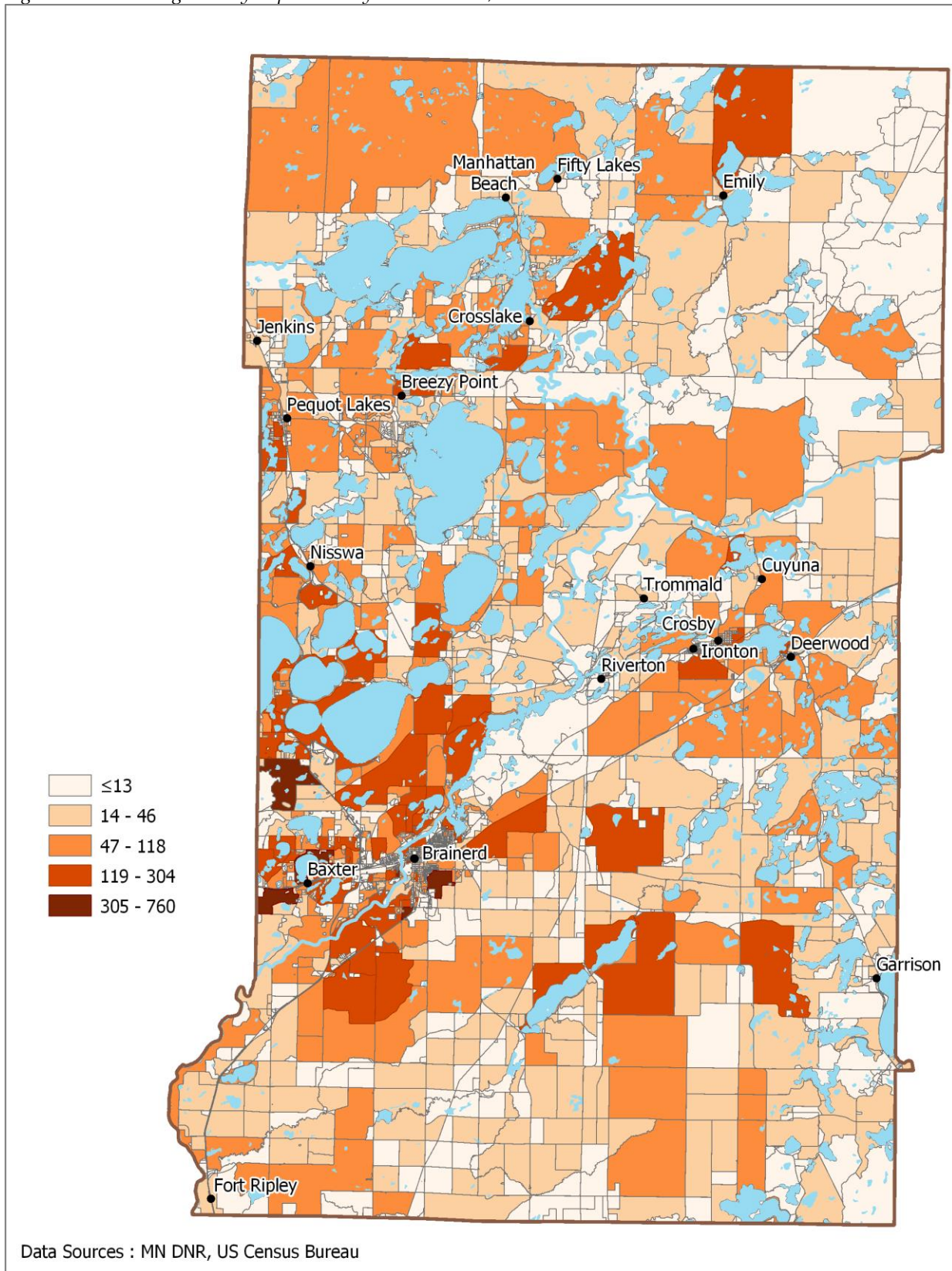
Community	2010 Population	% of County
Little Pine Township	86	0.14%
Long Lake Township	1,036	1.66%
Maple Grove Township	774	1.24%
Mission Township	817	1.31%
Nokay Kaje Township	830	1.33%
Oak Lawn Township	1,792	2.87%
Pelican Township	446	0.71%
Perry Lake Township	302	0.48%
Platte Lake Township	414	0.66%

Community	2010 Population	% of County
Rabbit Lake Township	319	0.51%
Roosevelt Township	601	0.96%
Ross Lake Township	165	0.26%
St. Mathias Township	622	1.00%
Timothy Township	162	0.26%
Wolford Township	379	0.61%
First Assessment UT	5,424	8.68%
Second Assessment UT	117	0.19%
<b>Total:</b>	<b>62,500</b>	

Source: U.S. Census Bureau, 2015

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Figure 1. Crow Wing County Population by Census Block, 2010



Population growth trends have an important influence on the needs and demands of a variety of services such as transportation, law enforcement, and emergency response. An understanding of population trends and location of population concentrations is important for making projections regarding potential impacts in the event of a disaster.

In 2010, Crow Wing County had a population of 62,500 residents, averaging 54 persons per square mile of land area. Brainerd, the largest city in the county and the county seat, has a population of 13,590.

Crow Wing County's population is increasing, rising 25% between 1990 and 2000, and adding another 13% population growth from 2000 to 2010. Since 1940, the population has risen by 107%. Table 5 below shows the population change in Crow Wing County between 1940 and 2010.

Table 5. Crow Wing County Population Change (1940-2010)

1940	1950	1960	1970	1980	1990	2000	2010	Change 1940- 2010	Change 2000- 2010
30,226	30,875	32,134	34,826	41,722	44,249	55,099	62,500	+107%	+13%

Source: U.S. Census Bureau, 2013

Crow Wing County's population is projected to grow by 9% between 2015 and 2045. Table 6 below shows population projections for Crow Wing County until 2045.

Table 6. Crow Wing County Population Projections (2015-2045)

2015	2020	2025	2030	2035	2040	2045	Projected Change 2015-2045
66,818	69,144	70,450	71,146	71,555	72,180	73,122	9%

Source: Minnesota State Demographic Center, Minnesota Planning, 2015

### 3.6 Economy

Crow Wing County has relatively balanced employment for across major industry sectors. However, Education and health services dominate by employing 7,770 individuals across the county which constitutes 28% of jobs in the county. Trade/transportation/utilities and leisure/hospitality are also major components of the county's economy. Major employers include the hospitals in Brainerd and Crosby, including Cuyuna Regional Medical Center, Brainerd Medical Center, and St. Joseph's Medical Center. The Brainerd School District employs 893 individuals in the Education sector and Ascensus provides 500 jobs pertaining to technology services (BLAEDC, 2016).

The number of jobs in the county rose by approximately 2% between 2004 and 2014. Table 7 provides an overview of the annual average employment by major industry sector in Crow Wing County.



Table 7. Annual Average Employment by Major Industry Sector, Crow Wing County

Industry	Number of Jobs (2004)	Number of Jobs (2014)
Natural Resources and Mining	47	99
Construction	2,155	1,655
Manufacturing	2,786	2,501
Trade, Transportation, Utilities	6,394	5,811
Information	NA	582
Financial Activities	1,448	1,506
Professional /Business Services	1,673	2,132
Education and Health Services	6,390	7,770
Leisure and Hospitality	3,954	3,966
Public Administration	1,192	1,308
Other Services	NA	901
<b>Total Number of Jobs:</b>	<b>27,646</b>	<b>28,233</b>

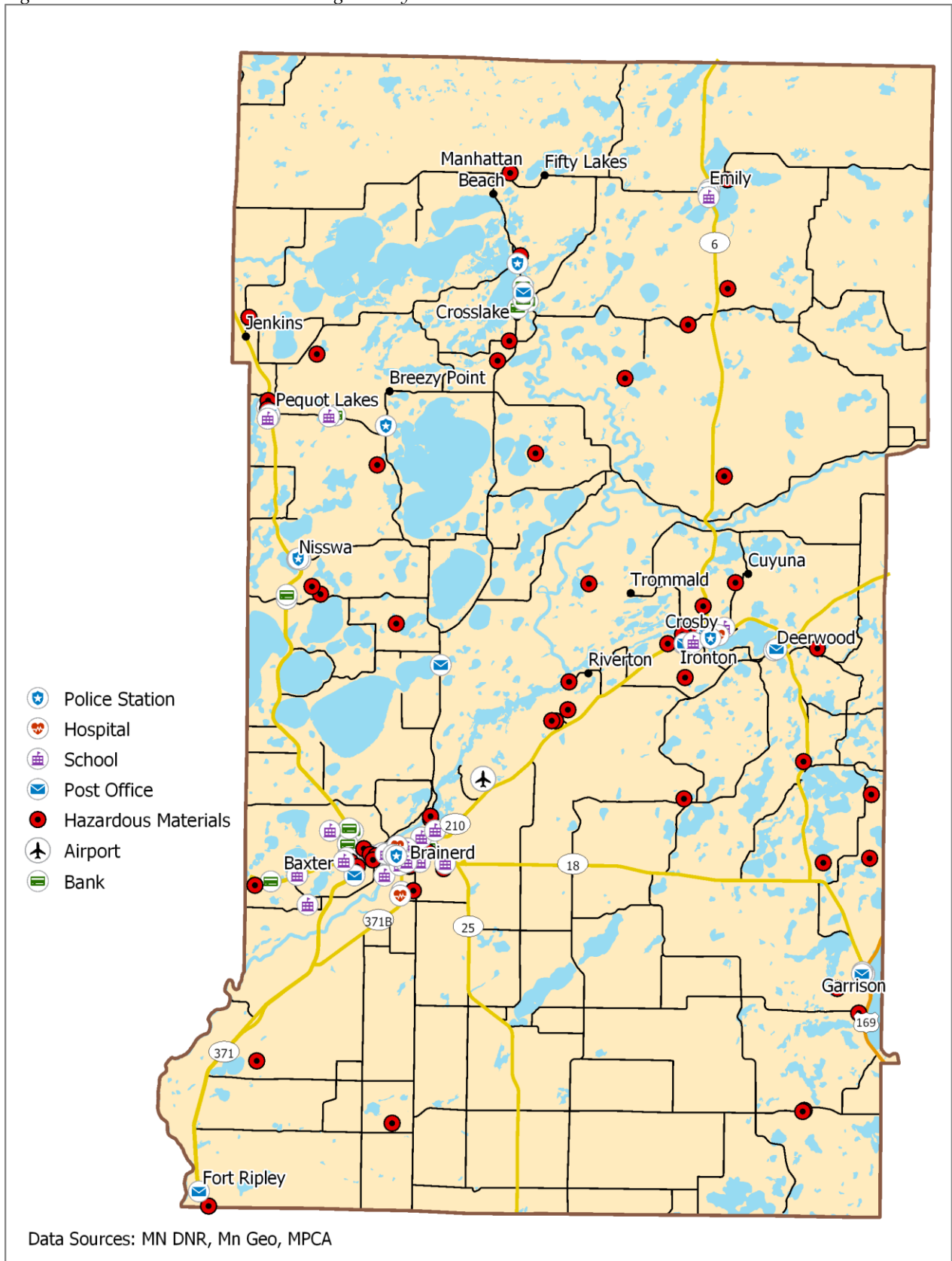
Source: Minnesota Dept. of Employment and Economic Development. Note: data discrepancies between segment values and totals exist due to data suppression for confidentiality.

The 2015 median household income was \$49,435 compared to a Minnesota average of \$61,492. The percent of the county's population living below the poverty level in 2015 was 10.4%, compared to 10.2% for the state of Minnesota.

### 3.7 Community Services & Infrastructure

The following section provides an overview on community services and infrastructure within Crow Wing County. Examples of community services include healthcare and public safety, while examples of community infrastructure include power utilities, water and sewer facilities, and the transportation network. Figure 2 below shows critical facilities in the county, and tables of all critical facilities can be found in Appendix B.

Figure 2. Critical Facilities in Crow Wing County



### 3.7.1 Health Care Providers

There are 2 hospitals in Crow Wing County, Cuyuna Regional Medical Center and St. Joseph's Medical Center. The Cuyuna Regional Medical Center services cancer patients with a cancer center and operates an intensive care unit. The hospital provides emergency services and stroke care in addition to a laboratory and surgery departments and many personal health education clinics.

Brainerd Medical Center provides emergency medicine, ENT, eye, and general surgery, a heart and vascular center, as well as rehabilitation services, obstetrics, mental or behavioral health clinic, and radiology.

There are two ambulance services covering Crow Wing County:

- **North Memorial** has 16 ambulances and 67 staff serving the Brainerd Region of Aitkin, Brainerd, Crosslake, Longville, Pine River.
- **Crosby Ambulance Service** has 3 ambulances and 18 staff.

Figure A - 13 in Appendix A depicts health services within Crow Wing County.

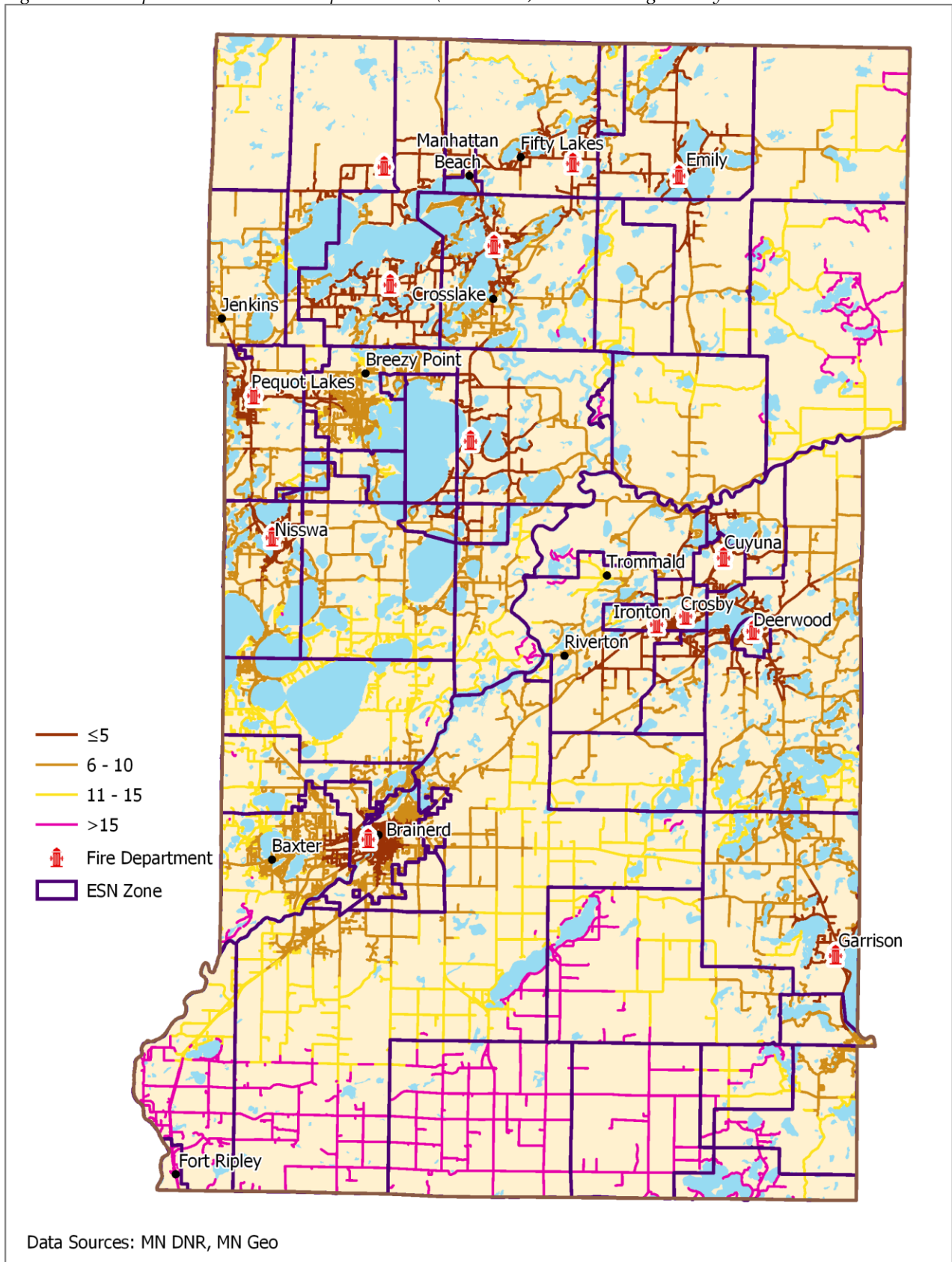
### 3.7.2 Public Safety Providers/Government Services

The Sheriff's Office is located at the law enforcement center in Brainerd. The following cities have their own police stations: Brainerd, Nisswa, Breezy Point, Crosby and Crosslake.

Figure A - 4 in Appendix A depicts government and emergency facilities, including city halls, fire departments, police departments, sheriff's department, and the Crow Wing County Courthouse.

Figure 3 shows fire departments and fire response times in Crow Wing County. These drive times were created using ArcGIS Network Analyst extension and Esri's Business Analyst. The user may note discrepancies between MnDOT road data and the map in this document; Network Analyst requires a seamlessly-connected data source in order to perform the calculations for drive times, which Business Analyst provides but MnDOT does not. The Business Analyst data was used for this reason. According to this model, several areas of the county are over 15 minutes away from the closest fire department.

Figure 3. Fire Departments and Fire Response Times (in minutes) in Crow Wing County



### **3.7.3 Utilities/Communications**

Electricity providers in Crow Wing County include Minnesota Power, Xcel Energy, Great River Energy, Crow Wing Power and Mille Lac's Energy.

Northern Natural Gas Company provides natural gas to Crow Wing County but extends their service area across the United States as it operates the largest interstate natural gas pipeline system in the United States.

Telephone companies in the county include the Consolidated Telephone Company, Emily Cooperative Telephone Company, TDS Telephone Company and Crosslake Communications.

Established in 2004, the Allied Radio Matrix for Emergency Response (ARMER) Program, administered in coordination with the Minnesota Statewide Radio Board, manages the implementation of a 700/800 megahertz (MHz) shared digital trunked radio communication system. In Crow Wing County, there are 4 ARMER towers (see Figure A - 5 in Appendix A).

### **3.7.4 Transportation**

The county transportation system is composed of roads, highways, an airport, public transit, railroads and trails. The system is designed to serve all residents, businesses, industries and tourists.

The existing roadway system reflects the concentration of urban development in the west around Brainerd. This area has the greatest concentration of roads and highest traffic volumes. MN-371 frames the eastern border of the county and connects to MN-210, which connects Brainerd to Crosby and extends east to Deerwood before exiting the extent of Crow Wing County. This highway interrupts MN-6, which offers transportation north of Crosby and south of Deerwood where this system joins MN-18 to direct traffic west toward Brainerd or southeast toward the city of Garrison.

According to Minnesota law, any structure or combination of structures over a ten-foot span length is considered a bridge. Most of the bridges in the county are multiple box culvert structures. The County is responsible for the inspection of 65 bridges. Twenty-two are on state or US highways, 24 can be found on county highways, 7 on municipal roads, 11 on township roads, and 1 on a private road.

The Brainerd Lakes Regional Airport is located just northeast of the city of Brainerd. It is owned by the city of Brainerd and Crow Wing County. While the airport is primarily used for general aviation, it is also served by one commercial airline.

Railroads in Crow Wing County serve regional agriculture and industrial uses. BNSF is currently the only carrier operating in Crow Wing County.

Brainerd & Crow Wing County Public Transit provides commuters with express bus service in and around the Brainerd and Baxter city areas. Jefferson Lines serves residents of Crow Wing County with a station in Brainerd that has stops in the Twin Cities Metro region. Crow Wing County has vanpool services and Transit Link dial-a-ride bus services available through Brainerd and Crow Wing Public Transit.

### 3.8 Land Use and Ownership

Crow Wing County covers a total of 1,157 square miles (740,480 acres). Land cover across the county is diverse with a balanced mix of forested area, cropland, and developed space with a mix of wetlands surrounding the multitude of lakes.

In 2012, 533 farms existed in the county, covering 99,972 acres (14% of the county). Of this farming land, 45% is cropland, 27% is classified as woodland, and 19% is pastureland. The rest is classified as “other uses.” The number of farms in the county decreased by 12% between 2007 and 2012, while the number of acres farmed decreased by 18% (Census of Agriculture, 2012).

According to Minnesota DNR data, the number of feedlots in Crow Wing County is 126. They are mapped in Figure A - 26 (Appendix A: Crow Wing County Maps).

Land ownership categories from the 2008 U.S. Geological Survey GAP (Gap Analysis Program) are shown in Figure A - 8 (Appendix A: Crow Wing County Maps). Land cover is also mapped in Figure A - 7.

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## Section 4 – Risk Assessment

The goal of mitigation is to reduce the future impacts of a hazard including loss of life, property damage, disruption to local and regional economies, and the expenditure of public and private funds for recovery. Sound mitigation practices must be based on sound risk assessment. A risk assessment involves quantifying the potential loss resulting from a disaster by assessing the vulnerability of buildings, infrastructure, and people.

Basing risk assessments on the best information available is important in developing effective mitigation actions that benefit communities. Geographic Information System (GIS) tools are not only helpful in producing maps, but they also show structures at risk and may determine damage estimates for potential hazard scenarios. MN Homeland Security and Emergency Management (HSEM) mitigation staff encourages the use of GIS tools in risk assessments because they produce good information to be used in the risk assessment process. In recognition of the importance of planning in mitigation activities, FEMA created **Hazards USA Multi-Hazard (Hazardus-MH)**, a powerful GIS-based disaster risk assessment tool. This tool enables communities to predict estimated losses from floods, hurricanes and other related phenomena and to measure the impact of various mitigation practices that might help reduce those losses. Hazardus-MH was used by UMD Geospatial Analysis Center staff in the flood hazard risk assessment (see section 4.4.5).

This assessment identifies the characteristics and potential consequences of a disaster, how much of the community could be affected by a disaster, and the impact on community assets. A risk assessment consists of 3 components — hazard identification and prioritization, risk profile and vulnerability profile.

### 4.1 Hazard Identification/Profile

#### 4.1.1 Hazard Identification

The cornerstone of the risk assessment is identification of the hazards that affect jurisdictions. To facilitate the planning process, several sources were employed to ensure that the natural hazards are identified prior to assessment.

The county maintenance of the plan includes continual updates of the hazards identified in the initial plan. The mitigation steering committee compared the hazards in the initial plan to current publications to determine if new hazards should be considered or if some should be deleted.

Natural hazards are identified in the FEMA publication “Multi-Hazard Identification and Risk Assessment – A Cornerstone of the National Mitigation Strategy,” also known as MHIRA. FEMA Region V developed a list based on state mitigation plans in the region. The list was divided into natural (Table 8) and other hazards (Table 9) as was done in the 2014 Minnesota State Hazard Mitigation Plan.

Table 8. FEMA MHIRA Natural Hazards in the 2014 Minnesota State Hazard Mitigation Plan

Flooding	Hail	Drought
Dam/Levee Failure	Lightning	Extreme Heat
Wildfire*	Winter Storms	Extreme Cold
Windstorms	Erosion	Earthquakes
Tornadoes	Land Subsidence (Sinkholes & Karst)	

\*Addressed in the State Mitigation Plan because Minnesota is a heavily forested state compared to other states in Region V.

For the purpose of this plan, FEMA defines other hazards or “man-made hazards” as technological hazards and terrorism. These are distinct from natural hazards primarily in that they originate from human activity. In contrast, while the risks presented by natural hazards may be increased or decreased as a result of human activity, they are not inherently human-induced. The term “technological hazards” refers to the origins of incidents that can arise from human activities such as the manufacture, transportation, storage, and use of hazardous materials. For the sake of simplicity, this guide assumes that technological emergencies are accidental and that their consequences are unintended. The term “terrorism” refers to intentional, criminal, and malicious acts. There is no single, universally accepted definition of terrorism, and it can be interpreted in many ways. For the purposes of this plan, FEMA refers to “terrorism” as the use of Weapons of Mass Destruction (WMD), including biological, chemical, nuclear, and radiological weapons; arson, incendiary, explosive, and armed attacks; industrial sabotage and intentional hazardous materials releases; and “cyber terrorism.”

Table 9. FEMA MHIRA Other Hazards in the 2014 Minnesota State Hazard Mitigation Plan

Terrorism	Nuclear Generating Plant Incidents	Ground and Surface Water Supply Contamination*
Infectious Disease Outbreak	Hazardous Materials Incidents	
Fires (Structures and Vehicles)	Transportation Incidents	

\*Addressed in the State Hazard Mitigation Plan because Minnesota has made a high investment in its prized resource, water.

#### 4.1.2 Vulnerability Assessment by Jurisdiction

The steering committee met multiple times to review and update the hazards faced by residents of Crow Wing County, update the existing mitigation actions published in the 2011 Multi-Hazard Mitigation Plan, and propose new mitigation actions.

To engage in this process, the committee drew on a number of data sources. First, the committee examined the hazards identified in the 2011 Hazard Mitigation Plan (Table 10). The natural hazards that pose risk to Crow Wing County were discussed and adjusted to reflect the definitions of natural hazards used in the State of Minnesota 2014 Multi-Hazard Identification and Risk Assessment list of natural hazards. This was done in order to assure that the risks faced by Crow Wing County were categorized the same way as the priority hazards established by the State of Minnesota.



Table 10. Hazards identified in the 2011 Crow Wing County Multi-Hazard Mitigation Plan

Natural Hazards			
Severe Summer Storms	Tornadoes	Flooding	Winter Storms & Events
Extreme Temperatures	Wind Storm (sustained)	Wildfire	Drought
Insect Infestation, Invasive Species, Excessive Wildlife Population	Earthquakes	Dust Storms	
Manmade Hazards			
Infectious Disease	Human-caused Fire		

While the focus of this MHMP is on natural hazards, planning took place with the understanding that many non-natural hazards could occur as a result of natural disasters (i.e. disruption in electrical service due to freezing rain causing problems for both utility corporations and vulnerable populations dependent on electricity for heat).

This plan draws on a variety of data sources including the State of Minnesota and Homeland Security Emergency Management Critical Infrastructure Strategy for the State of Minnesota (2010), FEMA's Local Mitigation Planning How-to Guide Integrating Manmade Hazards into Mitigation Planning (2003), and the State of Minnesota Multi Hazards Identification Risk Assessment.

Crow Wing County ranked hazards based on a Calculated Priority Risk Index, or CPRI, for their 2014 Threat Hazard Identification and Risk Assessment (THIRA). These rankings were considered by the steering committee in the process of ranking hazards for the MHMP update. The methodology of the CPRI is outlined below.

#### 4.1.3 Calculated Priority Risk Index

The vulnerability assessment builds upon the previously developed hazard information by identifying the community assets and development trends and intersecting them with the hazard profiles to assess the potential amount of damage that could be caused by each hazard event. A summary of Calculated Priority Risk Index (CPRI) categories and risk levels is shown in Table 11.

##### Definitions of CPRI Categories

**Probability** – a guide to predict how often a random event will occur. Annual probabilities are expressed between 0.001 or less (low) up to 1 (high). An annual probability of 1 predicts that a natural hazard will occur at least once per year.

**Magnitude/Severity** – indicates the impact to a community through potential fatalities, injuries, property losses, and/or losses of services. The vulnerability assessment gives information that is helpful in making this determination for each community.

**Warning Time** – plays a factor in the ability to prepare for a potential disaster and to warn the public. The assumption is that more warning time allows for more emergency preparations and public information.

**Duration** – relates to the actual amount of time that an incident may take place over time.

Table 11. Summary of Calculated Priority Risk Index (CPRI) Categories and Risk Levels

CPRI Category	DEGREE OF RISK			Assigned Weighting Factor
	Level ID	Description	Index Value	
Probability	Unlikely	Extremely rare with no documented history of occurrences or events. Annual probability of less than 0.001	1	45%
	Possible	Rare occurrences with at least one documented or anecdotal historic event. Annual probability that is between 0.01 and 0.001.	2	
	Likely	Occasional occurrences with at least two or more documented historic events. Annual probability that is between 0.1 and 0.01.	3	
	Highly Likely	Frequent events with a well-documented history of occurrence. Annual probability that is greater than 0.1.	4	
Magnitude/Severity	Negligible	Negligible property damages (less than 5% of critical and non-critical facilities and infrastructure). Injuries or illnesses are treatable with first aid and there are no deaths. Negligible quality of life lost. Shutdown of critical facilities for less than 24 hours.	1	30%
	Limited	Slight property damages (greater than 5% and less than 25% of critical and non-critical facilities and infrastructure). Injuries or illnesses do not result in permanent disability and there are no deaths. Moderate quality of life lost. Shut down of critical facilities for more than 1 day and less than 1 week.	2	
	Critical	Moderate property damages (greater than 25% and less than 50% of critical and non-critical facilities and infrastructure). Injuries or illnesses result in permanent disability and at least one death. Shut down of critical facilities for more than 1 week and less than 1 month.	3	
	Catastrophic	Severe property damages (greater than 50% of critical and non-critical facilities and infrastructure). Injuries or illnesses result in permanent disability and multiple deaths. Shut down of critical facilities for more than 1 month.	4	
Warning Time	Less than 6 hours	Less than 6 hours	4	15%
	6 to 12 hours	6 to 12 hours	3	
	12 to 24 hours	12 to 24 hours	2	
	More than 24 hours	More than 24 hours	1	
Duration	Brief	Up to 6 hours	1	10%
	Intermediate	Up to 1 day	2	
	Extended	Up to 1 week	3	
	Prolonged	More than 1 week	4	

The hazard rankings for the Crow Wing County MHMP update (Table 12) were based upon review of 1) hazard rankings in the past MHMP, 2) hazard rankings in the Calculated Priority Risk Index (CPRI)

conducted by the county, and 3) group review and discussion during the MHMP steering committee meetings.

Table 12. Hazard Ranking for 2017 MHMP Update

<b>Natural Hazards</b>	
<b>Type</b>	<b>Risk Severity</b>
Severe Summer Storms (Thunderstorms, Lightning, Hailstorms, Windstorms, Tornadoes)	High
Severe Winter Storms (blizzards, heavy snow)	High
Flash Flood & Riverine Flood	Moderate
Extreme Heat & Extreme Cold	Moderate
Wildfire	Moderate
Drought	Low
Landslides/Erosion	Low
Dam Failure	Low

#### 4.1.4 Hazard Profiling Concept of Planning

The risk assessments identify the characteristics and potential consequences of a disaster, how much of the community could be affected by a disaster, and the impact on community assets. A risk assessment consists of 3 components—hazard identification, risk profile, and vulnerability profile.

#### 4.1.5 GIS and Risk Assessment

The risk analysis step in this assessment quantifies the risk to the population, infrastructure, and economy of the community. Hazards that can be geographically identified (wildfires, windstorms, tornadoes, hail, floods) were mapped.

Hazus-MH was used to estimate the damages incurred for a 100-year flood and for general asset assessment. Hazus-MH also generates aggregated loss estimates for the entire county due to a 100-year flood. Aggregate inventory loss estimates, which include building stock analysis, are based upon the assumption that building stock is evenly distributed across each census block. Therefore, it is possible that overestimates of damage will occur in some areas while underestimates will occur in other areas. With this in mind, total losses tend to be more reliable over larger geographic areas (groups of many blocks) than for individual census blocks. It is important to note that Hazus-MH is not intended to be a substitute for detailed engineering studies.

#### 4.1.6 National Centers for Environmental Information (NCEI) Records

Historical storm event data was compiled from the National Centers for Environmental Information (NCEI). NCEI records are estimates of damage reported to the National Weather Service (NWS) from various local, state, and federal sources. However, these estimates are often preliminary in nature and may not match the final assessment of economic and property losses related to given weather events.

The NCEI data included 467 reported events in Crow Wing County from 1950 through April of 2017. However, some weather event categories only had available data going back as recent as 1996. No records before 1950 were available. A summary table of events related to each hazard type is included in the hazard profile sections that follow. A full table listing all events, including additional details, is included in Appendix C. NCEI hazard categories used in this plan are listed in Table 13.

Table 13. NCEI Historical Hazard Categories

Hazard	
Tornado	Hail
Thunderstorm Wind	Flood/Flash Flood
Winter Weather/ Winter Storm/Blizzard	Cold/Wind Chill
Excessive Heat/Heat	Lightning

#### 4.1.7 FEMA Declared Disasters

Another historical perspective is derived from FEMA-declared disasters. 7 major disaster and 2 emergency declarations in Crow Wing County have been made between 1957 and July 2017 (Figure 4).

Figure 4. FEMA-Declared Disasters and Emergencies in Minnesota, 1957-July 2017

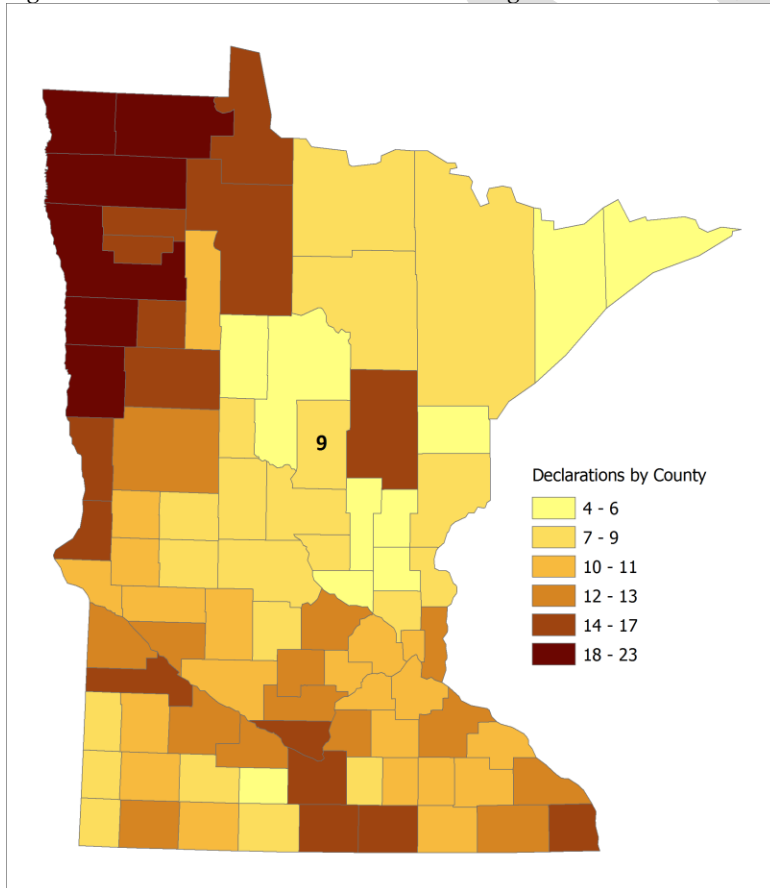


Table 14 and Table 15 show the details of the disasters including payments for Public Assistance (PA) and Individual Assistance (IA), listed under the flooding and severe storm profiles. No declarations were

made for the other storms listed in the NCEI database. Reviewing the federal payments for damages from the declared disasters is a way of correlating the impact from the NCEI report.

Table 14. FEMA-Declared Major Disasters in Crow Wing County (1953-July 2017)

Incident	Declaration Date and Disaster Number	Incident Period	Total PA Obligated by FEMA for Disaster in Minnesota	Total PA Obligated by FEMA for Disaster in Crow Wing County	Individual Assistance in Minnesota	Individual Assistance in Crow Wing County
Severe Storms, Flooding	7/6/2012 DR-4069	6/14/2012 – 6/21/2012	\$57,347,793	\$543,319	None	None
Flooding	5/16/2001 DR-1370	3/23/2001 – 7/3/2001	\$32,888,901	\$621,361	Yes, amount unknown	Yes, amount unknown
Severe Thunderstorms, Winds, Flooding, Tornadoes, Heat	8/18/1995 DR-1064	7/9/1995 – 7/14/1995	Yes, amount unknown	Yes, amount unknown	None	None
Severe Storms, Flooding	8/1/1972 DR-347	8/1/1972	Yes, amount unknown	Yes, amount unknown	Yes, amount unknown	Yes, amount unknown
Flooding	4/18/1969 DR-255	4/18/1969	Yes, amount unknown	Yes, amount unknown	Yes, amount unknown	Yes, amount unknown
Flooding	3/22/1966 DR-215	3/22/1966	Yes, amount unknown	Yes, amount unknown	Yes, amount unknown	Yes, amount unknown
Flooding	4/11/1965 DR-188	4/11/1965	Yes, amount unknown	Yes, amount unknown	Yes, amount unknown	Yes, amount unknown

\* Data provided by MN HSEM in September 2016, and <https://www.fema.gov/openfema-dataset-disaster-declarations-summaries-v1> accessed February 2017. Values are estimates collected at the time of the disaster.

Table 15. FEMA-Declared Emergencies in Crow Wing County (1974-July 2017)

Incident	Declaration Date and Disaster Number	Incident Period	Individual Assistance in Minnesota	Public Assistance (all affected areas)
Hurricane Katrina Evacuation	9/13/2005 EM-3242	8/29/2005 – 10/1/2005	\$0	\$2,470,003
Drought	6/17/1976 EM-3013	6/17/1976	None	Unknown

\* Data provided by MN HSEM in May 2016. Values are estimates collected at the time of the disaster.

Crow Wing County has also been part of several state disaster declarations. The State Disaster Program was signed into state law in 2014. It is ½ the threshold of the federal/FEMA public assistance (only) program. Crow Wing County was included in SD-004 (severe storms and wind in 2015), SD-008 (severe storms, flooding, heat, and a tornado in 2016), SD-010 (severe storms and wind in 2016), and SD-011 (severe storms and wind in 2016).

Table 16 depicts the historical projects in Crow Wing County resulting from hazard mitigation funding.

Table 16. Historical Hazard Mitigation Funding (HMGP and PDM) in Crow Wing County

Year	Project Description	Sub-Grantee	Federal Share
2014	Safe room in Garrison	Crow Wing County	\$231,060
2007	Local Multi-Hazard Mitigation Plan	Crow Wing County	\$38,072
1999	Utility protective measures	Crow Wing Co-Op Power & Light	\$240,000
1997	Buried overhead power line underground	Crow Wing Power	\$296,400
1995	Buried overhead power line underground	Crow Wing Power	\$98,175
<b>Total HMGP/PDM Funding – Crow Wing County</b>			<b>\$903,707</b>

\*Data downloaded from <https://www.fema.gov/media-library/assets/documents/28323> and <https://www.fema.gov/media-library/assets/documents/103341> on 2/20/2017.

## 4.2 Vulnerability Assessment

### 4.2.1 Asset Inventory

A 2010 essential facility dataset (schools, medical facilities, fire stations, and police stations compiled from state and county sources) was used to override the default Hazus-MH input database. Other critical facilities identified by the county were geocoded and overlaid with the Hazus-MH flood model output.

For the purposes of this plan, critical infrastructure and key resources were defined by Crow Wing County. Table 17 below identifies the critical facilities that were included in the analysis. Essential facilities are a subset of critical facilities. Names and locations of all critical facilities are found in Appendix B. Figure 5 below maps the critical facilities in Brainerd, while Figure 6 depicts critical facilities in Baxter. Figure 7 maps critical facilities in Crosby.

Table 17. Crow Wing County Critical Infrastructure and Facilities

Infrastructure Type	Number of Facilities	Infrastructure Type	Number of Facilities
Agriculture and Food	3	Energy	4
Banking and Finance	39	Government Facilities	28
Chemical and Hazardous Materials	67	Healthcare and Public Health	52
Commercial Facilities	28	Manufacturing	21
Communications	4	National Monuments and Icons	2
Dams	16	Nuclear	0
Defense Industrial Base	0	Postal and Shipping	14
Education	17	Transportation	1
Emergency Services	14	Water	19

Figure 5. Critical Facilities in Brainerd



Figure 6. Critical Facilities in Baxter





Figure 7. Critical Facilities in Crosby



### 4.2.2 Facility Replacement Costs

Crow Wing County-specific building data was sourced from the parcel tax databases and parcel polygon data included building valuations and occupancy class. Structure values for each parcel were aggregated within each parcel and assigned to the parcel centroid point. Records were aggregated to the relevant census administrative boundaries for the flood hazard analysis.

Facility replacement costs and total building exposure by general occupancy class are identified in Table 18, as calculated by Hazus.

Table 18. Crow Wing County Total Building Exposure

General Occupancy	Parcels Containing Structures	Total Building Exposure
Agriculture	0	\$139,000
Commercial	1	\$1,892,000
Education	0	\$7,844,000
Government	1	\$4,746,000
Industrial	0	\$426,000
Religious/Non-Profit	0	\$421,000
Residential	453	\$31,353,000
<b>Total:</b>	<b>455</b>	<b>\$46,821,000</b>

### 4.3 Future Development

Because Crow Wing County is vulnerable to a variety of natural hazards, the county government—in partnership with the state government—must make a commitment to prepare for the management of these types of events. Crow Wing County is committed to ensuring that county elected and appointed officials become informed leaders regarding community hazards so that they are better prepared to set and direct policies for emergency management and county response.

Crow Wing County is slowly rebounding from the Great Recession. The Brainerd Lakes Area is seeing a surge of development after the recession, with 5 major retailers building and opening up in 2017/2018. The rest of the county has not seen a change in development, settlement patterns or commercial expansion that would increase vulnerability to any natural hazards.

The Crow Wing County Emergency Management Director will work to keep the jurisdictions covered by the Multi-Hazard Mitigation Plan engaged and informed during the plan's cycle. By keeping jurisdictional leaders actively involved in the monitoring, evaluation and update of the MHMP, they will keep their local governments aware of the hazards that face their communities and how to mitigate those hazards through planning and project implementation. Each jurisdiction has identified mitigation strategies they will seek to implement in their communities (see *Appendix G: Mitigation Actions by Jurisdiction*). Jurisdictions will include considerations for hazard mitigation in relation to future development when updating local comprehensive plans or other plans that may influence development.

## 4.4 Hazard Profiles

### 4.4.1 Tornadoes

Tornadoes are defined as violently-rotating columns of air extending from thunderstorms to the ground, with wind speeds between 40-300 mph. They develop under 3 scenarios: (1) along a squall line; (2) in connection with thunderstorm squall lines during hot, humid weather; and (3) in the outer portion of a tropical cyclone. Funnel clouds are rotating columns of air not in contact with the ground; however, the column of air can reach the ground very quickly and become a tornado.

Since 2007, tornado strength in the United States is ranked based on the Enhanced Fujita scale (EF scale), replacing the Fujita scale introduced in 1971. The EF scale uses similar principles to the Fujita scale, with 6 categories from 0-5, based on wind estimates and damage caused by the tornado. The EF Scale is used extensively by the NWS in investigating tornadoes (all tornadoes are now assigned an EF Scale number), and by engineers in correlating damage to buildings and techniques with different wind speeds caused by tornadoes. To see a comparative table of F and EF scales, see <http://www.spc.noaa.gov/faq/tornado/ef-scale.html>.

Figure 8. Damage from Tornado in Deerwood MN (Kare 11 News, 2016)



In Minnesota, the peak months of tornado occurrence are June and July. The typical time of day for tornadoes in Minnesota ranges between 4:00 p.m. and 7:00 p.m. Most of these are minor tornadoes, with wind speeds under 125 miles per hour. A typical Minnesota tornado lasts approximately 10 minutes, has a path length of 5 to 6 miles, is nearly as wide as a football field, has a forward speed of about

35 miles an hour, and affects less than 0.1% of the county warned.

### Tornado History in Crow Wing County

According to the NCEI, 23 tornadoes were reported in Crow Wing County between 1950 and April 2017, causing no deaths or injuries, and \$10,905,000 dollars in property damage. Tornado classification ranged from F0/EF0 to F4 on the Fujita Scale.

The most recent tornado occurred in June of 2016 (Figure 8). The tornado formed 2 miles south-southwest of Deerwood, and traveled southeast across Nokay Lake Road where 2 mobile homes were destroyed. The tornado continued to move southeast over Placid Lake. Several mature hardwood trees were snapped approximately 5 feet above ground level on the west side of the lake indicating another area of EF2 damage. Additional EF2 tree damage was observed as the tornado moved onshore along the southeast side of Placid Lake. Extensive tree damage was observed along a stretch of MN-6, at a

summer camp, and over portions of a golf course. The tornado weakened beyond the golf course and dissipated before reaching Tame Fish Lake Road.

The last previously recorded tornado in Crow Wing County occurred in 2001.

In July of 1991, an F3 tornado tracked through Cass and Crow Wing Counties. It went across Gull Lake, destroying boats and a marina in the Brainerd area. The storms also hit a classic car show at the Brainerd International Raceway, flipping cars and trailers, and resulting in over \$2 million in losses (Seeley M. , 2015).

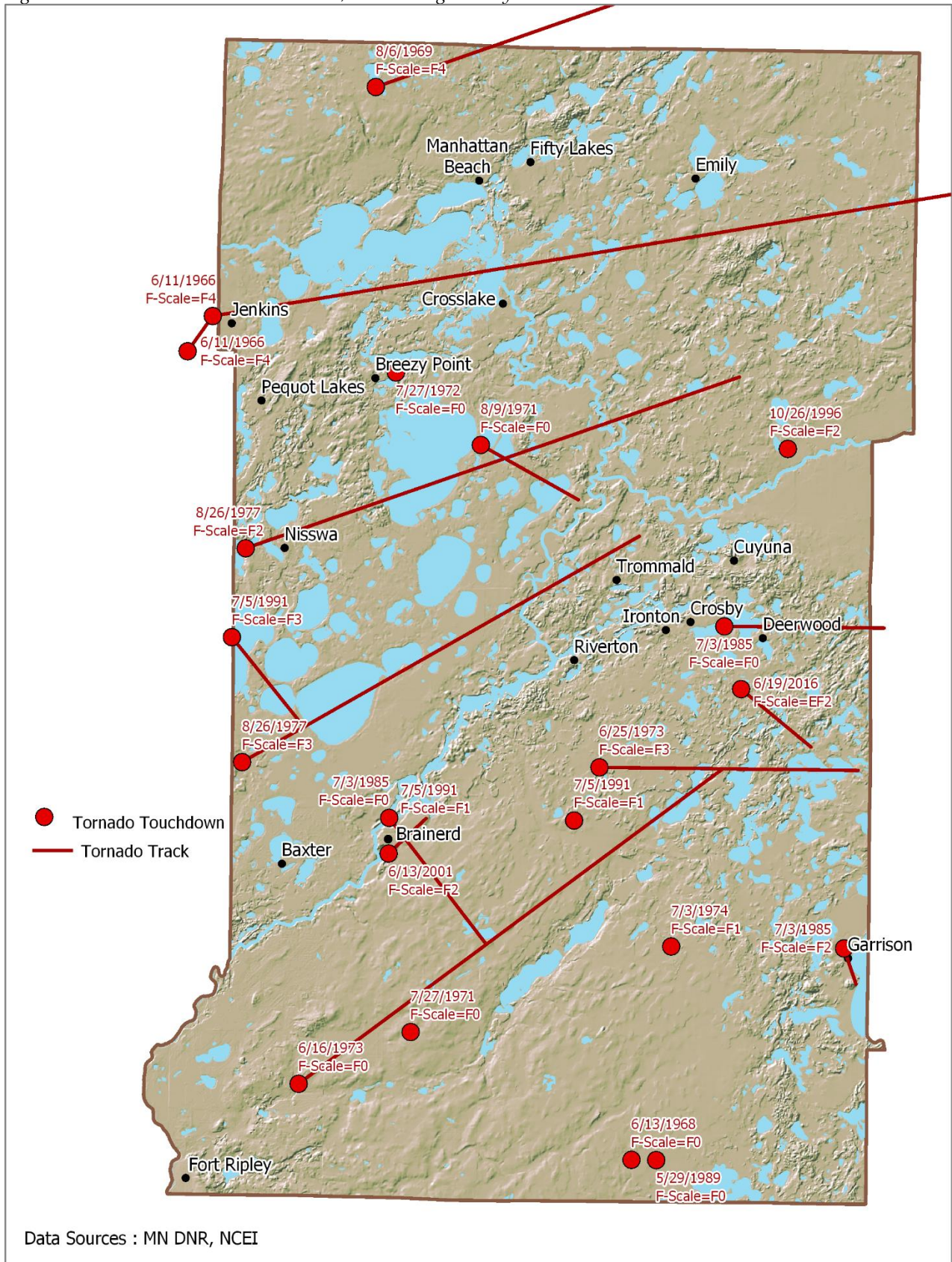
Figure 9 below shows tornado touchdown points and tracks in Crow Wing County from 1950-April 2017. Historic tornado occurrences in the county are listed in Table 19.

Table 19. Historic Tornado Events in Crow Wing County, 1950-April 2017

Location or County	Date	Magnitude	Deaths	Injuries	Property Damage
Crosby Beach	6/19/2016	EF2	0	0	0
Brainerd	6/13/2001	F2	0	0	0
Brainerd	10/26/1996	F2	0	0	\$50,000
Crow Wing	7/5/1991	F3	0	3	\$2,500,000
Crow Wing	7/5/1991	F1	0	0	0
Crow Wing	7/5/1991	F1	0	0	0
Crow Wing	5/29/1989	F0	0	0	0
Crow Wing	9/16/1988	F0	0	0	0
Crow Wing	7/3/1985	F0	0	0	\$250,000
Crow Wing	7/3/1985	F0	0	0	0
Crow Wing	7/3/1985	F2	0	0	\$25,000
Crow Wing	8/26/1977	F3	0	11	\$2,500,000
Crow Wing	8/26/1977	F2	0	0	\$25,000
Crow Wing	7/3/1974	F1	0	0	\$25,000
Crow Wing	6/25/1973	F3	0	2	\$2,500,000
Crow Wing	6/16/1973	F0	0	0	\$2,500
Crow Wing	7/27/1972	F0	0	0	0
Crow Wing	8/9/1971	F0	0	0	\$25,000
Crow Wing	7/27/1971	F0	0	0	\$2,500
Crow Wing	8/6/1969	F4	0	0	\$2,500,000
Crow Wing	6/13/1968	F0	0	0	0
Crow Wing	6/11/1966	F4	0	0	\$250,000
Crow Wing	6/11/1966	F4	0	0	\$250,000

Source: National Centers for Environmental Information

Figure 9. Tornado Touchdowns and Paths, Crow Wing County



## Tornadoes and Climate Change

Tornadoes and other severe thunderstorm phenomena frequently cause as much annual property damage in the U.S. as do hurricanes, and often cause more deaths. Although recent research has yielded insights into the connections between global warming and the factors that cause tornados and severe thunderstorms, such as atmospheric instability and increases in wind speed with altitude (Del Genio, Yao, & Jonas, 2007), these relationships remain mostly unexplored, largely because of the challenges in observing thunderstorms and tornadoes and simulating them with computer models (National Climate Assessment Development Advisory Committee, 2013).

According to Harold Brooks of NOAA’s National Severe Weather Laboratory, there is increasing variability in the “start” of tornado season. The number of days with more than 30 EF1 or greater tornadoes is increasing, while the number of days with at least 1 EF1 or greater tornadoes is decreasing. Thus, tornadoes are occurring on fewer days, but *more* are occurring on outbreak days.

The earliest reported tornado in Minnesota occurred on March 6, 2017, when 2 tornadoes touched down in southern Minnesota, which was 12 days earlier than the previous record. The Zimmerman tornado occurred 115 miles further north than the previous record from 1968. According to meteorologist Paul Huttner, “Those records fit seasonally and geographically with longer term climate trends pushing weather events earlier in the season and further northward” (Huttner, MPR News, 2017).

The state of Wisconsin has recorded 3 tornadoes in January and 6 in December during the period of 1844-2013 (National Weather Service Weather Forecast Office, 2014), including a January tornado in 2008.

## Vulnerability

The county has experienced tornadoes in 15 of the 66 full years on record. According to these statistics, there is a 23% chance of a tornado affecting Crow Wing County each year. The vulnerability of each jurisdiction to severe summer storms has not changed due to any development in the last 5 years.

## Plans and Programs in Place

*Public Information and Warning* – Crow Wing County can send out emergency messages and notifications through DLAN (our EOC software) via IPAWS to the public during emergencies in a timely manner. This can be area-specific if needed. Crow Wing County has an agreement through the local Hubbard Broadcasting radio station to send emergency notifications out immediately across a number of radio stations. Crow Wing County also uses Facebook and Twitter, and a webpage for Emergency Alerts, which has an option for property owners to sign up and get those alerts through texts or emails. Crow Wing County has a good relationship with the local media, which includes the newspapers, local TV, radio stations and NWS (National Weather Service), all of which assist in reaching the public with critical information.

*Emergency Operations Plan (EOP)* – Crow Wing County has an EOP, which includes all of the county departments as well as city officials and emergency organizations. The plan is organized to assist with the responsibilities and assignments during any type of emergency.

*Outdoor Warning Systems* – Crow Wing County has 44 outdoor warning sirens throughout the county, which are activated any time there is a tornado warning or winds measured at 70 MPH or greater. The sirens are tested monthly.

*Severe Weather Awareness Week* – Crow Wing County participates in the National Weather Service’s “Severe Weather Awareness Week” held in April each year. Activities include public outreach for severe storm safety information to the general public, schools, businesses, and government agencies to raise awareness of the dangers of severe spring/summer weather and how to properly deal with it.

*SKYWARN Program* – Crow Wing County conducts SKYWARN classes annually throughout the spring and summer months. Our largest class averages 100 participants every year. The City of Breezy Point is a StormReady Community.

*Mass Care Shelter Facilities* – A severe summer storm such as a tornado may result in displaced residents due to damaged homes. Crow Wing County has designated shelter facilities that have agreements with the American Red Cross. In addition, the Emergency Operations Plan (EOP) identifies potential shelter sites (primarily schools) for displaced or injured citizens.

### Program Gaps & Deficiencies

*Backup Power* – Not all government buildings have backup power generators, such as schools and city facilities within Crow Wing County.

*Storm Shelters/Safe Rooms* – Two mobile home parks and the Crow Wing County Fairgrounds have been identified as needing a storm shelter or safe room. Plans are in place in case sheltering is needed during a severe storm.

*NWS Weather Radar* – Due to the locations of the NWS radars from Crow Wing County, there is a gap and/or deficiency in predicting local weather. We experience delays in warnings given out and gaps in the timing of precipitation.

*StormReady* – There is a need to continue encouraging the cities of Crow Wing County to become a NWS “StormReady” community, and provide support to help communities accomplish the requirements for designation. To be officially StormReady, a community must:

- Establish a 24-hour warning point and emergency operations center
- Have more than one way to receive severe weather warnings and forecasts and to alert the public
- Create a system that monitors weather conditions locally
- Promote the importance of public readiness through community seminars
- Develop a formal hazardous weather plan, which includes training severe weather spotters and holding emergency exercises

#### 4.4.2 Windstorms

FEMA defines winds in excess of 58 miles per hour, excluding tornadoes, as windstorms. Straight-line winds and windstorms are used interchangeably in the plan. This hazard is treated as a different category

than tornadoes (which may also include high winds). Windstorms are among the nation's most severe natural hazards in terms of both lives lost and property damaged.

Severe winds can damage and destroy roofs, toss manufactured homes off their pier foundations, and tear light-framed homes apart. There are several different types of windstorms. A "downburst" is defined as a strong downdraft with an outrush of damaging winds on or near the earth's surface. Downbursts may have wind gusts up to 130 mph and are capable of the same damage as a medium-sized tornado. A "gust front" is the leading edge of the thunderstorm downdraft air. It is most prominent near the rain-free cloud base and on the leading edge of an approaching thunderstorm and is usually marked by gusty, cool winds and sometimes by blowing dust. The gust front often precedes the thunderstorm precipitation by several minutes. Straight-line winds, when associated with a thunderstorm, are most frequently found with the gust front. These winds originate as downdraft air reaches the ground and rapidly spreads out, becoming strong horizontal flow.

### Windstorm History in Crow Wing County

Crow Wing County frequently experiences winds blowing at over 50 knots. According to NCEI records there have been 188 thunderstorm wind events reported between 1950 and April 2017. The highest recorded wind speed in Crow Wing County was measured at 87 knots in Brainerd, MN on both June 13, 2001 and June 28, 1997. These winds can inflict damage to buildings and in some cases overturn high-profile vehicles.

A severe derecho occurred in Crow Wing County in July of 1977, with winds of 70-100 miles per hour. Forest blowdowns were recorded around Brainerd and Gull Lake Lodge's roof was blown off nearby. Several boats on Mille Lacs were destroyed due to 8-10 foot waves (Seeley M. , 2015).

The most recent severe wind and hail storms in Crow Wing County are shown in Figure 10.

### Windstorms and Climate Change

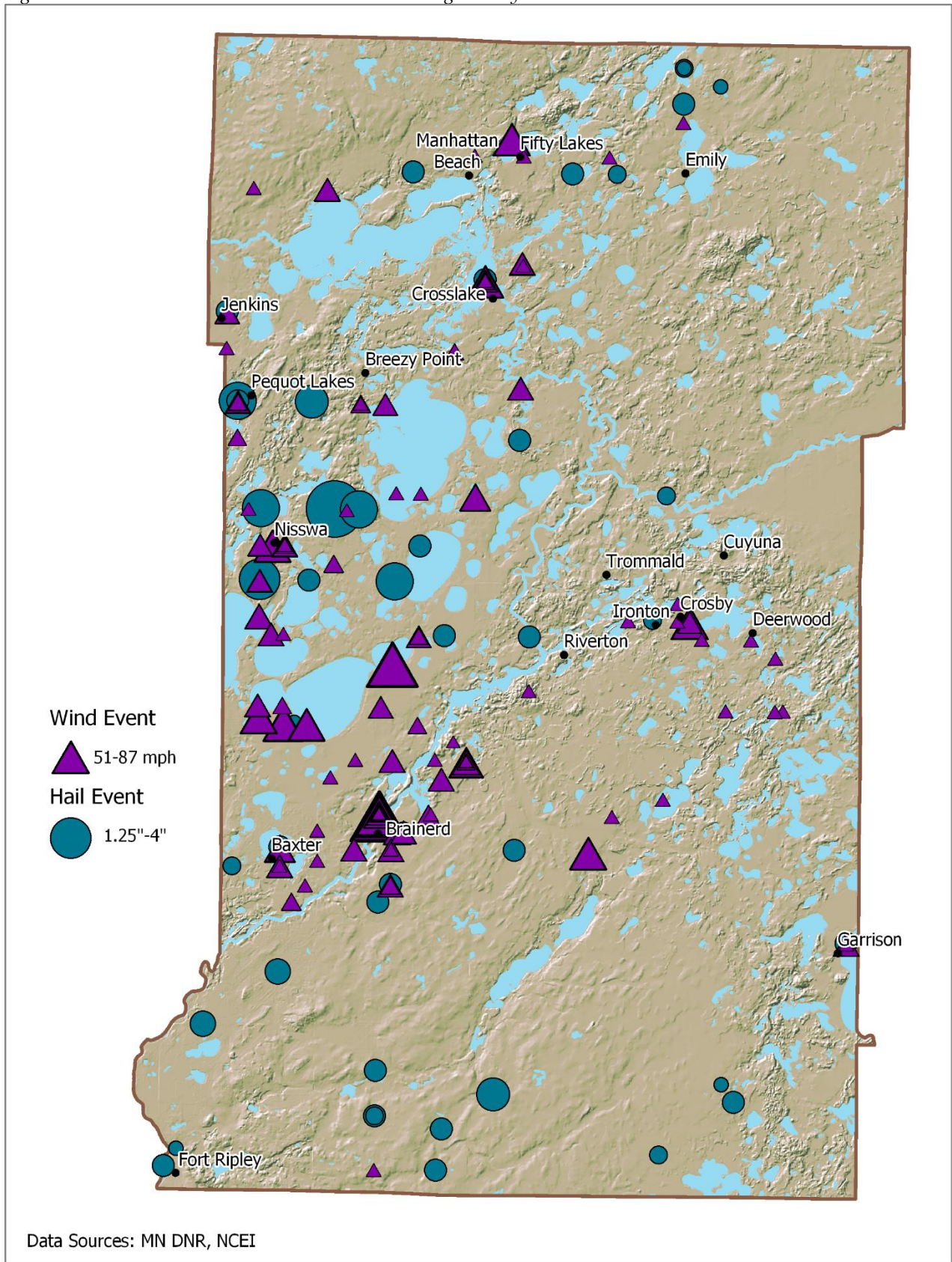
Lack of high-quality long-term data sets make assessment of changes in wind speeds very difficult (Kunkel, et al., 2013). One analysis generally found no evidence of significant changes in wind speed distribution. Other trends in severe storms, including the numbers of hurricanes and the intensity and frequency of tornadoes, hail, and damaging thunderstorm winds are uncertain. Since the impact of more frequent or intense storms can be larger than the impact of average temperature, climate scientists are actively researching the connections between climate change and severe storms (National Climate Assessment Development Advisory Committee, 2013).

### Vulnerability

The magnitude of summer storms each year is unpredictable and within Crow Wing County and the vulnerability of jurisdictions to windstorms does not vary geographically. The vulnerability of each jurisdiction to severe summer storms has not changed due to any development in the last 5 years.



Figure 10. Severe Wind and Hail Storms in Crow Wing County



## Plans and Programs in Place

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## Program Gaps & Deficiencies

*Backup Power* – Not all government buildings have backup power generators, such as schools and city facilities within Crow Wing County.

*Storm Shelters/Safe Rooms* – Two mobile home parks and the Crow Wing County Fairgrounds have been identified as needing a storm shelter or safe room. Plans are in place in case sheltering is needed during a severe storm.

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#### 4.4.3 *Lightning*

Lightning typically occurs as a by-product of a thunderstorm. In only a few millionths of a second, the air near a lightning strike is heated to 50,000° F, a temperature hotter than the surface of the sun.

The hazard posed by lightning is significant. High winds, rainfall, and a darkening cloud cover are the warning signs for possible cloud-to-ground lightning strikes. While many lightning casualties happen at the beginning of an approaching storm, more than half of lightning deaths occur after a thunderstorm has passed. Lightning has been known to strike more than 10 miles from the storm in an area with clear sky above.

Lightning strikes the ground approximately 25 million times each year in the U.S. According to the NWS, the chance of an individual in the U.S. being killed or injured by lightning during a given year is 1 in 240,000 (NOAA National Severe Storms Laboratory, n.d.).

Lightning is the most dangerous and frequently encountered weather hazard that most people in the United States experience annually. Lightning is the second most frequent killer in the U.S., behind floods and flash floods, with nearly 100 deaths and 500 injuries annually. The lightning current can branch off to strike a person from a tree, fence, pole, or other tall object. In addition, an electrical current may be conducted through the ground to a person after lightning strikes a nearby tree, antenna, or other tall object. The current may also travel through power lines, telephone lines, or plumbing pipes to damage property or cause fires.

#### *Lightning History in Crow Wing County*

The NCEI has recorded 7 lightning events in Crow Wing County, resulting in one injury in 1998 and a total cost of \$1.7 million dollars in property damage. No deaths were reported from these incidents.

According to the NCEI and a report by the deputy state fire marshal, in July of 1997 lightning started a fire that destroyed a restaurant on Gull Lake. No one was injured, but the fire resulted in \$1.5 million dollars in property damage.

#### *Lightning and Climate Change*

The projected possible intensity and frequency of tornadoes, hail, and damaging thunderstorm winds, the conditions associated with lightning, are uncertain (National Climate Assessment Development

Advisory Committee, 2013). Severe rain events are becoming more common and may include an additional risk of lightning.

### Vulnerability

The magnitude of summer storms each year is unpredictable and within Crow Wing County the vulnerability of jurisdictions to lightning does not vary geographically. The vulnerability of each jurisdiction to severe summer storms has not changed due to any development in the last 5 years.

### Plans and Programs in Place

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#### 4.4.4 Hail

Hailstorms are a product of severe thunderstorms. Hail is formed when strong updrafts within the storm carry water droplets above the freezing level, where they remain suspended and continue to grow larger, until their weight can no longer be supported by the winds. Hailstones can vary in size, depending on the strength of the updraft. The NWS uses the following descriptions when estimating hail sizes: pea size is ¼-inch, marble size is ½-inch, dime size is ¾-inch, quarter size is 1-inch, golf ball size is 1 ¾-inches, and baseball size is 2 ¾-inches. Individuals who serve as volunteer “storm spotters” for the NWS are located throughout the state, and are instructed to report hail dime size (¾-inch) or greater. Hailstorms can occur throughout the year; however, the months of maximum hailstorm frequency are typically between May and August. Although hailstorms rarely cause injury or loss of life, they can cause significant property damage.

#### Hail History in Crow Wing County

The largest hail size recorded in Crow Wing County occurred on June 19<sup>th</sup>, 2016. In Nisswa, MN hail 4" in diameter was produced; however, no fatalities or injuries or property damage were recorded from this event. In conjunction with heavy hail across the region a tornado was recorded that same day along with thunderstorm wind speeds exceeding 50 knots.

A hailstorm in May of 2011 caused \$8,000 of property damage; this was the costliest hail event in Crow Wing County as recorded by the NCEI. Hail sizes from this storm reached 2.5" and caused damage to roofs and buildings within the region. Table 20 shows storms producing hail greater than 1-inch diameter in Crow Wing County.

Table 20. Storms producing hail of greater than 1 inch diameter in Crow Wing County, 1950-April 2017

Date	Hail Size (inches)	Injuries	Date	Hail Size (inches)	Injuries	Date	Hail Size (inches)	Injuries
3/6/2017	1.5	0	6/6/2011	1.75	0	8/27/1994	1.75	0
7/11/2016	1.5	0	6/6/2011	1.5	0	8/7/1994	2	0
7/11/2016	1.5	0	5/10/2011	1.75	0	6/13/1992	1.75	0
6/19/2016	2.5	0	5/10/2011	2.5	0	6/13/1992	1.75	0
6/19/2016	2.75	0	7/14/2009	1.75	0	6/28/1991	1.75	0
6/19/2016	4	0	7/14/2010	1.5	0	8/28/1989	2.75	0
6/19/2016	2.75	0	8/13/2007	1.75	0	5/29/1989	1.5	0
6/19/2016	3	0	8/13/2007	1.5	0	5/29/1989	1.5	0
6/19/2016	2.75	0	7/2/2003	1.75	0	5/24/1989	1.75	0
6/19/2016	1.75	0	6/11/2001	1.5	0	6/24/1988	1.75	0
6/19/2016	1.75	0	8/14/2000	1.75	0	5/7/1988	1.5	0
8/12/2015	2	0	8/15/1999	1.25	0	8/4/1986	1.75	0
8/12/2015	1.25	0	7/28/1999	1.75	0	7/3/1985	1.75	0
8/24/2014	1.75	0	6/1/1998	1.75	0	4/26/1984	1.75	0
5/7/2014	1.5	0	9/18/1997	1.75	0	4/26/1984	1.75	0
8/26/2013	1.75	0	8/2/1997	1.25	0	5/10/1982	1.75	0
8/26/2013	1.75	0	7/11/1996	1.75	0	5/10/1982	1.75	0
6/6/2011	1.25	0	7/11/1996	1.75	0	6/5/1980	2	0
6/6/2011	1.25	0	5/17/1996	1.75	0	7/12/1978	1.75	0
6/6/2011	1.75	0	8/8/1995	2.5	0			0

Source: National Centers for Environmental Information

### Hail and Climate Change

According to the Federal Advisory Committee Draft National Climate Assessment (NCA), trends in severe storms, including the numbers of hurricanes and the intensity and frequency of tornadoes, hail, and damaging thunderstorm winds are uncertain. Since the impact of more frequent or intense storms can be larger than the impact of average temperature, climate scientists are actively researching the connections between climate change and severe storms (National Climate Assessment Development Advisory Committee, 2013).

The occurrence of very heavy precipitation has increased in Minnesota in recent decades and future projections also indicate this will continue (International Climate Adaptation Team, 2013). While it is unknown if this precipitation will occur during severe storms that produce hail, the possibility has not been ruled out.

### Vulnerability

Summer storms affect Crow Wing County each year, so there is a 100% probability that the county and its jurisdictions will be affected. According to the 66 full year NCEI record, there is a 55% chance of a significant hailstorm any year in Crow Wing County and a 42% chance in each year that there will be a hailstorm that produces hail greater than 1 inch in size.

The magnitude of summer storms each year is unpredictable and within Crow Wing County the vulnerability of jurisdictions to summer storms does not vary geographically. The vulnerability of each jurisdiction to severe summer storms has not changed due to any development in the last 5 years.

### Severe Summer Storms and Electrical Outages

According to NOAA data, the natural hazards that caused the greatest overall property loss in Minnesota between 1996 and 2014 were thunderstorms and lightning, at \$86.3 million per year. The state also experienced 23 electric transmission outages from 1992 to 2009, 5 of which were due to heat waves and thunderstorms. On average, the number of people affected annually by all electric outages during 2008 to 2013 in Minnesota was 449,995, with a high of 1,460,810 in 2011 (U.S. Department of Energy, 2015). Figure 11 below shows the seasonality of electric outages by month for the years 2008-2013, and Figure 12 shows the causes of outages in the state between 2008 and 2013, with the largest cause being weather/falling trees.

Figure 11. Electric Utility Reported Power Outages by Month (2008-2013)

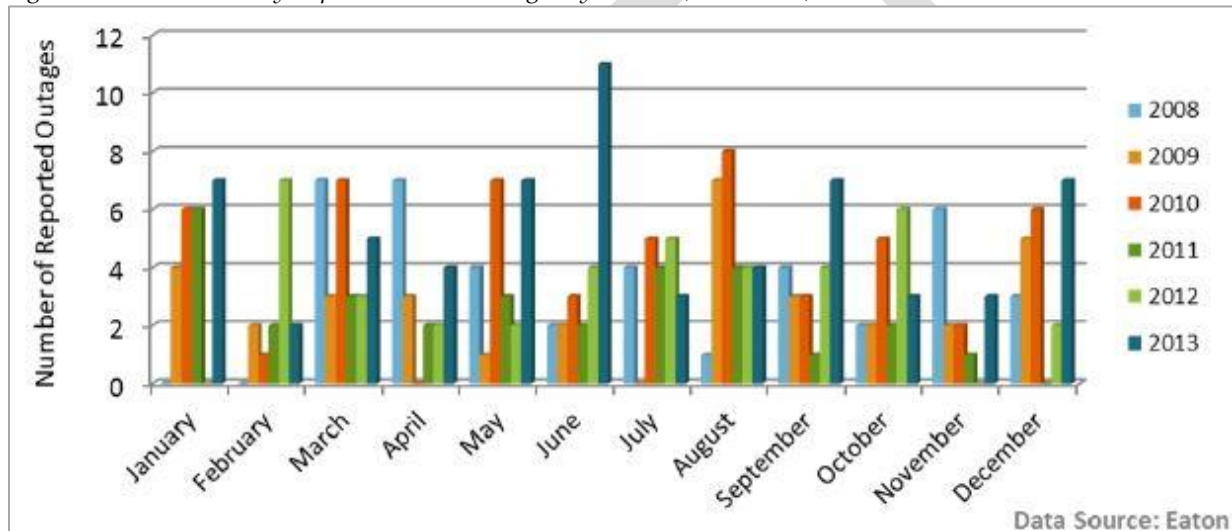
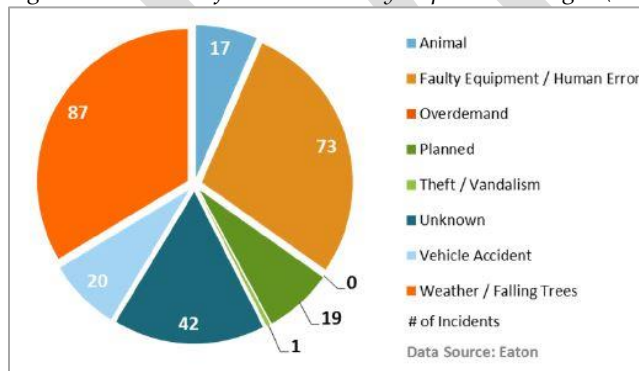


Figure 12. Causes of Electric-Utility Reported Outages (2008-2013)



### Plans and Programs in Place

**Public Information and Warning** – Crow Wing County can send out emergency messages and notifications through DLAN (our EOC software) via IPAWS to the public during emergencies in a timely manner. This can be area-specific if needed. Crow Wing County has an agreement through the local Hubbard

Broadcasting radio station to send emergency notifications out immediately across a number of radio stations. Crow Wing County also uses Facebook and Twitter, and a webpage for Emergency Alerts, which has an option for property owners to sign up and get those alerts through texts or emails. Crow Wing County has a good relationship with the local media, which includes the newspapers, local TV, radio stations and NWS (National Weather Service), all of which assist in reaching the public with critical information.

*Emergency Operations Plan (EOP)* – Crow Wing County has an EOP, which includes all of the county departments as well as city officials and emergency organizations. The plan is organized to assist with the responsibilities and assignments during any type of emergency.

*Outdoor Warning Systems* – Crow Wing County has 44 outdoor warning sirens throughout the county, which are activated any time there is a tornado warning or winds measured at 70 MPH or greater. The sirens are tested monthly.

*Severe Weather Awareness Week* – Crow Wing County participates in the National Weather Service’s “Severe Weather Awareness Week” held in April each year. Activities include public outreach for severe storm safety information to the general public, schools, businesses, and government agencies to raise awareness of the dangers of severe spring/summer weather and how to properly deal with it.

*SKYWARN Program* – Crow Wing County conducts SKYWARN classes annually throughout the spring and summer months. Our largest class averages 100 participants every year. The City of Breezy Point is a StormReady Community.

*Mass Care Shelter Facilities* – A severe summer storm such as a tornado may result in displaced residents due to damaged homes. Crow Wing County has designated shelter facilities that have agreements with the American Red Cross. In addition, the Emergency Operations Plan (EOP) identifies potential shelter sites (primarily schools) for displaced or injured citizens.

### Program Gaps & Deficiencies

*Backup Power* – Not all government buildings have backup power generators, such as schools and city facilities within Crow Wing County.

*Storm Shelters/Safe Rooms* – Two mobile home parks and the Crow Wing County Fairgrounds have been identified as needing a storm shelter or safe room. Plans are in place in case sheltering is needed during a severe storm.

*NWS Weather Radar* – Due to the locations of the NWS radars from Crow Wing County, there is a gap and/or deficiency in predicting local weather. We experience delays in warnings given out and gaps in the timing of precipitation.

*StormReady* – There is a need to continue encouraging the cities of Crow Wing County to become a NWS “StormReady” community, and provide support to help communities accomplish the requirements for designation. To be officially StormReady, a community must:

- Establish a 24-hour warning point and emergency operations center



- Have more than one way to receive severe weather warnings and forecasts and to alert the public
- Create a system that monitors weather conditions locally
- Promote the importance of public readiness through community seminars
- Develop a formal hazardous weather plan, which includes training severe weather spotters and holding emergency exercises.

#### **4.4.5 Flash Flood and Riverine Flood**

Flooding is a significant natural hazard throughout the United States. The type, magnitude, and severity of flooding are functions of the amount and distribution of precipitation over a given area, the rate at which precipitation infiltrates the ground, the geometry and hydrology of the catchment, and flow dynamics and conditions in and along the river channel. Upstream floods, also called flash floods, occur in the upper parts of drainage basins and are generally characterized by periods of intense rainfall over a short duration. These floods arise with very little warning and often result in locally intense damage, and sometimes loss of life, due to the high energy of the flowing water. Flood waters can snap trees, topple buildings, and easily move large boulders or other structures. Six inches of rushing water can upend a person; another 18 inches might carry off a car. Generally, upstream floods cause damage over relatively localized areas, but they can be quite severe. Urban flooding is a type of upstream flood, which involves the overflow of storm drain systems and can be the result of inadequate drainage combined with heavy rainfall or rapid snowmelt. Upstream or flash floods can occur at any time of the year in Minnesota, but they are most common in the spring and summer. The NCEI has recorded 9 flash floods in Crow Wing County since 1997.

Downstream floods, sometimes called riverine floods, refer to floods on large rivers at locations with large upstream catchments. Downstream floods are typically associated with precipitation events that are of relatively long duration and occur over large areas. Flooding on small tributary streams may be limited, but the contribution of increased runoff may result in a large flood downstream. The lag time between precipitation and the flood peak is much longer for downstream floods than for upstream floods, generally providing ample warning for people to move to safe locations and, to some extent, secure some property against damage.

Nationwide, floods caused 4,586 deaths from 1959 to 2005 while property and crop damage averaged nearly \$8 billion per year (in 2011 dollars) from 1981-2011 (Georgakakos, et al., 2014).

During the past several decades, agencies have used the “100-year floodplain” as the design standard for projects funded by the federal government. However, today floods of that magnitude are occurring far more often than once per century (Natural Resources Defence Council, 2015). In recognition of increasing risks, in January of 2015 the President issued an executive order that updates flood protection standards that guide federally-funded projects in or near floodplains or along coastlines. These new standards require federally-funded projects to either build 2 feet above the 100-year flood elevation for standard projects and three feet above for critical buildings like hospitals and evacuation centers; or build to the 500-year flood elevation (The White House, 2015).

## Flood History in Crow Wing County

Crow Wing County experienced its most recent flood on July 11, 2016. This event was a flash flood that occurred in the region surrounding Baxter and Brainerd, MN. The National Centers for Environmental Information recorded that nearly 9" of precipitation fell near Brainerd. Water covered the road at the intersections of Highway 371 and Excelsior Road, Birchdale Road and Wioda Road in Baxter. The Crow Wing County Sheriff's Office reported that a stretch of County Road 105 near Thompson Lake was closed due to flooding. There was also flooding in low-lying areas in Crosby, such as near the park by Serpent Lake. No deaths, injuries, or significant property damage was reported from this flood.

On June 19<sup>th</sup>, 2012, the Mississippi River at Fort Ripley rose to its 10-foot flood stage, due to the 500-year rainfall event that occurred in northeastern Minnesota and resulted in Presidential Disaster Declaration DR-4069, which included Crow Wing County. The Mississippi River crested at 12.42" on June 25<sup>th</sup>, and remained above flood stage through the end of June. As a result, many tributaries became backed up and flooded. Parts of Crow Wing State Park were flooded, including the picnic areas, trails and the boat landing. The boat landing was reopened on July 24<sup>th</sup>. The Black Bear and Miller Lakes neighborhoods were flooded, and numerous roads and bridges were damaged across the county. The NCEI property damage estimate for Crow Wing County was \$634,000. Public Assistance obligated by FEMA for the county was \$543,319; the State of Minnesota received \$57,347,793.

Table 21 below lists Crow Wing County's historical floods as recorded by the NCEI. Although no deaths or injuries were recorded with these floods, the cumulative property damage estimate is over \$850,000 dollars.

Table 21. Crow Wing County Historical Floods, 1997-April 2017

Location or County	Date	Type	Deaths	Injuries	Property Damage
Baxter	7/11/2016	Flash Flood	0	0	0
Emily	7/11/2016	Flash Flood	0	0	0
Baxter	7/11/2016	Flash Flood	0	0	0
Baxter	7/11/2016	Flash Flood	0	0	0
Baxter	7/11/2016	Flash Flood	0	0	0
Crosby	7/11/2016	Flash Flood	0	0	0
Nichols	5/1/2013	Flood	0	0	0
Ft Ripley	7/1/2012	Flood	0	0	0
Lennox	7/1/2012	Flood	0	0	0
Brainerd Airport	6/20/2012	Flood	0	0	0
Crow Wing	6/19/2012	Flood	0	0	\$634,000
Brainerd	6/19/2012	Flash Flood	0	0	0
Brainerd Airport	6/1/2012	Flood	0	0	0
Ft Ripley	6/1/2012	Flood	0	0	0
Ft Ripley	5/28/2012	Flood	0	0	0
Brainerd	5/28/2012	Flood	0	0	0
Ft Ripley	4/12/2011	Flood	0	0	0
Brainerd	7/7/2002	Flash Flood	0	0	\$250,000
Crow Wing	4/6/1997	Flood	0	0	0
Crow Wing	4/5/1997	Flood	0	0	0

Location or County	Date	Type	Deaths	Injuries	Property Damage
Pequot Lakes	7/6/1996	Flash Flood	0	0	0

Source: National Centers for Environmental Information

The National Oceanic and Atmospheric Administration (NOAA) Advanced Hydrologic Prediction Service provides information from gauge locations at points along various rivers across the United States. One USGS gauging station is located in the county on the Mississippi River at Brainerd. Its flood crest data for the top 10 gauge heights is recorded in Table 22 below.

Table 22. Historical Flood Crests for USGS gauging station on the Mississippi River at Brainerd

Date	Gauge Height (feet)	Stream-flow (cfs)
6/28/2012	17.61	17,900
4/30/2001	16.70	17,500
4/10/1997	16.03	15,400
/30/1996	14.59	14,000
4/18/2999	14.52	13,000
4/15/2014	14.10	12,900
7/17/2016	13.81	12,400
7/10/1993	13.65	12,200
4/06/2009	12.99	11,400
5/04/2008	12.59	10,900

### Vulnerability and Hazus-MH Hazard Analysis

Hazus-MH was used to estimate the damages incurred for a 100-year flood in Crow Wing County using a 10-meter DEM (digital elevation model) to create a flood depth grid from a pending DFIRM (digital flood insurance rate map) from

[ftp://ftp.dnr.state.mn.us/pub/waters/floodplain/County\\_data/Crow%20Wing/Pending/](ftp://ftp.dnr.state.mn.us/pub/waters/floodplain/County_data/Crow%20Wing/Pending/).

This documentation does not provide full details on the processes and procedures completed in the flood risk analysis, it is only intended to highlight the major inputs that were used. The fields obtained from the Crow Wing County tax assessor are noted in parentheses.

Crow Wing County-specific building data was sourced from parcel tax databases and parcel polygon databases, including building valuations (REPCOSTNEW in ImpDetail.xlsx) and occupancy class (CLASSCODE1 in Parcel\_Master.xlsx). Hazus-MH analysis of structures takes into account the depth of water in relation to the structure using finished square footage and number of stories (NBRUNITS \* STORIES in ImpDetail.xlsx). The tool also considers the actual dollar exposure to the structure for the costs of building reconstruction (REPCOSTNEW in ImpDetail.xlsx) and contents (calculated based on REPCOSTNEW and finished square footage). Damages are based upon the assumption that each structure will fall into a structural class (assumptions made based on YEARBUILT in primaryimprecord.xlsx), and structures in each class will respond in a similar fashion to a specific depth of flooding. Furthermore, the damage estimates assume an equal distribution of building classifications

across the developed portion of a census block. These assumptions suggest that the loss estimates for aggregate structural losses need to be viewed as approximations of losses that are subject to considerable variability rather than as exact engineering estimates of losses to individual structures.

Building counts were aggregated from the individual parcel records to the relevant census administrative boundaries. There are an estimated 37,225 parcels with structures in the region with a total replacement value (excluding contents) of \$6.1 billion dollars. Approximately 92% of the parcels (and 72% of the building value) are associated with residential housing. Using the Crow Wing County updated general building stock, the Hazus model reported an estimated 360 parcels with buildings will be at least moderately damaged. There are an estimated 21 buildings that will be completely destroyed.

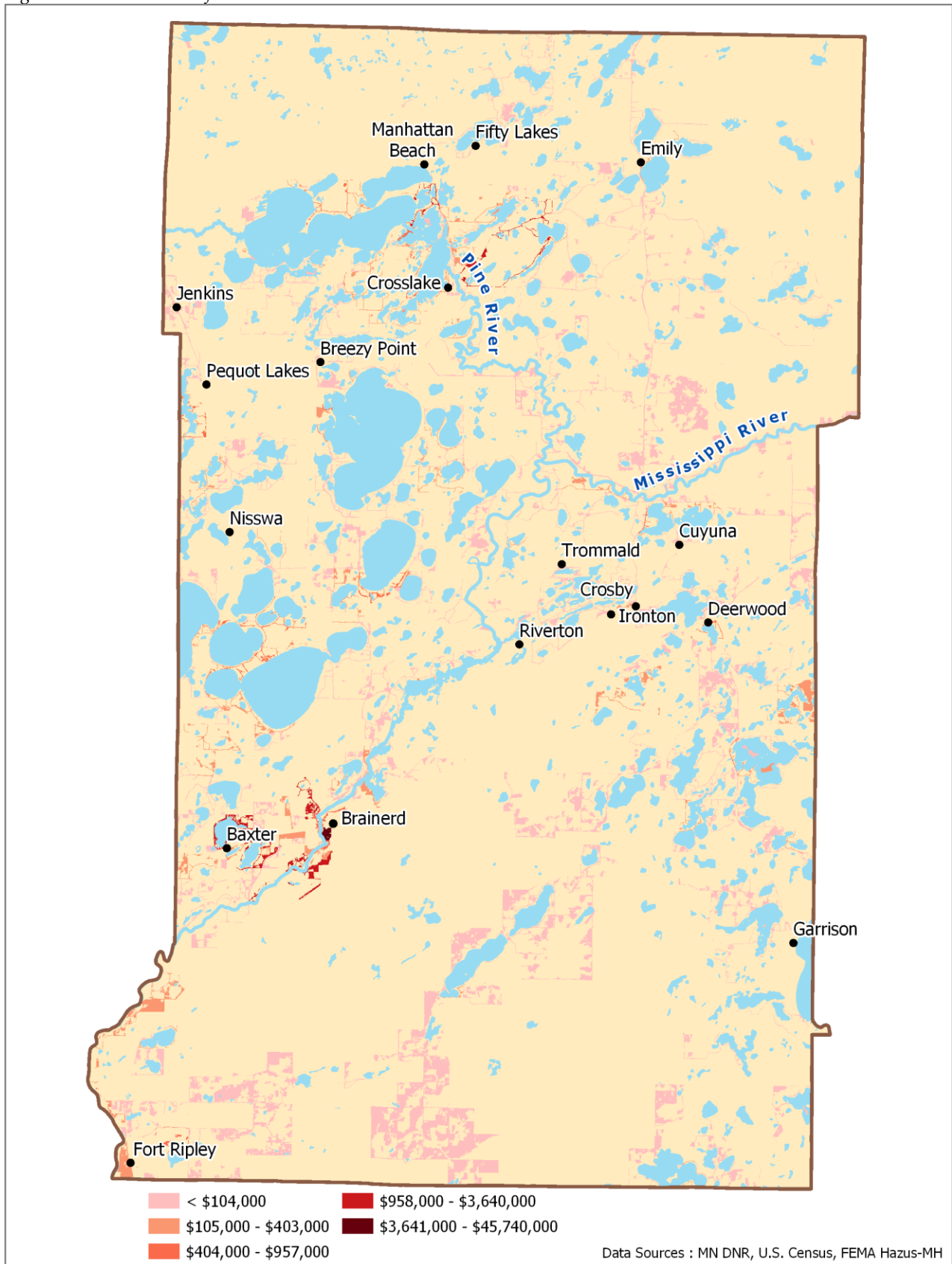
The total economic loss estimated for the flood is \$106 million dollars, which represents 4% of the total replacement value of the parcels exposed. Building losses are broken into 2 categories: direct building losses and business interruption losses. Direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. Business interruption losses are associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood. The total building-related losses in the Hazus model was \$105 million dollars. 1% of the estimated losses were related to business interruption in the region. Residential occupancies made up 42% of the total loss.

The reported building counts should be interpreted as degrees of loss rather than an exact number of buildings exposed to flooding. These numbers were derived from aggregate building inventories, which are assumed to be dispersed evenly across census blocks. Hazus-MH requires that a predetermined amount of square footage of a typical building sustain damage in order to produce a damaged building count. If only a minimal amount of damage to buildings is predicted, it is possible to see zero damaged building counts while also seeing economic losses. The total estimated number of damaged buildings, total building losses, and estimated total economic losses are shown in Table 23. The distribution of economic losses for Crow Wing County is depicted in Figure 13.

Table 23. Crow Wing County Total Economic Loss from 100-Year Flood

General Occupancy	Total Parcels	Parcels with Damaged Buildings	Total Building Exposure (In \$1000s)	Total Economic Loss (In \$1000s)	Building Loss (In \$1000s)
Agricultural	956	0	\$116,491	\$695	\$139
Commercial	1,793	1	\$739,716	\$9,104	\$1,892
Education	23	0	\$354,546	\$29,403	\$7,844
Government	135	1	\$181,462	\$17,775	\$4,746
Industrial	28	0	\$46,488	\$1,624	\$426
Religious/Non-Profit	199	0	\$277,988	\$3,009	\$421
Residential	34,091	453	\$4,434,438	\$44,570	\$31,353
<b>Total</b>	<b>37,225</b>	<b>455</b>	<b>\$6,151,129</b>	<b>\$106,180</b>	<b>\$46,821</b>

Figure 13. Distribution of Estimated Economic Loss in 100-Year Flood



Census blocks of concern should be reviewed in more detail to determine the actual percentage of facilities that fall within the flood hazard areas. The aggregate losses reported in this study may be overstated because values are distributed evenly in a census block. The 5 census blocks showing the highest estimated loss values are shown in Table 24, with their spatial extents shown in Figures 14-18.

*Table 24. Crow Wing County Census Blocks with the Greatest Estimated Losses in the 100-Year Floodplain*

<b>Census Block Number</b>	<b>Total Estimated Loss</b>	<b>City</b>
270359511004024	\$45,740,000	Brainerd
270359512001015	\$3,640,000	Brainerd
270359513011101	\$3,260,000	Baxter
270359502041019	\$2,604,000	Crosslake
270359513023026	\$2,436,000	Brainerd

Figure 14. Census Block #270359511004024 and 100-Year Floodplain in Brainerd



Figure 15. Census Block #270359512001015 and 100-Year Floodplain in Brainerd

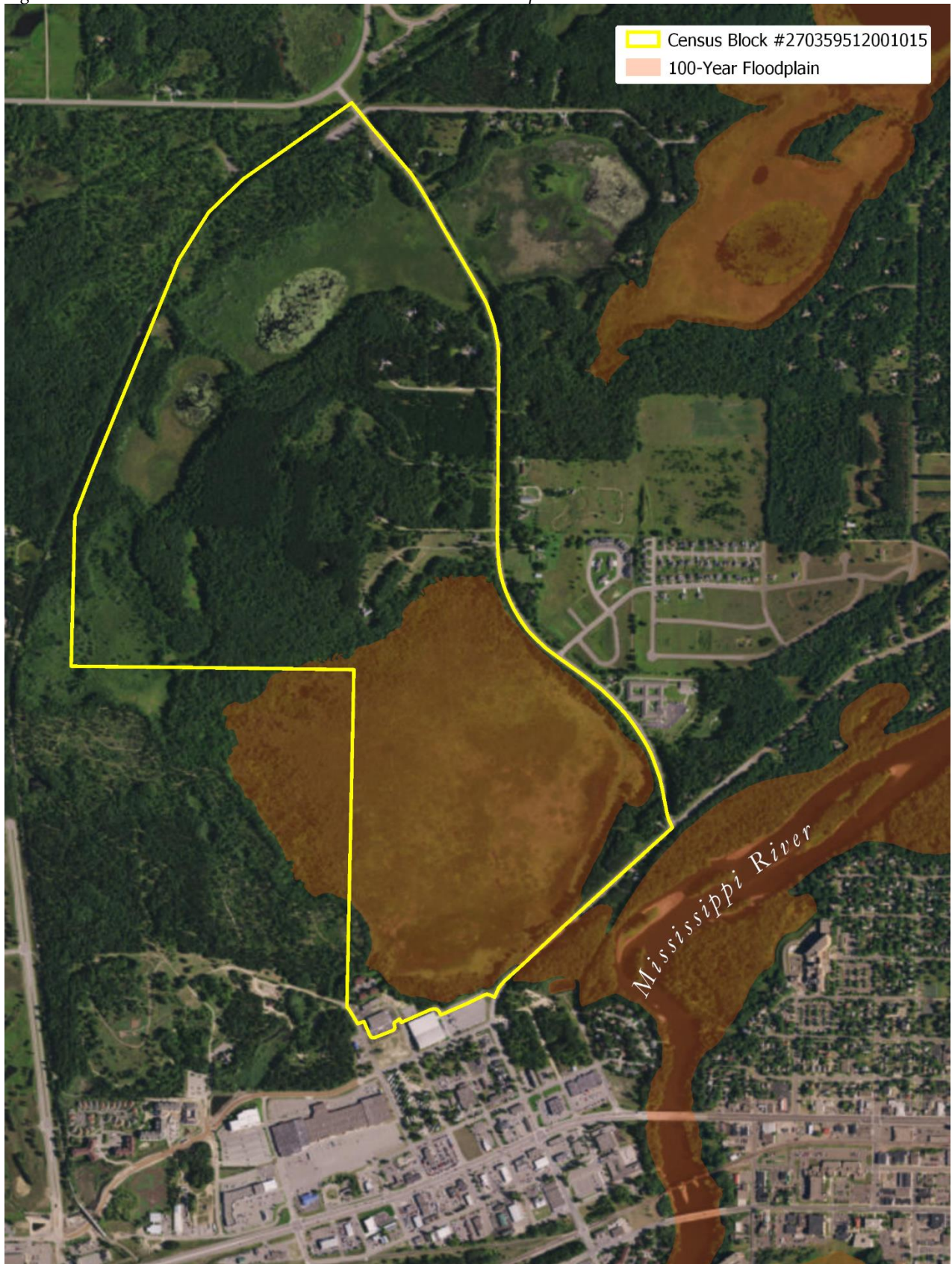




Figure 16. Census Block #270359513011101 and 100-Year Floodplain in Baxter

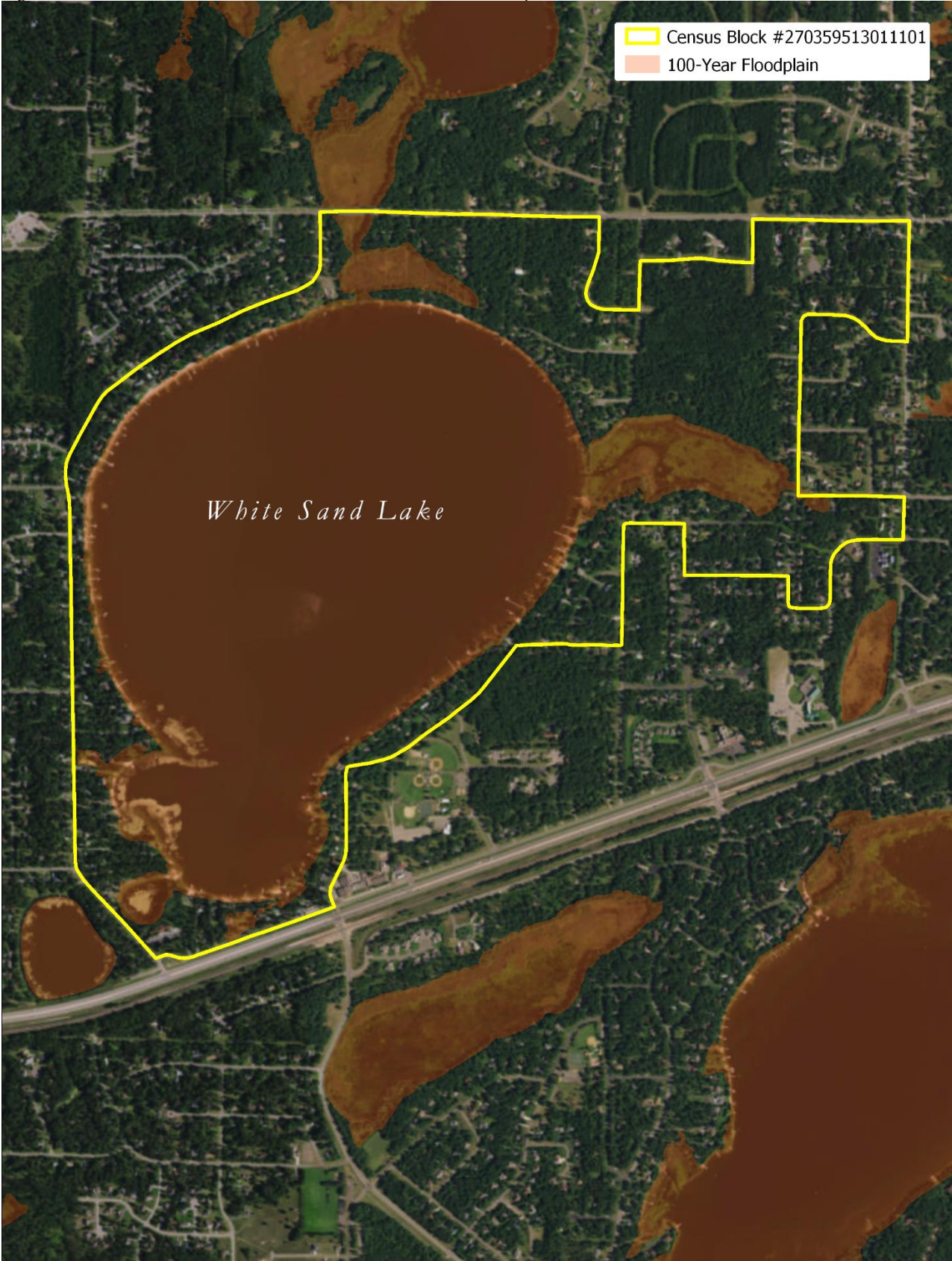


Figure 17. Census Block #270359502041019 and 100-Year Floodplain in Crosslake

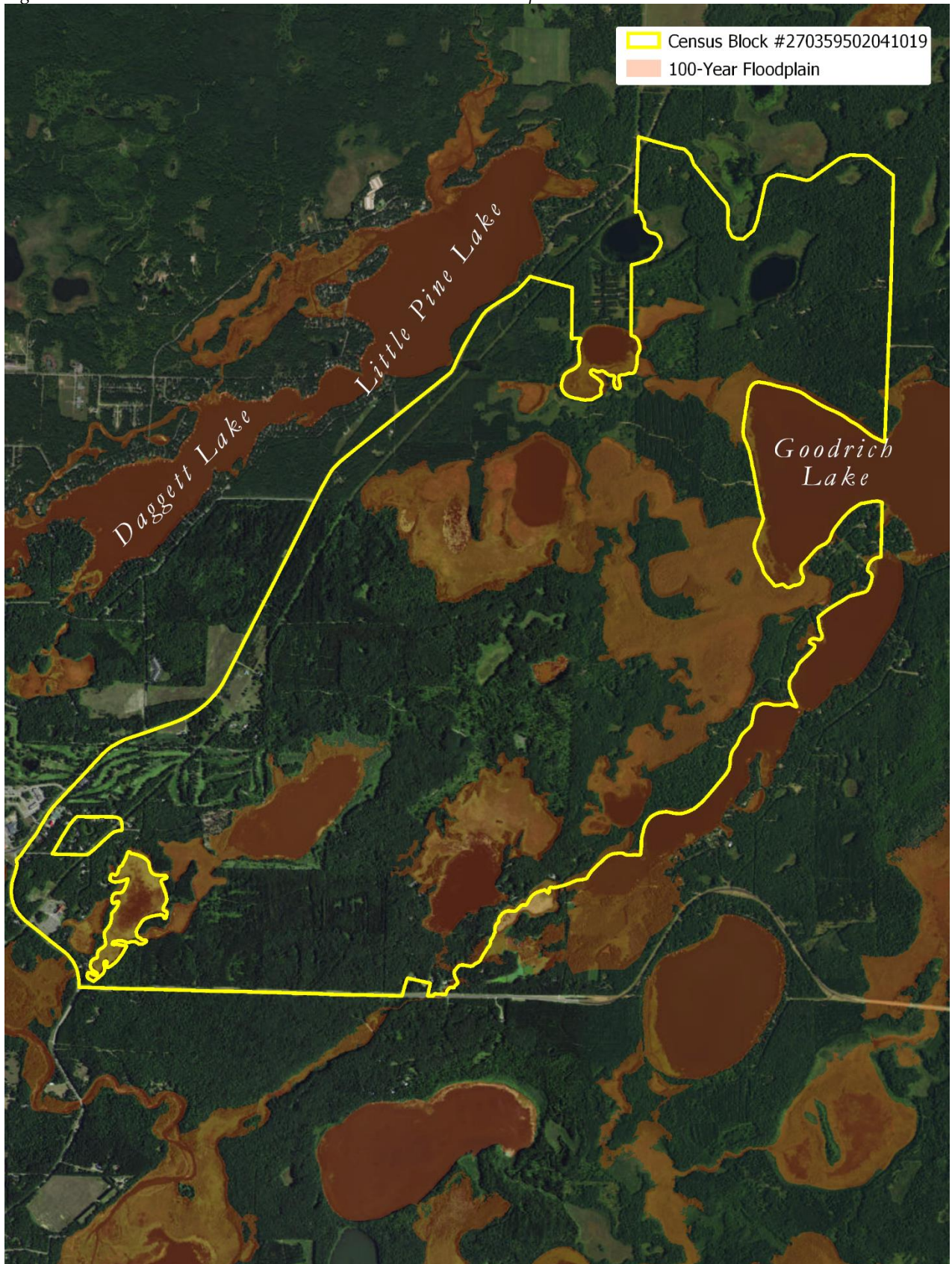
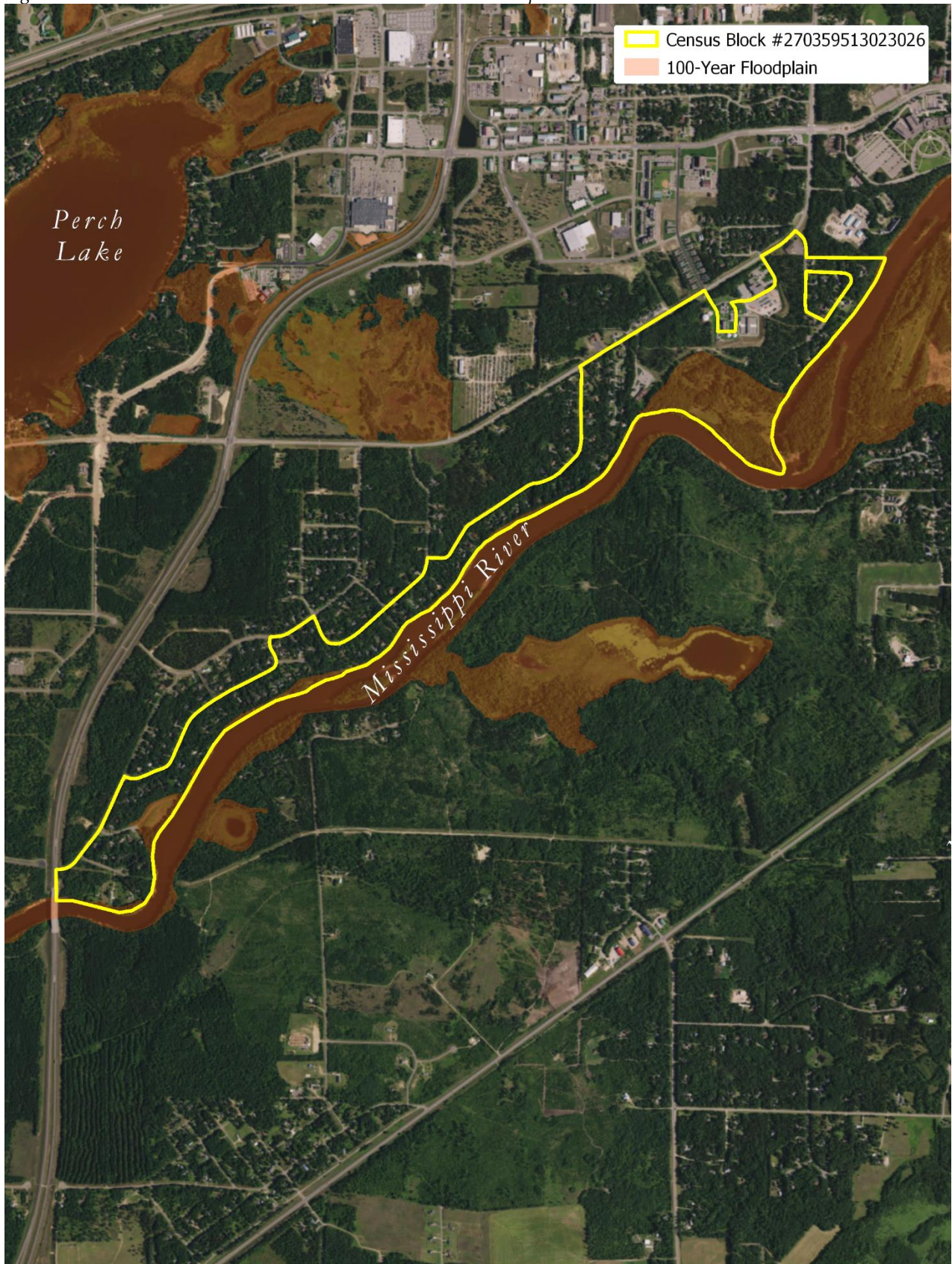


Figure 18. Census Block #270359513023026 and 100-Year Floodplain in Brainerd



### *Hazus-MH Essential Facility Loss Analysis*

Essential facilities encounter the same impacts as other buildings within the flood boundary: structural failure, extensive water damage to the facility, and loss of facility functionality (i.e. a damaged police station will no longer be able to serve the community). However, none of Crow Wing County's essential facilities (care facilities, fire stations, police stations, and schools) included in the Hazus analysis fall within the flood boundary.

### *Hazus-MH Shelter Requirement Analysis*

Hazus-MH estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus-MH also estimates those displaced people that may require accommodations in temporary public shelters. The model estimates 553 households may be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, the model estimates 673 people (out of a total population of 62,500) may seek temporary shelter in public shelters.

### *Hazus-MH Debris Generation Analysis*

Hazus estimates the amount of debris that may be generated by the flood based on best practice assumptions made using year built and occupancy class. The model breaks debris into 3 general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 10,529 tons of debris would be generated. Of the total amount, Finishes composes 57% of the total and Structural composes 25% of the total. If the debris tonnage is converted into an estimated number of truckloads, it would require 421 truckloads (at 25 tons/truck) to remove the debris generated by the flood.

### *Flooding and Climate Change*

As Minnesota's climate changes, the quantity and character of precipitation is changing. Average precipitation has increased in the Midwest since 1900, with more increases in recent years. The Midwest has seen a 45% increase in very heavy precipitation (defined as the heaviest 1% of all daily events) from 1958 to 2011 (National Climate Assessment Development Advisory Committee, 2013). This precipitation change has led to amplified magnitudes of flooding. Increased precipitation may also show seasonal changes, trending toward wetter springs and drier summers and falls. An example of a recent year with this character was 2012, when many MN counties were eligible for federal disaster assistance for drought, while others were eligible for flooding, and 7 were eligible for both in the same year (Seeley, 2013). In 2007, 24 Minnesota counties received drought designation, while 7 counties were declared flood disasters. In 2012, 55 Minnesota counties received federal drought designation at the same time 11 counties declared flood emergencies. In addition, the yearly frequency of the largest storms – those with 3 inches or more of rainfall in a single day – has more than doubled in just over 50 years. In the past decade, such dramatic rains have increased by more than 7% (MN Environmental Quality Board, 2014).

Southeastern Minnesota has experienced three 1000-year floods in the past decade: in September 2004, August 2007, and September 2010 (Meador, 2013). The 2004 flood occurred when parts of south-

central Minnesota received over 8 inches of precipitation. Faribault and Freeborn counties received over 10 inches in 36 hours. The deluge led to numerous reports of stream flooding, urban flooding, mudslides, and road closures (MN DNR, 2004). During the 2007 event, 15.10 inches fell in 24 hours in Houston County, the largest 24-hour rainfall total ever recorded by an official National Weather Service reporting location. The previous Minnesota record was 10.84 inches in 1972. The resulting flooding from the 2007 rainfall caused 7 fatalities (MN DNR, 2007). In September 2010, a storm on the 22-23<sup>rd</sup> resulted in more than 6 inches of rain falling over 5,000 square miles in southern Minnesota. Rainfall totals of more than 8 inches were reported in portions of 10 counties. The heavy rain, falling on soils already sodden from a wet summer, led to numerous reports of major rural and urban flooding. For many monitoring locations in southern Minnesota, stream discharge resulting from the deluge was the highest ever seen during an autumn flood (Minnesota Climatology Working Group, 2010).

June 2014 was the wettest month on record in Minnesota, with a state-averaged rainfall of 8.03 inches. This broke the previous record of 7.32 inches, which occurred in both July 1897 and June 1914. Rainfall totals for much of the state ranked above the 95<sup>th</sup> percentile when compared with the historical record; in some cases the totals tripled that of the historical rainfall average for June. Scott County received between 10-12 inches of rain during June 2014 (MN DNR, 2014). A presidential disaster declaration was declared due to the severe storms, winds, flooding, landslides, and mudslides (DR-4182), which included 37 Minnesota counties and 3 Indian Reservations.

### Plans and Programs in Place

*Public Information and Warning* – Crow Wing County can send out emergency messages and notifications through DLAN (our EOC software) via IPAWS to the public during emergencies in a timely manner. This can be area-specific if needed. Crow Wing County has an agreement through the local Hubbard Broadcasting radio station to send emergency notifications out immediately across a number of radio stations. Crow Wing County also uses Facebook and Twitter, and a webpage for Emergency Alerts, which has an option for property owners to sign up and get those alerts through texts or emails. Crow Wing County has a good relationship with the local media, which includes the newspapers, local TV, radio stations and NWS (National Weather Service), all of which assist in reaching the public with critical information.

*Emergency Operations Plan (EOP)* – Crow Wing County has an EOP, which includes all of the county departments as well as city officials and emergency organizations. The plan is organized to assist with the responsibilities and assignments during any type of emergency.

*Mass Care Shelter Facilities* – A major flood may result in displaced residents due to severe damage to homes. Crow Wing County has designated shelter facilities that have agreements with the American Red Cross. In addition, the Emergency Operations Plan (EOP) identifies potential shelter sites (primarily schools) for displaced or injured citizens.

*National Flood Insurance Program (NFIP)* – The NFIP is a federal program created by Congress to mitigate future flood losses nationwide through sound, community-enforced building and zoning ordinances and to provide access to affordable, federally-backed flood insurance protection for property owners. The NFIP is designed to provide an insurance alternative to disaster assistance to meet the escalating costs of repairing damage to buildings and their contents caused by floods. Participation in the NFIP is based

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

Crow Wing County along with the cities of Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Fifty Lakes, Fort Ripley, Nisswa and Riverton all participate in the NFIP program and have FEMA mapped high-risk areas. The following cities within the county do not have current FEMA mapped high-risk areas and do not participate in the NFIP: Cuyuna, Deerwood, Emily, Garrison, Ironton, Manhattan Beach, Pequot Lakes, and Trommald. According to MN DNR NFIP records, as of 8/26/16 only the City of Jenkins is listed as not participating in the NFIP but having FEMA mapped-high risk areas. FEMA is currently in the process updating the county's DFIRM maps and they should receive the new maps in 2017. This may affect NFIP participation for those cities currently not participating in the NFIP if the updated maps identify that they are within a FEMA mapped high-risk area for flooding.

### Program Gaps & Deficiencies

*Floodplain Mapping* – Crow Wing County has been waiting for 5 years for FEMA to update the floodplain maps.

*Black Bear/Miller Lake High Capacity Pump* – There is a need for a high capacity pump at the Black Bear/Miller Lake.

#### 4.4.6 Severe Winter Storms – Blizzards, Ice Storms

Blizzards are storms that contain heavy snowfall, strong winds, and cold temperatures. The combination of these elements creates blinding snow with near zero visibility, deep snowdrifts, and life-threatening wind chill temperatures. Blizzards are the most dramatic and destructive of all winter storms that occur within Crow Wing County, and are generally characterized as storms bearing large amounts of snow accompanied by strong winds. They have the ability to completely immobilize travel in large areas and can be life-threatening to humans and animals in their path. According to the National Weather Service (NWS), there is no fixed temperature requirement for blizzard conditions, but the life-threatening nature of low temperatures in combination with blowing snow and poor visibility increases dramatically when temperatures fall below 20° F. Blizzards typically occur between October and April; however, they occur most frequently from early November to late March.

Figure 19. Armistice Day Blizzard, 1940



The greatest numbers of blizzards historically have occurred in the months of January, followed by March and November, respectively. Crow Wing County, along with all areas of Minnesota, is susceptible to blizzards.

Damages from blizzards can range from human and livestock deaths to significant snow removal costs. Stranded drivers can make uninformed decisions, such as leaving the car to walk in conditions that put them at risk.

Because of the blinding potential of heavy snowstorms, drivers are also at risk of collisions with snowplows or other road traffic. Drivers and homeowners without emergency plans and kits are vulnerable to the life-threatening effects of heavy snow storms such as power outages, cold weather, and inability to travel, communicate, obtain goods or reach their destinations. Heavy snow loads can cause structural damage, particularly in areas where there are no building codes or where residents live in manufactured home parks. The frequency of structural fires tends to increase during heavy snow events, primarily due to utility disruptions and the use of alternative heating methods by residents.

Between the years of 1975 and 1991, there were 49 deaths associated with blizzards statewide, or an average of 3 deaths per year. Deaths attributable to blizzards have dropped in recent years, primarily due to increased weather awareness and warning capabilities across the state. The economic costs of winter storms are generally not recorded by the NCEI; however, a winter storm in November 2001 resulted in property damage of \$500,000.

Ice storms are described as occasions when damaging accumulations of ice occur due to freezing rain. The terms freezing rain and freezing drizzle warn the public that a coating of ice is expected on the ground and other exposed surfaces. Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers.

Communications and power can be disrupted for days while utility companies work to repair extensive damage. Ice forming on exposed objects generally ranges from a thin glaze to coatings more than 1 inch thick. Even small accumulations of ice on sidewalks, streets, and highways may cause extreme hazards to Crow Wing County motorists and pedestrians. Sleet does not stick to trees and wires, but sleet of sufficient thickness does cause hazardous driving conditions. Heavy sleet is a relatively rare occurrence, defined as an accumulation of ice pellets covering the ground to a depth of ½-inch or more.

Ice and sleet storms typically occur from October through April. The NWS notes that over 85% of ice storm-related deaths are the result of traffic accidents. The NCEI has recorded 6 ice storms since 1999. No deaths, injuries, or property damage resulted from the events.

Observing winter storm watches and warnings and adequate preparation can lessen the impact of blizzard events in Minnesota. Technical advances made in transportation, including safer vehicles and improved construction and maintenance of roads, have also contributed to the decline in deaths related to blizzards. Historical estimates of dollar losses associated with blizzards were not available for the

purposes of this analysis. However, costs incurred by state and local government for snow removal associated with disaster declaration DR-1158 (January 1997) totaled over \$27,300,000 dollars. Blizzards rank 9<sup>th</sup> out of the 10 natural hazards economically impacting Minnesota according to the statewide risk analysis. The chance that another winter storm affecting Crow Wing County will occur is highly probable.

### Severe Winter Storm History in Crow Wing County

The total of notable events defined as heavy snows, blizzards, winter weather, ice storms and winter storms in Crow Wing County recorded by the NCEI for the period from 1996 to April 2017 is 55. An overview of some of the most notable winter storm events can be found in Table 25 below.

Table 25. Notable Winter Weather Events in Crow Wing County

Date	Type	Cost	Deaths	Injuries	Description
12/25/2016	Ice Storm	0	0	0	Icy road conditions, numerous trees down, and power outages from the freezing rain.
11/18/2016	Blizzard	0	0	0	11 inches of snow fell in Brainerd, along with 40 mph winds that created visibility below one quarter mile.
2/12/2013	Heavy Snow	0	0	0	11 inches of snow fell around Brainerd, within a 3-day period causing poor driving conditions and school closures.

### Severe Winter Storms and Climate Change

Historically, winter storms have had a large impact on public safety in Minnesota. This will continue, with a possible increase in snowstorm frequency and annual total snowfall. Winter weather is often a cause of power outages. Pressures on energy use, reduced reliability of services, potential outages and the potential rise in household costs for energy are major climate change risks to public health.

According to the 2015 Minnesota Weather Almanac, a recent study of seasonal snowfall records across the state from 1890-2000 showed that 41 of 46 climate stations recorded an increase in average annual snowfall, by as much as 10 inches. Higher snowfall levels can result in greater runoff potential during spring snow melt, and many watersheds in Minnesota have shown more consistent measures of high-volume flows during spring, often at or above flood stage (Seeley M. , 2015).

### Vulnerability

The number of heavy snowfall years for the Midwest has fluctuated between 1900 and 2006. The periods of 1900-1920 and 1960-1985 had numerous years with snowfall totals over the 90<sup>th</sup> percentile. In the past 3 decades, the number of heavy seasonal snowfall totals has been much lower. Despite these generally lower seasonal snowfall totals, some areas of the Midwest have still experienced significant snow totals in the most recent decade. The 100-year linear trends based on decadal values show that the upper Midwest had statistically significant (1% level) upward linear trends in snowstorm frequency from 1901 to 2000 (Kunkel, et al., 2013).



Winter storms affect Crow Wing County each year, so there is a 100% probability that the county and its jurisdictions will be affected annually. The amount of snow and ice, number of blizzard conditions, and days of sub-zero temperatures each year are unpredictable and within Crow Wing County the vulnerability of jurisdictions to winter storms does not vary geographically. Citizens living in climates such as these must always be prepared for situations that put their lives or property at risk. It is not always the size of the storm or the depth of the cold, but an unprepared individual with a vehicle breakdown or lack of a personal winter safety kit that are at risk. Rural citizens are more vulnerable to issues with deep snow. The vulnerability of each jurisdiction to severe winter storms has not changed due to any development in the last 5 years.

### Severe Winter Storms and Electrical Outages

The leading cause of electric outages in Minnesota during 2008 to 2013 was weather/falling trees. Between 2008 and 2013, the greatest number of electric outages in Minnesota occurred during the month of March (U.S. Department of Energy, 2015).

### Plans and Programs in Place

*Public Information and Warning* – Crow Wing County can send out emergency messages and notifications through DLAN (our EOC software) via IPAWS to the public during emergencies in a timely manner. This can be area-specific if needed. Crow Wing County has an agreement through the local Hubbard Broadcasting radio station to send emergency notifications out immediately across a number of radio stations. Crow Wing County also uses Facebook and Twitter, and a webpage for Emergency Alerts, which has an option for property owners to sign up and get those alerts through texts or emails. Crow Wing County has a good relationship with the local media, which includes the newspapers, local TV, radio stations and NWS (National Weather Service), all of which assist in reaching the public with critical information.

*Snow Removal* – The Crow Wing County Highway Department has their own department Standard Operating Procedure (SOP). Crow Wing County, cities, townships and contractors complete the snow removal from all county, city and township roads. MNDOT will remove snow from the state highways.

*School Closings* – The 3 school districts including the Central Lakes College within Crow Wing County have policies and procedures in place for severe weather. All of the schools and college use a notification system, radio, television and social media to send out notifications when needed.

*Backup Power* – Crow Wing County campus buildings along with the County Highway Garage have generators.

*Winter Hazard Awareness Week* – Crow Wing County participates in the National Weather Service’s “Winter Hazard Awareness Week” held in November each year. Activities include public outreach for winter safety information to the general public, schools, businesses, and government agencies to raise awareness of the dangers of winter weather and how to properly deal with it.

### Program Gaps or Deficiencies

*Backup Power* – Not all government buildings have backup power generators, such as schools and city facilities within Crow Wing County.

#### 4.4.7 Extreme Cold

Winter in Crow Wing County can be severe, and especially dangerous for disabled citizens and outdoor workers. Record temperature lows and arctic-like wind chills can cause cold-related illnesses such as frostbite and hypothermia, which can be deadly. Hypothermia is the greatest and most life-threatening cold weather danger.

In Crow Wing County, cold winter weather can have severe or fatal impacts. Hypothermia occurs when the core body temperature drops below 96° F. Anyone who is exposed to severe cold without enough protection can develop hypothermia. Frostbite occurs when skin tissue and blood vessels are damaged from exposure to temperatures below 32° F. It most commonly affects the toes, fingers, earlobes, chin, cheeks, nose, and other body parts that are often left uncovered in cold temperatures. The NWS issues “Extreme cold” warnings when it feels like -30° F or colder across a wide area for several hours. Extreme cold watches are issued a day or two before the conditions are expected.

Medical costs related to extreme heat and cold can be enormous: in 2005 the total was \$1.5 billion nationwide, or more than \$16,000 per patient (Union of Concerned Scientists, 2009).

Below zero temperatures occur almost every winter in Minnesota. January is the coldest month, with daytime highs averaging 20° F and nighttime lows averaging 2° F. However, these averages do not tell the whole story. Maximum temperatures in January have been as high as 61° F and minimums as low as 36° F below zero.

Extreme cold temperatures affect the county nearly every year. Extremely cold air settled over Minnesota on January 31<sup>st</sup> of 1996, and remained entrenched through February 4<sup>th</sup>. A new record low temperature for Minnesota was set in the town of Tower on February 2, 1996, at -60° F. Numerous record low temperatures were set during the period at St. Cloud, Rochester and the Twin Cities. Minneapolis/St. Paul set 3 new record low temperatures as well as recording the 2<sup>nd</sup> coldest day on record on February 2, 1996. A mean temperature of -25° F was measured that day with a high of -17° F and a low of -32° F in the Twin Cities. This was within 2 degrees of tying the all-time record low temperature set in the Twin Cities and the coldest temperature recorded this century. Many central and southern Minnesota locations set new record low temperatures the morning of the 2<sup>nd</sup>. The Governor closed all schools that day.

In February of 2014, nearly all of Minnesota was between 10-15° F colder than normal (1981-2010 period) (High Plains Regional Climate Center, 2014). The winter of 2013-2014 was the sixth coldest on record in Minnesota (The Weather Channel, 2014), with schools in the Twin Cities canceling 5 times in January due to dangerous wind chills. It was the coldest winter in the Twin Cities in 35 years, with an average temperature for December-February of 9.7° F (MN DNR, 2014). Many areas in the state also experienced higher than average precipitation through the winter and spring months.

#### Extreme Cold History in Crow Wing County

January is the coldest month on average in Brainerd. The lowest temperature ever recorded there occurred in February 1996, when it fell to -54° F. The average minimum temperature in Brainerd for the month of January is -7° F (Intellicast, 2017). The average annual snowfall is 45.1" (High Plains Regional Climate Center, 1967-2017).

The National Centers for Environmental Information (NCEI) recorded 19 extreme cold/wind chill events between 1997 and April 2017. No deaths or injuries were reported.

### Extreme Cold and Climate Change

There is not yet any observable trend related to extreme cold and climate change in Minnesota. Cold temperatures have always been a part of Minnesota's climate and extreme cold events will continue. However, an increase in extreme precipitation or storm events such as ice storms as the climate changes could lead to a higher risk of residents being exposed to cold temperatures during power outages or other storm-related hazards during extreme cold.

### Vulnerability

Extreme cold temperatures affect the county nearly every year. The amount of snow and ice, number of blizzard conditions, and days of sub-zero temperatures each year are unpredictable.

Within Crow Wing County the risk of extreme cold does not vary geographically. Citizens living in climates such as these must always be prepared for situations that put their lives or property at risk. It is not always the depth of the cold, but an unprepared individual with a vehicle breakdown or lack of a personal winter safety kit that are at risk. Rural citizens not connected to city gas lines are more vulnerable to issues with extreme cold. The vulnerability of each jurisdiction to extreme cold has not changed due to any development in the last 5 years.

### Plans and Programs in Place

*Public Information and Warning* – Crow Wing County can send out emergency messages and notifications through DLAN (our EOC software) via IPAWS to the public during emergencies in a timely manner. This can be area-specific if needed. Crow Wing County has an agreement through the local Hubbard Broadcasting radio station to send emergency notifications out immediately across a number of radio stations. Crow Wing County also uses Facebook and Twitter, and a webpage for Emergency Alerts, which has an option for property owners to sign up and get those alerts through texts or emails. Crow Wing County has a good relationship with the local media, which includes the newspapers, local TV, radio stations and NWS (National Weather Service), all of which assist in reaching the public with critical information.

*Emergency Operations Plan (EOP)* – Crow Wing County has an EOP, which includes all of the county departments as well as city officials and emergency organizations. The plan is organized to assist with the responsibilities and assignments during any type of emergency.

*School Closings* – The 3 school districts including the Central Lakes College within Crow Wing County have policies and procedures in place for cold or severe weather. All of the schools and the college use a form of notification systems, radio, television and social media to send out notifications when needed.

*Salvation Army/Red Cross* – Volunteer organizations within the county assist during extreme cold temperatures. They will provide shelter, blankets, food, etc. to citizens who do not have any.

*Winter Hazard Awareness Week* – Crow Wing County participates in the NWS public outreach for winter safety information (including extreme cold) to the general public, schools, businesses, and government agencies.

*Mass Care Shelter Facilities* – A period of extreme cold coupled with a major power outage may require emergency sheltering for those in need. Crow Wing County has designated shelter facilities that have agreements with the Red Cross. In addition, the Emergency Operations Plan (EOP) identifies potential shelter sites (primarily schools) for displaced or injured citizens.

### Program Gaps or Deficiencies

*Generators for Backup Power to Shelter Facilities* – Not all government buildings have backup power generators, such as schools and city facilities. In the event of a power outage during a period of extreme heat or extreme cold, designated shelters (primarily schools) must be ready to provide either temporary or extended periods of sheltering for those in need. Not all designated shelter facilities have generator backup power to provide either heat or cooling if there is a loss of power.

#### 4.4.8 Extreme Heat

Humans need to maintain a constant body temperature if they are to stay healthy. Working in high temperatures induces heat stress when more heat is absorbed into the body than can be dissipated out. Heat illness such as prickly heat, fainting from heat exhaustion, or heat cramps are visible signs that people are working in unbearable heat. In the most severe cases, the body temperature control system breaks down altogether and body temperature rises rapidly. This is a heat stroke, which can be fatal. The NWS issues a heat advisory when, during a 24-hour period, the temperature ranges from 105° F to 114° F during the day, and remains at or above 80° F at night.

Extreme heat events are linked to a range of illnesses, even death, and can exacerbate pre-existing chronic conditions such as cardiovascular, respiratory, liver, and neurological diseases, endocrine disorders, and renal disease or failure. Populations who are most vulnerable to extreme heat include persons over 65 or under 5 years old; living alone, without air-conditioning, or residing on the topmost floor of a building; and with an income at or below the poverty line. People who are exposed to heat because of recreational activities or job-related activities also are more vulnerable, including athletes, construction workers, and landscape/agricultural workers (Adapting to Climate Change in Minnesota: 2013 Report of the Interagency Climate Adaptation Team, 2013).

Medical costs related to extreme heat and cold can be enormous: in 2005 the total was \$1.5 billion nationwide, or more than \$16,000 per patient (Union of Concerned Scientists, 2009).

#### Extreme Heat History in Crow Wing County

July is the hottest month on average in Brainerd. The highest temperature ever recorded there occurred in 1988, when it rose to 102° F (Intellicast, 2017). The average July maximum temperature (from 1942-March 2013) in Brainerd was 82° F (High Plains Regional Climate Center, 1967-2017).

The National Centers for Environmental Information has recorded 2 instances of extreme heat in Crow Wing County since 2010. The most recent event occurred in July of 2016 when heat indexes for the area measured 95-105 degrees. No deaths or injuries were reported. Another heat event was recorded in July of 2011.

#### Extreme Heat and Climate Change

Minnesota's average temperature has increased more than 1.5°F since recordkeeping began in 1895, with increased warming happening in recent decades (International Climate Adaptation Team, 2013).

Annual temperatures in the Midwest have generally been well above the 1901-1960 average since the late 1990s, with the decade of the 2000s being the warmest on record (Kunkel, et al., 2013). 7 of Minnesota's 10 warmest years occurred in the last 15 years. Projected increases are 2° F to 6° F more by 2050 and 5° F to 10° F by 2100 (MN Environmental Quality Board, 2014). The Midwest has experienced major heat waves and their frequency has increased over the last 6 decades (Perera, et al., 2012). For the U.S., mortality increases 4% during heat waves compared with non-heat wave days (Anderson & Bell, 2011). During July 2011, 132 million people across the U.S. were under a heat alert – and on July 20 the majority of the Midwest experienced temperatures in excess of 100° F. Heat stress is projected to increase as a result of climbing summer temperatures and humidity (Schoof, 2012). On July 19, 2011, Moorhead Minnesota set a new state record for the hottest heat index ever, at 134° F. That same day, Moorhead also recorded a new state record for the highest dew point at 88. It was the hottest, most humid spot on the planet that day (Douglas, 2011).

Recent statistics from NOAA show that there are more human fatalities each year due to heat waves than from floods, lightning, tornadoes and winter storms. Many cities have responded by creating Heat Wave Response Plans to ensure that those in marginal health without air conditioning can obtain the relief and care they need, and the Minnesota Department of Health developed the Extreme Heat Toolkit to help educate at-risk populations on how to reduce risks associated with heat waves (Seeley M. , 2015).

Increasing temperatures impacts Minnesota's agricultural industry. Agriculture is highly dependent on specific climate conditions. As a result of increasing temperature, crop production areas may shift to new regions of the state where the temperature range for growth and yield of those crops is optimal. According to the National Climate Assessment, the Midwest growing season has lengthened by almost 2 weeks since 1950 due in large part to earlier timing of the last spring freeze. This trend is expected to continue. While a longer growing season may increase total crop production, other climate changes, such as increased crop losses and soil erosion from more frequent and intense storms, and increases in pests and invasive species, could outweigh this benefit. There may also be higher livestock losses during periods of extreme heat and humidity. Losses of livestock from extreme heat lead to a challenge in the disposal of animal carcasses. Currently there are only 2 rendering facilities in Minnesota available for livestock disposal. If a rendering facility is not available, lost livestock must be composted on an impervious surface. If losses are high, finding an impervious surface large enough is a challenge. In an attempt to adapt to increased temperatures, livestock areas in Minnesota may shift farther north. As a result of new livestock areas and the resulting manure production, farmers may transition to manure-based fertilizer applications in areas where traditionally only commercial fertilizers have been used, with accompanying environmental advantages and disadvantages (Adapting to Climate Change in Minnesota: 2013 Report of the Interagency Climate Adaptation Team, 2013). In order to minimize the detrimental effects of heat stress on animal metabolism and weight gain, Minnesota farmers have also begun redesigning and retrofitting dairy, hog, and poultry barns with better watering, feeding, and ventilation systems (Seeley M. , 2015).

### Vulnerability

Within Crow Wing County the risk of extreme heat does not vary geographically. The vulnerability of each jurisdiction to extreme heat has not changed due to any development in the last 5 years.

## Plans and Programs in Place

*Public Information and Warning* – Crow Wing County can send out emergency messages and notifications through DLAN (our EOC software) via IPAWS to the public during emergencies in a timely manner. This can be area-specific if needed. Crow Wing County has an agreement through the local Hubbard Broadcasting radio station to send emergency notifications out immediately across a number of radio stations. Crow Wing County also uses Facebook and Twitter, and a webpage for Emergency Alerts, which has an option for property owners to sign up and get those alerts through texts or emails. Crow Wing County has a good relationship with the local media, which includes the newspapers, local TV, radio stations and NWS (National Weather Service), all of which assist in reaching the public with critical information.

*Emergency Operations Plan (EOP)* – Crow Wing County has an EOP, which includes all of the county departments as well as city officials and emergency organizations. The plan is organized to assist with the responsibilities and assignments during any type of emergency.

*Mass Care Shelter Facilities* – A period of extreme heat coupled with a major power outage may require emergency sheltering for those in need. Crow Wing County has designated shelter facilities that have agreements with the Red Cross. In addition, the Emergency Operations Plan (EOP) identifies potential shelter sites for displaced or injured citizens.

*Salvation Army/Red Cross* – Volunteer organizations within the county assist during extreme heat. They will assist at shelter sites with food, etc. to citizens or the community.

*Critical Energy Usage Alert Notifications* – Utility companies send out “peak energy alert notifications” asking consumers to reduce energy usage of major appliances for a certain timeframe. This can help avoid a major power outage during a period of extreme heat.

*Burning Permits/Restrictions* – Regulation of open burning and the use of burning permits has been an important tool in preventing wildfire in Minnesota. Burning permits are required by the MN DNR when the ground is not snow-covered. Permits can be obtained from MN DNR Forestry offices, local hardware stores and some gas stations within the county. When risk of wildfire is very high, burning is not permitted.

## Program Gaps or Deficiencies

*Generators for Backup Power to Shelter Facilities* – Not all government buildings have backup power generators, such as schools and city facilities. In the event of a power outage during a period of extreme heat or extreme cold, designated shelters (primarily schools) must be ready to provide either temporary or extended periods of sheltering for those in need. Not all designated shelter facilities have generator backup power to provide either heat or cooling if there is a loss of power.

### 4.4.9 Drought

A drought refers to an extended period of deficient rainfall relative to the statistical mean for a region. Drought can be defined according to meteorological, hydrological, socioeconomic, and agricultural criteria. Meteorological drought is qualified by any significant deficit of precipitation. Hydrological drought is manifest in noticeably reduced river and stream flow and critically low groundwater tables. The term agricultural drought indicates an extended dry period that results in crop stress and harvest

reduction. Socioeconomic drought refers to the situation that occurs when water shortages begin to affect people and their lives. It associates economic goods with the elements of meteorological, agricultural, and hydrological drought. Many supplies of economic goods (e.g., water, food grains, hydroelectric power) are greatly dependent on the weather. Due to natural variations in climate, water supplies are high in some years but low in others. Fluctuating long-term climate variations make drought difficult to predict.

### Drought History in Crow Wing County

National Centers for Environmental Information records show droughts occurring in Crow Wing County from July 2006-March 2007; August-September 2007; November 2012-April 2013; and April-May 2015.

The drought in the spring of 2015 was due to precipitation deficits since September 2014, resulting in severe drought conditions (D2) over the southern portion of Crow Wing County.

The hazard rank for drought in Crow Wing County is low. A drought may not have a severe impact on human life due to decreased water access; however, the economic impact on farmers could be significant. Extended drought conditions may also make an area more prone to wildfire. Trees may be lost due to lack of moisture. In severe instances, a drought may cause wells to dry up entirely.

### Drought and Climate Change

Droughts have been happening throughout Minnesota's history and it is not yet clear how climate change may impact this (International Climate Adaptation Team, 2013). While there was no apparent change in drought duration in the Midwest over the past century (Dai, 2011), the average number of days without precipitation is projected to increase in the future (National Climate Assessment Development Advisory Committee, 2013).

Even in areas where precipitation does not decrease, projected higher air temperatures will cause increased surface evaporation and plant water loss, leading to drier soils. As soil dries out, a larger proportion of the incoming heat from the sun goes into heating the soil and adjacent air rather than evaporating its moisture, resulting in hotter summers under drier climatic conditions (Mueller & Seneviratne, 2012).

Across the nation, drought is affecting water supplies, as ground and surface water levels are increasingly reduced due to growing consumption and withdrawal. These trends are expected to continue, with a higher likelihood of water shortages (Georgakakos, et al., 2014).

In 2007, 24 Minnesota counties received drought designation, while 7 counties were declared flood disasters. In 2012, 55 Minnesota counties received federal drought designation at the same time 11 counties declared flood emergencies (MN Environmental Quality Board, 2014).

In May of 2015, over 90% of Minnesota was undergoing severe or moderate drought, due to low snow levels during the 2014-2015 winter and dry spring weather, with precipitation deficits totaling 3-6 inches below average across much of the state since October 2014. Water levels on streams, lakes, and wetlands were below average, and wildfires were common during April of 2015. Blowing soil was also reported due to high winds and the dried-out landscape (MN DNR, 2015).

## Vulnerability

Jurisdictions in Crow Wing County do not vary in their vulnerability to drought. The vulnerability of each jurisdiction to drought has not changed due to any development in the last 5 years.

### Plans and Programs in Place

*Public Information and Warning* – Crow Wing County can send out emergency messages and notifications through DLAN (our EOC software) via IPAWS to the public during emergencies in a timely manner. This can be area-specific if needed. Crow Wing County has an agreement through the local Hubbard Broadcasting radio station to send emergency notifications out immediately across a number of radio stations. Crow Wing County also uses Facebook and Twitter, and a webpage for Emergency Alerts, which has an option for property owners to sign up and get those alerts through texts or emails. Crow Wing County has a good relationship with the local media, which includes the newspapers, local TV, radio stations and NWS (National Weather Service), all of which assist in reaching the public with critical information.

*Emergency Operations Plan (EOP)* – Crow Wing County has an EOP, which includes all of the county departments as well as city officials and emergency organizations. The plan is organized to assist with the responsibilities and assignments during any type of emergency.

*Burning Permits/Restrictions* – Regulation of open burning and the use of burning permits has been an important tool in preventing wildfire in Minnesota. Burning permits are required by the MN DNR when the ground is not snow-covered. Permits can be obtained from MN DNR Forestry offices, local hardware stores and some gas stations within the County. When risk of wildfire is very high, burning is not permitted.

*Minnesota Drought Response Plan* – The State of Minnesota has a statewide drought response plan in place. The plan was prepared by the Minnesota DNR.

### Program Gaps or Deficiencies

No program gaps or deficiencies have been identified.

#### 4.4.10 Wildfire

A wildfire is an uncontrolled fire spreading through vegetative fuels, posing danger and destruction to property. Wildfires can occur in undeveloped areas and spread to urban areas where structures and other human developments are more concentrated. While some wildfires start by natural causes like lightning, humans cause 4 out of every 5 wildfires. Debris burns, arson or carelessness are the leading causes of wildfires. As a natural hazard, a wildfire is often the direct result of a lightning strike that may destroy personal property and public land areas, especially on national and state forest lands. The dangers from wildfire include the destruction of timber, property and wildlife, and injury or loss of life to people living in the affected area or using the area for recreational facilities.

While wildfires are often viewed in a negative light, they are a naturally occurring part of the environment. Wildfires are an important component of healthy forest and prairie ecology, and can be beneficial by reducing dangerously high fuel levels and putting nutrients into the ground that spur new growth. In addition, many flora species require fire for seed germination. However, as people settled



this country and began clearing land and building homes, roads, railroads, and campgrounds, new artificial causes of wildfire emerged and their frequency and level of destruction increased.

Causes of wildfires vary from state to state. For example, in Florida, lightning ignites approximately half of all wildfires, while in Minnesota lightning causes less than 5% of all wildfires. These variations are due to climate, vegetation, topography, and weather. People burning debris cause most wildfires in Minnesota. However, wildfires are also caused by vehicle exhaust, sparks from trains and heavy equipment, camping, smoking, and lightning.

Topography affects the movement of air and fire over the ground surface. The slope and shape of terrain can change the rate of speed at which the fire travels. Weather affects the probability of wildfire and has a significant effect on its behavior. Temperature, humidity and wind affect the severity and duration of wildfires.

Homes threatened by wildfire are primarily those located in the “wildland-urban interface.” This is the zone where homes and subdivisions have been located in wildland areas where natural wildfires can have an impact. While wildfires are necessary for healthy ecosystems, they burn whatever fuel is in their path, whether vegetation or buildings.

One of the most common causes of a home being damaged or destroyed is due to radiant heat. In a wildfire, radiant heat is the heat given off by burning vegetation. The high temperatures of some wildfires can cause the deck, siding, or roof of a home to ignite, because the fire was too near the home. Studies in western wildfires have shown that approximately 85% of homes surviving a major wildfire had 30-50 feet of defensible space around them, coupled with fire-resistant roofing.

Approximately 1,600 wildfires occurred each year in Minnesota on average from 1976-2011 (MN DNR, 2011). Wildfires occur throughout the spring, summer and fall, however, most wildfires in Minnesota take place in March, April, and May. During this period, much of the existing vegetation has been killed due to winter temperatures and is dead, brown and combustible. Also, there is little green vegetation to serve as a barrier for a moving wildfire.

### Wildfire History in Crow Wing County

Wildfire has been ranked as a medium risk by Crow Wing County. The last fire reported by the DNR occurred on November 16<sup>th</sup>, 2016 which burned 1 acre of property.

The Minnesota DNR responded to 2,428 wildfires in Crow Wing County between 1985 and March, 2017, burning a total of 16,906 acres. Only 18 of the wildfires were caused by lightning; the rest were human-caused. These include fires not only on state lands, but also rural private lands for which there is not another agency with primary responsibility. Wildfires that are not included in this data are those that occur on federal and Native American lands, and those that are responded to by local fire departments. The largest fire burned 3,958 acres in 1988, near the southern border of the county. Its cause was arson. Another arson event in May of 1988 consumed 1,441 total acres on the far eastern side of the county. These fires, along with areas of peat soil, are mapped in Figure 20.

In 2002 Crow Wing County was part of a FEMA Fire Management Assistance Declaration (#2409) for the By Pass Fire.

According to MN DNR data, there are 46,371 acres of peat in Crow Wing County. Peat is partially decayed plant matter found in ancient bogs and swamps. Minnesota has approximately 6 million acres of peatland, the highest total acreage in the contiguous United States. Peat fires are deep-rooted fires that burn underground, lasting for weeks, months, or even years. They can smolder during winter months beneath the snow, surfacing again in the spring to burn above ground. Peat ignites when its moisture content is low, and then it supports combustion rather than flame. Once started, combustion is persistent because peat contains oxygen and needs little or no outside oxygen to continue burning. Peat's insulating qualities mean the fire loses little heat. As the peat dries, it becomes water repellent. These factors result in long-lasting fires that require extensive operations to extinguish. However, peat fires have not been an issue in Crow Wing County.

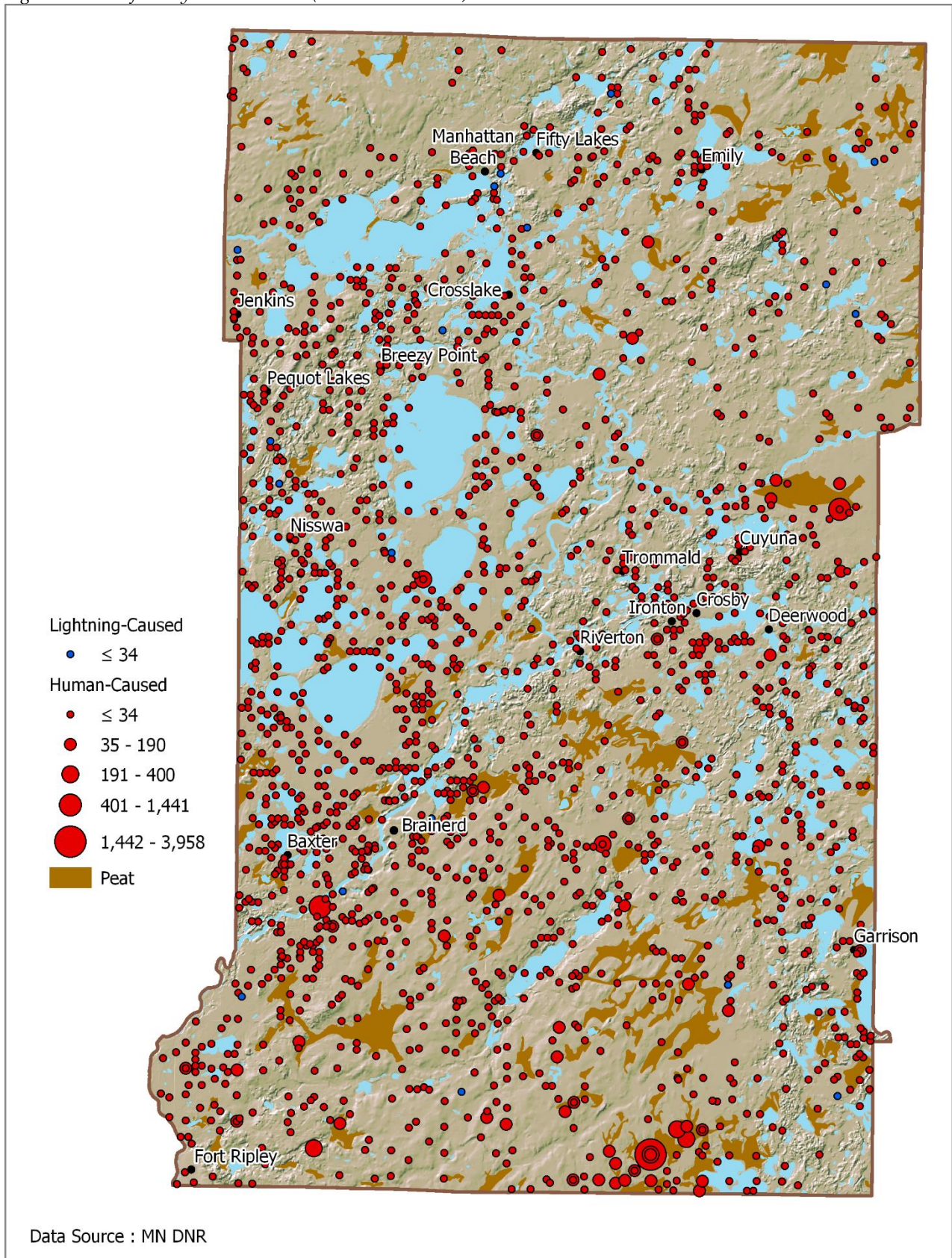
### Wildfire and Climate Change

Temperatures are predicted to rise in the state, which could lead to more extreme heat events and associated wildfire risks. As Minnesota's climate changes, weather fluctuations between drought and extreme rain events and increasing temperatures will result in changes to forest composition and/or distribution. These fluctuations can lead to dry conditions that may cause increased fire risk in both grassland and forest environments.

### Vulnerability

Jurisdictions in Crow Wing County do not vary in their vulnerability to wildfires. The vulnerability of each jurisdiction to wildfire has not changed due to any development in the last 5 years.

Figure 20. Wildfires by Acres Burned (1985-March 2017) and Peat Soil Areas



## Plans and Programs in Place

*Public Information and Warning* – Crow Wing County can send out emergency messages and notifications through DLAN (our EOC software) via IPAWS to the public during emergencies in a timely manner. This can be area-specific if needed. Crow Wing County has an agreement through the local Hubbard Broadcasting radio station to send emergency notifications out immediately across a number of radio stations. Crow Wing County also uses Facebook and Twitter, and a webpage for Emergency Alerts, which has an option for property owners to sign up and get those alerts through texts or emails. Crow Wing County has a good relationship with the local media, which includes the newspapers, local TV, radio stations and NWS (National Weather Service), all of which assist in reaching the public with critical information.

*Emergency Operations Plan (EOP)* – Crow Wing County has an EOP, which includes all of the county departments as well as city officials and emergency organizations. The plan is organized to assist with the responsibilities and assignments during any type of emergency.

*Burning Permits/Restrictions* – Regulation of open burning and the use of burning permits has been an important tool in preventing wildfire in Minnesota. Burning permits are required by the MN DNR when the ground is not snow-covered. Permits can be obtained from MN DNR Forestry offices, local hardware stores and some gas stations within the county. When risk of wildfire is very high, burning is not permitted.

*Fire Prevention Week* – In October of each year, local fire departments go to their respective schools and discuss safety, education, and procedures on how to prevent and/or escape fires. Many of the departments host open houses for individuals and families to come in and see their equipment.

*Cuyuna Range Fire Chiefs Mutual Aid Agreement* – All fire departments in Crow Wing County along with departments from Cass, Morrison and Aitkin Counties have mutual aid agreements for All-Hazard response, which includes fighting wildfires.

## Program Gaps or Deficiencies

*Community Wildfire Protection Plan (CWPP)* – Crow Wing County does not have a CWPP in place. A CWPP provides a collaborative effort for the identification of areas at risk for wildfire and mitigation strategies to implement by the community and homeowner.

*Firewise Program Activities* – Crow Wing County has started a Firewise Program with the MN DNR and has completed Level I Assessments for all of the Crow Wing County Fire Departments. The county and local fire departments can do more to participate in the MN DNR's Firewise program, which can assist with school outreach, homeowner education and training for creation of defensible space, provide guidance on CWPP development, installation of dry hydrants, and more.

### 4.4.11 Landslides and Soil Erosion

Erosion is the wearing away of land, such as the loss of a riverbank, beach, shoreline, or dune material. It is measured as the rate of change in the position or displacement of a riverbank or shoreline over a period of time. Short-term erosion typically results from periodic natural events, such as flooding, hurricanes, storm surges, and windstorms, but may be intensified by human activities. Long-term erosion is a result of multi-year impacts such as repetitive flooding, wave action, sea level rise, sediment loss,

subsidence, and climate change. Death and injury are not typically associated with erosion; however, it can destroy buildings and infrastructure (FEMA, 2013).

The movement of a mass of rock, debris, or earth down a slope by the force of gravity is considered a landslide. They occur when the slope or soil stability changes from stable to unstable, which may be caused by earthquakes, storms, volcanic eruptions, erosion, fire, or additional human-induced activities. Slopes greater than 10 degrees are more likely to slide, as are slopes where the height from the top of the slope to its toe is greater than 40 feet. Slopes are also more likely to fail if vegetative cover is low and/or soil water content is high. Potential impacts include environmental disturbance, property and infrastructure damage, and injuries or fatalities (FEMA, 2013).

### Soil Erosion/Landslides History in Crow Wing County

Road damage and erosion occurred with the flooding event in July 2012 in Crow Wing County. Soils were saturated from prolonged and heavy rains that totaled nearly 9" around Brainerd.

A 500-year rainfall event on June 20<sup>th</sup> 2012, caused the Mississippi River to exceed the previous record crest stage by nearly a foot and reach 17.61 feet by June 28<sup>th</sup>. This caused bank erosion and erosion to proximal parks, roadways and neighborhood facilities.

### Soil Erosion/Landslides and Climate Change

The increased magnitude and frequency of flooding events and storm activity that may result from climate change may in turn increase the risk of soil erosion and landslides. According to University of Washington geologist Dave Montgomery, "If the climate changes in a way that we get a lot more rainfall you would expect to see a lot more landslides" (Phillips, 2014).

In Minnesota, the wettest days are getting wetter. This can contribute to increased erosion in many locations due to flooding and saturation of soils. Reduced ice cover on lakes and shorelines (due to warmer temperatures) could potentially expose shorelines to increased erosion or damage during weather events when they previously may have been covered with ice (National Climate Assessment Development Advisory Committee, 2013).

According to the 2014 National Climate Assessment, "Increased precipitation intensity also increases erosion, damaging ecosystems and increasing delivery of sediment and subsequent loss of reservoir storage capacity" (Pryor, et al., 2014).

### Vulnerability

SSURGO Soil erodibility data was not available for Crow Wing County. According to geomorphology data originating from the UMD Geology Department, MN Geological Survey, and MN DNR, there are no areas in Crow Wing County with steep topographic expression. Most of the county is classified as either level, rolling to undulating, or hummocky (see Figure A - 27).

The vulnerability of each jurisdiction to soil erosion and landslides has not changed due to any development in the last 5 years.

## Plans and Programs in Place

*Crow Wing County Soil and Water Conservation District (SWCD) Programs* – The Crow Wing County SWCD works to provide training and education to the public and private property owners on mitigation measures for shoreline erosion and keeping water bodies healthy. The SWCD has a presence at the County Fair and has partnered with other state agencies such as the MPCA and MN DNR to provide important regional soil & water education programs. The SWCD also offers on-site visits and technical assistance to landowners in areas such as stormwater landscaping, shoreline restoration, wetland regulation, stormwater plan review, forest stewardship planning, shoreline erosion and grants.

If there is a natural disaster (i.e., flood, major drought or other issues) the SWCD is able to get state and federal dollars to assist landowners with engineering and mitigation from the natural disaster. The SWCD also works with an engineer that specializes in conservation practices.

## Program Gaps or Deficiencies

No program gaps or deficiencies have been identified.

### 4.4.12 Dam Failure

Dams are structures that retain or detain water behind a large barrier. When full or partially full, the difference in elevation between the water above the dam and below creates large amounts of potential energy, allowing the chance for failure. Dams can fail due to either 1) water heights or flows above the capacity for which the structure was designed; or 2) deficiencies in the structure such that it cannot hold back the potential energy of the water. If a dam fails, issues of primary concern include loss of human life/injury, downstream property damage, lifeline disruption (transportation routes and utility lines required to maintain or protect life), and environmental damage. Dams require constant monitoring and regular maintenance to insure their integrity.

### Dam Failure History in Crow Wing County

Table 26 below summarizes data on Crow Wing County's dams based on data from the National Inventory of Dams. They are also mapped in Figure 21 based on data from the MN DNR. According to the National Inventory of Dams, the following dams have Emergency Action Plans: Brainerd Dam, Pine River Dam and Pine River Dikes 13 & 14. Another dam that could impact Crow Wing County is the Sylvan Dam in neighboring Cass County. The dam is located in Pillager, MN, and owned by Minnesota Power.

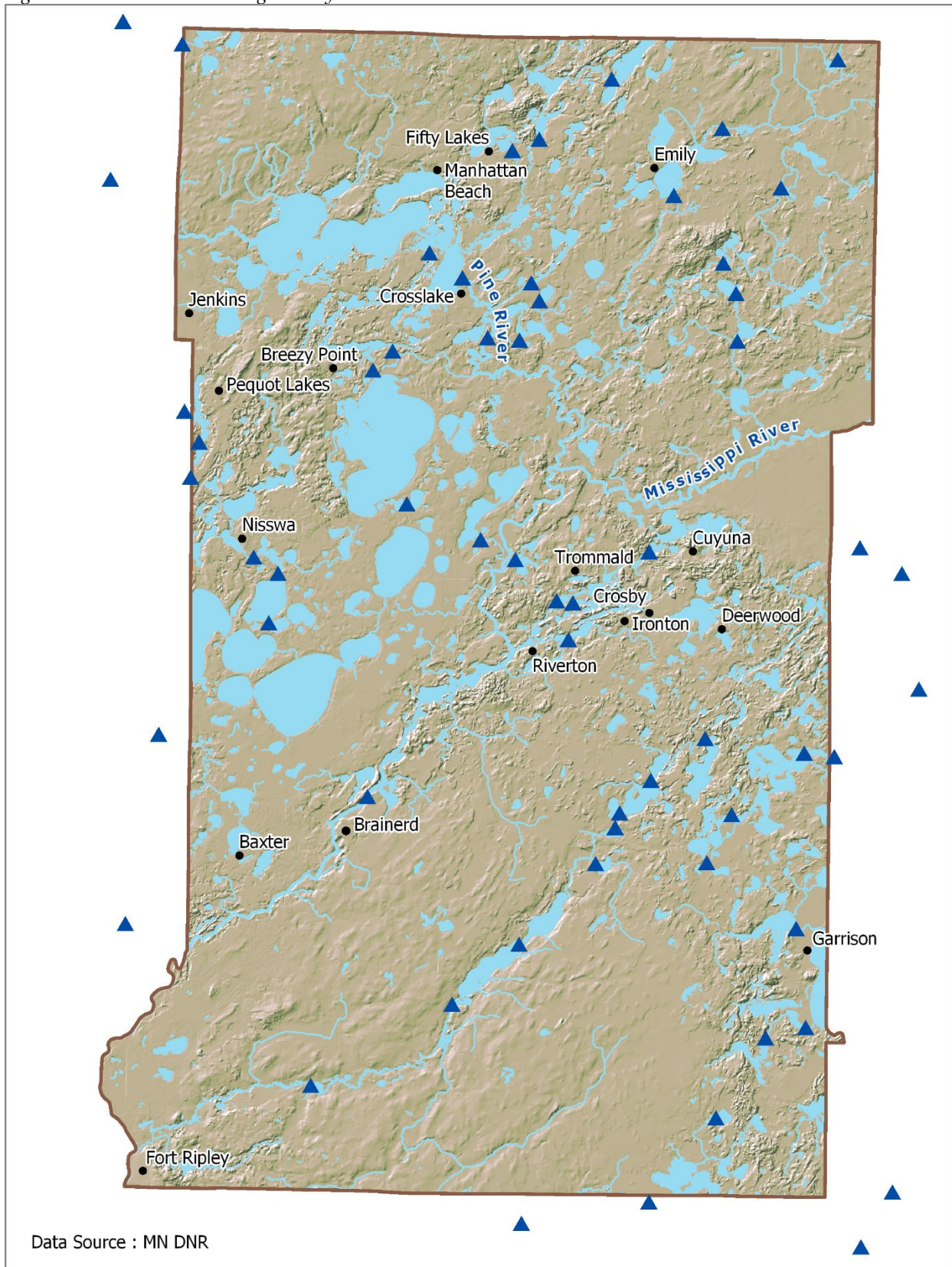
According to the USACE National Levee Database, there is one levee in Crow Wing County on Black Bear – Miller Lake. It was built in 1987 and is .08 miles in length.

Table 26. Dam Data for Crow Wing County (National Inventory of Dams)

Name	Owner	River	Primary Purpose	Year Built	NID Height	Dam Type
Big Pine Lake (Rock Dam)	Crow Wing County	Pine River	Recreation	1970	9'	Rockfill
Blackbear Lake	MN DNR – EWR	Mississippi River tributary	Other	1936	8'	Gravity

Name	Owner	River	Primary Purpose	Year Built	NID Height	Dam Type
Brainerd Hydroelectric Dam	Wausau Paper Printing & Writing, LLC	Mississippi River	Hydroelectric	1888	21'	N/A
Eagle Lake	MN DNR	Daggett Brook	Other	1936	8'	Gravity
Emily Lake	City of Emily	Little Pine River	Other	1939	11'	Gravity
Hawthorne (Nokay Lake)	Bower Hawthorn	Nokasippi River	Other	1966	8'	Earth
Little Pine Creek	Little Pine Company	Little Pine River	Other	1972	8'	Earth
Ossawinnamakee Lake (Pelican Brook)	MN DNR – Trails	Pelican Brook	Other	1937	10'	Gravity
Pelican Lake	Crow Wing County	Pelican Brook tributary	Other	1938	8'	Gravity
Perkins Pond	Richard Perkins	Daggett Brook	Fire Protection, Stock, or Small Fish Pond	1975	10'	Earth
Pine River Dam (Pine River Reservoir, Crosslake Corps of Engineers Dam)	CEMVP	Pine River	Fish and Wildlife Pond	1886	23'	Earth
Pine River Dikes 13 & 14 (Pine River Reservoir)	CEMVP	Pine River	Fish and Wildlife Pond	N/A	23'	N/A
Rogers Lake	MN DNR	N/A	N/A	1938	8'	N/A
Roosevelt Lake	MN DNR	Crooked Creek	Other	1936	8'	Gravity
Sibley Lake	MN DNR	Mayo Creek tributary	Other	1937	8'	Gravity
Velvet Lake (Phelps Lake)	MN DNR - Forestry	Pine River	Other	1937	8'	Gravity

Figure 21. Dams in Crow Wing County





## Dam Failure and Climate Change

Dams are designed based on assumptions about a river's annual flow behavior that will determine the volume of water behind the dam and flowing through the dam at any one time. Changes in weather patterns due to climate change may change the expected flow pattern. It is conceivable that bigger rainfalls at earlier times in the year could threaten a dam's designed margin of safety, causing dam operators to release greater volumes of water earlier in a storm cycle in order to maintain the required margins of safety. Such early releases of increased volumes can increase flood potential downstream.

While climate change will not increase the probability of catastrophic dam failure, it may increase the probability of design failures. Minnesota had a dam failure due to a large storm event in June 2012. The Forebay canal in Carlton County had operated as designed for nearly 100 years. The intensity of the 2012 rain event caused a failure of the canal wall which caused significant damage. Climate change is adding a new level of uncertainty that needs to be considered with respect to assumptions made during dam construction.

## Vulnerability

Areas most susceptible to the effects of dam failure are the populated places downstream from a dam location. The vulnerability of each jurisdiction to dam failure has not changed due to any development in the last 5 years.

## Plans and Programs in Place

*Public Information and Warning* – Crow Wing County can send out emergency messages and notifications through DLAN (our EOC software) via IPAWS to the public during emergencies in a timely manner. This can be area-specific if needed. Crow Wing County has an agreement through the local Hubbard Broadcasting radio station to send emergency notifications out immediately across a number of radio stations. Crow Wing County also uses Facebook and Twitter, and a webpage for emergency alerts, which has an option for property owners to sign up and get those alerts through texts or emails. Crow Wing County has a good relationship with the local media, which includes the newspapers, local TV, radio stations and NWS (National Weather Service), all of which assist in reaching the public with critical information.

*Emergency Operations Plan (EOP)* – Crow Wing County has an EOP, which includes all of the county departments as well as city officials and emergency organizations. The plan is organized to assist with the responsibilities and assignments during any type of emergency.

*Federal Emergency Management Agency (FEMA) National Dam Safety Program* – For 30 years, the federal government has used the National Dam Safety Program (NDSP) to protect Americans from dam failure. The NDSP is a partnership of states, federal agencies, and other stakeholders that encourages individual and community responsibility for dam safety. The NDSP is intended to help states bring the necessary resources to bear on inspection, classification, and emergency planning for dam safety.

*National Inventory of Dams (NID)* – The NID is a database managed by the Army Corps of Engineers. The NID is used to track information on the nation's water control infrastructure. Information from the NID is used in the development of water resource management, land use management, floodplain management, risk management and emergency action planning.

*Minnesota Department of Natural Resources, Division of Waters – Dam Safety Program* – The MN DNR Dam Safety Program and current dam safety regulations require the safe design, construction, operation, and maintenance of dams in Minnesota. The state program includes review of design plans and plans for proposed dams, safety inspections of existing dams, and repair of dams. The Dam Safety Program keeps a file on all dams that are subject to state dam safety regulations or have had information or reports generated on them for another purpose. A typical file contains construction plans, photos, inspection reports, and correspondence.

*U.S. Army Corps of Engineers* – The U.S. Army Corps of Engineers has plans in place for terroristic acts against the dams and flood control projects in the county.

#### **Program Gaps or Deficiencies**

No program gaps or deficiencies have been identified.

DRAFT

## Section 5 – Mitigation Strategy

The goal of mitigation is to protect lives and reduce the future impacts of hazards including property damage, disruption to local and regional economies, the amount of public and private funds spent to assist with recovery, and to build disaster-resistant communities. Mitigation actions and projects should be based on a well-constructed risk assessment, provided in Section 4 of this plan. Mitigation should be an ongoing process adapting over time to accommodate a community's needs.

### 5.1 Community Capability Assessments

The capability assessment identifies current activities used to mitigate hazards. The capability assessment identifies the policies, regulations, procedures, programs, and projects that contribute to the lessening of disaster damages. The assessment also provides an evaluation of these capabilities to determine whether the activities can be improved in order to more effectively reduce the impact of future hazards. The following sections identify existing plans and mitigation capabilities within all of the communities.

Appendix J lists the plans and programs in place in Crow Wing County as related to hazard mitigation. As part of the Crow Wing County MHMP update, the County, its cities, and townships were asked to participate in filling out a “Local Mitigation Capabilities Assessment” (LMCA) form to report on their current mitigation capabilities and program gaps. Appendix K lists the LMCA reports gathered for Crow Wing County.

#### 5.1.1 National Flood Insurance Program (NFIP)

The NFIP is a federal program created by Congress to mitigate future flood losses nationwide through sound, community-enforced building and zoning ordinances and to provide access to affordable, federally-backed flood insurance protection for property owners. The NFIP is designed to provide an insurance alternative to disaster assistance to meet the escalating costs of repairing damage to buildings and their contents caused by floods. Participation in the NFIP is based on an agreement between local communities and the federal government that states that if a community will adopt and enforce a floodplain management ordinance to reduce future flood risks to new construction in Special Flood Hazard Areas (SFHAs), the federal government will make flood insurance available within the community as a financial protection against flood losses.

Table 27 below shows which jurisdictions in Crow Wing County participate in the National Flood Insurance Program (NFIP).

Table 27. NFIP Participation in Crow Wing County

Jurisdiction Name	NFIP y/n	FEMA Mapped High-Risk Areas
Baxter	Yes	Yes
Brainerd	Yes	Yes
Breezy Point	Yes	Not currently but there are areas on preliminary new maps
Crosby	Yes	Yes
Crosslake	Yes	Yes

Jurisdiction Name	NFIP y/n	FEMA Mapped High-Risk Areas
Cuyuna	No	Not currently but there are areas on preliminary new maps
Deerwood	No	Not currently but there are areas on preliminary new maps
Emily	No	Not currently but there are areas on preliminary new maps
Fifty Lakes	Yes	Not currently but there are areas on preliminary new maps
Fort Ripley	Yes	Yes
Garrison	No	Not currently but there are areas on preliminary new maps
Ironton	No	Not currently but there are areas on preliminary new maps
Jenkins	No	Yes
Manhattan Beach	No	Not currently but there are areas on preliminary new maps
Nisswa	Yes	Not currently but there are areas on preliminary new maps
Pequot Lakes	No	Not currently but there are areas on preliminary new maps
Riverton	Yes	Yes
Trommald	No	Not currently but there are areas on preliminary new maps

MN DNR NFIP data current as of 7/16/2017

Repetitive loss properties are defined as properties that have had 2 or more flood insurance claims of \$1,000 or more in any rolling 10-year period. Property owners are asked to consider mitigation activities such as acquisition, relocation, or elevation, among other options. FEMA's Repetitive Loss (RL) properties strategy is to eliminate or reduce the damage to property and the disruption to life caused by repeated flooding of the same properties. Property owners are notified of their status by FEMA. However, there are no repetitive loss properties within Crow Wing County.

For more on the areas that flood repeatedly in Crow Wing County, see section 4.4.5 *Flash Flood and Riverine Flood*.

### 5.1.2 Plans and Ordinances

Crow Wing County and its incorporated communities have a number of plans and ordinances in place to ensure the safety of residents and the effective operation of communities, including a Zoning Ordinance, Floodplain Ordinance, Emergency Operations Plan, Capital Improvements Plan, and Stormwater Management Plan. In Section 4.4 of this plan (*Hazard Profiles*) a review of the plans and

programs in place was included as related to each of the hazards addressed in the plan. See Appendix J for a list of all plans and programs in place in Crow Wing County, and Appendix K for the local mitigation capabilities assessment reports.

## 5.2 Mitigation Goals

In Section 4.0 of this plan, the risk assessment identified Crow Wing County as prone to a number of natural hazards. The steering committee members understand that although hazards cannot be eliminated altogether, Crow Wing County can work toward building disaster-resistant communities.

The goals and strategies being developed for the 2019 Minnesota State Hazard Mitigation Plan for natural hazards were adopted for use in the Crow Wing County Plan (Table 28). This framework will allow for integration of the mitigation actions that are listed by Crow Wing County and its jurisdictions into the state plan. The state will then be able to develop a statewide strategy that will benefit all of Minnesota.

Table 28. Goals that will be used in the 2019 Minnesota State Hazard Mitigation Plan

<b>Flooding Goal:</b> Reduce deaths, injuries, property loss and economic disruption due to all types of flooding (riverine, flash flooding, dam/levee failure)
<b>Wildfire Goal:</b> Reduce deaths, injuries, property loss, natural resource and economic disruption due to wildfire (forest, prairie, grass, and peat bogs).
<b>Windstorms Goal:</b> Reduce deaths, injuries, property loss, and economic disruption due to windstorms.
<b>Severe Winter Storms Goal:</b> Reduce deaths, injuries, property loss, and economic disruption due to severe winter storms (blizzard, ice, and ice storm).
<b>Lightning Goal:</b> Reduce deaths, injuries, property losses, loss of services, and economic disruption due to lightning.
<b>Tornado Goal:</b> Reduce deaths, injuries, property loss, and economic disruption due to tornadoes.
<b>Drought Goal:</b> Reduce economic loss and environmental impacts due to drought
<b>Extreme Heat Goal:</b> Reduce deaths, injuries, and economic disruption due to extreme heat.
<b>Extreme Cold Goal:</b> Reduce deaths, injuries, property loss, and economic disruption due to extreme cold.
<b>Landslide/Erosion Goal:</b> Reduce deaths, injuries, property loss, and economic disruption due to landslides and erosion.

## 5.3 Mitigation Actions and Project Strategies

The mitigation actions in this plan are summarized into 4 main strategy types, as described in the FEMA publications *Local Mitigation Planning Handbook* (2013) and *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards* (2013). Also included are the new FEMA Climate Resilient Mitigation Actions (CRMA) released in 2016. Minnesota HSEM recommends the use of these mitigation strategies to be in alignment with the state plan and those recommended by FEMA. A fifth strategy type was determined by Minnesota HSEM for use within the state. They are listed in Table 29 below:

Table 29. Mitigation Strategies and Action Types

Mitigation Strategy	Description	Example Mitigation Actions
Local Plans and Regulations	These actions include government authorities, policies, or codes, that influence the way land and buildings are developed and built.	<ul style="list-style-type: none"> <li>• Comprehensive plans</li> <li>• Land use ordinances</li> <li>• Planning and Zoning</li> <li>• Building Codes and Enforcement</li> <li>• Floodplain ordinance</li> <li>• NFIP Community Rating System</li> <li>• Capital improvement programs</li> <li>• Open space preservation</li> <li>• Shoreline codes</li> <li>• Stormwater management regulations and master plans</li> </ul>
Structure and Infrastructure Projects	<p>These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure.</p> <p>This type of action also involves projects to construct manmade structures to reduce the impact of hazards.</p> <p>Many of these types of actions are projects eligible for funding through the FEMA Hazard Mitigation Assistance program.</p>	<ul style="list-style-type: none"> <li>• Acquisitions and elevations of structures in flood prone areas</li> <li>• Utility undergrounding</li> <li>• Structural retrofits</li> <li>• Floodwalls and retaining walls</li> <li>• Detention and retention structures</li> <li>• Culverts</li> <li>• Safe rooms</li> </ul>
Natural Systems Protection	These are actions that minimize damage and losses and also preserve or restore the functions of natural systems.	<ul style="list-style-type: none"> <li>• Sediment and erosion control</li> <li>• Stream corridor restoration</li> <li>• Forest management</li> <li>• Conservation easements</li> <li>• Wetland restoration and preservation</li> </ul>
Education and Awareness Programs	These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady or Firewise Communities. Although this type of mitigation reduces risk less directly than structural projects or regulation, it is an important foundation. A greater understanding and awareness of hazards and risk among local officials, stakeholders, and the public is more likely to lead to direct actions.	<ul style="list-style-type: none"> <li>• Radio or television spots</li> <li>• Websites with maps and information</li> <li>• Real estate disclosure</li> <li>• Presentations to school groups or neighborhood organizations</li> <li>• Mailings to residents in hazard-prone areas.</li> <li>• StormReady</li> <li>• Firewise Communities</li> </ul>

Mitigation Strategy	Description	Example Mitigation Actions
Mitigation Preparedness and Response	This is a State of Minnesota mitigation strategy with the intent of covering preparation and actions that protect life and property during a natural disaster.	<ul style="list-style-type: none"> <li>• Emergency operations plan</li> <li>• Flood fight plans and preparedness</li> <li>• Dam emergency action plans</li> <li>• Warning</li> <li>• Backup power</li> <li>• Emergency capabilities</li> </ul>

In the review and discussion of selected mitigation strategies and actions, steering committee members were asked to consider the ranking of mitigation actions by priority for implementation. Guidance for ranking mitigation activities is drawn from FEMA evaluation criteria. The evaluation criteria (STAPLE+E) included the following categories and questions:

**Social:**

- Will the proposed action adversely affect one segment of the population?
- Will the action disrupt established neighborhoods, break up voting districts, or cause the relocation of lower income people?

**Technical:**

- How effective is the action in avoiding or reducing future losses?
- Will it create more problems than it solves?
- Does it solve the problem or only a symptom?
- Does the mitigation strategy address continued compliance with the NFIP?

**Administrative:**

- Does the jurisdiction have the capability (staff, technical experts, and/or funding) to implement the action, or can it be readily obtained?
- Can the community provide the necessary maintenance?
- Can it be accomplished in a timely manner?

**Political:**

- Is there political support to implement and maintain this action?
- Is there a local champion willing to help see the action to completion?
- Is there enough public support to ensure the success of the action?
- How can the mitigation objectives be accomplished at the lowest cost to the public?

**Legal:**

- Does the community have the authority to implement the proposed action?
- Are the proper laws, ordinances, and resolutions in place to implement the action?
- Are there any potential legal consequences?
- Is there any potential community liability?
- Is the action likely to be challenged by those who may be negatively affected?

- Does the mitigation strategy address continued compliance with the NFIP?

**Economic:**

- Are there currently sources of funds that can be used to implement the action?
- What benefits will the action provide?
- Does the cost seem reasonable for the size of the problem and likely benefits?
- What burden will be placed on the tax base or local economy to implement this action?
- Does the action contribute to other community economic goals such as capital improvements or economic development?
- What proposed actions should be considered but be “tabled” for implementation until outside sources of funding are available?

**Environmental:**

- How will this action affect the environment (land, water, endangered species)?
- Will this action comply with local, state, and federal environmental laws and regulations?
- Is the action consistent with community environmental goals?

**5.3.1 Hazard Mitigation Actions**

Crow Wing County and its included municipalities share a common Multi-Hazard Mitigation Plan and worked closely to develop it. Local leaders work together with the Crow Wing County Emergency Management Director to assure that the hazards and mitigation actions included in this plan are accurate and addressed in their jurisdictions. The jurisdictions responsible for each action are: Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lake, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, Trommald and Crow Wing County.

Table 31 lists all mitigation actions for Crow Wing County and its jurisdictions. Appendix G contains separate mitigation action tables for each jurisdiction. Each of these mitigation action charts detail the hazard, the mitigation strategy and action to address it, the priority ranking for implementation (1 = High Priority; 2 = Moderate Priority; 3 = Low Priority, see Table 30), its current stage of implementation, the timeframe for implementation going forward, the jurisdictions who have identified they will work to implement the action, the responsible parties to carry through with implementation, and comments on how the plan will be implemented through existing planning mechanisms and potential funding to make implementation happen.

*Table 30. Criteria for Mitigation Action Priority Ranking*

Ranking	Criteria
High Priority (1)	<ul style="list-style-type: none"> <li>• Methods for reducing risk from the hazard are technically reliable.</li> <li>• The County has experience in implementing mitigation measures.</li> <li>• Mitigation measures are eligible under federal grant programs.</li> <li>• There are multiple mitigation measures for the hazard.</li> <li>• The mitigation measure(s) are known to be cost effective.</li> <li>• The mitigation measures protect lives and property for a long period of time, or are permanent risk reduction solutions.</li> </ul>



Ranking	Criteria
Moderate Priority (2)	<ul style="list-style-type: none"> <li>• Mitigation methods are established.</li> <li>• The County has limited experience with the kinds of measures that may be appropriate to mitigate the hazard.</li> <li>• Some mitigation measures are eligible for federal grants.</li> <li>• There is a limited range of effective mitigation measures for the hazard.</li> <li>• Mitigation measures are cost-effective only in limited circumstances.</li> <li>• Mitigation measures are effective for a reasonable period of time.</li> </ul>
Low Priority (3)	<ul style="list-style-type: none"> <li>• Methods for reducing risk from the hazard are not well-established, are not proven reliable, or are experimental.</li> <li>• The State or Counties have little or no experience in implementing mitigation measures, and/or no technical knowledge of them.</li> <li>• Mitigation measures are ineligible under federal grant programs.</li> <li>• There is a very limited range of mitigation measures for the hazard, usually only one feasible alternative.</li> <li>• The mitigation measure(s) have not been proven cost effective and are likely to be very expensive compared to the magnitude of the hazard.</li> <li>• The long-term effectiveness of the measure is not known, or is known to be relatively poor.</li> </ul>

Mitigation actions that have been completed or deleted from the 2011 Crow Wing County Multi Hazard Mitigation Plan are identified and reported on in Appendix H. Completed and deleted mitigation actions are not carried over into the updated mitigation action chart.

In addition to ranking the hazard mitigation actions using STAPLE+E, the steering committee also reports on the status of the mitigation action. Completed and deleted mitigation actions are denoted in Appendix H. Ongoing mitigation actions from the initial review were incorporated into annual reviews by the mitigation team. The status designations are:

- New – New actions that have been identified since the last plan
- Ongoing – Actions from the last plan that require continuing application
- In Progress – Actions from the last plan that are currently being acted upon

The mitigation types are defined as follows:

- Local Planning and Regulations
- Structure and Infrastructure Projects
- Natural Systems Protection
- Education and Awareness Programs
- Mitigation Preparedness and Response Support

Table 31. All Mitigation Actions for Crow Wing County

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time - frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
1	All-Hazards	Education & Awareness Programs	Work to ensure that all Crow Wing County residents are aware of and sign-up for the County's Emergency Warning System (EWS).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CW Emergency Management in coordination with local city government	The CWC Emergency Management Program regularly promotes sign-up for the EWS system via the County EM Facebook Page and during in-person events. Cities also work to promote sign-up by local residents by sharing information on city websites and announcements at public meetings.	County/City Budgets
2	All-Hazards	Local Planning & Regulations / Mitigation Preparedness and Response Support	Continue to upgrade and improve the County's Emergency Warning Systems.	Ongoing	High	2017-2021	Crow Wing County	CW Emergency Management	Improvement to EWS system has been made with the ability to send alerts out via the county web page, Facebook, Twitter and IPAWS through our DLAN software. CWC continues to address advanced warning for areas of First Assessment District (unorganized area north of Brainerd/Baxter).	County Budget
3	All-Hazards	Local Planning & Regulations	Continue to update the Crow Wing County Emergency Operation Plan and encourage cities to develop & update local-level EOPs.	Ongoing	High	2017-2021	Crow Wing County	CW Emergency Management	The CWC EOP is updated on an annual basis to address new HSEM MNWALK requirements.	County Budget
4	All-Hazards	Mitigation Preparedness & Response Support	Ensure that the Crow Wing County Emergency Operations Center (EOC) and facilities designated as mass care shelters are prepared to be fully functional.	Ongoing	High	2017-2021	Crow Wing County	CWC Emergency Management in coordination with city EM's.	Preparing supplies and other resources to ensure the readiness of our County EOC and shelters is an ongoing effort we work to address (i.e., backup power, data, HVAC, water/sewer). Cities are also encouraged to maintain the readiness of their local EOCs and ability to coordinate with CWC Emergency Mgmt.	County Funding

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time - frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
5	All-Hazards	Education & Awareness Programs	Promote education & awareness of severe weather and personal emergency preparedness for individuals, families, and businesses.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in coordination with city EM's.	CWC Emergency Management participates annually in the National Weather Service's spring and winter Severe Weather Awareness Weeks in April and November. We provide posters, brochures, and material on severe storms to the media and to property owners. Social media is also used to distribute the information. Local cities are encouraged to participate and share this information through their own local channels such as Facebook and city websites.	County/City Budgets
6	Severe Winter Storms	Education & Awareness Programs	Provide winter-specific preparedness information to homeowners and the public regarding personal safety precautions to protect life safety during severe winter storm events (i.e., blizzards, ice storms).	Ongoing	High	2017-2021	Crow Wing County	CWC Emergency Management in coordination with local city EM's.	During Winter Weather Awareness week and throughout the winter CWC Emergency Management provides information on winter storm preparedness to residents, businesses, and to property owners (i.e., furnace inspections, emergency car kits, and safe winter driving techniques.) Social media, TV, radio and newspaper are used to distribute the information. Local cities are encouraged to help distribution information through their own channels.	County Budget
7	Severe Winter Storms	Education & Awareness Programs	Provide information to property owners on building materials and practices that increase structural safety, and increase energy conservation in cold weather conditions.	Ongoing	High	2017-2021	Crow Wing County	CWC Land Services Dept. in coordination with City Public Works.	Homeowners are reminded to practice maintenance of their furnaces, and landowners with Individual Septic Treatment Systems are informed on ways to protect their systems from extreme cold.	County Budget

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time - frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
8	Severe Winter Storms	Natural Systems Protection	Encourage the planting of "Living Snow Fences" (trees and other vegetation) or the placement of other snow fences along roadways to help prevent blowing and drifting snow onto key transportation routes.	Ongoing	Low	2017 - 2021	Crow Wing County	CWC Highway Dept., SWCD, CWC Land Service Dept. in coordination with MnDOT and local cities road authorities	The planting of trees and natural vegetation is encouraged in areas of new development to minimize large snow accumulation to adjacent roads. CWC Highway Dept. has identified areas on CSAH 1, CSAH 12, CSAH 21, CSAH 16 & CR 131 to install living snow fence to reduce drifting snow.	NRCS (Federal funds), MNDot (State funds)
9	Severe Winter Storms	Local Planning & Regulations	Continue providing snow removal, salting, and sanding to minimize the impacts of snow accumulations on motorists.	Ongoing	High	2017 - 2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept. in coordination with local cities	This is a standing effort of the CWC Highway Dept. and local City Public Works.	County/City Budgets
10	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Identify critical facilities or infrastructure that do not have backup power in the event of a major power outage resulting from severe winter or summer storms. <i>(Critical facilities may include police/fire departments, EOC, health care facilities, water &amp; sewer treatment facilities, and other facilities deemed as critical, i.e. public schools and sheltering facilities).</i>	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, City Admin & Public Works	Not all county & city government buildings and schools have backup power generators to ensure energy in the event of a severe power outage. CWC and each jurisdiction will work to identify their respective critical facilities that should have backup power.	County/City Budgets

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time - frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
11	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Purchase and install generator hook-ups and encourage local generator purchases for identified critical facilities that require backup power.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Emergency Management, City Admin & Public Works	CWC, local city governments, and schools will evaluate feasibility to purchase and install generators for key facilities, and will do so as funding allows.	County/City Budgets, <b>Possible FEMA HMA 5% Initiative Funding for Generators</b>
12	Severe Winter & Summer Storms	Structure and Infrastructure Projects	Work with rural electrical and municipal coops to identify and address mitigation measures for above ground power lines that are susceptible to damage from severe winter or summer storms in order to reduce potential power outages.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Emily Cooperative Telephone Company, Crow Wing Power Cooperative, Mille Lacs Energy Cooperative, Brainerd Public Utilities, and Consolidated Telephone Company (CTC) in cooperation with local cities	Loss of power due to extreme storm events in the County creates long outage times and costly repairs. There has been overhead power disruption in hard-hit areas of trees. There is a wind "tunnel" from Gull Lake in the Round Lake Area of CR 115. The County and cities will work with local utilities as needed. BCA studies will be conducted for potential project areas to see where underground wires are possible.	Rural or Municipal Electric Coop Funding, <b>Possible FEMA HMA funding for Infrastructure Retrofit</b>
13	Severe Winter & Summer Storms	Local Planning & Regulations	Promote inspection and trimming of trees that may pose risk to falling on power lines during severe storm events.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Same as above.	Tree management in the right-of-way of roads is addressed by our CWC Highway Dept. and/or City Public Works and Utility Companies.	County/City Budgets

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time - frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
14	Severe Winter & Summer Storms	Education & Awareness Programs	Promote the use of NOAA weather radios as a key communications resource for residents, businesses, and facilities that house vulnerable populations (i.e., nursing homes, group homes, senior centers, and day care facilities).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management and local city EM's	This is an ongoing effort of emergency management programs at the county and local city level. We promote weather radios through PSA's, County Fair, National Night Out, NWS Severe Weather Awareness Weeks and through social media. CWC also continues to work with local vendors and State programs for rebates on NOAA Weather radios.	County/City Budgets
15	Severe Summer Storms	Mitigation Preparedness & Response Support	Provide/participate in the National Weather Service's SKYWARN "Storm Spotter" training in various parts of the County for first responders and community residents.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in collaboration with local cities and NWS	Each year CWC Emergency Management works with the National Weather Service to provide this training to local fire departments and local community volunteers. We will continue to encourage more volunteers to become active in the severe storm spotters network. Local cities will continue to remain active in this program.	County Budget and NWS funding to deliver program
16	Severe Summer Storms	Structure and Infrastructure Projects	Identify areas where vulnerable populations are susceptible to tornadoes or extreme wind events (i.e. schools, campgrounds, or mobile home parks) and evaluate for construction or retrofit of safe rooms or storm shelters.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	CWC Emergency Management continues to work with local cities that have experienced severe wind damage and recreational facilities on development of storm shelter areas. We are aware that there are two mobile home parks and the Crow Wing County Fairgrounds have been identified for having a need of a storm shelter or safe room.	County/City Budgets

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time - frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
17	Severe Summer Storms	Structure and Infrastructure Projects	Implement construction or retrofit projects for safe rooms or storm shelters in identified vulnerable locations.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	Any community safe room projects that the County is involved in will be part of the CWC Emergency Management program. FEMA grant funding may be sought to support an eligible safe room project.	County/City Budgets, <b>Possible FEMA HMA funding for Safe Room Construction</b>
18	Severe Summer Storms	Local Planning & Regulations / Mitigation Preparedness and Response Support	Ensure that plans are in place for mass care sheltering and designated shelter facilities are established throughout the County.	Ongoing	High	2017-2021	Crow Wing County	CWC Emergency Management, CWC Public Health in coordination with local city EM's and the American Red Cross	Crow Wing County has designated shelter facilities that have agreements with the American Red Cross. In addition, the Emergency Operations Plan (EOP) identifies potential shelter sites (primarily schools) for displaced or injured citizens. We encourage all cities to identify and designate community storm shelters.	County Budget
19	Severe Summer Storms	Local Planning & Regulations	Encourage the owners of all manufactured home parks (MHPs) and multiple family dwellings to plan for and establish storm shelters.	Ongoing	High	2017-2021	Crow Wing County	CWC County Emergency Management in collaboration with local cities with MHPs.	The encouragement of the storm shelter construction in all MPHs throughout Crow Wing County and has been made. Almost all of the parks do have storm shelters with the exception of a few that we encourage to build. Due to the seasonal & low-income tenant in the MHPs, the return on investment is not equal to the cost of installation. All MHPs are required by the MN Dept. of Health to have a storm shelter plan in place.	County/MPH Owner Budgets

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time - frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
20	Severe Summer Storms	Mitigation Preparedness and Response Support	Work to improve the coverage of Doppler radar for Crow Wing County.	Ongoing	High	2017-2021	Crow Wing County	CWC Emergency Management	This is an ongoing effort of CWC Emergency Management. Due to the locations of the NWS radars from Crow Wing County, there is a gap and/or deficiency in the predicting our local weather. We experience delays in warnings given out and gaps in the timing of precipitation.	County Budget
21	Severe Summer Storms	Mitigation Preparedness and Response Support	Continue to encourage the cities of Crow Wing County to become a NWS "StormReady" community and provide support to help communities accomplish the requirements for designation.	Ongoing	Moderate	2017-2021	Crow Wing County	CWC Emergency Management	CWC Emergency Management works to encourage all cities to become Storm Ready communities.	County Budget
22	Severe Summer Storms	Mitigation Preparedness & Response Support	Continue to install new or upgrade siren warning systems where needed in the County.	Ongoing	High	2017-2021	Crow Wing County	CWC Emergency Management in coordination with City Admin/Public Works	Crow Wing County has a system of emergency warning sirens throughout the county, which are used to alert residents during severe wind events. New outdoor warning sirens have been installed throughout Crow Wing County in the communities of Baxter, Nisswa, Pequot Lakes, Breezy Point, Emily, Riverton, Ideal Township, and Fairfield Township. The County and cities will continue to address the maintenance, testing, and upgrade of warning sirens as needed.	County Budget, NOAA/NWS Grants, <b>Possible FEMA grant funding through 5% Initiative</b>



#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time - frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
23	Severe Summer Storms	Local Planning & Regulations	Encourage the State of Minnesota to enhance building codes to prevent damage from high winds, including for areas of new development.	Ongoing	Moderate	2017-2021	Crow Wing County	CWC Land Services Dept. in coordination with local municipalities	Although building codes are not enforced by Crow Wing County and many local municipalities, property owners, builders, and developers should continue to be made aware that any construction, reconstruction, alteration, and repair of all structures in the county must be done in accordance with the Minnesota State Building Code. The County's Land Services Department can only issue a permit to the property owner or a state licensed contractor who is required to build to the State building code.	County/City Budgets
24	Severe Summer Storms	Education & Awareness Programs	Recommend the use of windbreaks in all new development where natural or man-made windbreaks do not exist. Recommend a list of building materials capable of handling high winds in areas without natural windbreaks.	Ongoing	High	2017-2021	Crow Wing County	CWC SWCD	This sort of outreach is provided through the SWCD programs with landowners.	SWCD Program Funding
25	Severe Summer Storms	Education & Awareness Programs	Conduct outreach to encourage property owners to take mitigation actions to protect property from severe wind damage.	Ongoing	High	2017-2021	Crow Wing County	CWC Emergency Management, CWC Land Services Dept., and SWCD	During severe weather awareness week and throughout the summer we provide information on severe storms to the media and to property owners. Social media is also used to distribute the information and can be found on the CWC webpage. Property owners are encouraged to trim trees near buildings, remove dead and diseased trees, and keep their lakeshore property in a natural state.	County/SWCD Budgets

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time - frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
26	Extreme Temps (Heat / Cold)	Education & Awareness Programs	Provide outreach & education to vulnerable populations in the community (i.e., senior citizens, young adults) on personal safety measures to take during periods of extreme heat / cold.	Ongoing	High	2017-2021	Crow Wing County	CWC Emergency Management / CWC Community Services in collaboration with local cities and schools and local hospitals and clinics	This is done as part of the NWS annual spring and winter severe weather awareness weeks. It is also done during actual periods of extreme temperatures. Information on staying safe during periods of extreme heat or cold is relayed to the public through channels such as Facebook, radio, and local newspapers. Emergency information is provided for emergency services offices and hospitals. All schools work to educate students on the dangers of extreme heat and cold as well.	County/City/ School Budgets
27	Flooding	Local Planning & Regulations / Structure and Infrastructure Projects	Identify and improve potential and historical areas of road washout, and replace aging or failing bridges and culverts that are inadequate in order to reduce future flood damages.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept, CW Land Services Dept., and local city and township public works	Crow Wing County and local jurisdictions maintain an annual inventory of problem areas due to flooding and plan for projects based on priority and available funding. CW County Highway Dept. has identified flood prone problematic areas on CR 105, CR 128, CSAH 11, CR 132, CR 106 & CR 144. In addition, there are bridges that are scour-sensitive and pose a hazard risk during high water. CR 128 has a shoreline improvement plan to reduce the risk of water over the road and erosion of the roadbed during high water.	County, and Township Budgets, <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time - frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
28	Flooding	Local Planning & Regulations	Encourage municipalities to require the development of new storm sewer infrastructure capable of handling a ten to twenty year rain event in areas of new development (i.e., new subdivisions) and adoption of a Stormwater ordinance regulating onsite stormwater management for new construction.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and SWCD in coordination with local City Admin and Public Works.	Facilitate adoption of stormwater ordinance through a series of workshops.	County/City Budgets, SWCD Grants i.e., Serpent Lake Project
29	Flooding	Structure and Infrastructure Projects	Develop stormwater management plans and improve stormwater management systems at the county and city level to address future high-impact rain events throughout the County.	Ongoing	New	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., CWC Highway Dept., CWC GIS, CWC SWCD and local city public works depts., MN DNR, MPCA	The County will seek outside grant funding where possible to fund eligible stormwater improvement projects, such as through MPCA and FEMA HMA funding for flood reduction projects. Local jurisdictions will be responsible for development of local stormwater management plans and identification of priority projects.	County/SWCD Budgets, Possible MPCA/PFA grant funding, <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>
30	Flooding	Local Planning & Regulations	Ensure that wellhead protection plans are in place to address flooding that may lead to contaminated drinking water.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., MN Dept of Health and local city and township public works depts.	Cities work directly with the Minnesota Department of Health on the development or update of wellhead protection plans to ensure they meet State requirements.	MDH Source Water Protection grant funding for wellhead improvement projects

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time - frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
31	Flooding	Local Planning & Regulations	Adopt the 2017 updated floodplain maps for Crow Wing County and ensure the update of local ordinances.	New	High	2017	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Crow Wing County Land Services Dept. and City Admin	Crow Wing County has new maps that will go effective 8/15/2017. Communities participating in the NFIP will update their ordinances and adopt the new maps (and make other updates).	County/City Budgets
32	Flooding	Local Planning & Regulations / Structure & Infrastructure Systems	Address the need for a high-capacity pump at the Black Bear/Miller Lake to reduce flooding to surrounding roads, and ensure there is a levee emergency plan in place.	New	High	2017-2021	Crow Wing County	CWC Highway Dept., CWC Land Services Dept. in coordination with City Public Works	Currently Highway and Black Bear Lake Association have an agreement in place for a vendor to supply pumps when the water reaches a certain height at the levy.	County Budget, <b>Possible FEMA HMA Funding for Localized Flood Mitigation Projects</b>
33	Flooding	Local Planning & Regulations / Structure & Infrastructure Systems	Keep culverts and drainage ditches free of debris to mitigate against over-the-road flooding.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept., CWC Land Services Dept. in coordination with City Public Works	The maintenance of culverts and drainage ditches is done through our CWC Highway Department and City Public Works. We also have Ditch 13 that flows from Lake Edward to North Long Lake. Local municipalities' public works work to monitor and address any problem areas for drainage at the local level.	County/City Budgets
34	Flooding	Local Planning & Regulations	Restrict building in floodplain areas that consistently flood.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and Local City Admin.	This action is the responsibility of the CWC Land Services Department and local city ordinances as per NFIP requirements.	County/City Budgets

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time - frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
35	Flooding	Local Planning & Regulations	Identify properties that experience damage from repetitive flooding, and work with property owners to buy out structures and turn into open-space.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., and local City Admin	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.	County/City Funding, <b>Possible FEMA grant funding for Property Acquisition</b>
36	Flooding	Local Planning & Regulations	Encourage individual landowners who live within floodplain areas to participate in the FEMA National Flood Insurance Program (NFIP).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., MN DNR, local City Admin, and FEMA	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.	County/City Budgets
37	Flooding	Natural Resource Protection	Regularly patrol streams and rivers for beaver dams and remove problem dams to mitigate against localized flood issues.	Ongoing	Moderate	2017-2021	Crow Wing County	CWC Land Services Dept. and Crow Wing County Highway Dept.	Monitoring and removal of problem beaver dams is an annual action carried out by the CWC Land Services Dept., Crow Wing County Highway Dept.	County Budget
38	Flooding	Mitigation Preparedness & Response Support	Maintain sandbags and flood fighting equipment.	Ongoing	High	2017-2021	Crow Wing County	CWC Emergency Management, and CWC Highway Dept.	CWC maintains 10,000 sandbags and flood fighting equipment. Sandbags are stored at the CWC Highway garage.	County Budget
39	Flooding	Education & Awareness Programs	Provide public education on dangers of flash flooding (i.e. Promote "Turn Around, Don't Drown" campaign).	Ongoing	High	2017-2021	Crow Wing County	CWC Emergency Management	During severe weather awareness week and throughout the summer CWC Emergency Management provides information on flash flooding to the media and to property owners. Social media is also used to distribute the information.	County Budget

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time - frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
40	Flooding	Education & Awareness Programs	Provide education and technical assistance to property owners on the application of green infrastructure methods to reduce localized flooding due to high rain events.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and CWC SWCD	This task is done through our CWC Land Services Dept. as well as the SWCD. Possible green-infrastructure projects will be considered for eligible FEMA HMA grant funding.	County Budgets, <b>Possible FEMA HMA funding for 5% Initiative Projects</b>
41	Wildfire	Local Planning & Regulations	Work with the MN DNR to develop a Community Wildfire Protection Plan (CWPP) for high-risk wildfire areas of Crow Wing County.	New	High	2017-2021	Crow Wing County	CWC Emergency Management in coordination with MN DNR and Crow Wing County Fire Chiefs	CWC Emergency Management will discuss development of a CWPP with the MN DNR and evaluate how it can be completed. Crow Wing County does not have a CWPP in place.	MN DNR Firewise Grant Funding
42	Wildfire	Natural Systems Protection	Work with MN DNR to conduct Level-I wildfire risk assessments in areas with significant wildfire potential in the county, specifically around communities at risk.	Ongoing	High	2017-2021	Crow Wing County	CWC Emergency Management in coordination with MN DNR and Crow Wing County local Fire Chiefs	Crow Wing County Fire Departments will continue to work with the MN DNR and communities in high-risk wildfire areas on this effort.	County Budget, MN DNR Firewise Grant Funding
43	Wildfire	Education & Awareness Programs	Promote defensible space education and provide training for property owners that have properties at-risk for wildfire.	Ongoing	High	2017-2021	Crow Wing County	CWC Emergency Management in coordination with MN DNR and Crow Wing County Fire Chiefs	Crow Wing County Fire Departments will continue to work with the MN DNR and communities in high-risk wildfire areas on this effort. Public education is provided through CW Emergency Management, local Fire Departments and MN DNR.	County Budget, MN DNR Firewise Grant Funding, <b>Possible FEMA HMA Grant Funding for Defensible Space</b>

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time - frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
44	Wildfire	Education & Awareness Programs	Continue to enforce burning restrictions when necessary.	Ongoing	High	2017-2021	Crow Wing County	CWC Land Services Dept., MN DNR, and Crow Wing County Fire Chiefs	This action is done through local Fire Departments, MN DNR and Law Enforcement.	County Budget, MN DNR
45	Wildfire	Natural Systems Protection	Continue to conduct controlled burns as necessary to prevent the spread of wildfires.	Ongoing	High	2017-2021	Crow Wing County	CWC Land Services Dept., MN DNR, and Crow Wing County Fire Chiefs	This action is done through local Fire Departments and MN DNR.	County Budget, MN DNR, <b>Possible FEMA HMA Grant Funding for Hazardous Fuels Reduction</b>
46	Wildfire	Local Planning & Regulations	Ensure the strong coordination between local fire departments and associations as well as those from outside areas to provide fire protection, which will reduce the impact of wildfires.	Ongoing	High	2017-2021	Crow Wing County	Crow Wing County Fire Chiefs	This action is done through Cuyuna Range Fire Chief Association, Crow Wing County Fire Chiefs and MN DNR.	Local Fire Department funding
47	Wildfire	Natural Systems Protection	Promote positive forestry management techniques including the removal of dead, dry vegetation and trees, which may ignite as a result of lightning or human-related causes.	Ongoing	High	2017-2021	Crow Wing County	CWC Land Services Dept., MN DNR, and Crow Wing County Fire Chiefs	This action is done through Cuyuna Range Fire Chief Association, Crow Wing County Fire Chiefs, MN DNR, CWC Emergency Management and CWC Land Services Dept.	Local Fire Department funding, MN DNR

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time - frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
48	Wildfire	Natural Systems Protection	Evaluate areas in the county to install dry hydrants to support wildfire suppression.	New	High	2017-2021	Crow Wing County	Emergency Management in coordination with local fire chiefs and MN DNR Forestry	CW County Emergency Management will work in coordination with local fire departments to review water access for fire suppression in rural areas. Where projects may be feasible we will seek to work in coordination with the MN DNR for dry hydrant projects.	Possible MN DNR Firewise Grant funding (50:50 cost share grant)
49	Wildfire	Natural Systems Protection	Evaluate and implement defensible-space measures for homes and structures that are within forested, high-risk wildfire areas, such as installation of external wildfire sprinkler systems and fuels-reduction measures.	New	High	2017-2021	Crow Wing County	Emergency Management in coordination with local fire chiefs and MN DNR Forestry	CW County Emergency Management will work in coordination with local fire departments and MN DNR Forestry to see where high-risk areas in the County may benefit from specific mitigation measures such as sprinklers or wildland fuels reduction.	Possible MN DNR Firewise Grant funding (50:50 cost share grant), <b>Possible FEMA HMA grant for wildfire mitigation</b>
50	Drought	Local Planning & Regulations / Education & Awareness Programs	Promote water conservation measures and fire safety awareness to residents during periods of drought. Enforce water conservation ordinances when needed (i.e., that prohibit watering lawns during drought).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in collaboration with SWCD and local cities	Promoting water conservation during periods of drought is a standing effort of the County and local governments, as well as the USDA and FSA Office.	County/City Budgets
51	Drought	Natural Systems Protection	Work with farmers to encourage crop rotation and planting crops according to water needs.	Ongoing	Low	2017-2021	Crow Wing County	Minnesota Extension Office, USDA and FSA Office	This is a standing element of outreach to local agricultural landowners.	MN Extension & SWCD budgets



#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time - frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
52	Drought / Erosion	Natural Systems Protection	Provide education and awareness on landscaping practices to communities and private landowners to mitigate against the impacts of drought and erosion (i.e., installation of shelter belts, measure for shoreline / streambank stabilization, and tree plantings for shade).	Ongoing	Moderate	2017-2021	Crow Wing County	CWC Land Services Dept., Minnesota Extension, and CWC SWCD	This is a standing effort of the Crow Wing County Soil and Water Conservation District. SWCD conducts regular outreach and site visits to provide technical assistance to communities in practices to reduce the impacts of drought and erosion. CWC Land Services Dept. and MN Extension also provide technical assistance and information to the public.	County Budget, MN Extension, and SWCD
53	Dam Failure	Local Planning & Regulations	Continue to have contact and coordination with the Crosslake, Big Pine Rock, and Brainerd Public Utility's Hydro dam operators.	Ongoing	Moderate	2017-2021	Crow Wing County	CWC Emergency Management, CWC Land Services Dept. and dam operators	CWC Emergency Management and CWC Land Services Dept. maintain communication and coordination with the dam operators on the condition of dams and addressing any concerns during periods of high rain events. In addition, there is the Black Bear Levy in Trommald and the Crosslake Rock Dam.	County Budget, Crosslake & Brainerd Public Utility Dam Operators

### **5.3.2 Mitigation Actions by Community**

This plan is a multi-jurisdictional plan that covers Crow Wing County, its school districts and the cities of Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lake, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton and Trommald. The Crow Wing County risks and mitigation activities identified in this plan also incorporate the concerns and needs of townships and other entities participating in this plan.

Mitigation actions are separated by jurisdiction in Appendix G.

## Section 6 – Plan Maintenance

### 6.1 Monitoring, Evaluation, and Updating the Plan

The Crow Wing County Multi-Hazard Mitigation Plan (MHMP) should be considered a living document. The plan should be updated and approved by FEMA at a minimum of every 5 years. The guidance in this section will function as the primary tool when reviewing progress on the implementation of the Crow Wing County MHMP.

The Crow Wing County Emergency Management Director is the individual responsible for leading all efforts to monitor, evaluate, and update the hazard mitigation plan within the 5-year window. Throughout the 5-year planning cycle, the Crow Wing County Emergency Management Director will convene planning team members from the County and each jurisdiction on an annual basis to monitor, review, evaluate, and update the Multi-Hazard Mitigation Plan. Feedback will be gathered on actions that have been completed or ideas for future mitigation actions that should be incorporated into the next update of the plan. This will be done during the 4<sup>th</sup> quarter of each year to coincide with annual update to the County's Emergency Operations Plan (EOP). Additional stakeholders will be added based on need. If needed, the Crow Wing County Emergency Management Director will convene the group to meet on a more regular basis to monitor plan implementation progress and reassess needs and opportunities. This could be done annually, or in response to funding cycles of programs that provide resources for hazard mitigation activities. If there is a need for a special meeting due to new developments or a declared disaster occurring in the county, the team will meet to update pertinent mitigation strategies. Depending on Crow Wing County opportunities and fiscal resources, mitigation projects may be implemented independently by individual communities or through local partnerships.

The committee will review the MHMP goals and objectives to determine their relevance to changing situations in Crow Wing County. In addition, state and federal policies will be reviewed to ensure they are addressing current and expected conditions. The committee will also review the risk assessment portion of the plan to determine if this information should be updated or modified. The parties responsible for the various implementation actions will report on the status of their projects, and will include which implementation processes worked well, any difficulties encountered, how coordination efforts are proceeding, and which strategies should be revised.

Updates or modifications to the MHMP during the 5-year planning process will require a public notice and a meeting prior to submitting revisions to the individual jurisdictions for approval. The plan will be updated via written changes, submissions as the committee deems appropriate and necessary, and as approved by county commissioners.

### 6.2 Implementation

Crow Wing County and its included municipalities share a common Multi-Hazard Mitigation Plan and work together closely to develop, revise, and implement it. This MHMP provides a comprehensive chart of mitigation actions for Crow Wing County and its jurisdictions (see Section 5.3.1, *Hazard Mitigation Actions*). Jurisdictions participated in the MHMP planning process and identified the specific mitigation

strategies that they would seek to implement in their communities during the 5-year planning cycle. These mitigation actions are provided in *Appendix G: Mitigation Actions by Jurisdiction*.

A number of implementation tools are available to address hazards. Many of these tools are below, however, in some cases additional discussion is needed in order to identify what strategies are most appropriate to use. This will be part of an ongoing discussion as Crow Wing County looks for opportunities for plan implementation. The following tools will be considered:

- **Education:** In many cases education of residents has been identified as one of the most effective mitigation strategies.
- **Capital Investments:** Capital investments such as fire and ambulance equipment, sprinkler systems and dry hydrants are tools that can limit risks and impacts of natural and man-made hazards.
- **Data Collection and Needs Assessments:** Data collection and needs assessments can aid in gaining a better understanding of threats and allow planning for mitigation strategies accordingly. As resources are limited for this part of the planning process, additional data collection is likely to be an ongoing activity as resources become available.
- **Coordination:** Responsibilities for mitigation strategies run across various county departments, local fire and ambulance departments, city and township governments, and a host of state and federal agencies. Ongoing coordination is an important tool to ensure resources are used efficiently. Coordination can also avoid duplication of efforts or prevent gaps that are created because of unclear roles and responsibilities. The mitigation plan review process can function as a tool to have an ongoing discussion of roles, responsibilities, and opportunities for coordination.
- **Regional Cooperation:** Counties and public safety services providers throughout the region often share similar challenges and concerns. In some cases, a regional approach may be warranted as a mitigation strategy in order to save resources. Mutual aid agreements are a tool already in use for a number of services. Needs assessments for fire and ambulance services and development of assistance for volunteer recruiting, training, and retention could benefit from a regional approach. Cooperation among counties could also help in lobbying for certain funding priorities that address concerns relating to challenges in service delivery in rural areas. Organizations such as FEMA Region V and the MN Department of HSEM through the Regional Program Coordinator can offer tools and resources to assist in these cooperative efforts.
- **Regulation:** Regulation is an important mitigation tool for Crow Wing County. Regulation plays a particularly important role for land use, access to structures and the protection of water resources and public health.

### 6.3 Continued Public Involvement

Continued public involvement is critical to the successful implementation of the Multi-Hazard Mitigation Plan (MHMP). The Crow Wing County Emergency Management Director and the steering committee members from the participating jurisdictions of the cities of Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lake, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan

Beach, Nisswa, Pequot Lakes, Riverton and Trommald will continue to engage new public stakeholders in planning discussions and project implementation during the 5-year cycle of this plan.

In order to seek continued public participation after the plan has been approved and during the 5-year window of implementation for this plan, the County will take the following measures:

- The plan will be posted on the Crow Wing County website for the public to read and provide feedback. Collected feedback will be reviewed and the plan will be amended as necessary.
- Information will regularly be posted on the Crow Wing County Emergency Management Facebook Page on current mitigation projects and topics and public feedback will be encouraged.
- Following major storms or natural disaster events, Crow Wing County Emergency Management will seek to gather concerns and new ideas for mitigation from local residents to include in the next update of the plan. This may be done through public meetings or news releases via local media (online, newspaper, radio).
- Each city participating in the plan will be responsible to keep their city councils, city departments, schools, and community members updated and engaged in the implementation of their respective mitigation action charts (see *Appendix G: Mitigation Actions by Jurisdiction*). Each respective jurisdiction will report their progress in this area to the Crow Wing County Emergency Management Director.
- Jurisdictions will use numerous means of public outreach to engage new public stakeholders in providing input on mitigation efforts or concerns on hazards by sharing information at city council meetings, sharing information at special events, working with local schools and partner organizations, and posting information on relevant local or social media that their communities use to inform and engage the public. As mitigation projects are implemented, jurisdictions will work to keep the public updated and engaged in those local efforts.

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# APPENDICES

- Appendix A – Crow Wing County Maps
- Appendix B – Crow Wing County Critical Facilities
- Appendix C – Crow Wing County Hazard Events
- Appendix D – Adopting Resolutions
- Appendix E – Steering Committee Meetings
- Appendix F – Public Outreach & Engagement Documentation
- Appendix G – Mitigation Actions by Jurisdiction
- Appendix H – Past Mitigation Action Review Status Report (2011-2016)
- Appendix I – Works Cited
- Appendix J – Crow Wing County Plans & Programs In Place
- Appendix K – Local Mitigation Capabilities Assessment Report

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# Appendix A

## Crow Wing County Maps

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Figure A - 1. Hydrography of Crow Wing County

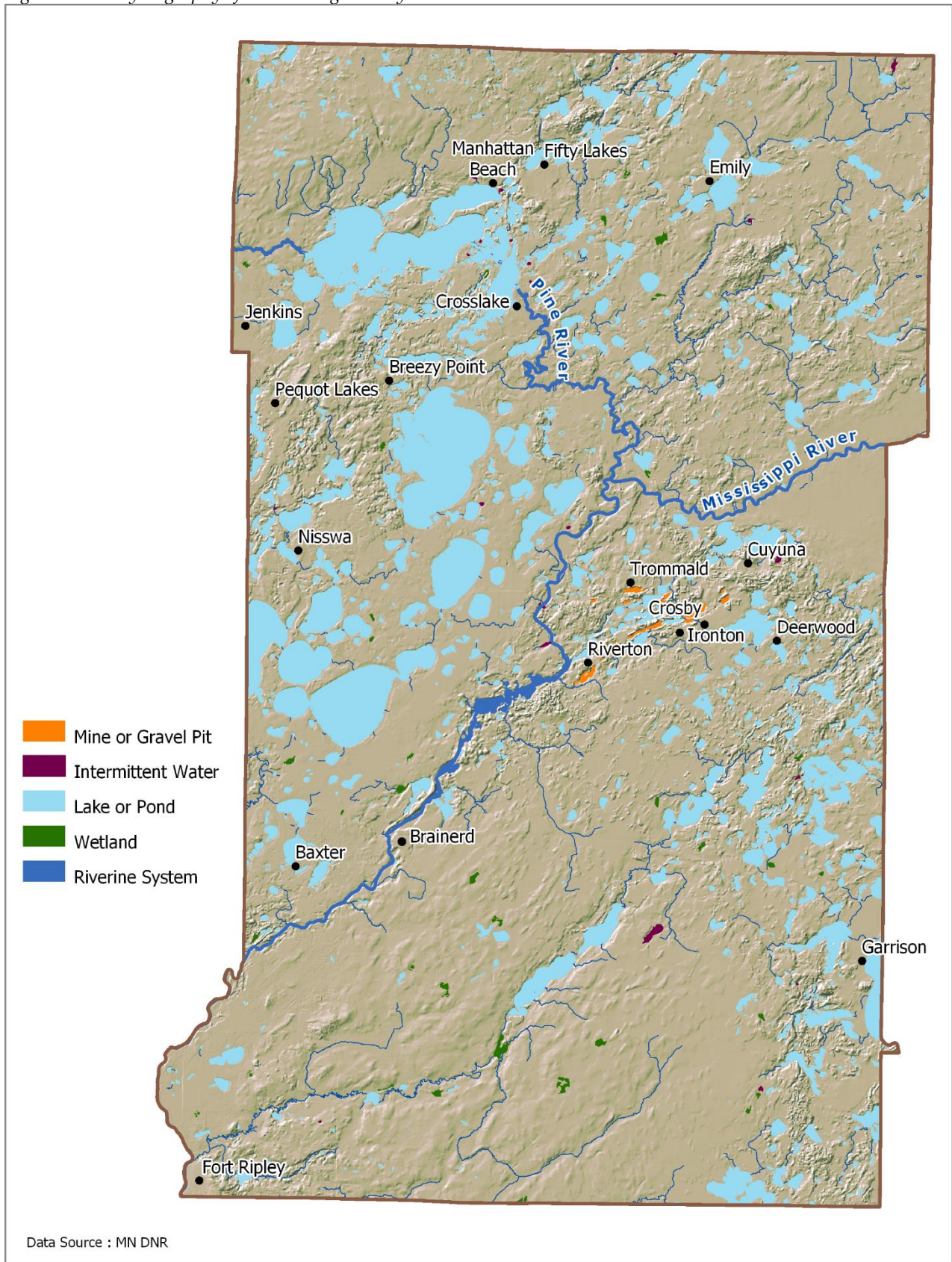


Figure A - 2. Crow Wing County Population by Census Block, 2010

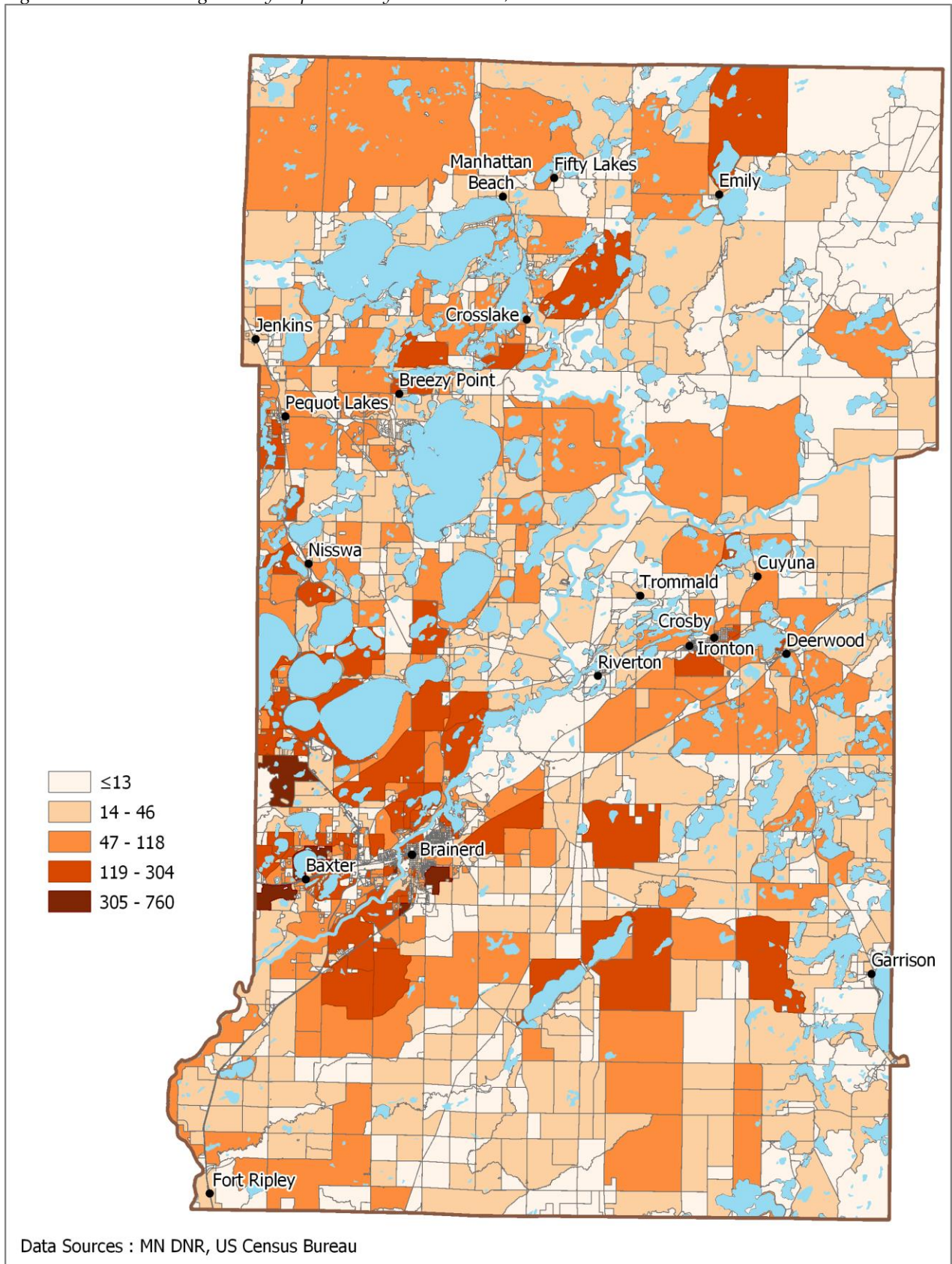


Figure A - 3. Fire Departments and Fire Response Times (in minutes) in Crow Wing County

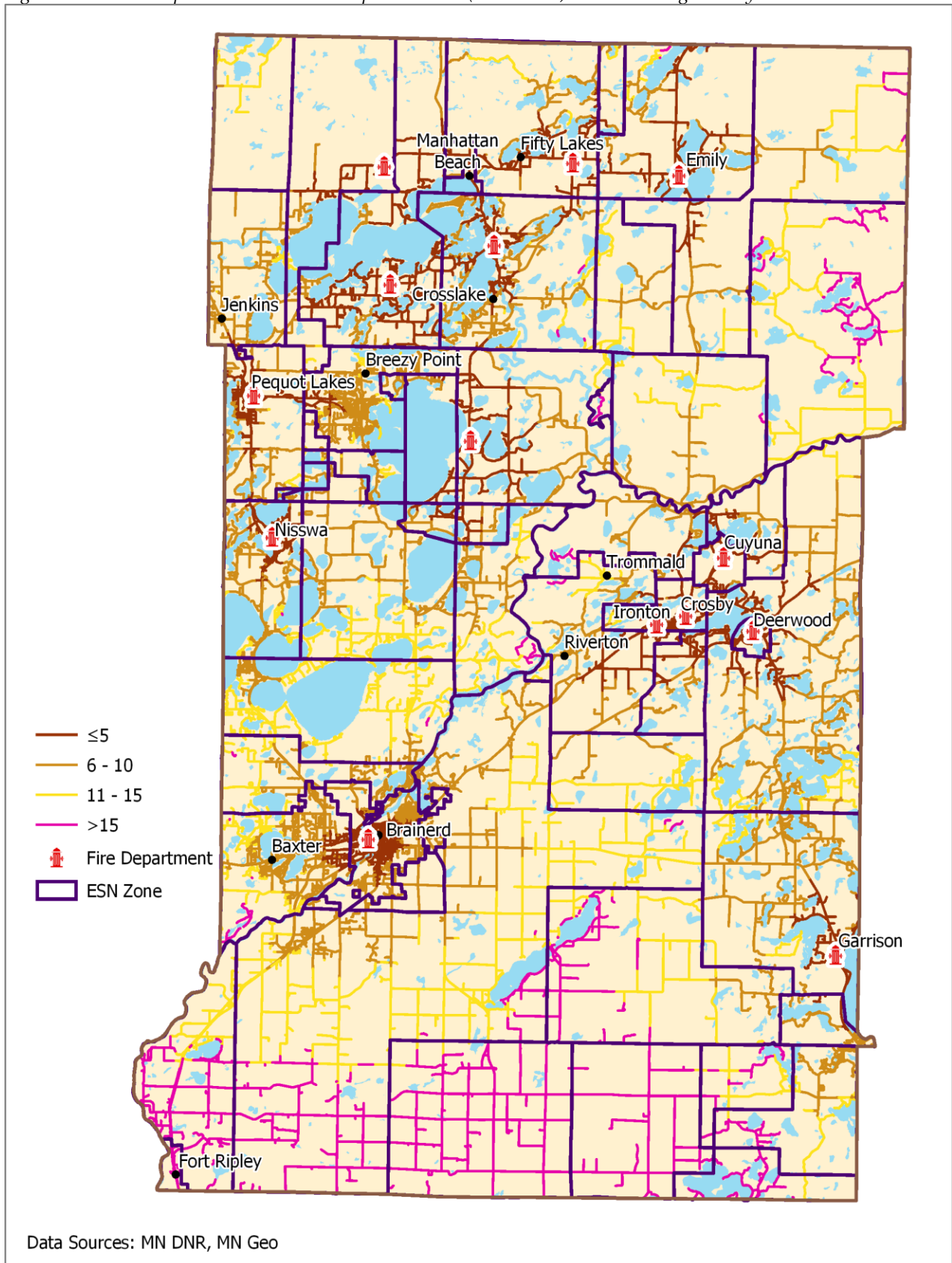


Figure A - 4. Crow Wing County Public Safety and Government Services

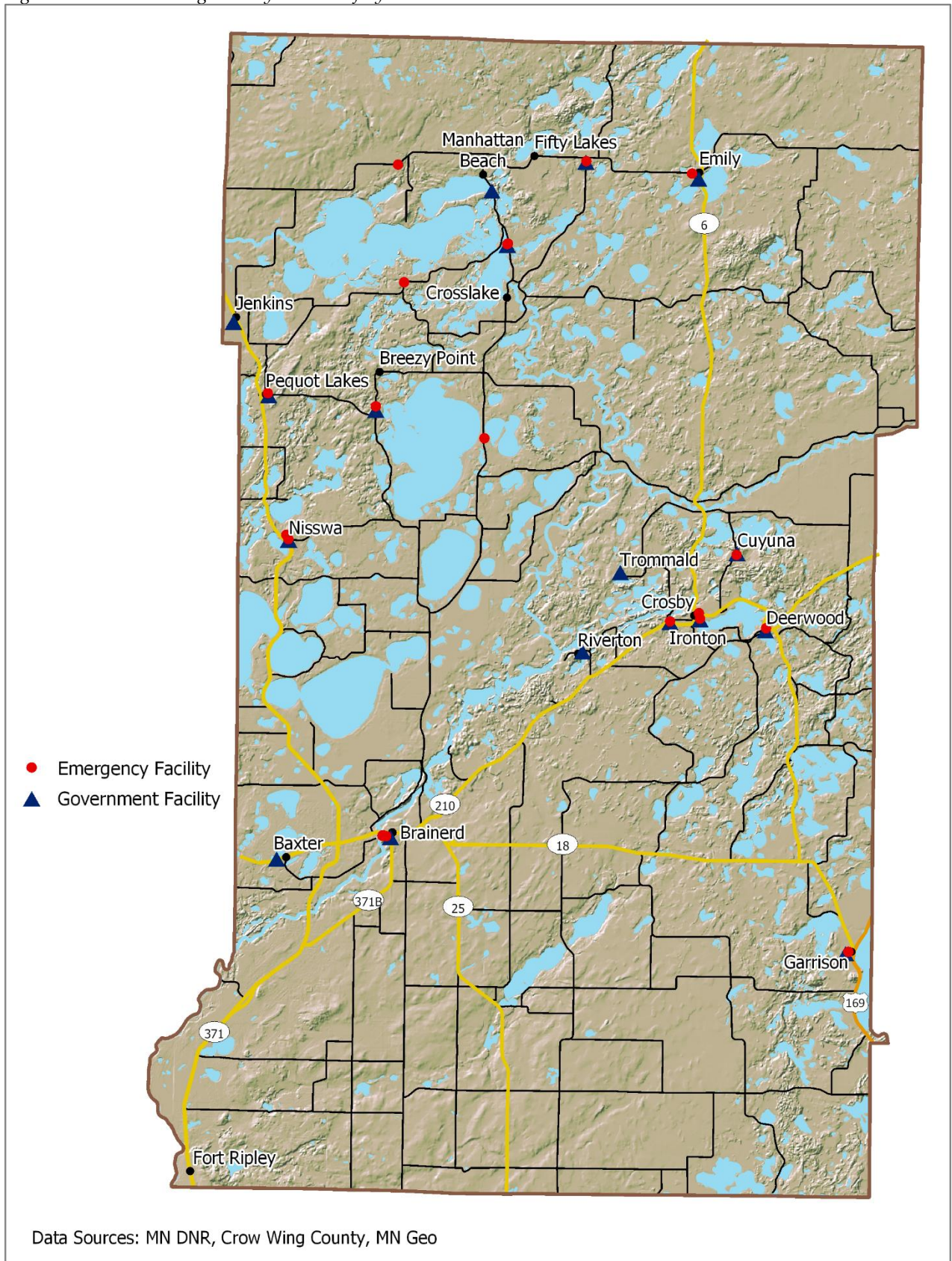


Figure A - 5. Crow Wing County Utilities and Communication Infrastructure

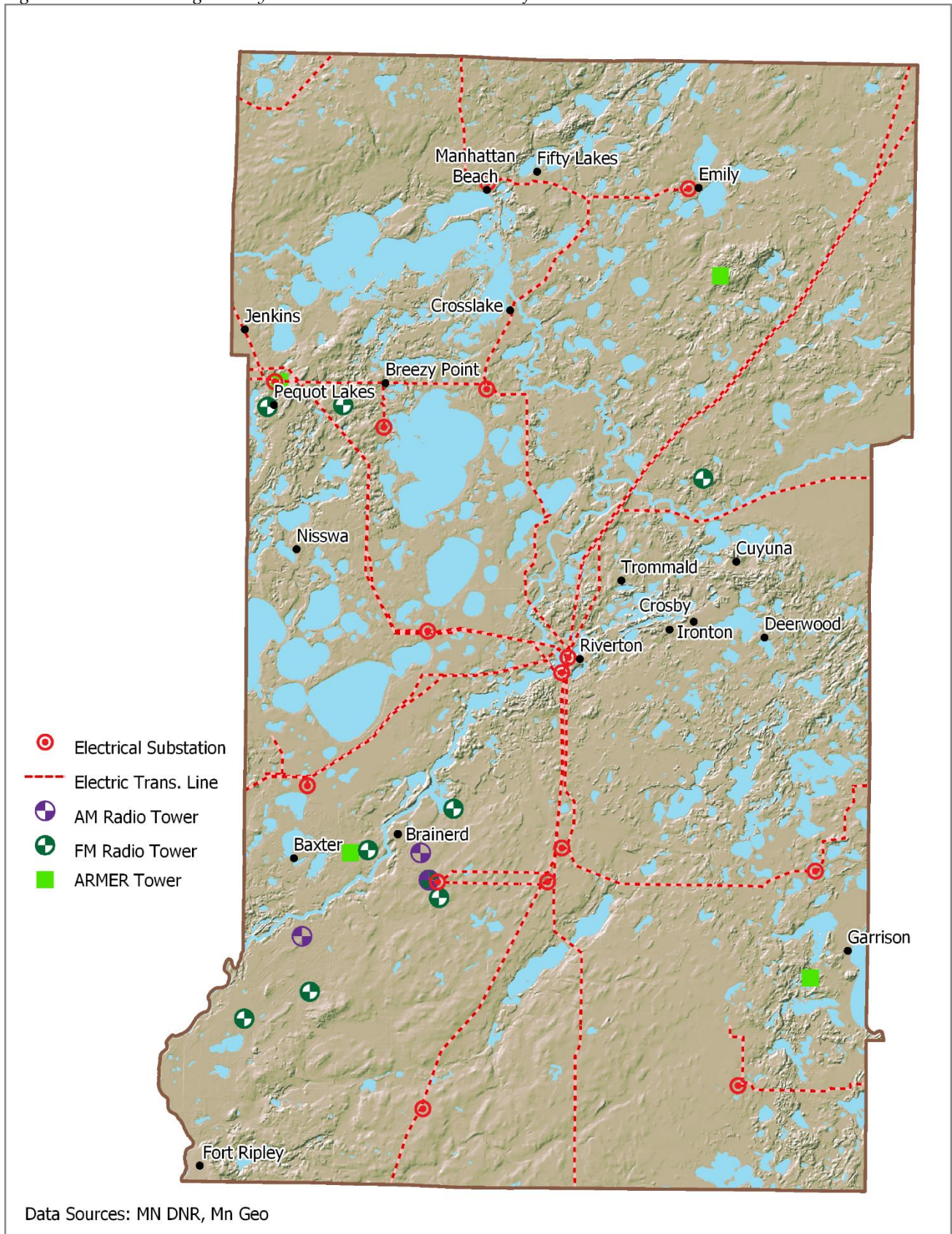


Figure A - 6. Crow Wing County Transportation Infrastructure

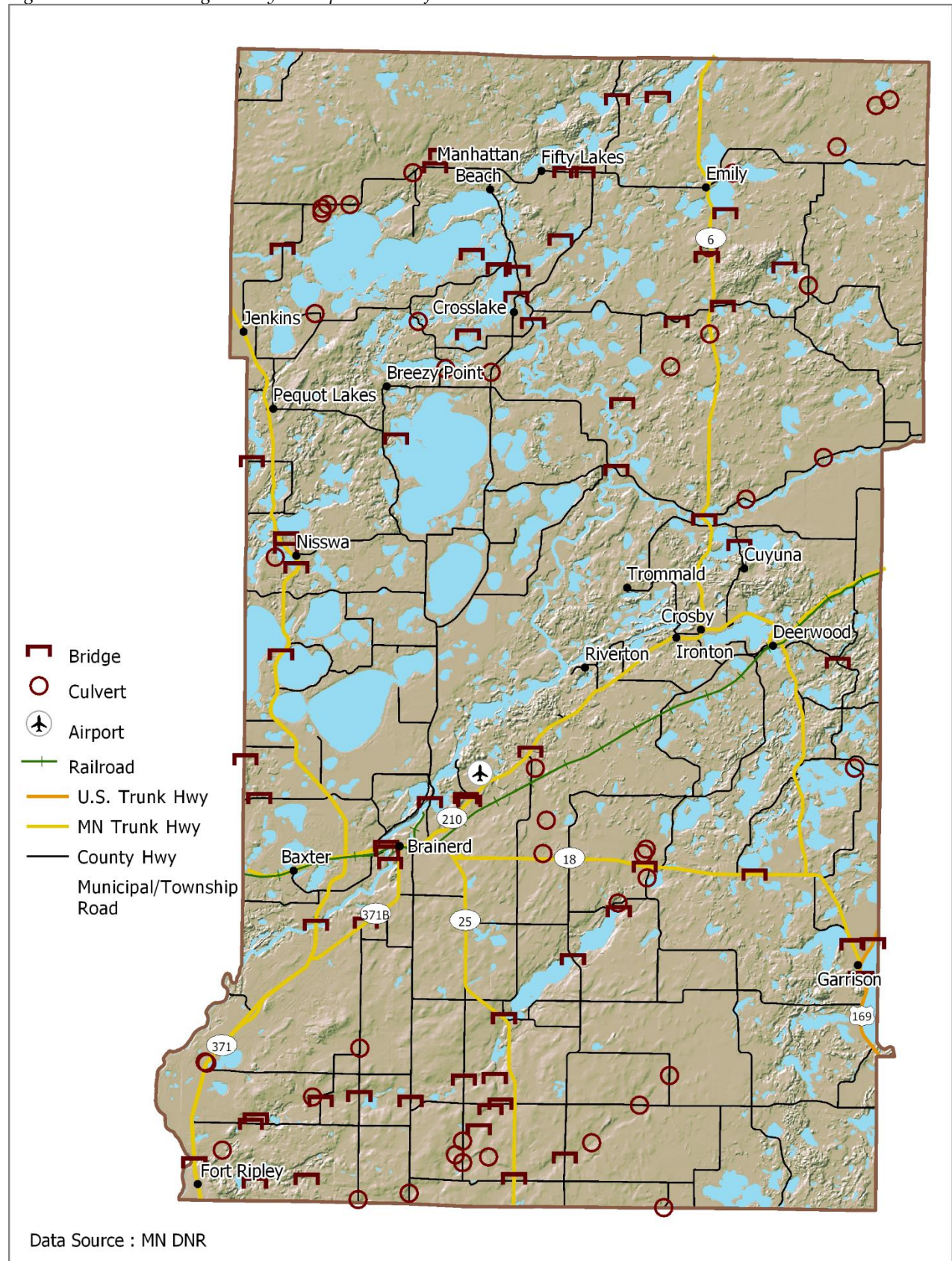


Figure A - 7. Crow Wing County Land Cover, National Land Cover Database, 2011

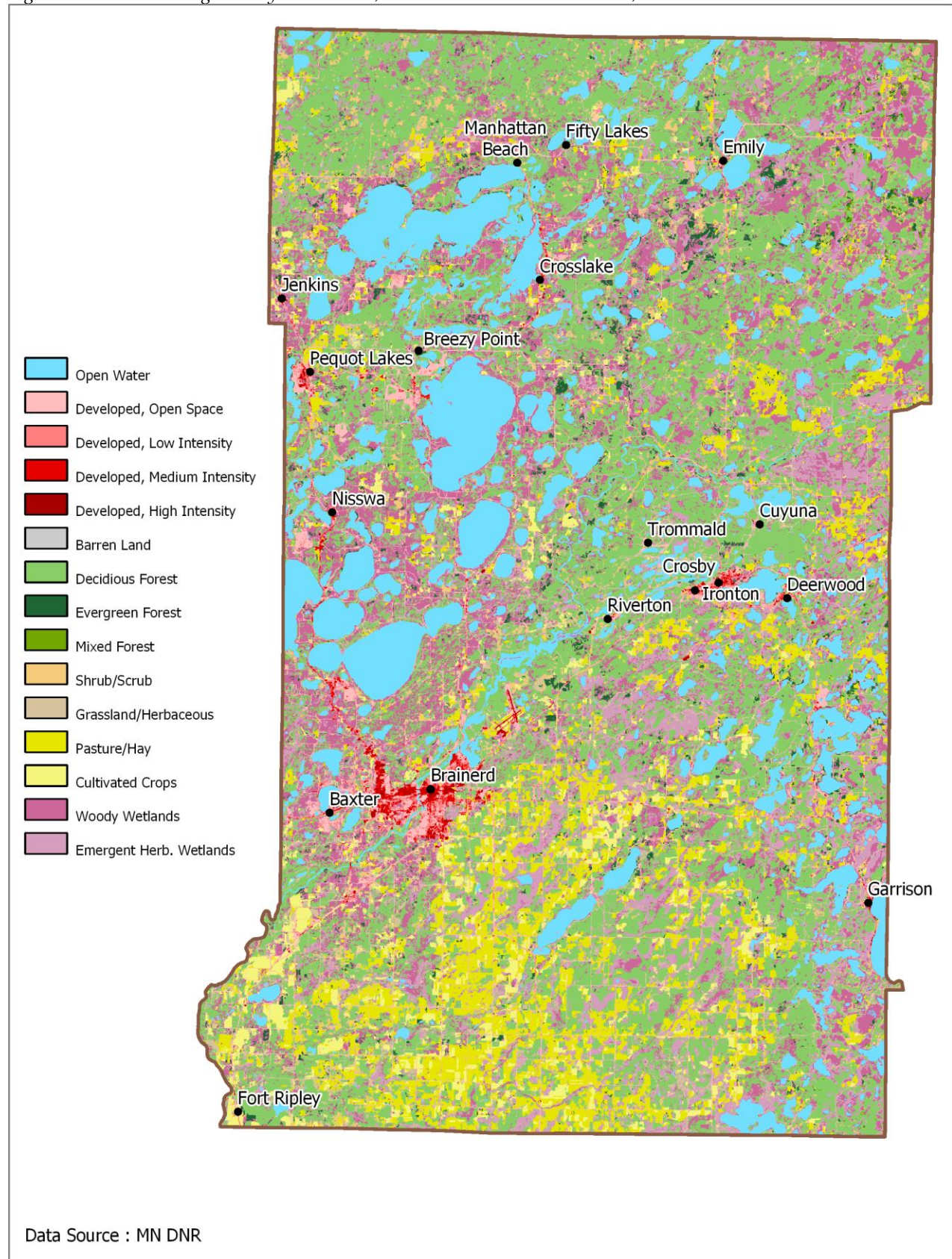




Figure A - 8. Crow Wing County Land Ownership by Agency

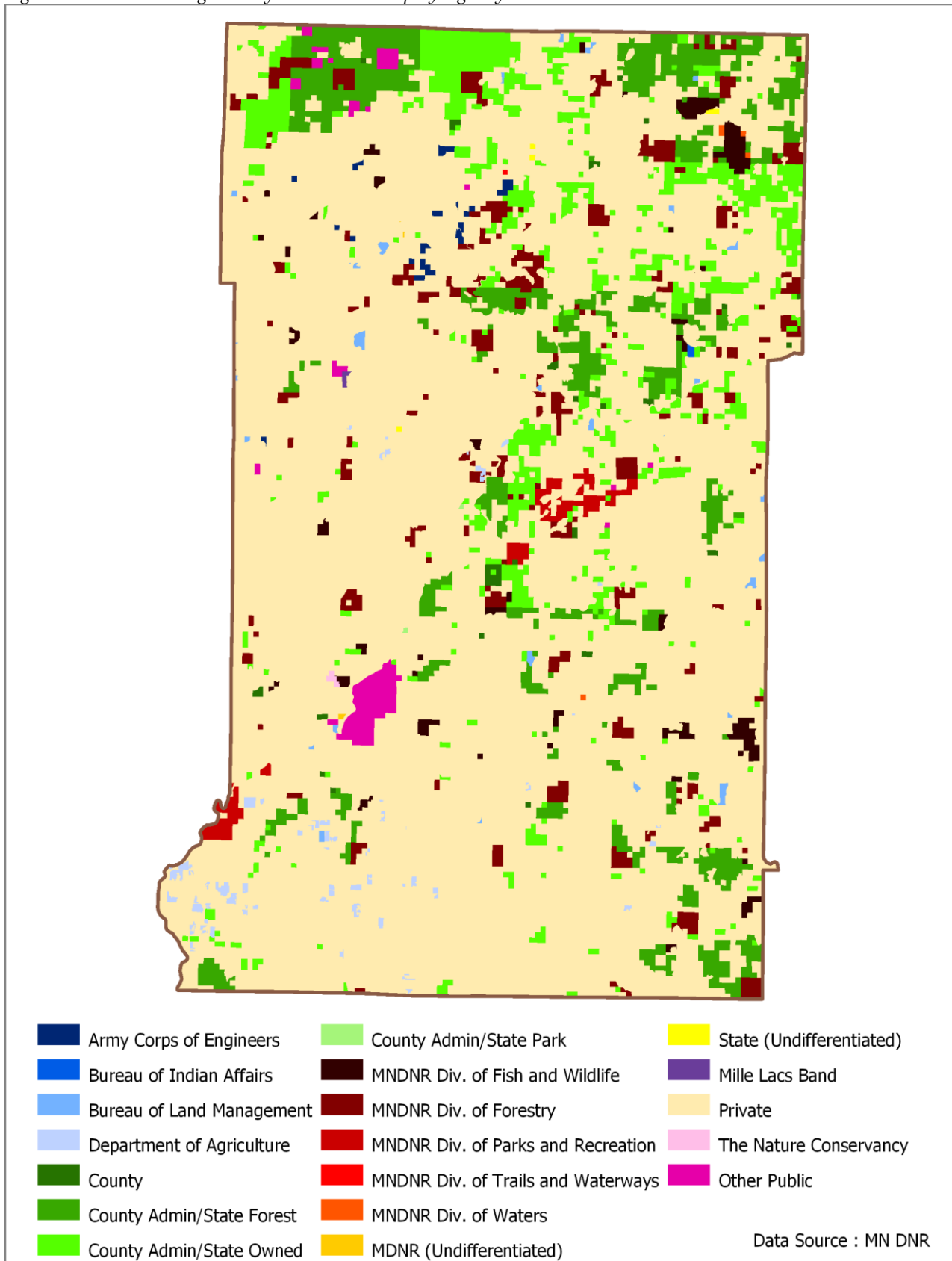


Figure A - 9. Severe Wind and Hail Storms in Crow Wing County

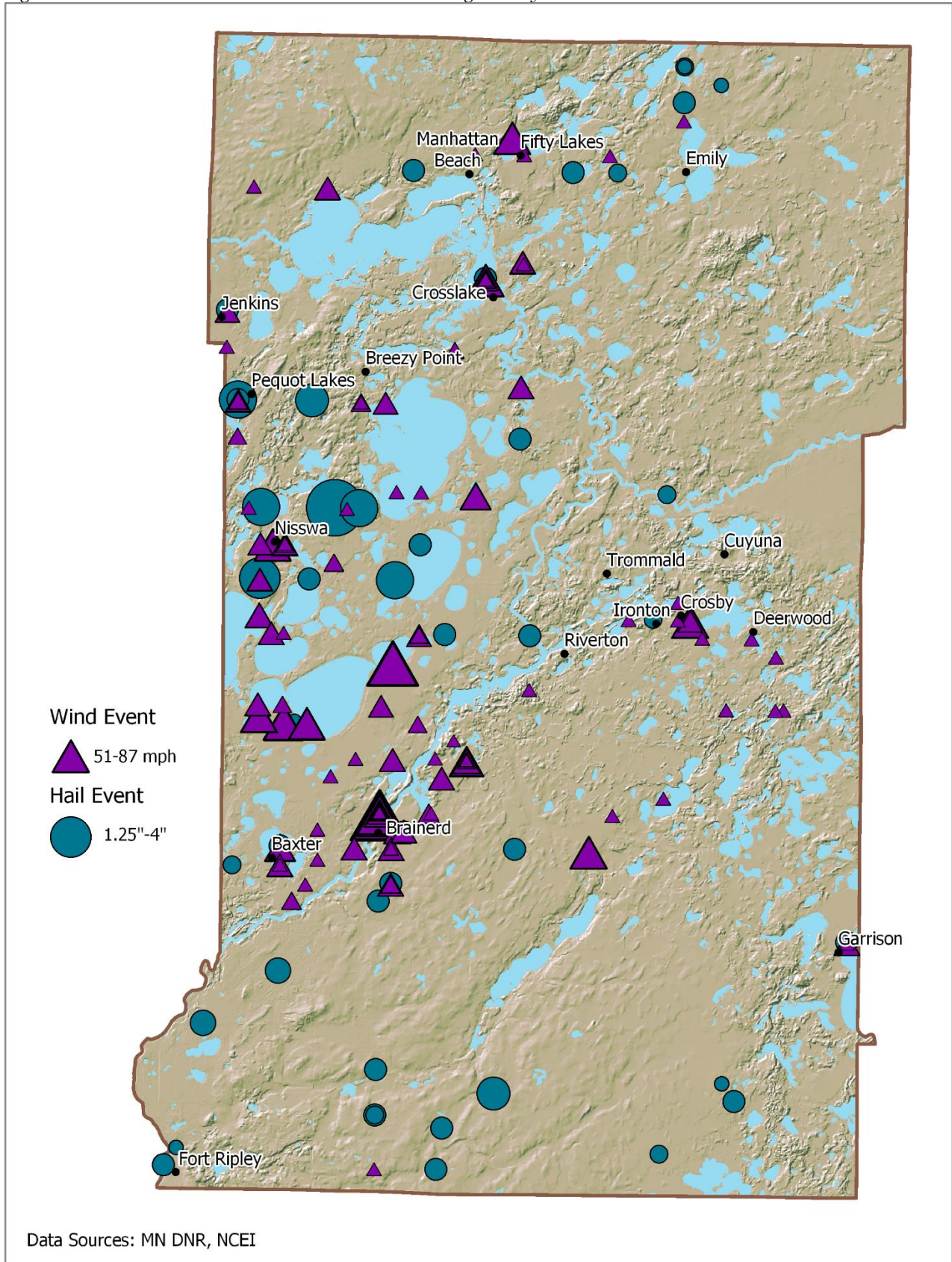


Figure A - 10. Tornado Touchdowns and Paths in Crow Wing County

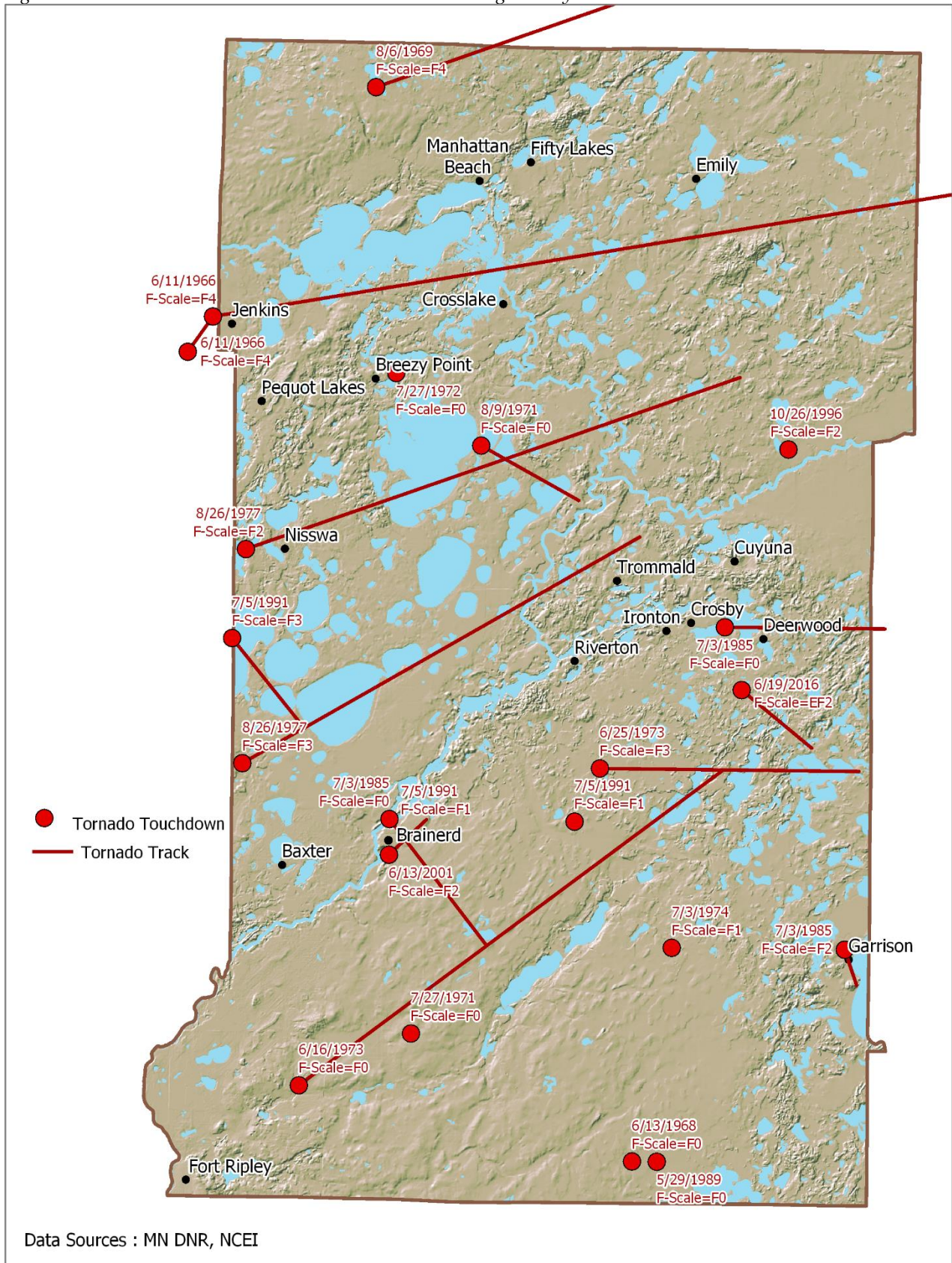


Figure A - 11. Dams in Crow Wing County

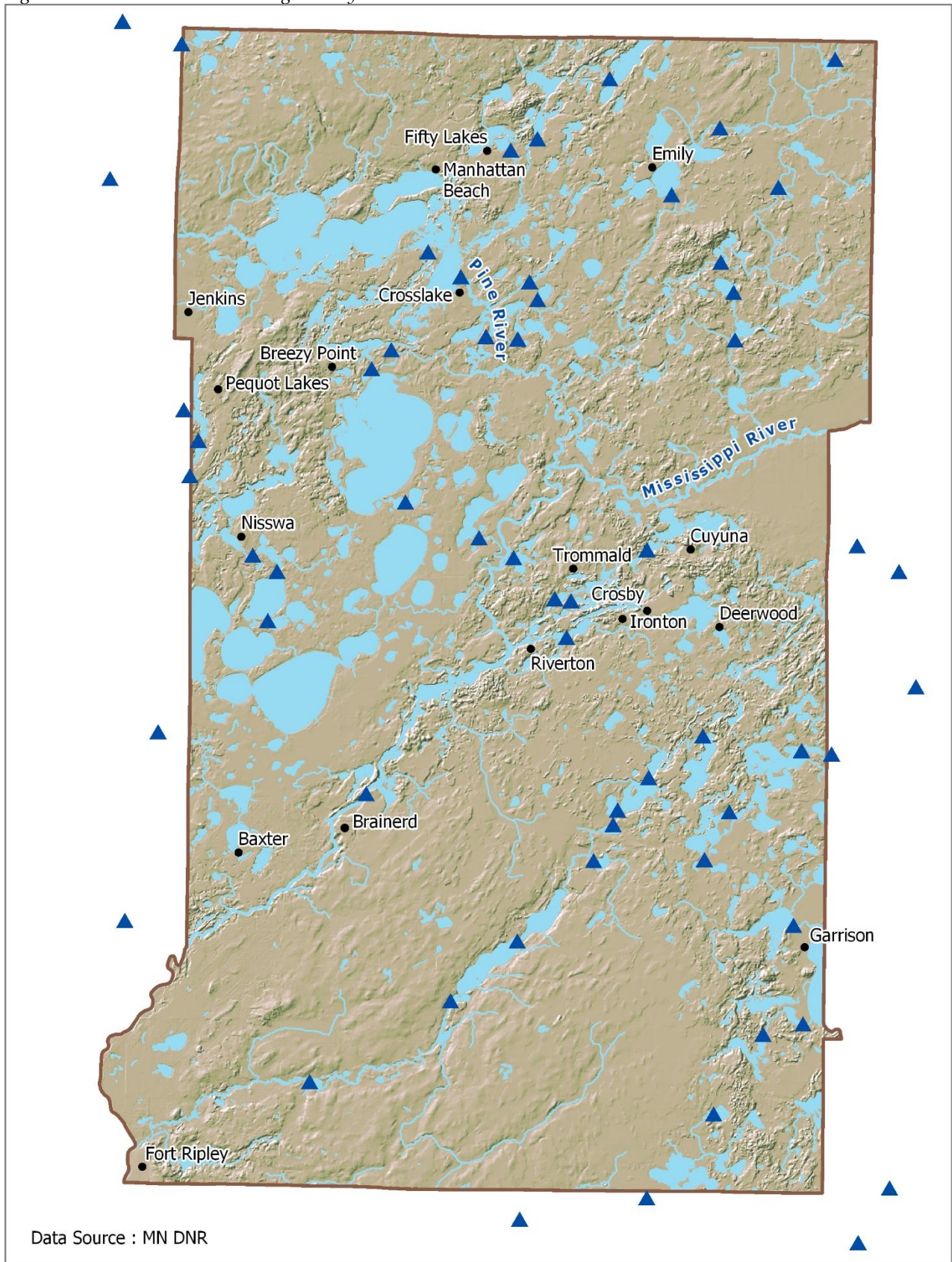


Figure A - 12. Sites with Hazardous or Chemical Waste in Crow Wing County

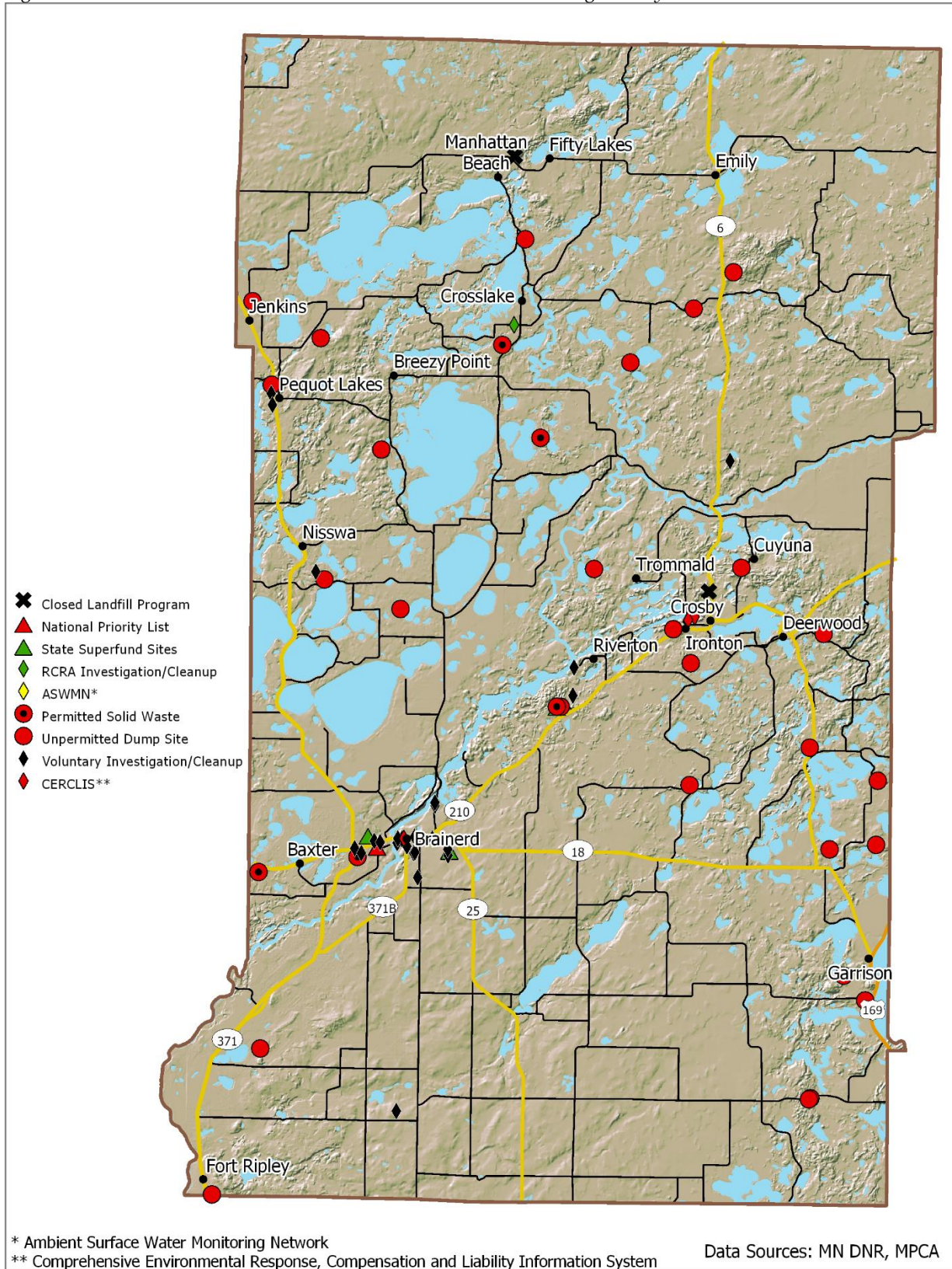
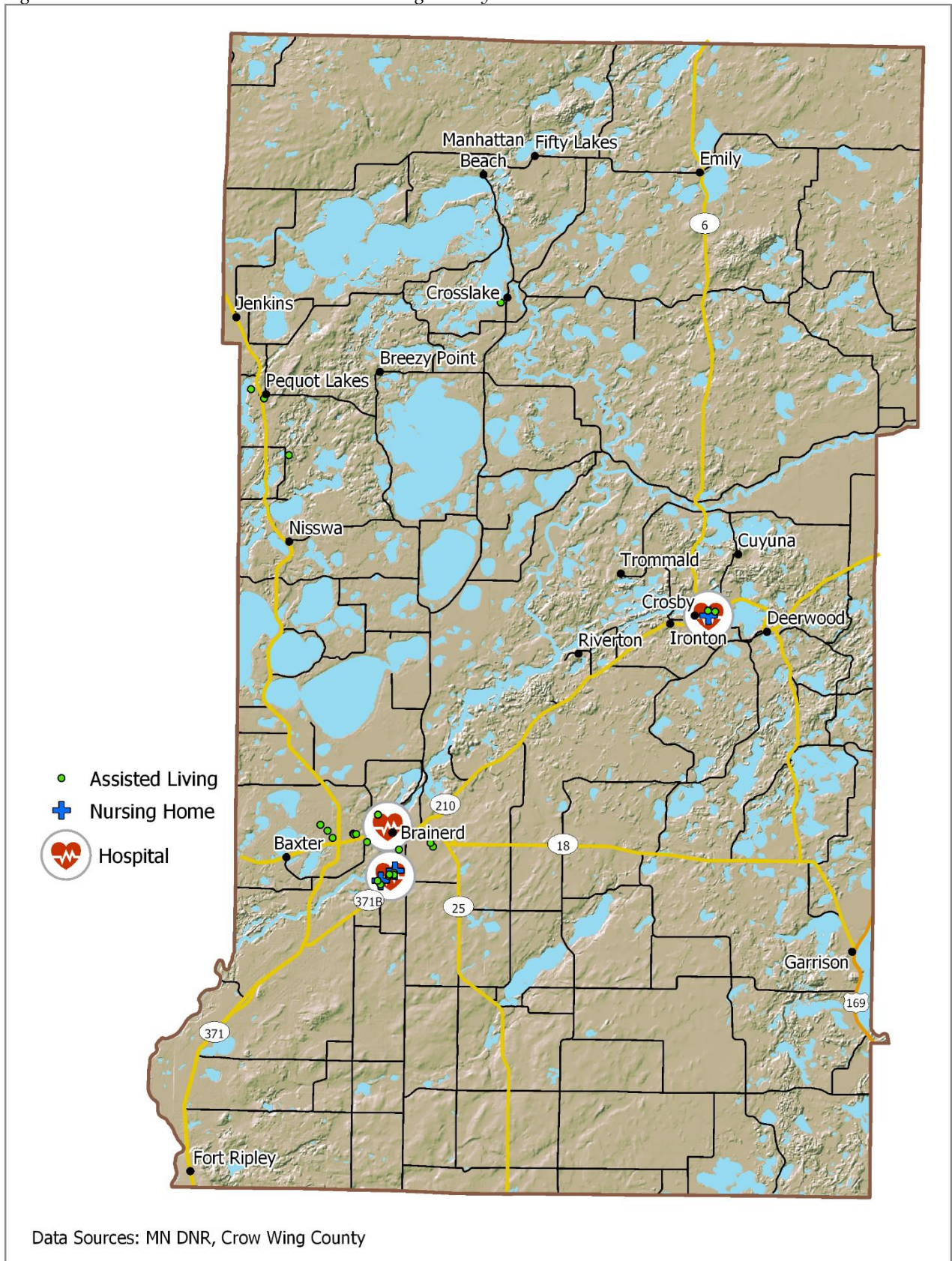


Figure A - 13. Health Care Providers in Crow Wing County



Data Sources: MN DNR, Crow Wing County

Figure A - 14. Crow Wing County Aquifer Vulnerability and Wells

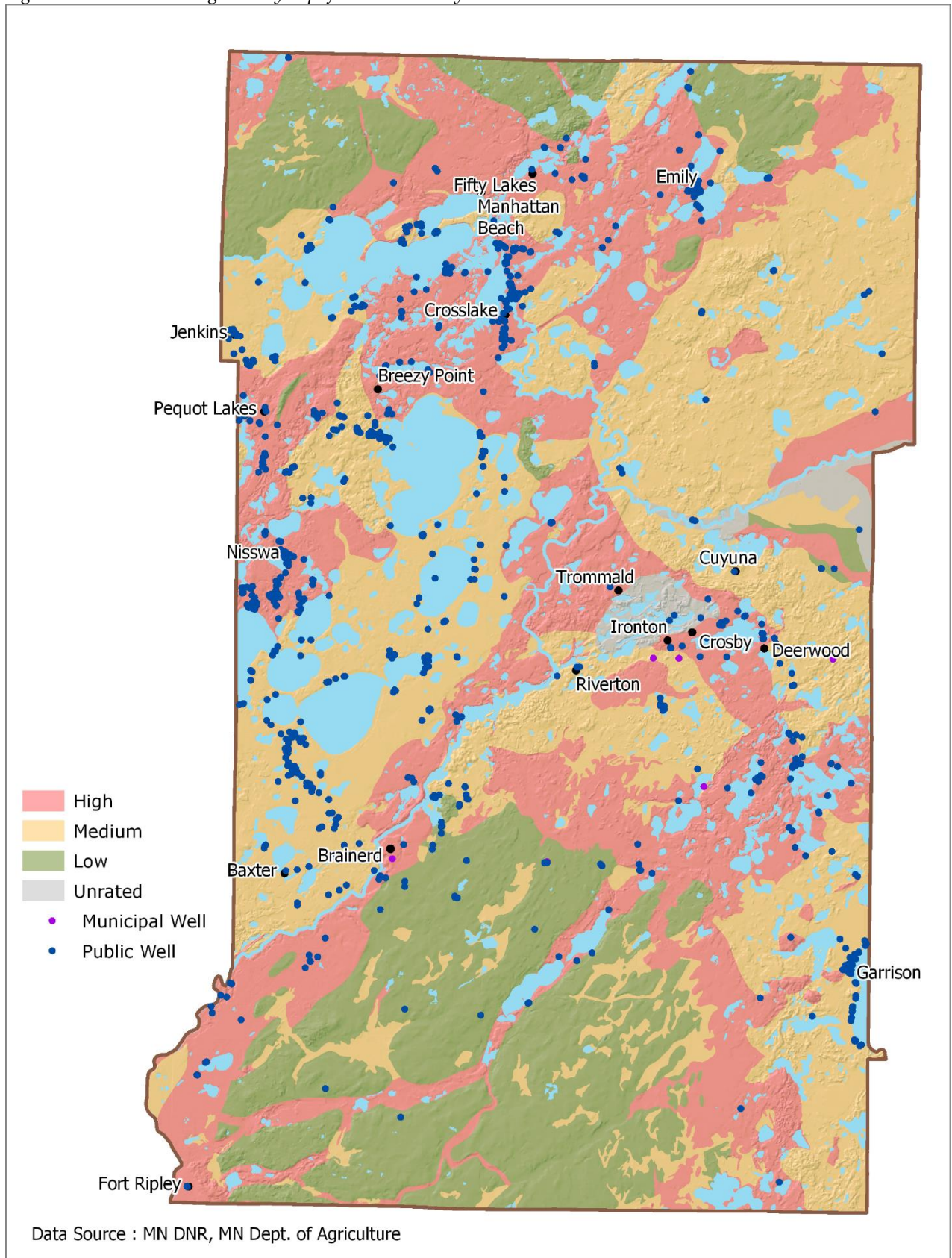


Figure A - 15. Critical Facilities in Crow Wing County

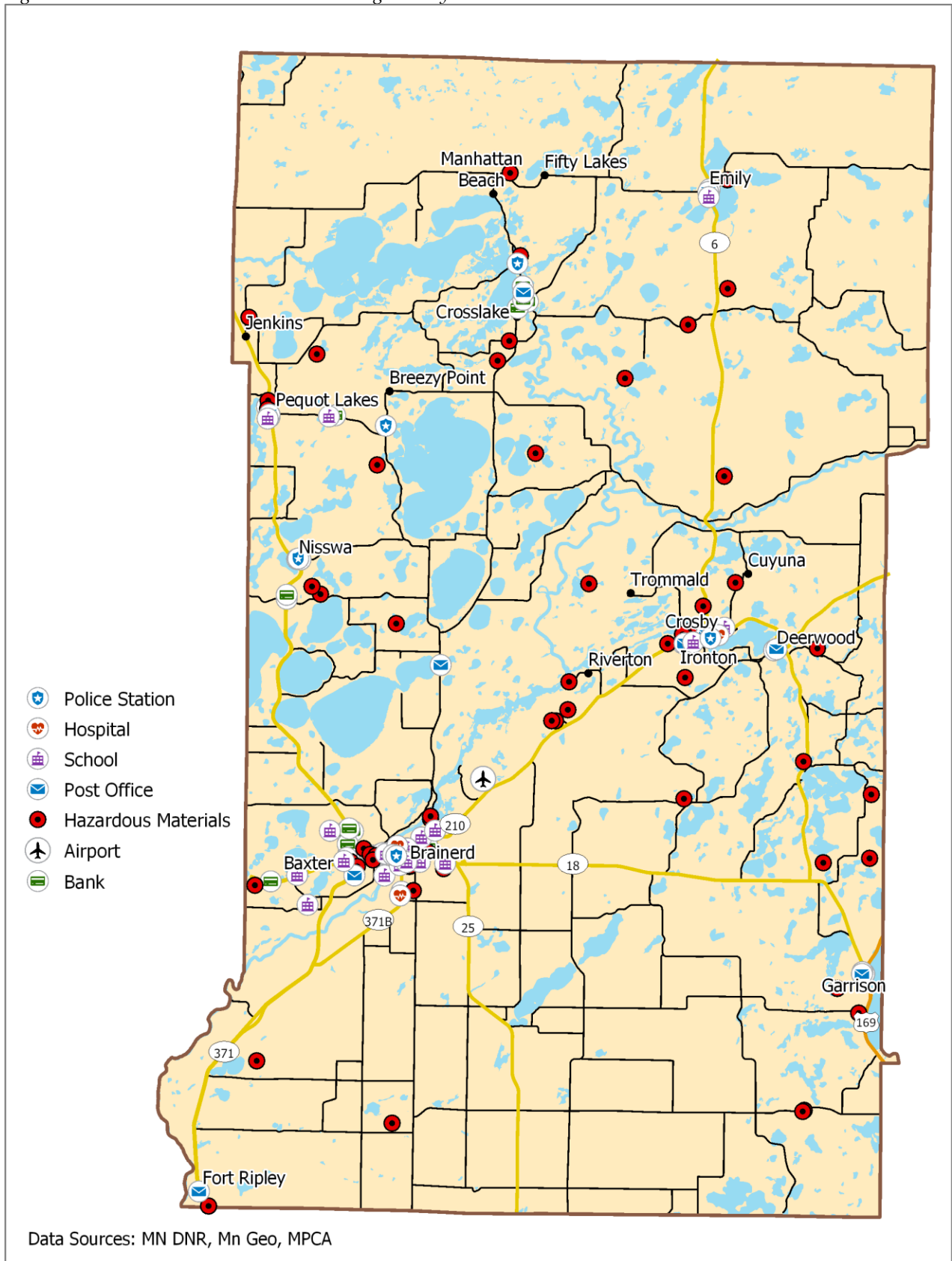




Figure A - 16. Critical Facilities in Brainerd

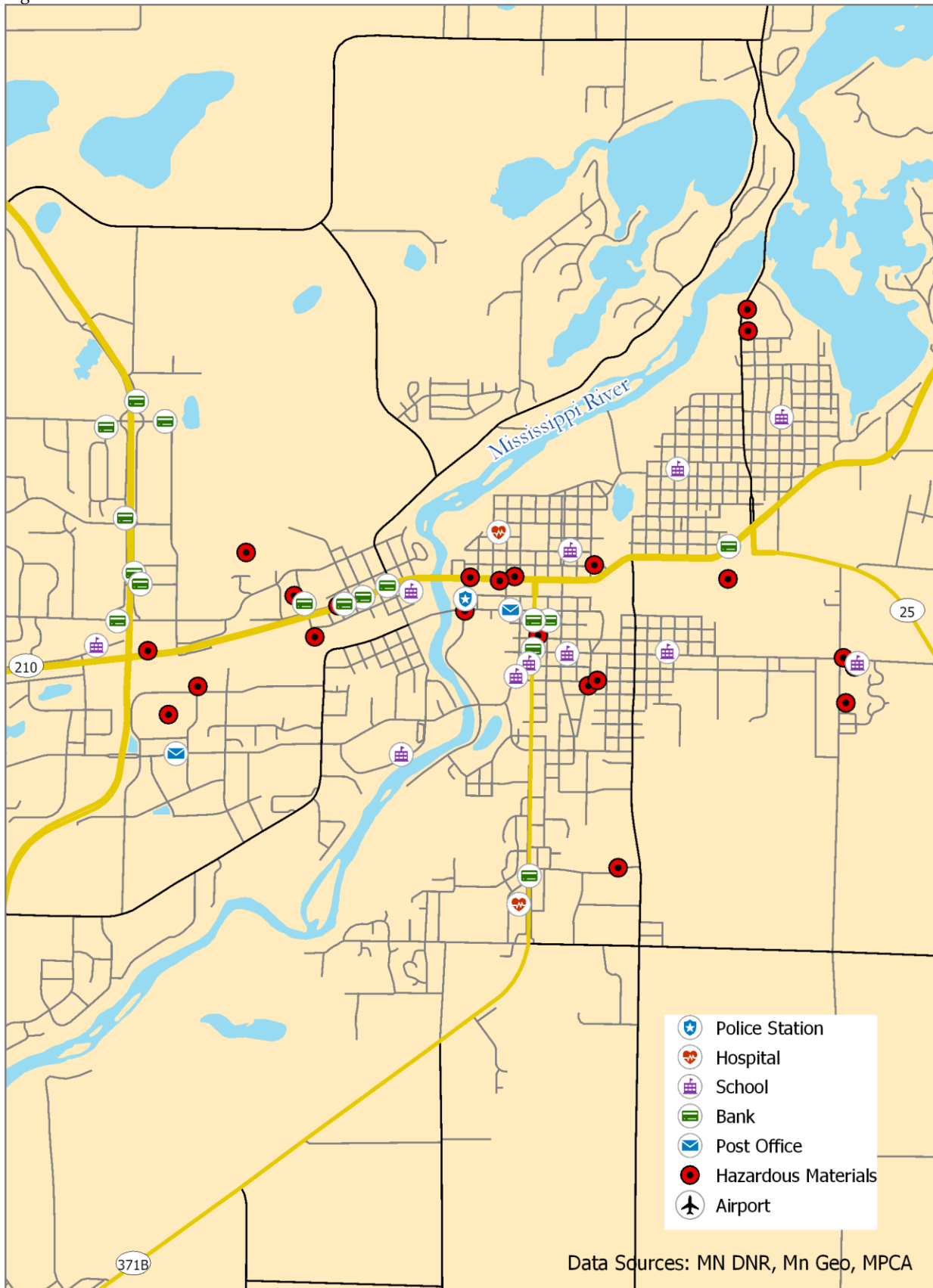


Figure A - 17. Critical Facilities in Baxter

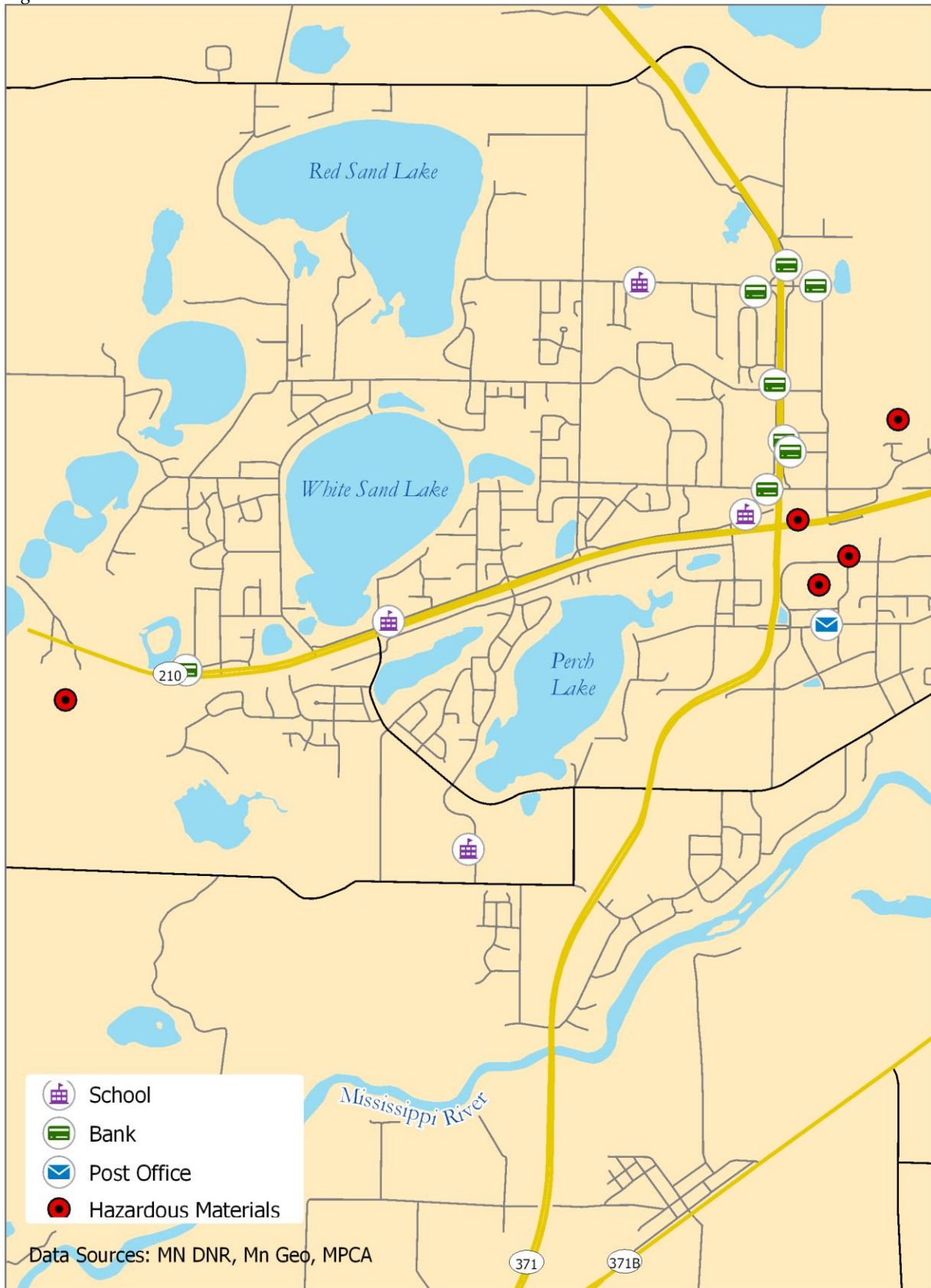


Figure A - 18. Critical Facilities in Crosby



Figure A - 19. Wildfires by Acres Burned (1985-March 2017) and Peat Soil Areas

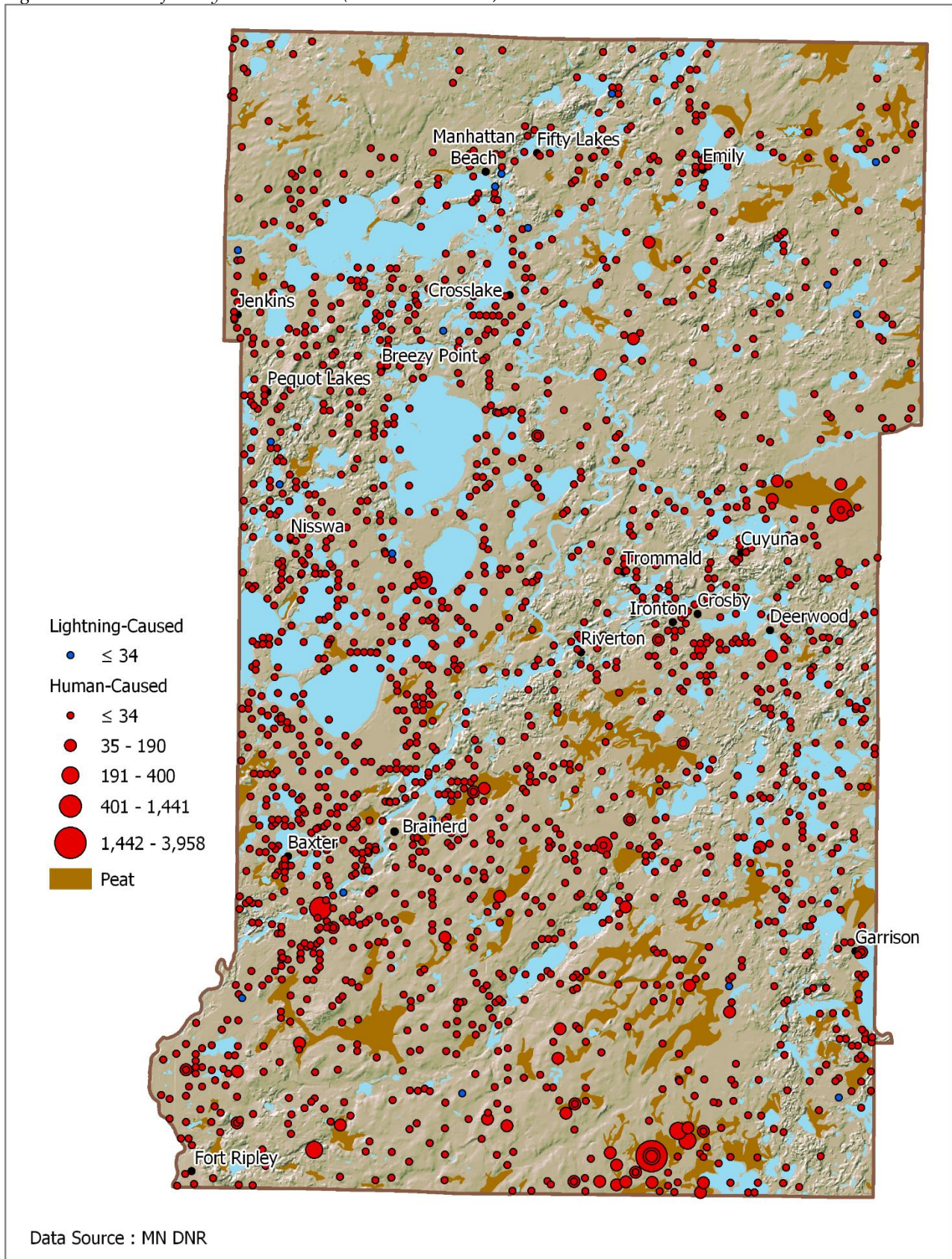


Figure A - 20. Distribution of Estimated Economic Loss in 100-Year Flood

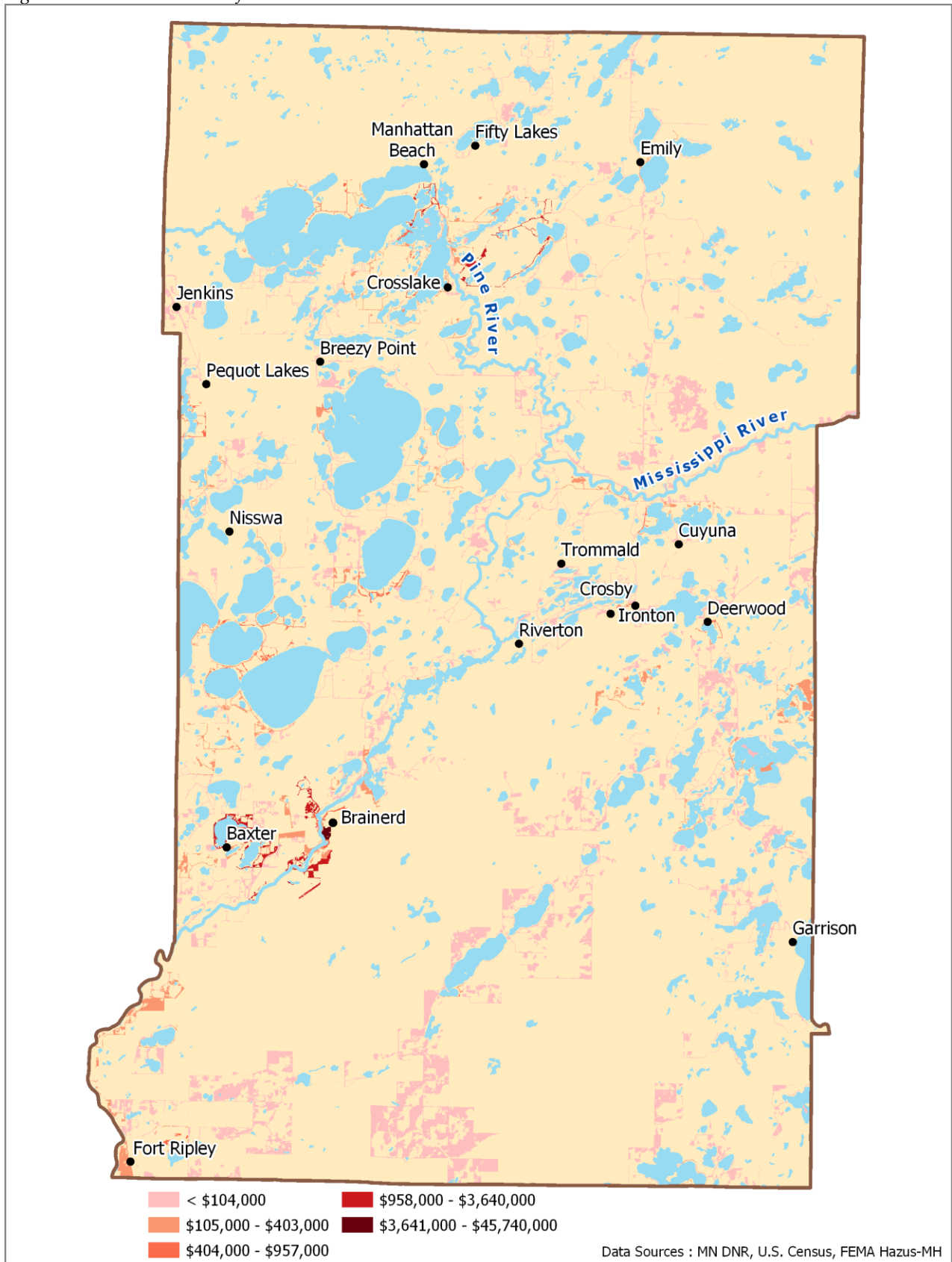


Figure A - 21. Census Block #270359511004024 and 100-Year Floodplain in Brainerd



Figure A - 22. Census Block #270359512001015 and 100-Year Floodplain in Brainerd

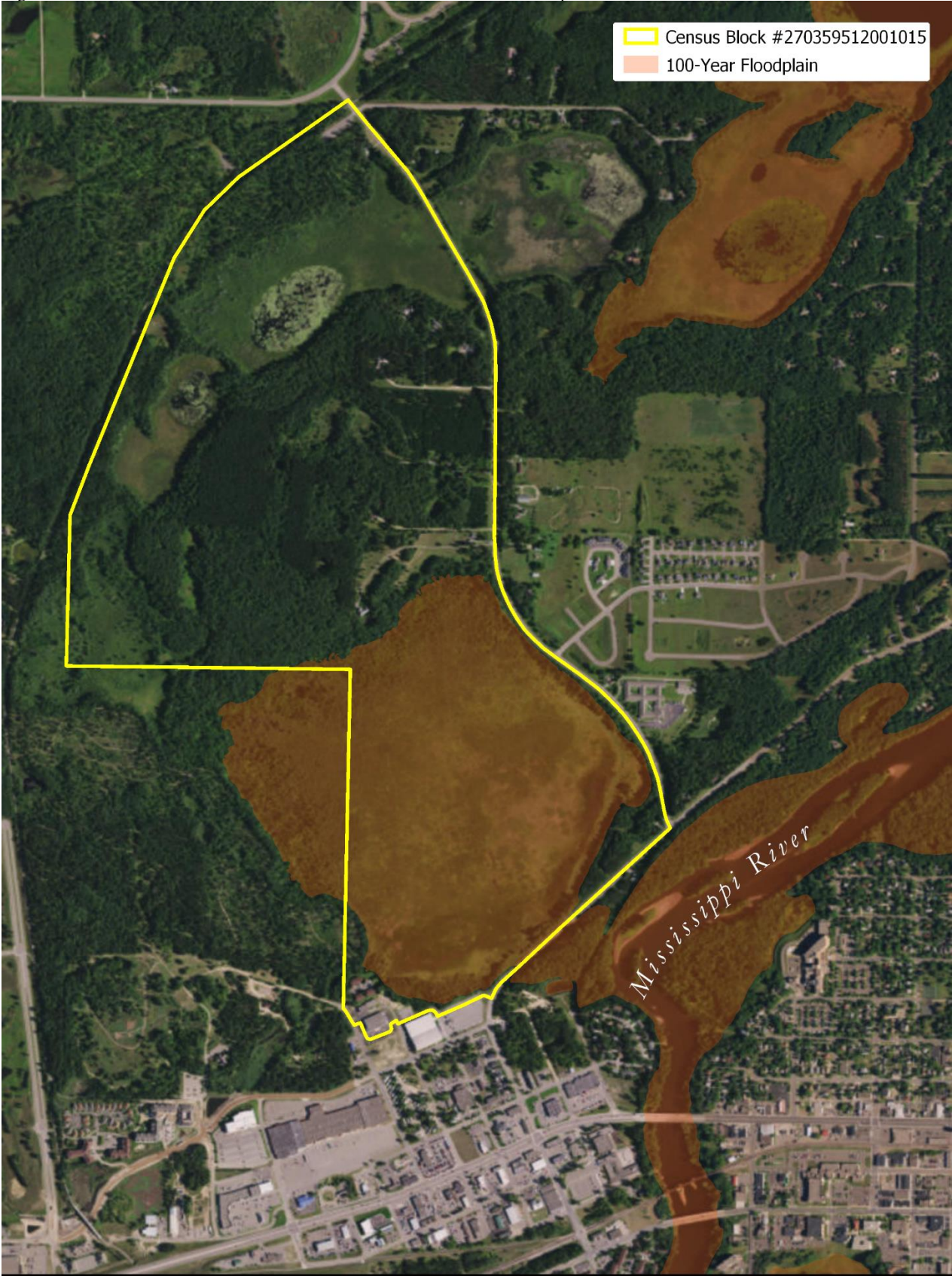


Figure A - 23. Census Block #270359513011101 and 100-Year Floodplain in Baxter

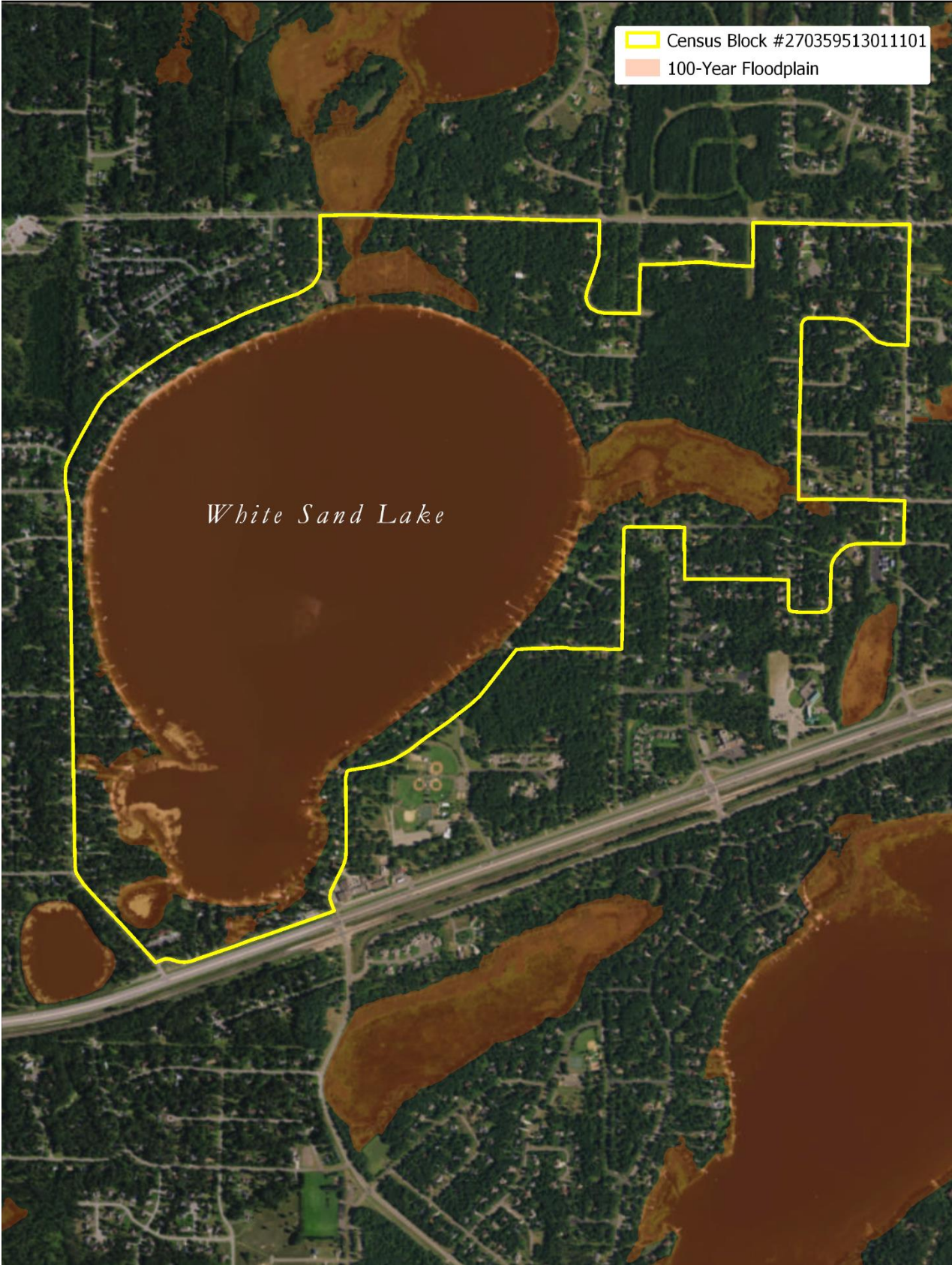




Figure A - 24. Census Block #270359502041019 and 100-Year Floodplain in Crosslake

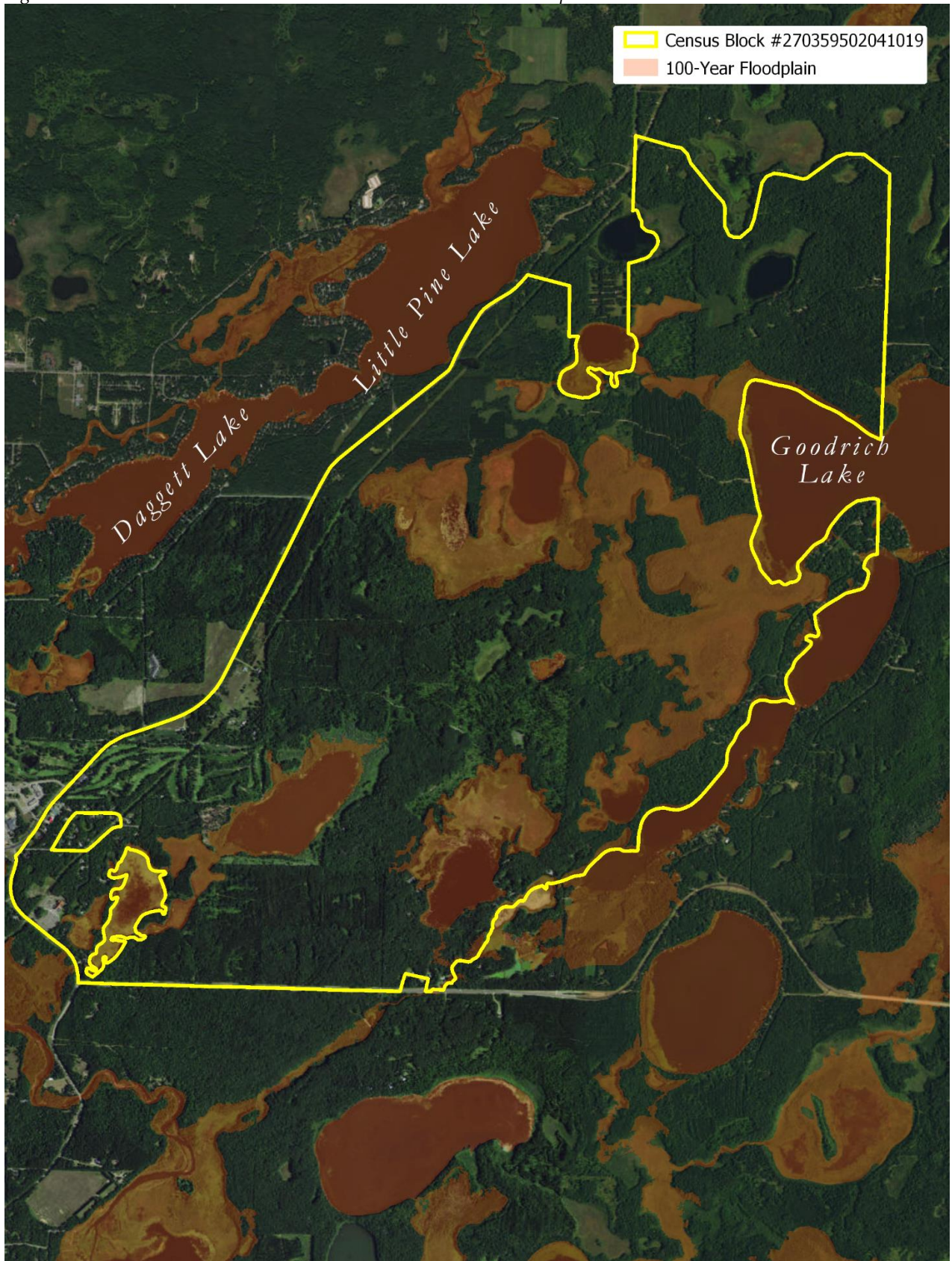


Figure A - 25. Census Block #270359513023026 and 100-Year Floodplain in Brainerd

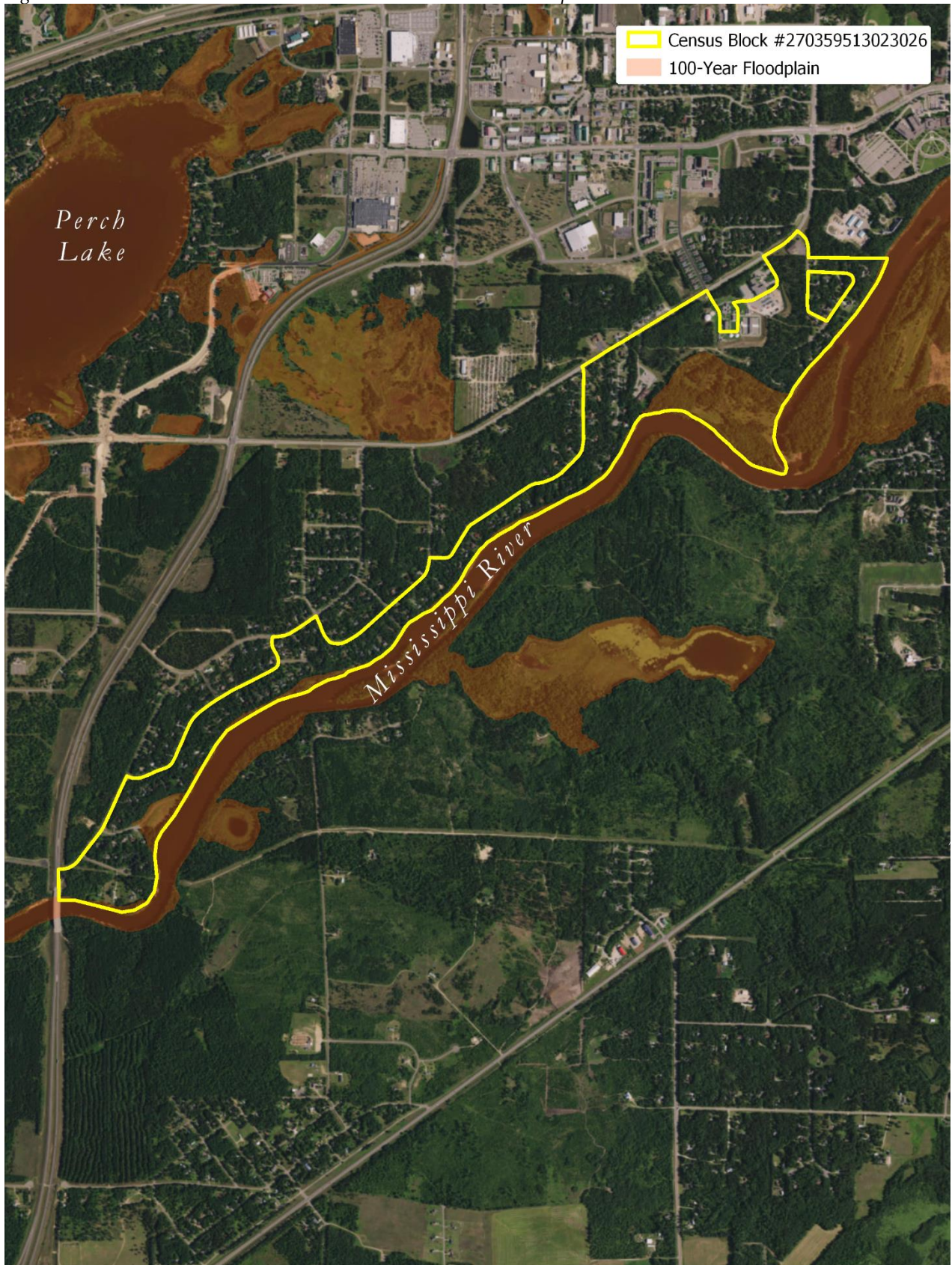


Figure A - 26. Feedlots in Crow Wing County

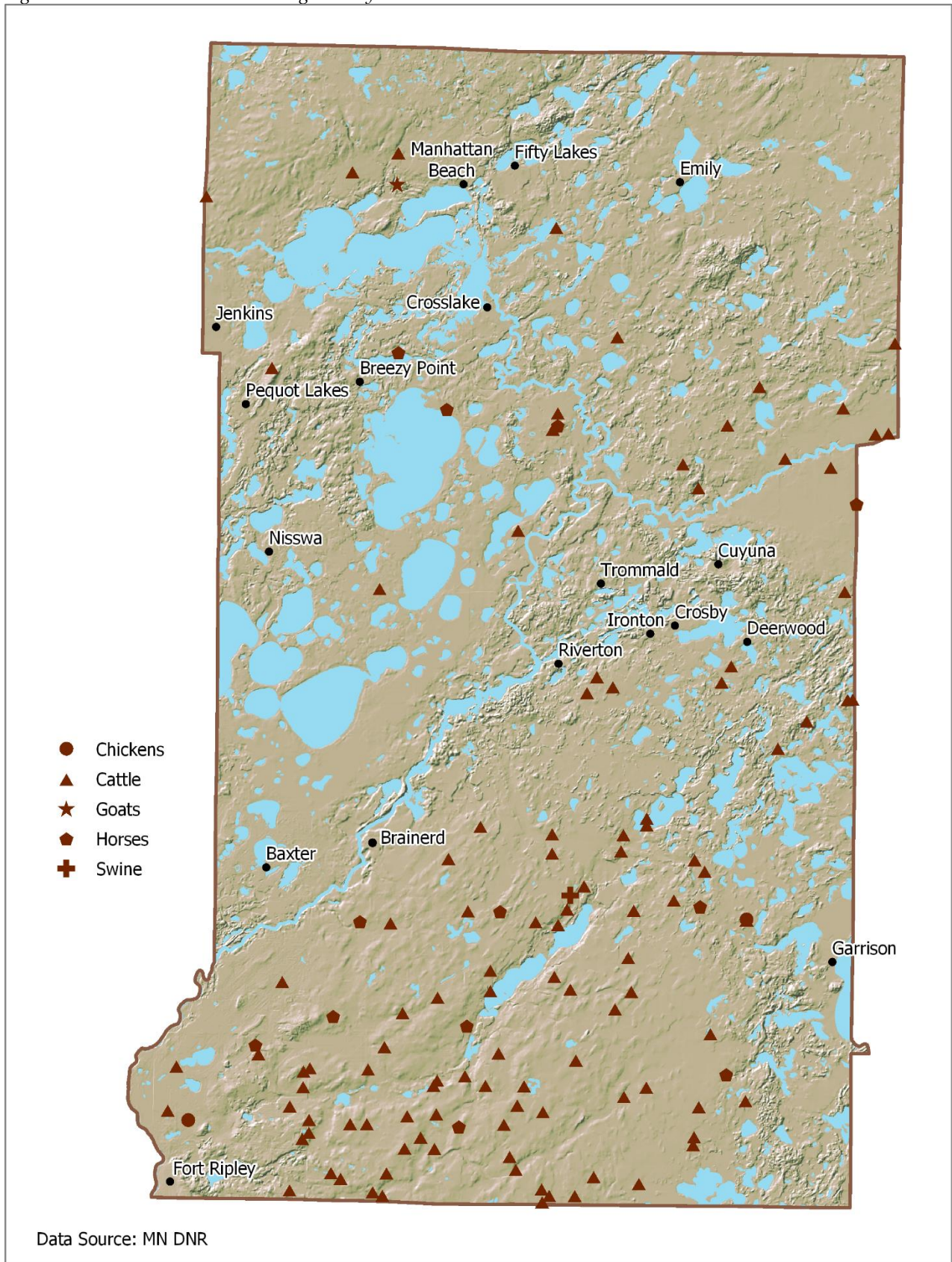
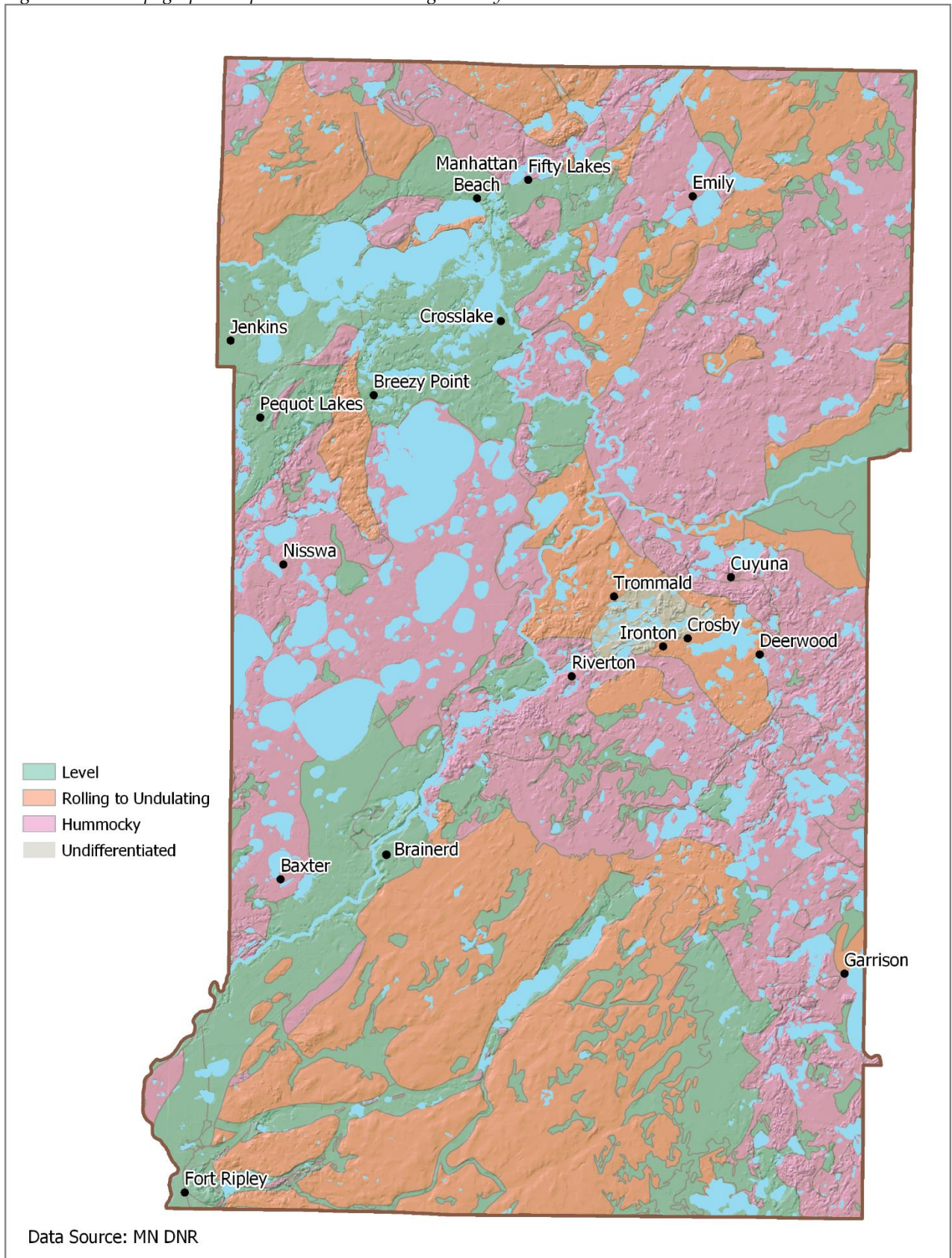


Figure A - 27. Topographic Expression in Crow Wing County



# **Appendix B**

## **Crow Wing County Critical Facilities**

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Agriculture & Food				
US Rural Development	7118 Clearwater Rd N	Baxter	MN	56425
Bjerga's Feed Store	915 Front St	Brainerd	MN	56401
Wild Acres Processing Inc	7443 Wild Acres Rd	Pequot Lakes	MN	56472

Banking & Finance				
Deerwood Bank	611 Washington St NE	Brainerd	MN	56401
Edward Jones	311 S 8th St	Brainerd	MN	56401
Allstate Financial Services	317 Washington St	Brainerd	MN	56401
MidMinnesota Federal Credit Union – Brainerd	200 S 6th St	Brainerd	MN	56401
U.S. Bank Branch	320 N 6th St	Brainerd	MN	56401
Bremer Bank	321 S 7th St	Brainerd	MN	56401
Brainerd Savings & Loan	524 S 6th St	Brainerd	MN	56401
Northwestern Mutual	315 E River Rd #201	Brainerd	MN	56401
David Johnson - Prudential Financial	517 NW 4th St	Brainerd	MN	56401
Wells Fargo Home Mortgage	424 W Washington St	Brainerd	MN	56401
Blum Capital Management LLC	724 W Washington St	Brainerd	MN	56401
Summit Point Financial	14084 Baxter Dr	Baxter	MN	56425
Country Financial	13954 Cypress Dr	Baxter	MN	56425
Mid-Minnesota Federal Credit Union – Baxter	13283 Isle Dr	Baxter	MN	56425
Frandsen Bank & Trust	7429 Excelsior Rd	Baxter	MN	56425
Bremer Bank	7558 Design Rd	Baxter	MN	56425
RiverWood Bank	14540 Dellwood Dr N	Baxter	MN	56425
First National Bank North	14521 Edgewood Dr N	Baxter	MN	56425
Deerwood Bank	14986 Lynwood Dr N	Baxter	MN	56425
American National Bank of MN	7638 Woida Rd N	Baxter	MN	56425
Black Ridge Bank	5411 Co Rd 18	Nisswa	MN	56468
Frandsen Bank & Trust Bank	24110 Smiley Rd	Nisswa	MN	56468
Black Ridge Bank	5411 Co Rd 18	Nisswa	MN	56468
Wells Fargo Bank	4284 Main St	Pequot Lakes	MN	56472
Pine River State Bank Bank	31019 Wildwood Ct	Pequot Lakes	MN	56472
Crow Wing Power Credit Union	17330 State Hwy 371	Brainerd	MN	56401
First National Bank North	35197 Co Rd 3	Crosslake	MN	56442
BlackRidgeBANK	35563 Co Rd 3	Crosslake	MN	56442
Frandsen Bank & Trust	35470 Co Rd 3	Crosslake	MN	56442
River Wood Bank	36139 Co Rd 66	Crosslake	MN	56442
Pine River State Bank	40099 MN-6	Emily	MN	56447

Banking & Finance				
Unity Bank	15 E Main St	Crosby	MN	56441
Wells Fargo Bank	221 4th St	Ironton	MN	56455
Deerwood Bank	21236 Archibald Rd	Deerwood	MN	56444
Deerwood Bank	9451 Madison St	Garrison	MN	56450
Security State Bank of Aitkin	27310 Central St	Garrison	MN	56450
Us Bank	108 US-169	Garrison	MN	56450

Chemical and Hazardous Materials				
Adney Lake Dump		Crosslake	MN	56442
Armour Mine #1		Crosby	MN	56441
Armour Mine #2		Crosby	MN	56441
Austin's Electric Pump	302 Washington St	Brainerd	MN	56401
Baxter City Of	50 Memorywood Dr N	Baxter	MN	56425
Bay Lake Dump		Bay Lake Township	MN	56444
BNSF - West Laurel Street		Brainerd	MN	56401
BNSF Railway Co - Brainerd	324 Washington St NE	Brainerd	MN	56401
BNSF Railway Co - Tie Plant	1271 Highland Scenic Dr S	Baxter	MN	56425
BNSF R-O-W	801 S 10th St	Brainerd	MN	56401
Brainerd Former City Dump		Brainerd	MN	56401
Brainerd Foundry Co Inc	801 10th St S	Brainerd	MN	56401 4150
Brainerd Gas Manufacturing		Brainerd	MN	56401
Brainerd TACC	1115 Wright St	Brainerd	MN	56401
Breezy Point Dump		Breezy Point	MN	56472
Communications Tower		Emily	MN	56447
Conoco Store #23307	801 W Washington Ave	Brainerd	MN	56401
Crosby Sanitary Landfill		Crosby	MN	56441
Crosslake Auto Body & Detail	13606 County Road 103	Crosslake	MN	56442
Crosslake Construction Demolition Debris	13116 Fawn Lake Rd	Crosslake	MN	56442
Crow Wing County Demo Debris Landfill	15732 Highway 210	Brainerd	MN	56401
Crow Wing County MMSW Landfill	15732 State Highway 210	Brainerd	MN	56401
Crow Wing County MMSW Landfill	15732 State Highway 210	Brainerd	MN	56401
Cuyuna City Dump		Cuyuna	MN	56444
Deerwood Dump		Deerwood	MN	56444
Emily City Dump		Emily	MN	56447
Fairfield Township Dump		Fairfield Township	MN	56447

Chemical and Hazardous Materials				
Fairfield Township Dump #2		Fairfield Township	MN	56447
Fifty Lakes Modified Sanitary Landfill	15732 State Highway 210	Brainerd	MN	56401
Fort Ripley City Dump		Fort Ripley	MN	56449
Fort Ripley Township Dump		Fort Ripley Township	MN	56449
Garrison Dump		Garrison	MN	56450
Hasse Dump		Garrison	MN	56450
Ideal Township Dump		Jenkins	MN	56456
Irondale Township Dump		Crosby	MN	56441
Ironton Dump		Ironton	MN	56455
ISD 181 Franklin Jr High School	1001 Kingwood St	Brainerd	MN	56401
Jenkins Dump		Jenkins	MN	56456
Jensens Garage	609 & 613 Norwood St	Brainerd	MN	56401
Juls Service	101 Washington St NE	Brainerd	MN	56401
Lake Edwards Township Dump		Lake Edwards Township	MN	56468
Larson's Sports	1300 Hwy 210 W	Brainerd	MN	56401
Marsh Run		Brainerd	MN	56401
Meyer Cleaners Inc	423 Washington St	Brainerd	MN	56401
Minnegasco Meter Site-Brainerd State Hos	3825 Oak St	Brainerd	MN	56401
Minnegasco Meter Site-Potlach	1723 Mill Ave	Brainerd	MN	56401
Mission Township Transfer Station	15732 State Highway 210	Brainerd	MN	56401
MNDOT BNSF North Track	TH 210	Baxter	MN	56425
Nisswa City Dump		Nisswa	MN	56468
Nisswa Dump		Nisswa	MN	56468
Nokay Lake Dump		Nokay Lake Township	MN	56459
North Cross Lake Dump		Manhattan Beach	MN	56442
Pequot Lakes Dump		Pequot Lakes	MN	56472
Pequot Publishing	129 W Lake St	Pequot Lakes	MN	56472
Poor Gary's Disposal Service	15732 State Highway 210	Brainerd	MN	56401
Potlatch - Demolition Landfill Baxter	15732 State Highway 210	Brainerd	MN	56401
Rathcke Property	Spruce St	Pequot Lakes	MN	56472
Roosevelt Township Dump - 2		Pine Center	MN	56450



Chemical and Hazardous Materials				
Roosevelt Township Transfer Station	15732 State Highway 210	Brainerd	MN	56401
Rutger's Resort Dump		Bay Lake	MN	56444
Sludge Disposal Area		Brainerd	MN	56401
Southeast Brainerd GW Contamination	29th and Oak St (Highway 18)	Brainerd	MN	56401
Trommald Dump		Trommald	MN	56441
Unnamed Dump - Katrine		Katrine	MN	56444
Unnamed Dump - Mission Twnshp		Mission Township	MN	56465
Wausau Paper Printing & Writing LLC	1801 Mill Ave NE	Brainerd	MN	56401
Wilds on the Mississippi River	Bald Eagle Dr	Riverton	MN	56455

Commercial Facilities				
Anderson Brothers Construction	11325 MN-210	Brainerd	MN	56401
Grandview Lodge	23521 Nokomis Ave	Nisswa	MN	56468
Breezy Point Resort	9252 Breezy Point Dr	Pequot Lakes	MN	56472
Ruttger's Bay Lake Lodge	25039 Tame Fish Lake Rd	Deerwood	MN	56444
Knife River	7925 Industrial Park Rd S	Baxter	MN	56425
Bernicks	13394 Dogwood Dr	Baxter	MN	56425
Pepsi-Cola	2024 SE 13th St	Brainerd	MN	56401
Brainerd International Speedway	5523 Birchdale Rd	Brainerd	MN	56401
North Central Speedway	9651 MN-371 BUS	Brainerd	MN	56401
TCBX Inc	1748 SE 13th St	Brainerd	MN	56401
Midwest Machinery	7045 Foley Rd	Baxter	MN	56425
Just for Kix	7842 College Rd	Baxter	MN	56425
Walmart	7295 Glory Rd S	Baxter	MN	56425
Home Depot	7207 Foley Rd	Baxter	MN	56425
Costco	13650 Elder Dr	Baxter	MN	56425
Cub Foods – Baxter	14133 Edgewood Dr N	Baxter	MN	56425
Cub Food – Brainerd	417 8th Ave NE	Brainerd	MN	56401
Supper One	7895 Excelsior Rd	Baxter	MN	56425
ALDI	14620 Dellwood Dr N	Baxter	MN	56425
Schwan Food Co	7998 Industrial Park Rd S	Baxter	MN	56425
Morey's Seafood Market	1581 I Audubon Way	Brainerd	MN	56401
Target	14546 Dellwood Dr N	Baxter	MN	56425
Schaefer's Foods	23962 Smiley Rd	Nisswa	MN	56468
Supervalu	30503 State Hwy 371	Pequot Lakes	MN	56472
Reed's Market & Gas Express	35561 Co Rd 3	Crosslake	MN	56442

Commercial Facilities				
Lake Country Foods & Gas Inc	40327 MN-6	Emily	MN	56447
Emily Meats	39990 MN-6	Emily	MN	56447
Crosby Super One Foods	101 E Main St	Crosby	MN	56441

Communications				
Emily Cooperative Telephone Company	0040 MN Hwy 6	Emily	MN	56447
Crosslake Communications	35910 Co Hwy 66	Crosslake	MN	56442
Consolidated Telephone Company	1102 Madison St	Brainerd	MN	56401
TDS Telephone Company	30965 2nd St	Pequot Lakes	MN	56472

Dams				
Big Pine Lake (Rock Dam)				
Blackbear Lake				
Brainerd Hydroelectric Dam				
Eagle Lake				
Emily Lake				
Hawthorne (Nokay Lake)				
Little Pine Creek				
Ossawinnamakee Lake (Pelican Brook)				
Pelican Lake				
Perkins Pond				
Pine River Dam (Pine River Reservoir, Crosslake Corps of Engineers Dam)				
Pine River Dikes 13 & 14 (Pine River Reservoir)				
Rogers Lake				
Roosevelt Lake				
Sibley Lake				
Velvet Lake (Phelps Lake)				

Education				
Brainerd Learning Center	311 10th Ave. NE	Brainerd	MN	56401
Baxter Elementary School	5546 Fairview Road	Baxter	MN	56425
Brainerd High School	702 South 5th Street	Brainerd	MN	56401
Forestview Middle School	12149 Knollwood Drive	Baxter	MN	56425
Garfield Elementary	1120 10th Avenue NE	Brainerd	MN	56401

Education				
Harrison Elementary	1515 Oak Street	Brainerd	MN	56401
Lincoln Education Center	604 South 6th Street	Brainerd	MN	56401
Lowell Elementary	704 3rd Avenue NE	Brainerd	MN	56401
Nisswa Elementary	5533 Lakers Lane	Nisswa	MN	56468
Riverside Elementary School	220 3rd Street NW	Brainerd	MN	56401
School Farm	12119 State Hwy 25	Brainerd	MN	56401
South Campus	400 Quince Street	Brainerd	MN	56401
Washington Educational Service Building	804 Oak Street	Brainerd	MN	56401
Crosby High School	711 Poplar Street	Crosby	MN	56441
Cuyuna Range Elementary	509 6 <sup>th</sup> Ave NE	Crosby	MN	56441
Pequot Lakes High School	30805 Olson St	Pequot Lakes	MN	56472
Eagle View Elementary	6539 Co Rd 11	Breezy Point	MN	56472

Emergency Services				
Brainerd Fire Department	23 Laurel St	Brainerd	MN	56401
Crosby Volunteer Fire Department	21 1 <sup>st</sup> Street NW	Crosby	MN	56441
Crosslake Fire Department	37028 Co Rd 66	Crosslake	MN	56442
Cuyuna Fire Department	24849 Minnesota Ave	Deerwood	MN	56444
Deerwood Volunteer Fire Department	23786 Serpent Road	Deerwood	MN	56444
Emily Volunteer Fire Department	20837 County Road 1	Emily	MN	56447
Fifty Lakes Fire Department	40366 County Road 3	Fifty Lakes	MN	56448
Garrison Fire and Rescue Department	27128 Central Street	Garrison	MN	56450
Ideal Township Fire Department Station 1	35458 Butternut Point Road	Pequot Lakes	MN	56472
Ideal Township Fire Department Station 2	9229 County Road 1	Pine River	MN	56474
Ironton Fire Department	309 3 <sup>rd</sup> Street	Ironton	MN	56455
Mission Township Fire Department	29474 County Road 3	Merrifield	MN	56465
Nisswa Fire Department	25636 Main Street	Nisswa	MN	56468
Pequot Lakes Fire Department	4638 County Road 11	Pequot Lakes	MN	56472
Crow Wing County Sheriff's Office	304 Laurel St	Brainerd	MN	56401
Baxter Police	13190 Memorywood Dr	Baxter	MN	56425
Brainerd Police	225 E River Rd	Brainerd	MN	56401
Breezy Point Police	8361 Co Rd 11	Pequot Lakes	MN	56472
Crosby Police	2 2nd St SW	Crosby	MN	56441
Cuyuna Police	24945 Minnesota Ave	Cuyuna	MN	56444

Emergency Services				
Deerwood Police	23770 Forest Rd	Deerwood	MN	56444
Emily Police	21236 2nd St	Emily	MN	56447
Nisswa Police	5442 City Hall St	Nisswa	MN	56468
Pequot Lakes Police	4638 Co Rd 11	Pequot Lakes	MN	56472
Life Link	16384 Airport Rd	Brainerd	MN	56401
North Memorial Ambulance Aircare	16384 Airport Rd	Brainerd	MN	56401
North Memorial Ambulance	210 NW 5th St	Brainerd	MN	56401
Crosby Ambulance		Crosby	MN	56441

Energy				
Crow Wing Power	17330 State Hwy 371	Brainerd	MN	56401
Great River Energy	6002 Pine Beach Road	Brainerd	MN	56401
Minnesota Power	21297 Co Rd 59	Ironton	MN	56455
Xcel Energy	17246 State Hwy 371	Brainerd	MN	56401
Mille Lacs Energy	36559 US-169	Aitkin	MN	56431

Government Facilities				
Crow Wing County Historic Court Houses	326 Laurel St.	Brainerd	MN	56401
Crow Wing County Land Services	322 Laurel St.	Brainerd	MN	56401
Crow Wing County Community Services	204 Laurel St.	Brainerd	MN	56401
Crow Wing County Central Services	202 Laurel St.	Brainerd	MN	56401
Crow Wing County Historical Society/Museum	326 Laurel St.	Brainerd	MN	56401
Crow Wing County Sheriff's Office	304 Laurel St.	Brainerd	MN	56401
Crow Wing County Jail	313 Laurel St.	Brainerd	MN	56401
Crow Wing County Judicial Center	213 Laurel St.	Brainerd	MN	56401
Crow Wing County Highway Department	16589 Co Rd 142	Brainerd	MN	56401
Crow Wing County Highway & Crosslake Maintenance Facility	13870 Whipple Dr.	Crosslake	MN	56442
Crow Wing County Fair Grounds	2000 SE 13th St	Brainerd	MN	56401
Brainerd City Hall	501 Laurel St.	Brainerd	MN	56401
Baxter City Hall	13190 Memorywood Dr	Baxter	MN	56425
Breezy Point City Hall	8319 Co Rd 11	Breezy Point	MN	56472
Crosby City Hall	2 2 <sup>nd</sup> St. SW	Crosby	MN	56441

Government Facilities				
Crosslake City Hall	37028 Co Rd 66	Crosslake	MN	56442
Cuyuna City Hall	24945 Minnesota Ave	Cuyuna	MN	56444
Deerwood City Hall	23770 Forest Rd	Deerwood	MN	56444
Emily City Hall	39811 MN Hwy 6	Emily	MN	56447
Fifty Lakes City Hall	40366 Co Rd 3	Fifty Lakes	MN	56448
Garrison City Hall	27069 Central St.	Garrison	MN	56450
Ironton City Hall	309 3 <sup>rd</sup> St.	Ironton	MN	56455
Jenkins City Hall	3141 Pine Tree Ave	Jenkins	MN	56474
Manhattan Beach City Hall	39118 Co Rd 66	Manhattan Beach	MN	56442
Nisswa City Hall	5442 City Hall St.	Nisswa	MN	56468
Pequot Lakes City Hall	4638 Co Rd 11	Pequot Lakes	MN	56472
Riverton City Hall	16663 Main St.	Riverton	MN	56455
Trommald City Hall	18105 Whitetail St.	Trommald	MN	56441

Healthcare and Public Health				
Crow Wing County Community Services – Public Health	204 Laurel St.	Brainerd	MN	56401
Essentia Health – St. Joseph’s Hospital	523 N 3 <sup>rd</sup> St.	Brainerd	MN	56401
Brainerd VA Clinic	722 NW 7 St.	Brainerd	MN	56401
Essentia Health St. Joseph’s Cancer Center	523 NW 3 <sup>rd</sup> St.	Brainerd	MN	56401
Essentia Health St. Joseph’s – Brainerd Clinic	2024 S. 6 <sup>th</sup> St.	Brainerd	MN	56401
Northern Orthopedics	2014 S 6 <sup>th</sup> St.	Brainerd	MN	56401
Essentia Health St. Joseph’s – Baxter Clinic	13060 Isle Dr.	Baxter	MN	56425
Brainerd Lakes Surgical Center	13114 Isle Dr.	Baxter	MN	56425
Cuyuna Regional Medical Center – Baxter	13205 Isle Dr.	Baxter	MN	56425
Essentia Health – Baxter Convenient Care	14133 Edgewood Dr.	Baxter	MN	56425
Cuyuna Regional Medical Center – Hospital	320 E Main St.	Crosby	MN	56441
Essentia Health St. Joseph’s – Emily Clinic	20918 Co Rd 1	Emily	MN	56447
Essentia Health St. Joseph’s – Crosslake Clinic	35205 Co Rd 3	Crosslake	MN	56442
Essentia Health St. Joseph’s – Pequot Lakes	4317 W Woodman St.	Pequot Lakes	MN	56472
Riverwood - Garrison Clinic	27278 State Hwy 18	Garrison	MN	56450
Mille Lacs Health System	27378 State Hwy 18	Garrison	MN	56450
Bethany Samaritan	804 Wright St	Brainerd	MN	56401

Healthcare and Public Health				
Woodland	100 Buffalo Hills Ln. E	Brainerd	MN	56401
Cuyuna Regional Medical Center	320 E Main St	Crosby	MN	56441
Almond House	802 SE 28th St.	Brainerd	MN	56401
Arbor Glen	14177 Broadmoor Dr.	Baxter	MN	56425
Autumn Glen	14180 Broadmoor Dr.	Baxter	MN	56425
Bethany Senior Living	1953 7th St S	Brainerd	MN	56401
Birchwood Samaritan House	2509 Greenwood St.	Brainerd	MN	56401
Carefree Living	2723 Oak St.	Brainerd	MN	56401
Central Minnesota Senior Care	1008 10th St. S	Brainerd	MN	56401
CRMC Assisted Living	300 3rd Ave NE	Crosby	MN	56441
Diamond Willow	14396 Grand Oaks Dr	Baxter	MN	56425
Edgewood-Baxter	7276 Excelsior Rd N	Baxter	MN	56425
Edgewood - Dellwood	300 3rd Ave NE	Crosby	MN	56441
Edgewood Vista	14890 Beaver Dam Rd	Brainerd	MN	56401
Elmwood Samaritan House	2517 Greenwood St.	Brainerd	MN	56401
Excelsior Place	1421 I Firewood Dr.	Baxter	MN	56425
Golden Horizons	13631 East Shore Road	Crosslake	MN	56442
Harmony House	218 SW 9th St.	Brainerd	MN	56401
Heartwood Senior Living	500 Heartwood Dr.	Crosby	MN	56441
Heritage House	5384 Country Care Lanes	Pequot Lakes	MN	56472
Hills Crossing	5307 Hills Crossing	Nisswa	MN	56468
Lakes Country Apartments	1953 South 7th St.	Brainerd	MN	56401
Northern Lakes Senior Living	8186 Excelsior Rd.	Baxter	MN	56425
Oakwood Samaritan House	2501 Greenwood St.	Brainerd	MN	56401
Oak Crest Manor Apts	2106 Spruce Dr.	Brainerd	MN	56401
Oak Crest Manor II	2014 Spruce Dr.	Brainerd	MN	56401
Parkview	31215 N Heath St.	Pequot Lakes	MN	56472
Senior Class Care	4451 East Woodman St	Pequot Lakes	MN	56472
Senior Class Care	5301 Hills Crossing	Nisswa	MN	56468
Woodland Good Samaritan Apts.	200 Buffalo Hills Lane	Brainerd	MN	56401
Baxter CBHH	14241 Grand Oaks Dr	Baxter	MN	56425
Brainerd MSSH	11615 State Ave	Brainerd	MN	56401
MN Teen Challenge	2424 Business 371	Brainerd	MN	56401
CARE Four Winds	11800 State Highway 18	Brainerd	MN	56401
CMRC	320 E Main St	Crosby	MN	56441

Manufacturing				
Clow Stamping	23103 Co Rd 3	Merrifield	MN	56465
Lexington Manufacturing	10055 Thiesse Rd	Brainerd	MN	56401
Avantech	7790 Hastings Rd	Baxter	MN	56425

Manufacturing				
Landis+gyr Inc	6436 Co Rd 11	Pequot Lakes	MN	56472
Pequot Tool & Manufacturing Inc	3457 Veterans St	Jenkins	MN	56472
Precision Tool Technologies, Inc. Tool Manufacturer	924 Wright St	Brainerd	MN	56401
Stern Assembly	1100 Industrial Park Road SW	Brainerd	MN	56401
LM Steel Manufacturing & Supply	924 Thiesse Dr	Brainerd	MN	56401
Silver Star Manufacturing LLC	3231 Oak St	Brainerd	MN	56401
Bang Printing	3323 Oak St	Brainerd	MN	56401
ATEK Manufacturing	210 10th Ave NE	Brainerd	MN	56401
Hy-Tec Construction	11360 MN-371 BUS	Brainerd	MN	56401
Javron Inc	18129 Co Rd 3	Brainerd	MN	56401
BNSF Brainerd Equipment Shop	324 Washington St NE	Brainerd	MN	56401
Mirada Research & Manufacturing	809 4th St	Ironton	MN	56455
Graphic Packaging International	975 3rd St SW	Crosby	MN	56441
Ricka Manufacturing Inc	31968 Ricka Ln	Pequot Lakes	MN	56472
Permatite Manufacturing Inc	4720 Co Rd 11	Pequot Lakes	MN	56472
Nortech Systems - Merrifield Office	12136 Crystal Lake Rd	Merrifield	MN	56465
Gopher Tackle Manufacturing Company	24927 Minnesota Ave	Deerwood	MN	56444
Brian's Welding	10131 Industrial Road	Brainerd	MN	56401

National Monuments & Icons				
Northern Pacific Center	1511 Northern Pacific Rd	Brainerd	MN	56401
Historical Water Tower	124 6 <sup>th</sup> Street North	Brainerd	MN	56401

Postal and Shipping				
US Post Office	7757 College Rd	Baxter	MN	56425
FedEx Ground	1701 Thiesse Dr	Brainerd	MN	56401
UPS CC Brainerd	1009 Madison Ave	Brainerd	MN	56401
US Post Office	422 Laurel St	Brainerd	MN	56401
US Post Office	207 W Main St	Crosby	MN	56441
US Post Office	35860 County Rd 66	Crosslake	MN	56442
US Post Office	23809 Forest Rd	Deerwood	MN	56444
US Post Office	20984 County Rd 1	Emily	MN	56447
US Post Office	617 Front St	Fort Ripley	MN	56449
US Post Office	9424 Jefferson St	Garrison	MN	56450
US Post Office	115 4th St	Ironton	MN	56455

### Postal and Shipping

US Post Office	11029 Crystal Lake Rd	Merrifield	MN	56465
US Post Office	25551 Main St	Nisswa	MN	56468
US Post Office	4294 Main St	Pequot Lakes	MN	56472

### Transportation

Brainerd Lakes Regional Airport	16384 Airport Road #5	Brainerd	MN	56401
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### Water

Brainerd Water Department	8027 Highland Scenic Rd	Baxter	MN	56425
Baxter Utility	13190 Memorywood Dr	Baxter	MN	56425
City of Nisswa Wastewater Treatment Plant/Maintenance	24722 Charmin Ave	Nisswa	MN	56468
Water Tower	7410 Hastings Rd	Baxter	MN	56425
Water Tower	7091 Foley Rd	Baxter	MN	56425
Water Tower	15042 Inglewood Dr	Baxter	MN	56425
Water Tower	501 Laurel St	Brainerd	MN	56401
Water Tower	11800 State Highway 18	Brainerd	MN	56401
Water Tower	1425 South Mission Rd	Brainerd	MN	56401
Nisswa Treatment Facility	24757 Charmin Ave	Nisswa	MN	56468
Pequot Lakes Treatment Facility	4638 County Road 11	Pequot Lakes	MN	56472
Water Tower	4294 Main St	Pequot Lakes	MN	56472
Breezy Point Treatment Facility	8306 Thrane Dr	Breezy Point	MN	56472
Water Tower	9252 Breezy Point Dr	Breezy Point	MN	56472
Emily Waste Water Treatment	Yost Road	Emily	MN	56447
Serpent Lake Water Treatment	18135 County Road 30	Crosby	MN	56441
Ironton Water Tower	435 4 <sup>th</sup> Avenue NW	Ironton	MN	56455
Crosby Water Tower	1077 1 <sup>st</sup> Street SW	Crosby	MN	56441
Deerwood Water Tower	23770 Forest Rd	Deerwood	MN	56444



# **Appendix C**

## **Crow Wing County Hazard Events**

DRAFT

The National Centers for Environmental Information Database was queried for all notable events since 1950. However, some categories of events do not have records prior to 1996. Data was available through April of 2017.

Table C - 1. All tornadoes recorded by NCDC, 1950-April 2017

Location or County	Date	Magnitude	Deaths	Injuries	Property Damage
Crosby Beach	6/19/2016	EF2	0	0	0
Brainerd	6/13/2001	F2	0	0	0
Brainerd	10/26/1996	F2	0	0	\$50,000
Crow Wing	7/5/1991	F3	0	3	\$2,500,000
Crow Wing	7/5/1991	F1	0	0	0
Crow Wing	7/5/1991	F1	0	0	0
Crow Wing	5/29/1989	F0	0	0	0
Crow Wing	9/16/1988	F0	0	0	0
Crow Wing	7/3/1985	F0	0	0	\$250,000
Crow Wing	7/3/1985	F0	0	0	0
Crow Wing	7/3/1985	F2	0	0	\$25,000
Crow Wing	8/26/1977	F3	0	11	\$2,500,000
Crow Wing	8/26/1977	F2	0	0	\$25,000
Crow Wing	7/3/1974	F1	0	0	\$25,000
Crow Wing	6/25/1973	F3	0	2	\$2,500,000
Crow Wing	6/16/1973	F0	0	0	\$2,500
Crow Wing	7/27/1972	F0	0	0	0
Crow Wing	8/9/1971	F0	0	0	\$25,000
Crow Wing	7/27/1971	F0	0	0	\$2,500
Crow Wing	8/6/1969	F4	0	0	\$2,500,000
Crow Wing	6/13/1968	F0	0	0	0
Crow Wing	6/11/1966	F4	0	0	\$250,000
Crow Wing	6/11/1966	F4	0	0	\$250,000
<b>Highest Property Value Damage</b>					<b>\$2,500,000</b>

Table C - 2. All severe hail storm events recorded by NCDC, 1950-April 2017

Location or County	Date	Size in Inches	Deaths	Injuries	Property Damage
Baxter	3/6/2017	1.5	0	0	0
Lake Hubert	3/6/2017	0.75	0	0	0
Deerwood	7/11/2016	1.0	0	0	0
Ironton	7/11/2016	0.88	0	0	0

Location or County	Date	Size in Inches	Deaths	Injuries	Property Damage
Crosby	7/11/2016	1.0	0	0	0
Ironton	7/11/2016	1.5	0	0	0
Crosby	7/11/2016	1.0	0	0	0
Brainerd	7/11/2016	0.88	0	0	0
Brainerd	7/11/2016	1.5	0	0	0
Pelican Lakes	7/11/2016	0.75	0	0	0
Crosby	6/25/2016	0.75	0	0	0
Lake Hubert	6/19/2016	1.75	0	0	0
Mission	6/19/2016	1.75	0	0	0
Merrifield	6/19/2016	2.75	0	0	0
Lake Hubert	6/19/2016	2.75	0	0	0
Nisswa	6/19/2016	3.0	0	0	0
Nisswa	6/19/2016	4.0	0	0	0
Nisswa	6/19/2016	2.75	0	0	0
Pequot Lakes Airport	6/19/2016	2.5	0	0	0
Nisswa	9/6/2015	0.75	0	0	0
Emily	9/6/2015	0.88	0	0	0
Lennox	8/12/2015	2	0	0	0
Ft Ripley	8/12/2015	1.25	0	0	0
Deerwood	8/8/2015	0.75	0	0	0
Manhattan Beach	6/7/2015	0.88	0	0	0
Crosby Beach	6/3/2015	0.75	0	0	0
Lake Hubert	9/4/2014	0.88	0	0	0
Brainerd	9/1/2014	0.75	0	0	0
Woodrow	8/24/2014	1.75	0	0	0
Riverton	8/18/2014	1	0	0	0
Riverton	8/18/2014	1	0	0	0
Crosby Beach	8/18/2014	1	0	0	0
Wolford	5/7/2014	1.5	0	0	0
Crosby Beach	5/7/2014	0.75	0	0	0
Brainerd	5/7/2014	0.88	0	0	0
Deerwood	5/7/2014	1	0	0	0
Crosby	8/26/2013	0.75	0	0	0
Brainerd	8/26/2013	1.75	0	0	0
Pine Center	8/26/2013	1.75	0	0	0
Manhattan Beach	8/6/2013	1	0	0	0
Manhattan Beach	6/19/2012	0.75	0	0	0
Fifty Lakes	6/19/2012	1	0	0	0

Location or County	Date	Size in Inches	Deaths	Injuries	Property Damage
Ironton	5/28/2012	1	0	0	0
Deerwood	5/28/2012	0.88	0	0	0
Merrifield	7/30/2011	0.88	0	0	0
Emily	6/6/2011	1.75	0	0	0
Emily	6/6/2011	1.5	0	0	0
Emily	6/6/2011	1.75	0	0	0
Emily	6/6/2011	1.25	0	0	0
Emily	6/6/2011	1.25	0	0	0
Brainerd	5/22/2011	0.88	0	0	0
Ft Ripley	5/10/2011	1	0	0	0
Shepard	5/10/2011	1.75	0	0	\$5,000
Shepard	5/10/2011	2.5	0	0	\$8,000
Ironton	7/17/2010	1	0	0	0
Ft Ripley	7/17/2010	0.75	0	0	0
Emily	7/14/2010	1.5	0	0	0
Emily	5/24/2010	0.75	0	0	0
Brainerd	7/14/2009	0.88	0	0	0
Merrifield	7/14/2009	1.75	0	0	0
Brainerd	7/14/2009	0.75	0	0	0
Brainerd	6/23/2009	0.75	0	0	0
Nisswa	7/11/2008	0.75	0	0	0
Barrows	7/2/2008	0.75	0	0	0
Brainerd	7/2/2008	1	0	0	0
Brainerd	5/31/2008	0.75	0	0	0
Crow Wing	8/13/2007	1	0	0	0
Brainerd	8/13/2007	0.88	0	0	0
Brainerd	8/13/2007	1.75	0	0	0
Brainerd	8/13/2007	0.75	0	0	0
Baxter	8/13/2007	0.75	0	0	0
Ft Ripley	8/13/2007	1	0	0	0
Baxter	8/13/2007	1.5	0	0	0
Brainerd	8/13/2007	0.88	0	0	0
Nisswa	5/29/2006	0.75	0	0	0
Brainerd	5/29/2006	0.88	0	0	0
Emily	5/29/2006	1	0	0	0
Crosslake	6/23/2005	0.75	0	0	0
Brainerd	6/20/2005	0.75	0	0	0
Ft Ripley	6/8/2005	0.88	0	0	0
Pequot Lakes	7/2/2003	1	0	0	0
Jenkins	7/2/2003	1.75	0	0	0

<b>Location or County</b>	<b>Date</b>	<b>Size in Inches</b>	<b>Deaths</b>	<b>Injuries</b>	<b>Property Damage</b>
Pequot Lakes	7/2/2003	0.75	0	0	0
Breezy Pt	7/2/2003	0.75	0	0	0
Baxter	7/17/2001	1	0	0	0
Ft Ripley	7/17/2001	0.88	0	0	0
Baxter	6/13/2001	0.75	0	0	0
Crosslake	6/13/2001	0.75	0	0	0
Brainerd	6/11/2001	1.5	0	0	0
Emily	5/15/2001	0.75	0	0	0
Crosslake	8/14/2000	1.75	0	0	0
Emily	8/14/2000	1	0	0	0
Brainerd	8/15/1999	1	0	0	0
Brainerd	8/15/1999	1.25	0	0	0
Ft Ripley	7/28/1999	0.75	0	0	0
Ft Ripley	7/28/1999	1.75	0	0	0
Deerwood	6/6/1999	1.75	0	0	0
Crosby	9/26/1998	1	0	0	0
Nisswa	9/26/1998	1.75	0	0	0
Crosby	7/20/1998	0.75	0	0	0
Crosby	7/20/1998	1	0	0	0
Emily	6/1/1998	1	0	0	0
Crosslake	6/1/1998	1	0	0	0
Fifty Lakes	6/1/1998	1.75	0	0	0
Ft Ripley	9/18/1997	1.75	0	0	0
Pine Center	8/2/1997	1.25	0	0	0
Brainerd	10/26/1996	1	0	0	0
Fifty Lakes	9/10/1996	0.75	0	0	0
Crosslake	7/21/1996	0.75	0	0	0
Brainerd	7/11/1996	1.75	0	0	0
Crosby	7/11/1996	0.75	0	0	0
Swanburg	7/11/1996	1.75	0	0	0
Pequot Lakes	7/1/1996	0.75	0	0	0
Crosslake	7/1/1996	1	0	0	0
Crosslake	7/1/1996	0.75	0	0	0
Brainerd	5/17/1996	1.75	0	0	0
Pequot Lakes	8/8/1995	0.75	0	0	0
Breezy Point	8/8/1995	2.5	0	0	0
Brainerd	7/14/1995	0.75	0	0	0
Crow Wing	8/27/1994	1.75	0	0	0
Island Lake	8/27/1994	1	0	0	0
Crow Wing	8/7/1994	2	0	0	0

Location or County	Date	Size in Inches	Deaths	Injuries	Property Damage
Pine Center	8/7/1994	1	0	0	0
Crow Wing	6/13/1992	1.75	0	0	0
Crow Wing	6/13/1992	1.75	0	0	0
Crow Wing	9/15/1991	1	0	0	0
Crow Wing	7/5/1991	0.75	0	0	0
Crow Wing	6/28/1991	1.75	0	0	0
Crow Wing	7/17/1990	1	0	0	0
Crow Wing	8/28/1989	2.75	0	0	0
Crow Wing	5/29/1989	0.75	0	0	0
Crow Wing	5/29/1989	1.5	0	0	0
Crow Wing	5/29/1989	1.5	0	0	0
Crow Wing	5/24/1989	1.75	0	0	0
Crow Wing	6/24/1988	1.75	0	0	0
Crow Wing	5/7/1988	1.5	0	0	0
Crow Wing	8/29/1987	0.75	0	0	0
Crow Wing	8/4/1986	1.75	0	0	0
Crow Wing	7/3/1985	1.75	0	0	0
Crow Wing	6/21/1985	0.75	0	0	0
Crow Wing	4/26/1984	1.75	0	0	0
Crow Wing	4/26/1984	1.75	0	0	0
Crow Wing	5/10/1982	1.75	0	0	0
Crow Wing	5/10/1982	1.75	0	0	0
Crow Wing	9/8/1980	0.75	0	0	0
Crow Wing	7/14/1980	1	0	0	0
Crow Wing	6/5/1980	1	0	0	0
Crow Wing	6/5/1980	2	0	0	0
Crow Wing	9/1/1979	1	0	0	0
Crow Wing	8/2/1979	1	0	0	0
Crow Wing	7/12/1978	1.75	0	0	0
Crow Wing	8/13/1971	1	0	0	0
<b>Highest Value Property Damage</b>					<b>\$8,000</b>

Table C - 3. All severe thunderstorm wind events recorded by NCDC, 1950-April 2017

Location or County	Date	Type	Magnitude (Knots)	Deaths	Injuries	Property Damage
(Brd) Weiland Fld Bra	8/4/2016	Thunderstorm Wind	68	0	0	0

Location or County	Date	Type	Magnitude (Knots)	Deaths	Injuries	Property Damage
Woodrow	8/4/2016	Thunderstorm Wind	70	0	0	0
Pequot Lakes Airport	8/4/2016	Thunderstorm Wind	56	0	0	0
(Brd) Weiland Fld Bra	8/4/2016	Thunderstorm Wind	61	0	0	0
Brainerd	8/4/2016	Thunderstorm Wind	61	0	0	0
Brainerd	8/4/2016	Thunderstorm Wind	61	0	0	0
Lake Hubert	8/4/2016	Thunderstorm Wind	56	0	0	0
Lake Hubert	8/4/2016	Thunderstorm Wind	61	0	0	0
Nisswa	8/4/2016	Thunderstorm Wind	70	0	0	0
Lake Hubert	8/4/2016	Thunderstorm Wind	63	0	0	0
Brainerd	8/4/2016	Thunderstorm Wind	70	0	0	0
Crosby Beach	7/23/2016	Thunderstorm Wind	52	0	0	0
Brainerd	7/21/2016	Thunderstorm Wind	52	0	0	0
Manhattan Beach	7/21/2016	Thunderstorm Wind	70	0	0	0
Nisswa	7/21/2016	Thunderstorm Wind	61	0	0	0
Crosslake	7/21/2016	Thunderstorm Wind	61	0	0	0
Pequot Lakes	7/21/2016	Thunderstorm Wind	61	0	0	0
Manhattan Beach	7/21/2016	Thunderstorm Wind	61	0	0	0
(Brd) Weiland Fld Bra	7/11/2016	Thunderstorm Wind	51	0	0	0
Manhattan Beach	7/11/2016	Thunderstorm Wind	52	0	0	0
Jenkins	7/11/2016	Thunderstorm Wind	52	0	0	0
Esdon	6/19/2016	Thunderstorm Wind	52	0	0	0
Bay Lake	6/19/2016	Thunderstorm Wind	52	0	0	0
Bay Lake	6/19/2016	Thunderstorm Wind	52	0	0	0
Bay Lake	6/19/2016	Thunderstorm Wind	52	0	1	0
Fifty Lakes	9/6/2015	Thunderstorm Wind	52	0	0	0
Crosby	8/8/2015	Thunderstorm Wind	52	0	0	0
Manhattan Beach	7/24/2015	Thunderstorm Wind	52	0	0	0
Baxter	7/12/2015	Thunderstorm Wind	52	0	0	0
Lake Hubert	7/12/2015	Thunderstorm Wind	61	0	0	0
Baxter	7/12/2015	Thunderstorm Wind	52	0	0	0
Pequot Lakes Arpt.	7/12/2015	Thunderstorm Wind	52	0	0	0
Brainerd	7/12/2015	Thunderstorm Wind	61	0	0	0
Brainerd	7/12/2015	Thunderstorm Wind	52	0	0	0
Merrifield	7/12/2015	Thunderstorm Wind	82	0	0	0
Baxter	7/12/2015	Thunderstorm Wind	70	0	0	0
Baxter	7/12/2015	Thunderstorm Wind	73	0	0	0
Brainerd	7/12/2015	Thunderstorm Wind	52	0	0	0
Brainerd	7/12/2015	Thunderstorm Wind	52	0	0	0

Location or County	Date	Type	Magnitude (Knots)	Deaths	Injuries	Property Damage
Baxter	7/12/2015	Thunderstorm Wind	61	0	0	0
Crow Wing	4/2/2015	High Wind	56	0	0	0
Lake Hubert	9/20/2014	Thunderstorm Wind	52	0	0	0
Emily	9/20/2014	Thunderstorm Wind	52	0	0	0
Riverton	9/20/2014	Thunderstorm Wind	52	0	0	0
Deerwood	9/20/2014	Thunderstorm Wind	52	0	0	0
Nisswa	9/4/2014	Thunderstorm Wind	52	0	0	0
Ironton	9/4/2014	Thunderstorm Wind	52	0	0	0
Baxter	9/4/2014	Thunderstorm Wind	61	0	0	0
Brainerd	9/4/2014	Thunderstorm Wind	61	0	0	0
Baxter	9/4/2014	Thunderstorm Wind	52	0	0	0
Brainerd	9/4/2014	Thunderstorm Wind	61	0	0	0
Nisswa	7/21/2014	Thunderstorm Wind	61	0	0	0
Mission	7/21/2014	Thunderstorm Wind	61	0	0	0
Nisswa	6/11/2014	Thunderstorm Wind	52	0	0	0
Breezy Pt	6/11/2014	Thunderstorm Wind	52	0	0	0
Breezy Pt	6/11/2014	Thunderstorm Wind	52	0	0	0
Jenkins	8/26/2013	Thunderstorm Wind	52	0	0	0
Pequot Lakes Arpt.	8/26/2013	Thunderstorm Wind	52	0	0	\$5,000
Brainerd	8/26/2013	Thunderstorm Wind	56	0	0	0
Crosslake	7/25/2013	Thunderstorm Wind	60	0	0	\$6,000
Deerwood	7/25/2013	Thunderstorm Wind	52	0	0	0
Brainerd	8/4/2012	Thunderstorm Wind	58	0	0	0
Brainerd	7/4/2012	Thunderstorm Wind	50	0	0	0
Crosslake	6/19/2012	Thunderstorm Wind	50	0	0	0
Merrifield	6/10/2012	Thunderstorm Wind	50	0	0	0
Crosslake	5/3/2012	Thunderstorm Wind	50	0	0	0
Crosslake	5/3/2012	Thunderstorm Wind	50	0	0	0
Crosby	7/30/2011	Thunderstorm Wind	52	0	0	0
Pequot Lakes	5/30/2011	Thunderstorm Wind	55	0	0	0
Breezy Pt	5/30/2011	Thunderstorm Wind	65	0	0	\$15,000
Brainerd Weiland Fld	5/30/2011	Thunderstorm Wind	52	0	0	0
Nisswa	5/30/2011	Thunderstorm Wind	55	0	0	0
Merrifield	5/30/2011	Thunderstorm Wind	60	0	0	0
Breezy Pt	5/30/2011	Thunderstorm Wind	60	0	0	\$3,000
Crosslake	5/30/2011	Thunderstorm Wind	55	0	0	0
Crow Wing	10/26/2010	Strong Wind	42	0	0	\$8,000
Crosslake	8/7/2010	Thunderstorm Wind	50	0	0	\$500
Ft Ripley	7/17/2010	Thunderstorm Wind	50	0	0	\$1,000



Location or County	Date	Type	Magnitude (Knots)	Deaths	Injuries	Property Damage
Nisswa	7/14/2010	Thunderstorm Wind	52	0	0	\$2,000
Brainerd	7/14/2010	Thunderstorm Wind	52	0	0	\$6,000
Brainerd	7/14/2010	Thunderstorm Wind	51	0	0	0
Brainerd	7/14/2010	Thunderstorm Wind	52	0	0	\$6,000
Crosslake	7/10/2010	Thunderstorm Wind	50	0	0	0
Fifty Lakes	6/17/2010	Thunderstorm Wind	50	0	0	0
Crow Wing	5/22/2010	Strong Wind	43	0	0	\$3,500
Brainerd	7/14/2009	Thunderstorm Wind	52	0	0	0
Baxter	5/31/2009	Thunderstorm Wind	50	0	0	0
Baxter	5/31/2009	Thunderstorm Wind	50	0	0	0
Brainerd	5/31/2009	Thunderstorm Wind	62	0	0	0
Merrifield	5/31/2009	Thunderstorm Wind	50	0	0	0
Nisswa	7/11/2008	Thunderstorm Wind	60	0	0	0
Brainerd	6/12/2008	Thunderstorm Wind	50	0	0	0
Brainerd	6/12/2008	Thunderstorm Wind	52	0	0	0
Crosslake	6/12/2008	Thunderstorm Wind	50	0	0	0
Crosslake	6/12/2008	Thunderstorm Wind	50	0	0	0
Brainerd	8/13/2007	Thunderstorm Wind	52	0	0	0
Brainerd	8/13/2007	Thunderstorm Wind	53	0	0	0
Garrison	8/13/2007	Thunderstorm Wind	52	0	0	0
Crosslake	5/21/2007	Thunderstorm Wind	52	0	0	0
Brainerd	7/29/2006	Thunderstorm Wind	55	0	0	0
Pequot Lakes	7/25/2006	Thunderstorm Wind	50	0	0	0
Breezy Pt	7/25/2006	Thunderstorm Wind	50	0	0	0
Brainerd/Crow Wing C	7/1/2006	Thunderstorm Wind	60	0	0	0
Crosslake	6/5/2006	Thunderstorm Wind	50	0	0	0
Brainerd	8/9/2005	Thunderstorm Wind	60	0	0	0
Nisswa	8/9/2005	Thunderstorm Wind	60	0	0	0
Crosby	8/9/2005	Thunderstorm Wind	60	0	0	0
Nisswa	6/29/2005	Thunderstorm Wind	50	0	0	0
Brainerd	6/29/2005	Thunderstorm Wind	50	0	0	0
Crosslake	6/23/2005	Thunderstorm Wind	55	0	0	0
Merrifield	6/20/2005	Thunderstorm Wind	55	0	0	0
Merrifield	6/20/2005	Thunderstorm Wind	55	0	0	0
Nisswa	9/23/2004	Thunderstorm Wind	60	0	0	0
Nisswa	9/23/2004	Thunderstorm Wind	60	0	0	0
Brainerd	9/23/2004	Thunderstorm Wind	60	0	0	0
Crosslake	9/23/2004	Thunderstorm Wind	60	0	0	0
Pequot Lakes	7/13/2004	Thunderstorm Wind	55	0	0	0

Location or County	Date	Type	Magnitude (Knots)	Deaths	Injuries	Property Damage
Jenkins	4/28/2004	Thunderstorm Wind	60	0	0	0
Pequot Lakes	4/18/2004	Thunderstorm Wind	56	0	0	0
Crosslake	4/18/2004	Thunderstorm Wind	56	0	0	0
Deerwood	7/21/2002	Thunderstorm Wind	50	0	0	0
Breezy Pt	7/8/2002	Thunderstorm Wind	50	0	0	0
Crosslake	4/16/2002	Thunderstorm Wind	50	0	0	0
Breezy Pt	8/8/2001	Thunderstorm Wind	50	0	0	0
Emily	8/8/2001	Thunderstorm Wind	50	0	0	0
Baxter	7/17/2001	Thunderstorm Wind	50	0	0	0
Brainerd	6/13/2001	Thunderstorm Wind	87	0	0	0
Brainerd	8/31/2000	Thunderstorm Wind	80	0	0	\$200,000
Crosslake	7/25/1999	Thunderstorm Wind	70	0	3	0
Crosslake	7/25/1999	Thunderstorm Wind	50	0	0	0
Nisswa	7/25/1999	Thunderstorm Wind	50	0	0	0
Brainerd	7/22/1999	Thunderstorm Wind	50	0	0	0
Deerwood	7/22/1999	Thunderstorm Wind	50	0	0	0
Pequot Lakes	7/4/1999	Thunderstorm Wind	55	0	0	0
Baxter	6/9/1999	Thunderstorm Wind	50	0	0	0
Brainerd	6/9/1999	Thunderstorm Wind	50	0	0	0
Deerwood	6/6/1999	Thunderstorm Wind	50	0	0	0
Crosby	6/6/1999	Thunderstorm Wind	50	0	0	0
Brainerd	9/25/1998	Thunderstorm Wind	78	0	0	\$1,000,000
Crosslake	7/20/1998	Thunderstorm Wind	55	0	0	0
Pequot Lakes	7/20/1998	Thunderstorm Wind	50	0	0	0
Crosby	7/20/1998	Thunderstorm Wind	50	0	0	0
Crosslake	6/27/1998	Thunderstorm Wind	52	0	0	0
Breezy Pt	6/27/1998	Thunderstorm Wind	50	0	0	0
Brainerd	10/8/1997	Thunderstorm Wind	50	0	0	0
Pequot Lakes	10/8/1997	Thunderstorm Wind	50	0	0	0
Brainerd	6/28/1997	Thunderstorm Wind	87	0	0	0
Crosby	6/28/1997	Thunderstorm Wind	70	0	0	0
Garrison	8/6/1996	Thunderstorm Wind	61	0	0	0
Brainerd	7/21/1996	Thunderstorm Wind	78	0	0	0
Brainerd	7/21/1996	Thunderstorm Wind	50	0	0	0
Crosslake	7/11/1996	Thunderstorm Wind	50	0	0	0
Pequot Lakes	6/29/1996	Thunderstorm Wind	60	0	0	0
Brainerd	6/29/1996	Thunderstorm Wind	55	0	0	\$19,000
Merrifield	6/29/1996	Thunderstorm Wind	60	0	0	0
Brainerd	7/14/1995	Thunderstorm Wind	0	0	0	0
Pequot Lakes	7/14/1995	Thunderstorm Wind	0	0	0	0

Location or County	Date	Type	Magnitude (Knots)	Deaths	Injuries	Property Damage
Crosslake	7/12/1995	Thunderstorm Wind	60	0	0	\$5,000
Pierz	6/19/1994	Thunderstorm Wind	0	0	0	0
Crow Wing	6/19/1994	Thunderstorm Wind	0	0	0	\$500
Brainerd	6/19/1994	Thunderstorm Wind	0	0	0	\$500
Crow Wing	6/27/1991	Thunderstorm Wind	65	0	0	0
Crow Wing	6/27/1991	Thunderstorm Wind	65	0	0	0
Crow Wing	9/13/1990	Thunderstorm Wind	0	0	0	0
Crow Wing	7/17/1990	Thunderstorm Wind	56	0	0	0
Crow Wing	7/2/1989	Thunderstorm Wind	0	0	0	0
Crow Wing	5/24/1989	Thunderstorm Wind	0	0	0	0
Crow Wing	7/10/1987	Thunderstorm Wind	0	0	0	0
Crow Wing	8/6/1986	Thunderstorm Wind	60	0	0	0
Crow Wing	7/4/1986	Thunderstorm Wind	0	0	0	0
Crow Wing	4/21/1985	Thunderstorm Wind	52	0	0	0
Crow Wing	6/6/1984	Thunderstorm Wind	0	0	0	0
Crow Wing	4/27/1984	Thunderstorm Wind	0	0	0	0
Crow Wing	4/27/1984	Thunderstorm Wind	0	0	0	0
Crow Wing	7/2/1983	Thunderstorm Wind	0	0	0	0
Crow Wing	8/21/1982	Thunderstorm Wind	0	0	0	0
Crow Wing	7/18/1980	Thunderstorm Wind	61	0	0	0
Crow Wing	6/5/1980	Thunderstorm Wind	63	0	0	0
Crow Wing	6/5/1980	Thunderstorm Wind	63	0	0	0
Crow Wing	8/9/1979	Thunderstorm Wind	0	0	0	0
Crow Wing	8/14/1978	Thunderstorm Wind	51	0	0	0
Crow Wing	6/9/1976	Thunderstorm Wind	52	0	0	0
Crow Wing	7/13/1974	Thunderstorm Wind	55	0	0	0
Crow Wing	9/20/1970	Thunderstorm Wind	0	0	0	0
Crow Wing	7/15/1969	Thunderstorm Wind	0	0	0	0
Crow Wing	6/25/1969	Thunderstorm Wind	0	0	0	0
Crow Wing	7/7/1959	Thunderstorm Wind	0	0	0	0
Crow Wing	8/12/1956	Thunderstorm Wind	0	0	0	0
<b>Highest Value Property Damage</b>						<b>\$1,000,000</b>

Table C - 4. All extreme flood events recorded by NCDC, 1996-April 2017

Location or County	Date	Type	Deaths	Injuries	Property Damage
Baxter	7/11/2016	Flash Flood	0	0	0

Location or County	Date	Type	Deaths	Injuries	Property Damage
Emily	7/11/2016	Flash Flood	0	0	0
Baxter	7/11/2016	Flash Flood	0	0	0
Baxter	7/11/2016	Flash Flood	0	0	0
Baxter	7/11/2016	Flash Flood	0	0	0
Crosby	7/11/2016	Flash Flood	0	0	0
Nichols	5/1/2013	Flood	0	0	0
Ft Ripley	7/1/2012	Flood	0	0	0
Lennox	7/1/2012	Flood	0	0	0
Brainerd Airport	6/20/2012	Flood	0	0	0
Crow Wing	6/19/2012	Flood	0	0	\$634,000
Brainerd	6/19/2012	Flash Flood	0	0	0
Brainerd Airport	6/1/2012	Flood	0	0	0
Ft Ripley	6/1/2012	Flood	0	0	0
Ft Ripley	5/28/2012	Flood	0	0	0
Brainerd	5/28/2012	Flood	0	0	0
Ft Ripley	4/12/2011	Flood	0	0	0
Brainerd	7/7/2002	Flash Flood	0	0	\$250,000
Crow Wing	4/6/1997	Flood	0	0	0
Crow Wing	4/5/1997	Flood	0	0	0
Pequot Lakes	7/6/1996	Flash Flood	0	0	0
<b>Highest Value Property Damage:</b>					<b>\$634,000</b>

Table C - 5. All severe winter weather events recorded by NCDC, 1996-April 2017

Location or County	Date	Type	Deaths	Injuries	Property Damage
Crow Wing (Zone)	12/25/2016	Ice Storm	0	0	0
Crow Wing (Zone)	11/18/2016	Blizzard	0	0	0
Crow Wing (Zone)	11/17/2016	Heavy Snow	0	0	0
Crow Wing (Zone)	11/10/2014	Heavy Snow	0	0	0
Crow Wing (Zone)	4/16/2014	Heavy Snow	0	0	0
Crow Wing (Zone)	2/20/2014	Heavy Snow	0	0	0
Crow Wing (Zone)	12/2/2013	Heavy Snow	0	0	0
Crow Wing (Zone)	4/14/2013	Heavy Snow	0	0	0
Crow Wing (Zone)	3/4/2013	Heavy Snow	0	0	0
Crow Wing (Zone)	2/10/2013	Heavy Snow	0	0	0
Crow Wing (Zone)	12/8/2012	Heavy Snow	0	0	0
Crow Wing (Zone)	2/28/2012	Heavy Snow	0	0	0
Crow Wing (Zone)	3/22/2011	Heavy Snow	0	0	0
Crow Wing (Zone)	12/30/2010	Heavy Snow	0	0	0

Location or County	Date	Type	Deaths	Injuries	Property Damage
Crow Wing (Zone)	12/20/2010	Heavy Snow	0	0	0
Crow Wing (Zone)	10/26/2010	Heavy Snow	0	0	0
Crow Wing (Zone)	1/22/2010	Ice Storm	0	0	0
Crow Wing (Zone)	12/23/2009	Winter Storm	0	0	0
Crow Wing (Zone)	4/1/2009	Winter Storm	0	0	0
Crow Wing (Zone)	3/31/2009	Winter Storm	0	0	0
Crow Wing (Zone)	3/10/2009	Winter Storm	0	0	0
Crow Wing (Zone)	12/30/2008	Heavy Snow	0	0	0
Crow Wing (Zone)	12/13/2008	Winter Storm	0	0	0
Crow Wing (Zone)	4/25/2008	Winter Storm	0	0	0
Crow Wing (Zone)	4/10/2008	Winter Storm	0	0	0
Crow Wing (Zone)	4/5/2008	Winter Storm	0	0	0
Crow Wing (Zone)	12/1/2007	Winter Storm	0	0	0
Crow Wing (Zone)	4/2/2007	Winter Storm	0	0	0
Crow Wing (Zone)	3/1/2007	Winter Storm	0	0	0
Crow Wing (Zone)	2/23/2007	Winter Storm	0	0	0
Crow Wing (Zone)	1/21/2005	Heavy Snow	0	0	0
Crow Wing (Zone)	1/25/2004	Heavy Snow	0	0	0
Crow Wing (Zone)	11/22/2003	Heavy Snow	0	0	0
Crow Wing (Zone)	4/16/2003	Ice Storm	0	0	0
Crow Wing (Zone)	12/17/2002	Ice Storm	0	0	0
Crow Wing (Zone)	3/9/2002	Heavy Snow	0	0	0
Crow Wing (Zone)	3/7/2002	Heavy Snow	0	0	0
Crow Wing (Zone)	11/26/2001	Winter Storm	0	0	0
Crow Wing (Zone)	2/24/2001	Heavy Snow	0	0	0
Crow Wing (Zone)	2/7/2001	Heavy Snow	0	0	0
Crow Wing (Zone)	1/29/2001	Ice Storm	0	0	0
Crow Wing (Zone)	3/15/2000	Heavy Snow	0	0	0
Crow Wing (Zone)	2/15/2000	Heavy Snow	0	0	0
Crow Wing (Zone)	3/8/1999	Heavy Snow	0	0	0
Crow Wing (Zone)	2/1/1999	Ice Storm	0	0	0
Crow Wing (Zone)	11/9/1998	Winter Storm	0	0	0
Crow Wing (Zone)	3/31/1998	Heavy Snow	0	0	0
Crow Wing (Zone)	11/13/1997	Heavy Snow	0	0	0
Crow Wing (Zone)	3/13/1997	Heavy Snow	0	0	0
Crow Wing (Zone)	1/4/1997	Winter Storm	0	0	0
Crow Wing (Zone)	4/12/1996	Winter Weather	0	0	0
Crow Wing (Zone)	3/24/1996	Heavy Snow	0	0	0
Crow Wing (Zone)	2/26/1996	Heavy Snow	0	0	0

Location or County	Date	Type	Deaths	Injuries	Property Damage
Crow Wing (Zone)	1/28/1996	Heavy Snow	0	0	0
Crow Wing (Zone)	1/17/1996	Heavy Snow	0	0	0
<b>Highest Value Property Damage</b>					<b>0</b>

Table C - 6. All severe cold/wind chill events recorded by NCDC, 1996-April 2017

Location or County	Date	Type	Deaths	Injuries	Property Damage
Crow Wing (Zone)	2/22/2015	Extreme Cold/Wind Chill	0	0	0
Crow Wing (Zone)	1/7/2015	Extreme Cold/Wind Chill	0	0	0
Crow Wing (Zone)	3/1/2014	Extreme Cold/Wind Chill	0	0	0
Crow Wing (Zone)	2/27/2014	Extreme Cold/Wind Chill	0	0	0
Crow Wing (Zone)	1/27/2014	Extreme Cold/Wind Chill	0	0	0
Crow Wing (Zone)	1/22/2014	Extreme Cold/Wind Chill	0	0	0
Crow Wing (Zone)	1/4/2014	Extreme Cold/Wind Chill	0	0	0
Crow Wing (Zone)	12/30/2013	Cold/Wind Chill	0	0	0
Crow Wing (Zone)	1/21/2013	Cold/Wind Chill	0	0	0
Crow Wing (Zone)	1/19/2012	Extreme Cold/Wind Chill	0	0	0
Crow Wing (Zone)	1/13/2009	Extreme Cold/Wind Chill	0	0	0
Crow Wing (Zone)	12/15/2008	Extreme Cold/Wind Chill	0	0	0
Crow Wing (Zone)	3/7/2008	Cold/Wind Chill	1	0	0
Crow Wing (Zone)	2/9/2008	Cold/Wind Chill	0	0	0
Crow Wing (Zone)	1/29/2008	Extreme Cold/Wind Chill	0	0	0
Crow Wing (Zone)	2/3/2007	Extreme Cold/Wind Chill	0	0	0
Crow Wing (Zone)	2/17/2006	Cold/Wind Chill	0	0	0
Crow Wing (Zone)	1/14/2005	Cold/Wind Chill	0	0	0
Crow Wing (Zone)	1/15/1997	Cold/Wind Chill	0	0	0
<b>Highest Value Property Damage</b>					<b>0</b>

Table C - 7. All extreme heat/heat events recorded by the NCDC, 1996-April 2017

Location or County	Date	Type	Deaths	Injuries	Property Damage
Crow Wing (Zone)	7/20/2016	Excessive Heat	0	0	0
Crow Wing (Zone)	7/16/2011	Heat	0	0	0
<b>Highest Value Property Damage</b>					<b>0</b>

Table C - 8. All lightning events recorded by the NCDC, 1996-April 2017

Location or County	Date	Deaths	Injuries	Property Damage
Brainerd	5/23/2012	0	0	\$140,000
Jenkins	4/28/2004	0	0	0
Crosslake	6/22/2003	0	0	0
Brainerd	7/8/2000	0	0	\$1,000
Brainerd	3/8/2000	0	0	\$50,000
Baxter	6/11/1998	0	1	0
Brainerd	7/13/1997	0	0	\$1,500,000
<b>Highest Value Property Damage</b>				<b>\$1,500,000</b>

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# **Appendix D**

## **Adopting Resolutions**

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*Resolutions to be added to Appendix D by Crow Wing County following final approval of the plan by FEMA.*

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# **Appendix E**

## **Steering Committee Meetings**

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# Minnesota 10-County Multi-Hazard Mitigation Update Project Kick-off Orientation Webinar

UNIVERSITY OF MINNESOTA GEOSPATIAL ANALYSIS CENTER



## Webinar Purpose & Goals

**Purpose:**

The purpose of this webinar is provide an orientation kick-off meeting for the Emergency Managers participating in the Minnesota 10-County Multi-Hazard Mitigation Plan Update project.

**Goals:**

- Introduce the UMD Team and County contacts.
- Provide an overview of the project.
- Clarify roles and responsibilities.
- Outline the planning process, discuss key tasks and timelines.
- Discuss next steps and answer your questions.

## Introductions

**Who We Are (UMD Project Team)**



Stacey Stark, Director, Geospatial Analysis Center (GAC)



Micaella Penning, Research Associate, GIS Specialist, Cartographer, and Editor (GAC)



Steve Graham, Research Associate and Flood Modeling Specialist (GAC)



Bonnie Hundrieser, Emergency Management Planning Consultant (Hundrieser Consulting LLC)

**Who You Are (County Emergency Managers):**

- \*Name, Title, and County
- \*Past Experience with MHMP?

**Minnesota HSEM:**

Jennifer Nelson, MN HSEM, State Hazard Mitigation Officer

## Project Overview

➤ **10 Counties**

Jurisdiction	FEMA's Expiration Date
Beeton	2/16/2017
Crow Wing	8/25/2016
Faribault	5/20/2013
Freeborn	5/18/2015
Grant	5/18/2015
Hubbard	3/23/2016
Clonsted	5/18/2015
Steele	12/5/2016
Wabasha	8/31/2015
Wilkin	8/30/2016





## Why UMD-GAC?

- **Proven experience**  
GAC has extensive experience in the comprehensive review and update of county MHMPs, as well as update of the State MHMP.
- **Advanced Capabilities**  
GAC has expertise in the application of GIS, HAZUS, and research to support MHMP development and meeting all FEMA requirements.
- **Ability to Expedite**  
GAC has the ability to expedite the MHMP update process for multiple counties through a consistent approach and format, which also supports State and FEMA review of draft plans.
- **Planning Team**  
GAC project team includes working with advanced GIS students and experienced consultants to effectively complete tasks.

## EM Roles & Responsibilities

- Act as main Point of Contact.
- Coordinate communication and outreach to engage local planning team, additional key stakeholders, and the public.
- Review past mitigation actions and provide status update.
- Provide information for Capabilities Assessment (Plans & Programs in Place / Program Gaps or Deficiencies) for each hazard.
- Assist in development of new mitigation action chart (must be county and jurisdictionally specific) that includes projects for HMA eligibility.
- Provide information for Critical Facilities forms.
- Provide coordination with GIS and assessor's data managers in order to obtain GIS and parcel information for GIS analyses.
- Assist in timely review of material throughout the plan update process via phone, email, and in-person meetings.
- Track required local match and submit to HSEM.

## MHMP Updates & Crosswalk Requirements

*Key Considerations for Discussion*

## HM Plan Contents

- Hazard Mitigation Planning overview and process
- County physical and social profile
- Asset Inventory
- Hazard Profiles
- Hazard Assessment and Vulnerability Analysis
- Mitigation Actions and Strategy
- Plan Maintenance

## Planning Process

Each Emergency Manager will play a critical role in identification and engagement of a planning team and the public throughout the update process. The MHMP must document who was involved & how, and include representation from the county, each jurisdiction, neighboring communities, local and regional agencies.

**Key Considerations for MHMP Updates:**

- What tools do you use to communicate? (i.e., Facebook, email, etc.)
- What standing events or committees might you use in this process? (local emergency preparedness committees, County/City board meetings, county fair, etc.)
- How do you plan to address:
  - Jurisdictional Engagement
  - Stakeholder Engagement (who are they?)
  - Public Engagement

## Hazard Identification and Risk Assessment

All plans will address the **natural hazards** identified to pose risk to the county and its jurisdictions. Non-natural hazards (technological and human-caused) will not be included in the risk and vulnerability assessment and development of mitigation strategies and actions.

**Key Considerations for MHMP Updates:**

- Identify specific impacts and vulnerabilities (at the county/jurisdiction level) due to natural hazards.
- Identify if and how any priorities changed since the last plan (i.e., financial, legal, political realities, and post-disaster conditions).
- Identify existing development or future development that may increase or decrease the community's vulnerability to natural hazard events.

## Mitigation Strategy

Key activities to support the update of the Mitigation Strategy will include a capabilities assessment for mitigating against natural hazards, as well as a comprehensive review of the status of mitigation strategies and actions in the previously approved plan.

**Key Considerations for MHMP Updates:**

- Plans and Programs in Place that support mitigation.
- Program Gaps or Deficiencies that hinder mitigation.
- Identification of projects that may be eligible for HMA funding.
- Inclusion of other eligible agency or organizational stakeholders in development & implementation of mitigation actions (i.e., Public Utilities, MN DNR, School Districts, Boy Scouts of America).

## Plan Adoption

After FEMA has provided "APA" status (Approval Pending Adoption), the county and all participating jurisdictions must formally adopt the plan.

**Key Considerations for MHMP Updates:**

- This step is often a difficult challenge for Emergency Managers after the plan is completed, and can bog down the process of final plan adoption and thus eligibility for applying for FEMA HMA funding.
- Are there communication measures to be used during the planning process to minimize this issue? What steps do you think can be taken to make this process easier for your current plan update?

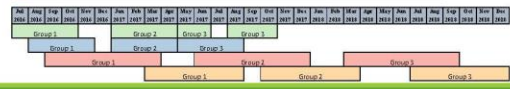
## Project Timeline

- 36 - Month timeline
- Staggering of Counties will be required to complete UMD's update of risk assessments, research of hazard histories, etc. for each county.
- All county Emergency Managers will be provided with resources to work on independently. Customized worksheets and technical assistance will be provided to you to facilitate the process.
  - Capabilities Assessment by each Natural Hazard
  - Status Update on Prior Mitigation Actions
  - Compilation of Critical & Essential Facilities in each jurisdiction

## Estimated Time-line

Group 1: Faribault, Freeborn, Olmsted, Grant  
 Group 2: Wabasha, Hubbard, Wilkin  
 Group 3: Crow Wing, Steele, Benton

	WHAT	CONSULTANT ROLES	COUNTY ROLES
A	research, obtaining information, review previous mitigation actions	student and GIS analyst work, dependent on student schedules	work can be done with minimal interaction with county
B	flood data preparation and flood analysis	GIS analyst work - done in immediate succession	
C	planning meetings, develop mitigation actions	planner work, groups need to be in succession, stage C must be complete before stage D in each county	frequent interaction with county necessary
D	complete draft plan and public meetings		



## Questions?

What questions do you have for UMD or HSEM about the MHMP Update process?

## Contact Information

Stacey Stark, MS, GISP  
 Geospatial Analysis Center  
[slstark@d.umn.edu](mailto:slstark@d.umn.edu)  
 218-726-7438

## Crow Wing County Multi-Hazard Mitigation Plan Update

January 31, 2017 MHMP Planning Team Meeting  
Brainerd Fire Hall, Brainerd, MN - 2:00 p.m. – 4:00 p.m.



### Meeting Summary:

On Tuesday, January 31, 2017, key county, city, and other stakeholders were convened to participate in a Planning Team Meeting for the update of the Crow Wing County Multi-Hazard Mitigation Plan (MHMP). The meeting was facilitated by the University of Minnesota – Duluth Geospatial Analysis Center (GAC) staff and Bonnie Hundrieser who are leading the update of the Crow Wing County MHMP. A total of 30 people attended the meeting.

The opening presentation covered:

- The purpose of hazard mitigation planning.
- The role & responsibilities of the Planning Team.
- An overview of content in the MHMP (County physical & social profile, Asset Inventory, Hazard Assessment and Vulnerability Analysis, Capability Assessment and Mitigation Actions).
- Group review and discussion of hazard rankings for Crow Wing County. ***(For the MHMP plan update, two natural hazards were deemed to have increased in risk: Flooding was moved from moderate to high because the County has experienced 100 year events in the last 3-4 years. Wildfire was moved from moderate to high as a result of recent severe wind events that have resulted in an increased fuel load in forested areas.)***
- A review of mitigation strategies and considerations for developing local mitigation actions.
- An overview of the FEMA Hazard Mitigation Assistance (HMA) Grants program.

Following the presentation a facilitated Mitigation Action Working Session was held. Participants discussed the natural hazards of concern to their communities and filled out Mitigation Action Worksheets to identify new, jurisdictionally-specific mitigation actions to be included in the MHMP plan update. Mitigation actions were required to fall within one of the 5 mitigation action strategies:

1. Local Planning and Regulations
2. Structure and Infrastructure Projects
3. Natural Systems Protection
4. Education and Awareness Programs
5. Mitigation Preparedness and Response Support

Following the Mitigation Action Working Session, the group then discussed the upcoming process and anticipated timeline for engaging the public and other key stakeholders in an open plan review period and public meetings. Meeting attendees were told that they would be contacted for additional information as needed and kept informed on the upcoming steps in the planning process, including opportunities for draft plan review and final selection of mitigation actions for inclusion in the plan.

**Attached to this meeting summary are the following documentation items:**

- Crow Wing County HMP Meeting Email Invite
- 1-31-17 Meeting Agenda
- 1-31-17 Meeting Sign-in Sheets
- 1-31-17 Power Point Presentation Slides
- 1-31-17 Meeting Handouts (Mitigation Strategies & Mitigation Ideas Worksheet)
- 1-31-17 Mitigation Ideas Working Session (jurisdictional worksheets)

*Meeting Summary Prepared By: Bonnie Hundrieser, UMD Project Team, (Hundrieser Consulting LLC)*



**From:** John Bowen  
**To:** [jhulsether@ci.brainerd.mn.us](mailto:jhulsether@ci.brainerd.mn.us); [denise.sundquist@isd181.org](mailto:denise.sundquist@isd181.org); [Chris.Lindholm@skj.k12.mn.us](mailto:Chris.Lindholm@skj.k12.mn.us); [Tim.Holmes@ci.brainerd.mn.us](mailto:Tim.Holmes@ci.brainerd.mn.us); [email@bpu.org](mailto:email@bpu.org); [Tim.Houle@ci.brainerd.mn.us](mailto:Tim.Houle@ci.brainerd.mn.us); [Paul.Thiede@ci.brainerd.mn.us](mailto:Paul.Thiede@ci.brainerd.mn.us); [Rachel.Nystrom@ci.brainerd.mn.us](mailto:Rachel.Nystrom@ci.brainerd.mn.us); [Paul.Koenig@ci.brainerd.mn.us](mailto:Paul.Koenig@ci.brainerd.mn.us); [Rosemary.Franzen@ci.brainerd.mn.us](mailto:Rosemary.Franzen@ci.brainerd.mn.us); [Kara.Terry@ci.brainerd.mn.us](mailto:Kara.Terry@ci.brainerd.mn.us); [Kara.Griffin@ci.brainerd.mn.us](mailto:Kara.Griffin@ci.brainerd.mn.us); [Michelle.Moritz@ci.brainerd.mn.us](mailto:Michelle.Moritz@ci.brainerd.mn.us); [Jay.Sikkink@ci.brainerd.mn.us](mailto:Jay.Sikkink@ci.brainerd.mn.us); [Gary.Griffin@ci.brainerd.mn.us](mailto:Gary.Griffin@ci.brainerd.mn.us); [Chris.Pence@ci.brainerd.mn.us](mailto:Chris.Pence@ci.brainerd.mn.us); [Mark.Lied@ci.brainerd.mn.us](mailto:Mark.Lied@ci.brainerd.mn.us); [Debby.Erickson@ci.brainerd.mn.us](mailto:Debby.Erickson@ci.brainerd.mn.us); [Nate.Rose@ci.brainerd.mn.us](mailto:Nate.Rose@ci.brainerd.mn.us); [Tim.Bray@ci.brainerd.mn.us](mailto:Tim.Bray@ci.brainerd.mn.us); [Rob.Hall@ci.brainerd.mn.us](mailto:Rob.Hall@ci.brainerd.mn.us); [Reid.Thiessen@ci.brainerd.mn.us](mailto:Reid.Thiessen@ci.brainerd.mn.us); [Todd.Dahl@ci.brainerd.mn.us](mailto:Todd.Dahl@ci.brainerd.mn.us); [Denny.Lasher@ci.brainerd.mn.us](mailto:Denny.Lasher@ci.brainerd.mn.us); [CITY.OF.RIVERFERTON@ci.brainerd.mn.us](mailto:CITY.OF.RIVERFERTON@ci.brainerd.mn.us); [bmanhart@crosslake.net](mailto:bmanhart@crosslake.net); [Scott.Goddard@ci.brainerd.mn.us](mailto:Scott.Goddard@ci.brainerd.mn.us); [Dave.Fischer@ci.brainerd.mn.us](mailto:Dave.Fischer@ci.brainerd.mn.us); [sstrong@ci.brainerd.mn.us](mailto:sstrong@ci.brainerd.mn.us); [jthoreen@ci.brainerd.mn.us](mailto:jthoreen@ci.brainerd.mn.us); [mostgarden@ci.brainerd.mn.us](mailto:mostgarden@ci.brainerd.mn.us); [Corky.McQuiston@ci.brainerd.mn.us](mailto:Corky.McQuiston@ci.brainerd.mn.us); [cityhall@baxtermn.gov](mailto:cityhall@baxtermn.gov); [Jim.Fysted@ci.brainerd.mn.us](mailto:Jim.Fysted@ci.brainerd.mn.us); [dolson@baxtermn.gov](mailto:dolson@baxtermn.gov); [Tom.Blomer@ci.brainerd.mn.us](mailto:Tom.Blomer@ci.brainerd.mn.us); [tsailer@ci.brainerd.mn.us](mailto:tsailer@ci.brainerd.mn.us); [twalter@baxtermn.gov](mailto:twalter@baxtermn.gov); [Craig@nisswapolice.com](mailto:Craig@nisswapolice.com); [Nisswa.Fire@ci.nisswa.mn.us](mailto:Nisswa.Fire@ci.nisswa.mn.us); [mwentler@ci.nisswa.mn.us](mailto:mwentler@ci.nisswa.mn.us); [Tom.Blomer@ci.brainerd.mn.us](mailto:Tom.Blomer@ci.brainerd.mn.us); [eklang@pequotlakes-mn.gov](mailto:eklang@pequotlakes-mn.gov); [Nancy.Malecha@pequotlakes-mn.gov](mailto:Nancy.Malecha@pequotlakes-mn.gov); [pequotfd@pequotlakes-mn.gov](mailto:pequotfd@pequotlakes-mn.gov); [mloven@pequotlakes-mn.gov](mailto:mloven@pequotlakes-mn.gov); [dbittner@pequotlakes-mn.gov](mailto:dbittner@pequotlakes-mn.gov); [Public.Works@ci.cityofbreezypointmn.us](mailto:Public.Works@ci.cityofbreezypointmn.us); [planner@cityofbreezypointmn.us](mailto:planner@cityofbreezypointmn.us); [jrudberg@cityofbreezypointmn.us](mailto:jrudberg@cityofbreezypointmn.us); [kevin@cityofbreezypointmn.us](mailto:kevin@cityofbreezypointmn.us); [cityhall@ci.jenkins.mn.us](mailto:cityhall@ci.jenkins.mn.us); [cityclerk@crosslake.net](mailto:cityclerk@crosslake.net); [Chief1@crosslake.net](mailto:Chief1@crosslake.net); [crosslakez@crosslake.net](mailto:crosslakez@crosslake.net); [publicwk@crosslake.net](mailto:publicwk@crosslake.net); [city@manhattanbeachmn.org](mailto:city@manhattanbeachmn.org); [ann50lakes@emily.net](mailto:ann50lakes@emily.net); [pz50lakes@emily.net](mailto:pz50lakes@emily.net); [josh.herold@gmail.com](mailto:josh.herold@gmail.com); [kenny\\_roden@yahoo.com](mailto:kenny_roden@yahoo.com); [clerk@emily.net](mailto:clerk@emily.net); [cuyunapolice@gmail.com](mailto:cuyunapolice@gmail.com); [info@ci.cuyuna.mn.us](mailto:info@ci.cuyuna.mn.us); [bill.bedard@ci.cuyuna.mn.us](mailto:bill.bedard@ci.cuyuna.mn.us); [Kim.Coughlin-Crosby.Polic.Department@ci.crosby.mn.us](mailto:Kim.Coughlin-Crosby.Polic.Department@ci.crosby.mn.us); [kim.Coughlin@cityofcrosby.com](mailto:kim.Coughlin@cityofcrosby.com); [jdacent@cityofcrosby.net](mailto:jdacent@cityofcrosby.net); [lisa.sova@cityofcrosby.com](mailto:lisa.sova@cityofcrosby.com); [jeffturk@cityofdeerwood.com](mailto:jeffturk@cityofdeerwood.com); [ctvgarni@frontiernet.net](mailto:ctvgarni@frontiernet.net); [kokerman@ci.jenkins.mn.us](mailto:kokerman@ci.jenkins.mn.us); [lostn50s@mleqwb.net](mailto:lostn50s@mleqwb.net); [Bonnie.Hundrieser@ci.brainerd.mn.us](mailto:Bonnie.Hundrieser@ci.brainerd.mn.us)  
**Subject:** Crow Wing County Multi-Hazard Mitigation Plan Meeting Invitation  
**Date:** Wednesday, January 4, 2017 12:34:38 PM

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Good Afternoon,

Your presence is requested at a Planning Team meeting for the 2017 update of the Crow Wing County Multi-Hazard Mitigation Plan on:

**Date:** Tuesday, January 31st  
**Time:** 2:00 p.m. – 4:00 p.m.  
**Location:** Brainerd Fire Hall (23 Laurel Street, Brainerd, MN 56401)

The update of the County's hazard mitigation plan (MHMP) is a requirement by the State of Minnesota Department of Homeland Security & Emergency Management (HSEM) as well as the Federal Emergency Management Agency (FEMA) every 5 years. Our last MHMP from 2011 is due for an update and our planning is currently underway. The plan addresses the natural hazards that face Crow Wing County and will result in mitigation actions for implementation that will reduce or eliminate loss of life or damage to property as a result of natural hazard events. Your input is needed as being part of a County department or city or jurisdiction within the county. Additional key partners have also been invited.

Your participation in this hazard mitigation plan is important for several reasons:

1. You will have input on projects we can implement at the county and local level that will help to eliminate or reduce the impacts of future natural disaster events.
2. Participating jurisdictions and the County may be eligible to apply for significant federal mitigation funding from FEMA to implement specific projects that meet eligibility requirements.
3. Mitigation planning is a fundamental element in emergency management and local planning that we all must address to keep our communities safe and resilient.
4. FEMA and the State of Minnesota require that local jurisdictions participate in the planning process. Your participation is important so that the County can ensure that we meet this

requirement.

During this 2 hour meeting we will discuss the natural hazards that face our county, discuss mitigation actions to include in the plan, and the funding that is available from FEMA for eligible mitigation projects. The meeting will be facilitated by the University of Minnesota – Duluth Geospatial Analysis Center and Bonnie Hundrieser, an emergency management planning consultant working closely with us on this project.

Please RSVP to this invitation by Friday, January 13th. If you cannot attend, we do ask that you send someone in your place to represent your county department/city jurisdiction/or other organization.

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

Thank you,

John Bowen  
Crow Wing County Sheriff's Office  
Emergency Management Director  
304 Laurel St.  
Brainerd MN 56401  
218-825-3445  
<http://crowwing.us/356/Emergency-Management>

**MISSION STATEMENT**

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# Crow Wing County Multi-Hazard Mitigation Plan Update

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## Planning Team Meeting

Tuesday, January 31, 2017, 2:00 p.m. – 4:00 p.m.  
Brainerd Fire Hall, Brainerd, MN

### Presenting:

- Micaella Penning, University of Minnesota –Duluth, Geospatial Analysis Center
- Bonnie Hundrieser, Hundrieser Consulting LLC (UMD MHMP Project Team)

### Agenda:

1. Welcome and Introductions (John Bowen, Crow Wing County EM Director)
2. Crow Wing County MHMP Plan Update
  - *About the Plan*
  - *Planning Team*
  - *Plan Content*
3. Review of Mitigation Strategies and Developing Mitigation Actions
4. Hazard Mitigation Assistance (HMA) Grants
5. Mitigation Action Working Session

### Contact:

*For more information on the Crow Wing County MHMP Update, please contact:*

- John Bowen, Crow Wing County Emergency Management Director  
218-825-3445 / [John.Bowen@crowwing.us](mailto:John.Bowen@crowwing.us)
- Bonnie Hundrieser, UMD Project Team Member  
218-343-3468 / [hundrieserconsulting@gmail.com](mailto:hundrieserconsulting@gmail.com)

# Crow Wing County Multi-Hazard Mitigation Plan Update

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## Planning Team Meeting

Tuesday, January 31, 2017, 2:00 p.m. – 4:00 p.m.  
Brainerd Fire Hall, Brainerd, MN

### Presenting:

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- Bonnie Hundrieser, Hundrieser Consulting LLC (UMD MHMP Project Team)

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*For more information on the Crow Wing County MHMP Update, please contact:*

- John Bowen, Crow Wing County Emergency Management Director  
218-825-3445 / [John.Bowen@crowwing.us](mailto:John.Bowen@crowwing.us)
- Bonnie Hundrieser, UMD Project Team Member  
218-343-3468 / [hundrieserconsulting@gmail.com](mailto:hundrieserconsulting@gmail.com)

Crow Wing County 1/31/17 Planning Team Meeting  
Participant Sign-in List (30 attendees)

Crow Wing County MHMP Update Tuesday, January 31, 2017 Planning Team Meeting Participant Sign-in List			
Name	Jurisdiction/Agency/Organization	Title	Email
Michelle Moritz	Crow Wing County Community Services	Public Health Nurse	<a href="mailto:michelee.moritz@crowwing.us">michelee.moritz@crowwing.us</a>
Trent Hawkinsen	Brainerd Public Utilities	Line Supervisor	<a href="mailto:thawkinson@bpu.org">thawkinson@bpu.org</a>
Josh Netland	Emily Consolidated Telephone Company	General Manager	<a href="mailto:inetland@emily.net">inetland@emily.net</a>
Eric Quale	Crow Wing Power	Chief Operating Officer	<a href="mailto:quale@cwpower.com">quale@cwpower.com</a>
Jim Exsted	Baxter Police Department	Chief	<a href="mailto:jexsted@baxtermn.gov">jexsted@baxtermn.gov</a>
Kevin Merschman	Breezy Point Police Department	Chief	<a href="mailto:kevin@cityofbreezypointmn.us">kevin@cityofbreezypointmn.us</a>
Rosemary Franzen	Crow Wing County Board	County Commissioner	<a href="mailto:mfranzen@a.com">mfranzen@a.com</a>
Kara Gruffub	Crow Wing County Community Services	Program Manager	<a href="mailto:kara.griffin@crowwing.us">kara.griffin@crowwing.us</a>
Chris Lindholm	Pequot Lakes School Dist	Superintendent	<a href="mailto:clindholm@isd186.org">clindholm@isd186.org</a>
Tom Blomer	City of Nisswa	Public Works Director	<a href="mailto:tom@ci.nisswa.mn.us">tom@ci.nisswa.mn.us</a>
Tony Sailer	City of Brainerd	Parks and Rec Director	<a href="mailto:tsailer@ci.brainerd.mn.us">tsailer@ci.brainerd.mn.us</a>
Jim Thoreen	City of Brainerd	City Administrator	<a href="mailto:ithoreen@ci.brainerd.mn.us">ithoreen@ci.brainerd.mn.us</a>
Jamie Skjeveland	Crosby School Dist. 182	Superintendent	
Paul Sandy	City of Brainerd	Assistant Engineer	<a href="mailto:psandy@ci.brainerd.mn.us">psandy@ci.brainerd.mn.us</a>
Jeff Hulsether	City of Brainerd	City Engineer	<a href="mailto:jhulsether@ci.brainerd.mn.us">jhulsether@ci.brainerd.mn.us</a>
Tim Holmes	City of Brainerd	Fire Chief	<a href="mailto:tholmes@ci.brainerd.mn.us">tholmes@ci.brainerd.mn.us</a>
Shawn Strong	City of Brainerd	IT/GIS Coordinator	<a href="mailto:sstrong@ci.brainerd.mn.us">sstrong@ci.brainerd.mn.us</a>
Jay Sikkink	Crow Wing County	IT Director	<a href="mailto:jay.sikkink@crowwing.us">jay.sikkink@crowwing.us</a>
Debby Eerickson	Crow Wing County	Admin Services Director	<a href="mailto:Debby.erickson@crowwing.us">Debby.erickson@crowwing.us</a>
Reid Thiesse	Crow Wing County	Facilities Manager	<a href="mailto:Reid.thiesse@crowwing.us">Reid.thiesse@crowwing.us</a>
Chip Lohmiller	City of Crosslake	Fire Chief	<a href="mailto:chief1@crosslake.net">chief1@crosslake.net</a>
Rachel Nystrom	County Board	County Commissioner	<a href="mailto:rachel.nystrom@crowwing.us">rachel.nystrom@crowwing.us</a>
Paul Thiede	County Board	County Commissioner	<a href="mailto:paul.thiede@crowwing.us">paul.thiede@crowwing.us</a>
Josh Doty	City of Baxter	Community Director	<a href="mailto:idoty@baxtermn.gov">idoty@baxtermn.gov</a>
Blain Johnson	AREMA	Region 2 Planner	<a href="mailto:blain.johnson@paramountplanning.net">blain.johnson@paramountplanning.net</a>
Scott Bowers	Crow Wing Power	Puchasing Manager	<a href="mailto:bowers@cwpower.com">bowers@cwpower.com</a>
Tim Houle	Crow Wing County	County Administrator	<a href="mailto:tim.houle@crowwing.us">tim.houle@crowwing.us</a>
Tim Bray	Crow Wing County	County Engineer	<a href="mailto:tim.bray@crowwing.us">tim.bray@crowwing.us</a>
Denise Sundquist	Brainerd School Dist. 181	Health and Safety	<a href="mailto:Denise.sundquist@isd181.org">Denise.sundquist@isd181.org</a>
John Bowen	Crow Wing County	Emergency Management Director	<a href="mailto:john.bowen@crowwing.us">john.bowen@crowwing.us</a>

Crow Wing County – Multi Hazard Mitigation Plan Update  
 Planning Team Meeting – Tuesday, January 31, 2017

PARTICIPANT SIGN IN SHEET

Name	Agency/Organization	Title	Email
1. Michelle Moritz	Crow Wing Community Sewer	PN	michelle.moritz@crowwing.us
2. Trent Hawkins	BPU	Line sup	thawkinson@bpu.org
3. Josh Wetland	ECTC	GM	jwetland@emily.net
4. Eric Quale	Coaling Power	COO.	quale@coalingpower.com
5. Jim Eustel	Baxter F.D.	Chief	jeustel@baxtermn.gov
6. Kevin Messelmann	Wesley Point P.D.	Chief	kevin@cityofwesleypointmn.us
7. Alex Nelson	G.A.E., UMD	GIS Tech	nelson@geod.umn.edu
8. Rosemary Skovron	UIC	Community Programs Manager	mfranz@uic.edu
9. Kara Griffin	UIC	Programs Manager	kgriffin@uic.edu
10. Alexis Lindholm	Regent Schools	Schools Dir.	alindholm@regentschools.org
11. Tom Blomer	City of Missoula	Public Works Dir.	tblomer@ci.missoula.mn.us
12. Tony Skler	Bramerd City of	Parks & Rec. Director	tskler@ci.mn.us
13. Jim Tharner	" "	City Administrator	jtharner@ci.mn.us
14. Jamie Skovron	ISD 182	Supt	jskovron@isd182.org
15. Paul Sandy	City of Brainerd	Assis. City Engineer	psandy@ci.brainerd.mn.us
16. Jeff Henszler	" "	City Engineer	jhenszler@ci.brainerd.mn.us
17. Tim Holmes	Bramerd Fire Dept	Fire Chief	tholmes@ci.brainerd.mn.us
18. Mark Ostgard	City of Brainerd	City Planner	mostgard@ci.brainerd.mn.us
19. Shawn Strong	Bramerd	FFGIS Coord.	sstrong@brainerd.org

Name	Agency/Organization	Title	Email
20. Jay Sikkink	Crow Wing County	IT Director	Jay.Sikkink@crowwing.us
21. Debby Erickson	CWC	Admin Services Dir	Debby.Erickson@crowwing.us
22. Reid Thiese	CWC	FACILITIES MGR	REID.THIESE@CROWWING.US
23. Chip Lammiller	CROSSLAKE FIRE	CHIEF	CHIEF1@CROSSLAKE.NET
24. Josh Doty	City of Baxter	Community Dev Director	jdoty@baxtermn.gov
25. Blain Johnson	AREMA	Region 2 Planner	blain.johnson@paramountplanning.net
26. Paul Thiede	CWC	Commissioner	Paul.Thiede@crowwing.us
27. Scott Bowers	Crow Wing Power	Purchasing Manager	bowers@cwpower.com
28. Rachel	Crow Wing County	Community Services	Rachel.Muller@crowwin.
29. Tim Houde	Crow Wing County	County Administrator	T.M.Houde@crowwing.us
30. Tim Bray	Crow Wing County	County Engineer	tim.bray@crowwing.us
31. Denise Sumpster	ISD 181	Health & Safety	denise.sumpster@isd181.com
32. John Bowen	Crow Wing County	Emergency Management Director	john.bowen@crowwing.us
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2/6/2017

**Crow Wing County  
Multi-Hazard Mitigation Plan Update**  
January 31<sup>st</sup>, 2017 Planning Meeting



### Agenda

1. Welcome and Introductions
2. MHMP Plan Update Overview
  - About the Plan
  - Planning Team
  - Plan Content
3. Review of Mitigation Strategies and Developing Mitigation Actions
4. Hazard Mitigation Assistance (HMA) Grants
5. Mitigation Action Working Session

### About your UMD Project Team

**SWENSON COLLEGE  
OF SCIENCE & ENGINEERING**  
UNIVERSITY OF MINNESOTA DULUTH  
*Driven to Discover*

- The **Geospatial Analysis Center (GAC) at the University of Minnesota Duluth** was contracted by Minnesota HSEM to facilitate the development of this plan and to conduct spatial analysis, mapping and research for the plan.
- The GAC has worked on 13 MHMP's (2011-2016) and is currently working on 10 county MHMP updates in Minnesota.
- Working with the GAC is **Bonnie Hundrieser**, who specializes in Emergency Management planning.

### About the Plan

The Multi-Hazard Mitigation Plan (MHMP) is a requirement of the Federal Disaster Mitigation Act of 2000 (DMA 2000). **The development of a local government plan is required in order to maintain eligibility for certain federal disaster assistance and hazard mitigation funding programs.**

***MHMP's must:***

- Be updated every 5 years
- Identify hazards and conduct a risk assessment
- Include goals, strategies, and mitigation actions
- Address all jurisdictions (county/cities)
- Engage stakeholder and include public participation

### What is Hazard Mitigation?

- HM is **sustained action** to reduce or eliminate long-term risk to people and their property from hazards.
- HM Planning is the process local government use to **identify risks and vulnerabilities** associated with natural disasters, and develop **long-term strategies** for protecting people and property from future hazard events.
- HM planning allows communities to strategically plan for and **work together** to implement activities that are cost effective, technically feasible and environmentally sound .... **BEFORE** a disaster strikes.
- A dollar spent on mitigation grants leads to an average of \$3.65 in avoided post-disaster relief costs and increased federal tax revenues.

### The MHMP Planning Team

An MHMP **must** be developed with the participation of jurisdictional (county/city) representatives and other key stakeholders. This group is referred to as the "Planning Team".

***The role of the Planning Team is to help:***

1. Rank hazards, prioritize mitigation strategies and identify specific projects for implementation.
2. Assist with public outreach and participate in public meetings.
3. Review the draft plan and provide feedback.
4. Facilitate final adoption of the MHMP by local government.



2/6/2017

### Content of the MHMP

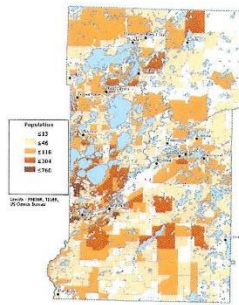
- County physical and social profile
- Asset Inventory
- Hazard Assessment and Vulnerability Analysis
- Capability Assessment
- Mitigation Actions

### Crow Wing County

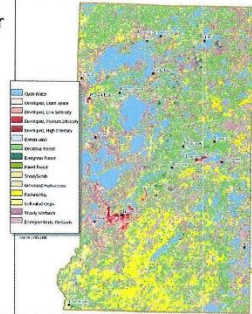
This is a multi-jurisdictional plan that covers Crow Wing County, including the cities of Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, & Trommald.

*The County and Cities are required to adopt the final plan. Townships are covered under the umbrella of the County.*

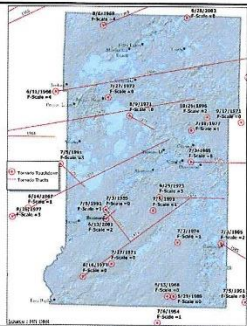
Crow Wing County, 2010 pop.



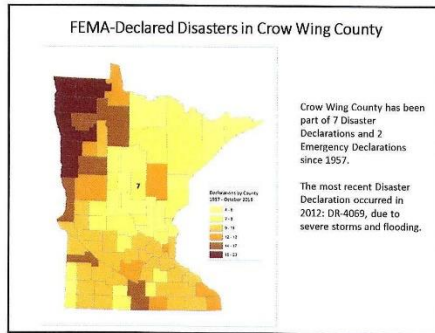
Land Cover



Tornado History



2/6/2017



### Crow Wing County Hazard History Story Map

<http://arcg.is/2iQSI5m>

### What Hazards are Addressed?

A Multi-Hazard Mitigation Plan looks primarily at natural disasters, including:

Flooding	Hail	Drought
Dam/Levee Failure	Lightning	Extreme Heat
Wildfire	Winter Storms	Extreme Cold
Windstorms	Erosion	Earthquakes
Tornadoes	Land Subsidence (Sinkholes & Karst)	

*Hazard Categories from the Minnesota State Plan*

Manmade hazards are not required by the DMA 2000 to be addressed in the MHMP.

### How are Hazards Identified & Ranked for a Community?

- Previous Hazard Events
- Historical Data (National Climatic Data Center)
- Previous MHMP's
- Calculated Priority Risk Index (CPRI)

**CPRI Risk Factors**

- PROBABILITY
- MAGNITUDE/SEVERITY
- WARNING TIME
- DURATION

*CPRI Assessment for Hazard Risk Ranking*

### Priorities of Risks Faced by Crow Wing County (2017)

The following hazards rankings for Crow Wing County are based on the on the past MHMP and THIRA.

They are provided for discussion for inclusion in the 2017 MHMP Update.

Natural Hazards		Risk Severity
Type		
Severe Summer Storms (Thunderstorms, Lightning, Hailstorms, Windstorms, Tornadoes)		High
Severe Winter Storms		High
Flash Flood & Riverine Flood		Moderate
Wildfire		Moderate
Extreme Heat & Extreme Cold		Moderate
Erosion / Land Subsidence (sinkholes & Karst)		Low
Drought		Low
Dam Failure		Low

### Review of Mitigation Capabilities

Multi-Hazard Mitigation Plans require that each jurisdiction **must** document the existing authorities, policies, programs, and resources in place for mitigation.

- What **plans and programs** are in place to support mitigation against that hazard?
- What **program gaps or deficiencies** exist to support mitigation against that hazard?

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**Mitigation Strategy #1:  
Local Planning and Regulations**

Government, administrative, or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses.

*Examples include planning and zoning, building codes, capital improvement programs, open space preservation, and stormwater management regulations.*

**Mitigation Strategy #2:  
Structure and Infrastructure Projects**

Actions that involve the construction of structures to reduce the impact of a hazard, such as dams, levees, floodwalls, seawalls, retaining walls, and safe rooms; and actions that involve the modification of existing buildings or structures to protect them from a hazard or remove them from the hazard area.

*Examples include acquisition, elevation, structural retrofits, storm shutters, and shatter-resistant glass. Climate Resilient Mitigation Actions include flood diversion and storage and green infrastructure. This mitigation strategy includes road/bridge/culvert projects for local flood mitigation.*

**Mitigation Strategy #3:  
Natural Systems Protection**

Actions that, in addition to minimizing hazard losses, preserve or restore the functions of natural systems.

*These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, wetland restoration and preservation, aquifer storage and recovery and floodplain and stream restoration.*

**Mitigation Strategy #4:  
Education and Awareness Programs**

Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them.

*Such actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.*

**Mitigation Strategy #5:  
Mitigation Preparedness & Response Support**

*(HSEM added strategy for use in the state)*

Actions that protect people and property prior to, during and immediately after a disaster or hazard event. Services include warning systems and emergency response services.

*These activities are not typically considered mitigation, but support reduction of the effects of damaging events.*

**Mitigation Actions Update**

*So far, the following has been completed in the review of mitigation actions in the last MHMP:*

1. What mitigation actions **have been completed** since the last plan was adopted.
2. What mitigation actions **should be deleted**.
3. What mitigation actions **have not been completed or may be an on-going action** to roll-over into the new plan.

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### Next Steps in Developing Actions

1. Identify specific mitigation strategies and actions at the jurisdictional level based on the community's risk and vulnerabilities.
2. Consider priority, timeframe, who's responsible, and what is in place to support implementation.
3. Consider potential funding and cost/benefit.
4. Engage key partners and stakeholders in providing local expertise and feedback.
5. Provide opportunities for public involvement and feedback in the planning process.

### FEMA's Hazard Mitigation Assistance (HMA) Grant Program

The Federal Emergency Management Agency (FEMA) provides grant funding to help communities to implement eligible mitigation projects that will help to reduce or eliminate the impact of future hazard or disaster events.



*Not all mitigation actions are eligible for federal HMA funding. Identification of eligible projects for potential HMA funding is a critical part of the MHMP planning process!*

### Mitigation Grant Eligibility

- Local Units of Government
- All jurisdictions in State
  - City, County, Tribal, private non-profit
- Cost Share - 75%/25%
- **Project must be identified in local HM plan**

### Application Process

- Notice of Available Funds
- Application
- Benefit Cost Analysis
- Environmental Historic Preservation
- State and FEMA review
- Award ~ 3 year period of performance
- Closeout

### Eligible project types

- **Acquisition/Elevation/Relocation**
  - Substantially or repetitively damaged (flood or erosion)
  - Threat of imminent danger (slope failure)
- **Tornado Safe Rooms** (severe storms/tornadoes)
- **Powerline retrofit/strengthening** (severe storms/ice)
- **Wildfire sprinklers/defensible space/resistant materials**
- **Slope stabilization**
- **Flood risk reduction activities**

### New! Climate Resilient Mitigation Actions (CRMA)

FEMA encourages communities to incorporate **climate resilience** in all mitigation actions through use of **green infrastructure methods** and designing projects to increase **ecosystem service benefits**

1. Aquifer Storage and Recovery (ASR)
2. Floodwater Diversion, Storage, and Recovery
3. Floodplain and Stream Restoration

# Mitigation Strategies

For every community, there are a range of mitigation actions that can be taken to work to reduce or eliminate the impacts of future natural hazard and disaster events. Following are the four types of mitigation strategies recommended by the Federal Emergency Management Agency (FEMA) for the organization of mitigation actions:

- 1) **Local Planning and Regulations:** Government, administrative, or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning and zoning, building codes, capital improvement programs, open space preservation, and stormwater management regulations.
- 2) **Structure and Infrastructure Projects:** Actions that involve the construction of structures to reduce the impact of a hazard, such as dams, levees, floodwalls, seawalls, retaining walls, and safe rooms; and actions that involve the modification of existing buildings or structures to protect them from a hazard or remove them from the hazard area. Examples include acquisition, elevation, structural retrofits, storm shutters, and shatter-resistant glass. CRMA include flood diversion and storage (FDS) and green infrastructure.
- 3) **Natural Systems Protection:** Actions that, in addition to minimizing hazard losses, preserve or restore the functions of natural systems. These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation. Aquifer storage and recovery (ASR) and floodplain and stream restoration (FSR).
- 4) **Education and Awareness Programs:** Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.

*A fifth strategy was added by Minnesota HSEM for use in the state:*

- 5) **Mitigation Preparedness and Response Support:** Actions that protect people and property prior to, during and immediately after a disaster or hazard event. Services include warning systems and emergency response services.. These activities are typically not considered mitigation, but support reduction of the effects of damaging events.

## MITIGATION ACTIONS WORKSHEET

HAZARD: \_\_\_\_\_ / JURISDICTION: \_\_\_\_\_

**Mitigation Strategy:**

- |  |   |
|--|---|
| <input type="checkbox"/> Local Planning & Regulations          | <input type="checkbox"/> Education and Awareness                      |
| <input type="checkbox"/> Structure and Infrastructure Projects | <input type="checkbox"/> Mitigation Preparedness and Response Support |
| <input type="checkbox"/> Natural Systems Protection            |   |

**Mitigation Action:**

HAZARD: \_\_\_\_\_ / JURISDICTION: \_\_\_\_\_

**Mitigation Strategy:**

- |  |   |
|--|---|
| <input type="checkbox"/> Local Planning & Regulations          | <input type="checkbox"/> Education and Awareness                      |
| <input type="checkbox"/> Structure and Infrastructure Projects | <input type="checkbox"/> Mitigation Preparedness and Response Support |
| <input type="checkbox"/> Natural Systems Protection            |   |

**Mitigation Action:**

HAZARD: \_\_\_\_\_ / JURISDICTION: \_\_\_\_\_

**Mitigation Strategy:**

- |  |   |
|--|---|
| <input type="checkbox"/> Local Planning & Regulations          | <input type="checkbox"/> Education and Awareness                      |
| <input type="checkbox"/> Structure and Infrastructure Projects | <input type="checkbox"/> Mitigation Preparedness and Response Support |
| <input type="checkbox"/> Natural Systems Protection            |   |

**Mitigation Action:**

HAZARD: \_\_\_\_\_ / JURISDICTION: \_\_\_\_\_

**Mitigation Strategy:**

- |  |   |
|--|---|
| <input type="checkbox"/> Local Planning & Regulations          | <input type="checkbox"/> Education and Awareness                      |
| <input type="checkbox"/> Structure and Infrastructure Projects | <input type="checkbox"/> Mitigation Preparedness and Response Support |
| <input type="checkbox"/> Natural Systems Protection            |   |

**Mitigation Action:**

HAZARD: \_\_\_\_\_ / JURISDICTION: \_\_\_\_\_

**Mitigation Strategy:**

- |  |   |
|--|---|
| <input type="checkbox"/> Local Planning & Regulations          | <input type="checkbox"/> Education and Awareness                      |
| <input type="checkbox"/> Structure and Infrastructure Projects | <input type="checkbox"/> Mitigation Preparedness and Response Support |
| <input type="checkbox"/> Natural Systems Protection            |   |

**Mitigation Action:**

HAZARD: \_\_\_\_\_ / JURISDICTION: \_\_\_\_\_

**Mitigation Strategy:**

- |  |   |
|--|---|
| <input type="checkbox"/> Local Planning & Regulations          | <input type="checkbox"/> Education and Awareness                      |
| <input type="checkbox"/> Structure and Infrastructure Projects | <input type="checkbox"/> Mitigation Preparedness and Response Support |
| <input type="checkbox"/> Natural Systems Protection            |   |

**Mitigation Action:**

Crow Wing County  
1-31-17 MHMP Planning Meeting  
**Mitigation Ideas Worksheet Notes**

Following are notes from the Crow Wing County 1-31-17 MHMP Planning Team Meeting “Mitigation Action Working Session” part of the meeting. Participants broke into discussion groups and used Mitigation Action Worksheets to brainstorm new mitigation ideas for their jurisdiction.

Participants used the worksheets to develop mitigation action ideas, identifying:

- Hazard – what natural hazard does the action focus on?
- Jurisdiction – what jurisdiction is for? (City/Township/County)
- Strategy – which mitigation strategy does this action relate to?
- Action – what is a description of the mitigation action?

The mitigation actions identified during this session will be used to support development of new mitigation actions to include in the Crow Wing County MHMP Update.

**Crow Wing County**

*Contact: Reid Thiesse, Crow Wing County Facilities Manager*

Hazard: All Hazards  
Strategy: Mitigation Preparedness and Response Support  
Action: Identify what buildings of CWC are designated as emergency operations locations and what services are required (i.e., power, data, HVAC, water/sewer) at said locations and what required supplies needed are on-hand. (i.e., fallout shelters, Red Cross shelter locations for downtown fire, storms, or floods).

**Crow Wing County**

*Contact: Kara Griffin, Crow Wing County Public Health, Programs Manager*

Hazard: All-Hazards (Power Outage / Safe Water Availability / Evacuation)  
Strategy: Education and Awareness  
Action: Use of videos, PSAs, websites, and media to raise public awareness and education with needed information on safety measures to take, prevention upstream, etc.

**City of Emily**

*Contact: Josh Netland, Emily Cooperative Telephone Company*

Hazard: Power Outages  
Strategy: Structure and Infrastructure Systems  
Action: Install underground facilities for telephone lines.

Hazard: Severe Summer Storms (High Winds/Tornado)  
Strategy: Structure and Infrastructure Systems / Education and Awareness  
Action: Establish safe room or storm shelter areas and educate the public on their purpose and use.



**Crow Wing County**

Contact: *Tim Bray, Crow Wing County Engineer*

Hazard: Flooding (City of Trommald)  
Strategy: Local Planning and Regulations / Structure and Infrastructure Systems  
Action: Levee emergency planning. Pump for Miller Black Bear Levee.

Hazard: Severe Weather  
Strategy: Mitigation Preparedness and Response Support  
Action: Advanced warning for areas of First Assessment District (unorganized area north of Brainerd/Baxter).

Hazard: Overhead Power Loss  
Strategy: Structure and Infrastructure Projects  
Action: There has been overhead power disruption in hard-hit areas of trees. There is a wind "tunnel" from Gull Lake in the Round Lake Area of CR 115. Relocate overhead lines underground.

**Crosby-Ironton ISD #182**

Contact: *Jamie Skjeveland, Superintendent*

Hazard: Severe Wind Storm/Tornado  
Strategy: Structure and Infrastructure Systems  
Action: Evaluate school for construction or retrofit of a safe room to protect students and staff in the event of a tornado or extreme wind event.

Hazard: Extended Power Outage  
Strategy: Mitigation Preparedness and Response Support  
Action: Generator backup support needed in the event the school is used for sheltering and there has been a power outage. Power would be needed to support lights, septic solutions, clean water, etc.

**Brainerd Public Schools ISD #181**

Contact: *Denise Sundquist, Health and Safety*

Hazard: Severe Summer Storms (Straight Line Winds/Tornado)  
Strategy: Structure and Infrastructure Systems  
Action: We need to consider a community safe room as a part of new construction in the school district. We are not interested in reinforcing current areas (no retrofit of facilities).

Hazard: Fire  
Strategy: Natural Systems Protection  
Action: Based on storms of September 2014, should we be concerned about fire damage at Forestview Middle School? (creation of defensible space)

**Pequot Lakes School District ISD #186**

*Contact: Chris Lindholm, Superintendent*

Hazard: Extended Power Outage  
Strategy: Mitigation Preparedness and Response Support  
Action: Obtain generators for school to support sheltering during periods of extreme power outage.

**Crow Wing Power Cooperative**

*Contact: Eric Quale, Chief Operating Officer*

Hazard: Loss of Power  
Strategy: Structure and Infrastructure Systems  
Action: Convert overhead electrical distribution lines to underground electrical distribution lines. Mitigate the impacts of high winds, lightning, tree failure, ice loading, etc.

Hazard: Loss of Power  
Strategy: Structure and Infrastructure Systems  
Action: Convert underground electrical distribution lines to overhead electrical distribution lines. Underground wires will fail, could be impacted by floods. Extreme cold in Crow Wing County creates long outage times and costly repairs. A benefit cost analysis may prove wise to replace underground with overhead wires.

**City of Brainerd**

*Contact: Tony Sailer, Director - Brainerd Parks and Recreation*

Hazard: Tornado/High Winds  
Strategy: Structure and Infrastructure Projects  
Action: Construction of Safe Rooms: Some of our parks have no brick structure, or no structure at all, for park users (sports teams, families, etc to go to in case of tornados or damaging winds. The park office is also a wood/metal structure with no safe place. The campground may also be in need of a safe room to provide emergency shelter for campers.

**City of Brainerd**

*Contact: Corky McQuiston, Chief - Brainerd Police Department*

Hazard: All-Hazards (Disaster Response)  
Strategy: Mitigation Preparedness and Response Support  
Action: Obtain an enhanced Emergency Notification system that integrates with IPAWS to help deliver more regionalized, specific emergency notifications and post disaster instructions.

Hazard: All-Hazards (Disaster Response)  
Strategy: Mitigation Preparedness and Response Support  
Action: UAV equipment program. Respond to disasters faster to plan and evaluate resources needed. Add safety feature to response to hazardous scenes.

**City of Brainerd**

*Contact: Paul Sandy, Assistant City Engineer*

Hazard: Tornadoes/Severe Wind Storms  
Strategy: Structure and Infrastructure Projects  
Action: We are in need of safe rooms at multiple trailer parks and elderly home communities in Brainerd.

Hazard: Severe Summer or Winter Storms  
Strategy: Education and Awareness  
Action: Provide public education using social medial (i.e. Facebook) on what to do in case of severe summer or winter storms (i.e., tornado - don't go out on porch).

**City of Brainerd**

*Contact: Shawn Strong, IT/GIS Coordinator*

Hazard: All-Hazards (Communications)  
Strategy: Mitigation Preparedness and Response Support  
Action: City needs to develop a local access control position for social media in order to disseminate information and receive feedback. (Have a specific staff person to manage social media and public information).

Hazard: Tornado/Severe Wind Events  
Strategy: Structure and Infrastructure Projects  
Action: We have insufficient storm shelters for people who use parks, open space; working with schools for outdoor events. (Consider construction of safe rooms)

**City of Crosslake**

*Contact: Chip Lohmiller, Chief - Crosslake Fire*

Hazard: Wildfire  
Strategy: Local Planning and Regulations / Education and Awareness  
Action: Work with Planning and Zoning on land development and regulations. Educate the public on wildland fires and how to prepare individual homesites. Work with fire, DNR, and Firewise program.

Hazard: Severe Summer Storms (straight line winds/tornado)  
Strategy: Structure and Infrastructure Project  
Action: Construct safe rooms at campground in Crosslake, Trout Lake Camp, Camp Nlutson, and Boy Scouts Camp.

**City of Nisswa**

*Contact: Tom Blomer, Public Works Director*

Hazard: Severe Summer Storms (Tornado/Extreme Wind Event)  
Strategy: Structure and Infrastructure Projects  
Action: Need a safe room /rooms for tornadoes or wind downtown, and maybe other areas throughout for tourists/public visiting. We currently only have small rooms available that are not well-marked.

Hazard: Wildfire  
Strategy: Natural Systems Protection  
Action: Removal of down/dead trees. Looking for a way to incentive people to clean up downed and dead trees (especially larger lots that could start large fires).

Hazard: Power Outage  
Strategy: Mitigation Preparedness and Response Support  
Action: Need generator hook-ups and a second back up generator that would provide power to City Hall and additional city structures.

Hazard: Power Outages due to High wind/Heavy snow/Ice  
Strategy: Structure and Infrastructure Projects  
Action: Need either trees moved away from power lines or power put underground in more places to prevent them from coming down in the event of high winds and/or heavy snow/ice. We have had difficulty re-opening roads and restoring services after storms due to downed powerlines.

Hazard: High Winds/Heavy Snow  
Strategy: Mitigation Preparedness and Response Support  
Action: Need a big pay loader for tree removal. We are currently using a tractor that is too light at doing emergency use.

**Crow Wing County Multi-Hazard Mitigation Plan Update  
MHMP Planning Team Meeting #2  
6/22/17, Brainerd Fire Hall, Brainerd MN, 2:00 p.m. – 4:00 p.m.**

**Meeting Summary:**

On Thursday, June 22, 2017 members of the Crow Wing County Multi-Hazard Mitigation (MHMP) Planning Team convened to conduct a review and discussion of the draft mitigation action charts developed for Crow Wing County and the city jurisdictions participating in the plan. The meeting was facilitated by Bonnie Hundrieser, a member of the University of Minnesota – Duluth Geospatial Analysis Center (GAC) planning team that is leading the update of the Crow Wing County MHMP. A total of 20 people attended the meeting, representing Crow Wing County departments, city / township personnel and other key stakeholders.

The opening Power Point presentation covered a re-cap of key points regarding the MHMP plan update (purpose of the plan, who the plan covers, who needs to participate, what hazards are addressed and how they are ranked, mitigation strategies to be used, and what projects may be eligible for FEMA HMA funding). The presentation also provided a detailed breakdown of the Mitigation Action Chart to explain the relevance of each column to be addressed in the chart.

Following the presentation, the planning team participated in a facilitated discussion of the County's draft master Mitigation Action Chart which included mitigation actions for the county as well as for the cities participating in the plan. Mitigation actions included in the chart were identified through the County's review of past mitigation actions (actions to continue), as well as new mitigation actions that were identified during the first planning team meeting "Mitigation Actions Ideas Working Session." County and city representatives discussed each of the mitigation actions, adding comments, corrections, and identifying where cities would be listed to implement particular items in their respective jurisdictions.

Following the Mitigation Action Chart review, the group was informed that they would be emailed drafts of the mitigation action charts for county and city level review and input. The group also discussed the upcoming process of posting the final draft of the plan for the public to review and comment on, and then submission of the draft plan to HSEM and FEMA for final review and approval.

**Attached to this meeting summary are the following documentation items:**

- Crow Wing County HMP Mtg. #2 Email Invite
- 6-22-17 Meeting Agenda
- 6-22-17 Meeting Sign-in Sheets
- 6-22-17 Power Point Presentation Slides

*Meeting Summary Prepared By:  
Bonnie Hundrieser, UMD Project Team, (Hundrieser Consulting LLC)*

**From:** John Bowen  
**To:** [ihulsether@ci.brainerd.mn.us](mailto:ihulsether@ci.brainerd.mn.us); [denise.sundquist@isd181.org](mailto:denise.sundquist@isd181.org); [Chris.Lindholm@ci.k12.mn.us](mailto:Chris.Lindholm@ci.k12.mn.us); [Tim.Holmes](mailto:Tim.Holmes); [Jim.Exsted](mailto:Jim.Exsted); [email@bpu.org](mailto:email@bpu.org); [Tim.Houle](mailto:Tim.Houle); [Paul.Thiede](mailto:Paul.Thiede); [Rachel.Nystrom](mailto:Rachel.Nystrom); [Paul.Koering](mailto:Paul.Koering); [Nate.Rose](mailto:Nate.Rose); [Rosemary.Franzen](mailto:Rosemary.Franzen); [Kara.Terry](mailto:Kara.Terry); [Kara.Griffin](mailto:Kara.Griffin); [Michelle.Moritz](mailto:Michelle.Moritz); [Jay.Sikkink](mailto:Jay.Sikkink); [Gary.Griffin](mailto:Gary.Griffin); [Chris.Pence](mailto:Chris.Pence); [Mark.Liedl](mailto:Mark.Liedl); [Debby.Frickson](mailto:Debby.Frickson); [Nate.Rose](mailto:Nate.Rose); [Tim.Brav](mailto:Tim.Brav); [Rob.Hall](mailto:Rob.Hall); [Reid.Thiesse](mailto:Reid.Thiesse); [Todd.Dahl](mailto:Todd.Dahl); [Denny.Lasher](mailto:Denny.Lasher); [CITY.OF.RIVERTON](mailto:CITY.OF.RIVERTON); [bmanhart@crosslake.net](mailto:bmanhart@crosslake.net); [Scott.Goddard](mailto:Scott.Goddard); [Dave.Fischer](mailto:Dave.Fischer); [sstrong@ci.brainerd.mn.us](mailto:sstrong@ci.brainerd.mn.us); [jthoreen@ci.brainerd.mn.us](mailto:jthoreen@ci.brainerd.mn.us); [mostgarden@ci.brainerd.mn.us](mailto:mostgarden@ci.brainerd.mn.us); [Corky.McQuiston](mailto:Corky.McQuiston) ([corky.mcquiston@ci.brainerd.mn.us](mailto:corky.mcquiston@ci.brainerd.mn.us)); [cityhall@baxtermn.gov](mailto:cityhall@baxtermn.gov); [Jim.Exsted](mailto:Jim.Exsted); [dolson@baxtermn.gov](mailto:dolson@baxtermn.gov); [Tom.Blomer](mailto:Tom.Blomer); [tsailer@ci.brainerd.mn.us](mailto:tsailer@ci.brainerd.mn.us); [twalter@baxtermn.gov](mailto:twalter@baxtermn.gov); [Craig@nisswapolice.com](mailto:Craig@nisswapolice.com); [Nisswa.Fire](mailto:Nisswa.Fire); [mwentler@ci.nisswa.mn.us](mailto:mwentler@ci.nisswa.mn.us); [Tom.Blomer](mailto:Tom.Blomer); [eklang@pequotakes-mn.gov](mailto:eklang@pequotakes-mn.gov); [Nancy.Malecha](mailto:Nancy.Malecha); [pequotfd@pequotakes-mn.gov](mailto:pequotfd@pequotakes-mn.gov); [Todd.Dahl](mailto:Todd.Dahl); [mloven@pequotakes-mn.gov](mailto:mloven@pequotakes-mn.gov); [dhattner@pequotakes-mn.gov](mailto:dhattner@pequotakes-mn.gov); [Public.Works](mailto:Public.Works); [planner@cityofbreezypointmn.us](mailto:planner@cityofbreezypointmn.us); [jrudberg@cityofbreezypointmn.us](mailto:jrudberg@cityofbreezypointmn.us); [kevin@cityofbreezypointmn.us](mailto:kevin@cityofbreezypointmn.us); [cityhall@ci.jenkins.mn.us](mailto:cityhall@ci.jenkins.mn.us); [cityclerk@crosslake.net](mailto:cityclerk@crosslake.net); [Chief1@crosslake.net](mailto:Chief1@crosslake.net); [crosslakepz@crosslake.net](mailto:crosslakepz@crosslake.net); [publicwk@crosslake.net](mailto:publicwk@crosslake.net); [city@manhattanbeachmn.org](mailto:city@manhattanbeachmn.org); [ann50lakes@emily.net](mailto:ann50lakes@emily.net); [pz50lakes@emily.net](mailto:pz50lakes@emily.net); [josh.herold@gmail.com](mailto:josh.herold@gmail.com); [kenny\\_roden@yahoo.com](mailto:kenny_roden@yahoo.com); [clerk@emily.net](mailto:clerk@emily.net); [cuyunapolice@gmail.com](mailto:cuyunapolice@gmail.com); [info@ci.cuyuna.mn.us](mailto:info@ci.cuyuna.mn.us); [bill.bedard](mailto:bill.bedard); [Kim.Coughlin](mailto:Kim.Coughlin) - [Crosby.Polic.Department](mailto:Crosby.Polic.Department) ([kim.Coughlin@cityof-crosby.com](mailto:kim.Coughlin@cityof-crosby.com)); [jdecant@cityof-crosby.net](mailto:jdecant@cityof-crosby.net); [lisa.sova@cityof-crosby.com](mailto:lisa.sova@cityof-crosby.com); [jeffturk@cityofdeenwood.com](mailto:jeffturk@cityofdeenwood.com); [citygami@frontiernet.net](mailto:citygami@frontiernet.net); [kokerman@ci.jenkins.mn.us](mailto:kokerman@ci.jenkins.mn.us); [lostn50s@mlcwb.net](mailto:lostn50s@mlcwb.net); [Bonnie.Hundrieser](mailto:Bonnie.Hundrieser)

**Subject:** Crow Wing County 2nd Planning meeting for Multi-Hazard Mitigation Plan  
**Date:** Wednesday, May 31, 2017 9:12:26 AM

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Good Morning,

Your presence is requested at the 2nd Planning Team meeting for the update of the Crow Wing County Multi-Hazard Mitigation Plan on:

**Date:** Thursday, June 22nd, 2017  
**Time:** 2:00 p.m. – 4:00 p.m.  
**Location:** Brainerd Fire Hall (23 Laurel Street, Brainerd MN, 56401)

During this meeting we will be reviewing the draft Mitigation Action Chart to be included in the plan. Your feedback will be needed to identify & discuss the mitigation actions that will be listed for your city/county department/agency/or organization. This is a State and Federal requirement we must cover for the plan to be approved. The meeting will be facilitated by Bonnie Hundrieser, an emergency management planning consultant working closely with us on this project.

Please RSVP your attendance to me via reply to this email. If you cannot attend, please seek to send someone else in your stead as your representation at this meeting is important.

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

Thank you,

John Bowen  
Crow Wing County Sheriff's Office  
Emergency Management Director  
304 Laurel St.  
Brainerd MN 56401  
218-825-3445  
<http://crowwing.us/356/Emergency-Management>

#### **MISSION STATEMENT**

**With courage, honor, and integrity we protect the rights and dignity of all citizens. In**

**partnership with our communities, we strive to preserve the peace and are dedicated to excellence in the delivery of public safety services.**

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# Crow Wing County Multi-Hazard Mitigation Plan (MHMP) Update

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## Planning Team Meeting #2

Thursday, June 22<sup>nd</sup>, 2:00 p.m. - 4:00 p.m.  
Brainerd Fire Hall – Brainerd, MN

**Presenting:**

Bonnie Hundrieser, UMD MHMP Project Team Member

**Agenda:**

1. **Welcome & Introductions**
2. **MHMP - Recap of Key Points**
3. **Mitigation Action Chart (MAC) Presentation**  
Explanation of all columns of the MAC and content to be identified.
4. **MAC Working Session: Group Review & Feedback**  
Group review and feedback of the Faribault County Master Mitigation Action Chart.  
This will include identification of specific mitigation actions for jurisdictions / review and feedback of jurisdictional MAC's.
5. **Discussion of Next Steps**
  - Completion of all Mitigation Action Charts
  - Planning Team review of draft MHMP
  - Public news release, posting draft MHMP, and public review

**Contact:**

*For more information on the Crow Wing County MHMP Update, please contact:*

- John Bowen, Crow Wing County Emergency Management Director  
218-825-3445 / [John.Bowen@crowwing.us](mailto:John.Bowen@crowwing.us)
- Bonnie Hundrieser, UMD Project Team Member  
218-343-3468 / [hundrieserconsulting@gmail.com](mailto:hundrieserconsulting@gmail.com)



Crow Wing County 6/22/17 Planning Team Meeting  
Participant Sign-in List (20 attendees)

Crow Wing County MHMP Update Planning Team Meeting #2, Thursday, May 22, 2017, 2:00 p.m. - 4:00 p.m. Participant Sign-in List			
Name	Agency/Organization	Title	Email
Trent Hawkinsen	Brainerd Public Utilities	Line Supervisor	<a href="mailto:thawkinson@bpu.org">thawkinson@bpu.org</a>
Kara Terry	Crow Wing County Community Serv	Director	<a href="mailto:kara.terry@crowwing.us">kara.terry@crowwing.us</a>
Tim Houle	Crow Wing County Administration	County Administrator	<a href="mailto:tim.houle@crowwing.us">tim.houle@crowwing.us</a>
Jim Exsted	Baxter Police Department	Chief	<a href="mailto:jexsted@baxtermn.gov">jexsted@baxtermn.gov</a>
Kevin Merschman	Breezy Point Police Department	Chief	<a href="mailto:kevin@cityofbreezypointmn.us">kevin@cityofbreezypointmn.us</a>
Corky McQuiston	Brainerd Police Department	Chief	<a href="mailto:corky.mcquiston@ci.brainerd.mn.us">corky.mcquiston@ci.brainerd.mn.us</a>
Rich Spiczka	Pequot Lakes School Dist	Comm Ed Director	<a href="mailto:rspiczka@isd186.org">rspiczka@isd186.org</a>
Scott Magnuson	Brainerd Public Utilities	Superintendent	<a href="mailto:smagnuson@bpu.org">smagnuson@bpu.org</a>
Tony Sailer	City of Brainerd	Parks and Rec Director	<a href="mailto:tsailer@ci.brainerd.mn.us">tsailer@ci.brainerd.mn.us</a>
Jim Thoreen	City of Brainerd	City Administrator	<a href="mailto:jthoreen@ci.brainerd.mn.us">jthoreen@ci.brainerd.mn.us</a>
Gary Griffin	Crow Wing County Land Services	Director	<a href="mailto:gary.griffin@crowwing.us">gary.griffin@crowwing.us</a>
Justin Burske	NJPA	Zoning Administrator	<a href="mailto:justin.burske@njpacoop.org">justin.burske@njpacoop.org</a>
Paul Sandy	City of Brainerd	Assistant Engineer	<a href="mailto:psandy@ci.brainerd.mn.us">psandy@ci.brainerd.mn.us</a>
Tim Holmes	City of Brainerd	Fire Chief	<a href="mailto:tholmes@ci.brainerd.mn.us">tholmes@ci.brainerd.mn.us</a>
Shawn Strong	City of Brainerd	IT/GIS Coordinator	<a href="mailto:sstrong@ci.brainerd.mn.us">sstrong@ci.brainerd.mn.us</a>
Paul Thiede	County Board	County Commissioner	<a href="mailto:paul.thiede@crowwing.us">paul.thiede@crowwing.us</a>
Tim Houle	Crow Wing County	County Administrator	<a href="mailto:tim.houle@crowwing.us">tim.houle@crowwing.us</a>
Jory Danielson	Crow Wing County	County Engineer	<a href="mailto:jory.danielson@crowwing.us">jory.danielson@crowwing.us</a>
Earl Wolleat	Brainerd School Dist. 181	Health and Safety	<a href="mailto:earl.wolleat@isd181.org">earl.wolleat@isd181.org</a>
John Bowen	Crow Wing County	Emergency Mgmt. Director	<a href="mailto:john.bowen@crowwing.us">john.bowen@crowwing.us</a>

Crow Wing County – Multi Hazard Mitigation Plan Update  
 Planning Team Meeting #2  
 Thursday, June 22, 2017, 2:00 p.m. – 4:00 p.m.

**PARTICIPANT SIGN IN SHEET**

Name	Agency/Organization	Title	Email
1. Scott Macnison	B.P.U.	SUPERINTENDENT	smagnison@bpu.org
2. Kara Terry	CLU Community Services	Director	kara.terry@crowwing.us
3. Gary Griffin	CLU Land Services	Director	gary.griffin@crowwing.us
4. Paul Thiede	Cur Ramon	Owner	Paul.Thiede@curramon.us
5. Justin Burske	NSDA	Zoning Administrator	Justin.Burske@nsda.org
6. Paul Sandy	City of Brainerd	City Engineer	psandy@ci.brainerd.mn.us
7. Tim Ecksted	Baxter PD	Police	tecksted@baxtermn.gov
8. Erik Wolkert	Brainerd Public Schools	Planes & Controls	Erik.Wolkert@BPSD171.OTV
9. Rich Sprick	Brainerd Lakes Public Schools	Comm SD Director	rsprick@isd180.org
10. Jay Duison	Crow Wing County High	Machine Supervisor	jay.duison@crowwing.us
11. Kevin Merschwald	Brewery from PD	Chief	kevin@breweryfrompd.us
12. Tim Holmes	Brainerd Fire	Chief	tholmes@ci.brainerd.mn.us
13. John Bowen	Crow Wing County SO	Emergency Mgt	john.bowen@crowwing.us
14. Corky McQuiston	Brainerd Police	Police Chief	corky.mcquiston@ci.brainerd.mn.us
15. Michelle Moritz	Brainerd Co Gas	Public Health Supervisor	michelle.moritz@crowwing.us
16. Tim Houder	Crow Wing County Admin	Administrator	tim.houder@crowwing.us
17.			
18.			

6/16/2017

**Crow Wing County  
Multi-Hazard Mitigation Plan Update**

Thursday, May 22, 2017  
Planning Meeting #2: Mitigation Action Chart Review



**Agenda**

1. Welcome and Introductions
2. MHMP – Recap of Key Points
3. Mitigation Action Chart (MAC) Overview
4. MAC Working Session
5. Overview of Next Steps

**MHMP - Recap of Key Points**

- Crow Wing County is updating its **Multi-Hazard Mitigation Plan (MHMP)** to fulfill a state & federal requirement. The plan must be updated every 5 years.
- The purpose of the plan is to identify & assess natural hazards that pose risk to the County and it's jurisdictions and **develop long-term strategies and mitigation actions** that will help to reduce or eliminate the impact of future hazard or disaster events.

*Who the Plan Covers*

This is a multi-jurisdictional plan that covers Crow Wing County, including the cities of Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deenwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, & Trommald.

*The County and Cities are required to adopt the final plan.  
Townships are covered under the umbrella of the County.*

*Who Needs to Participate*

Participation of **key county/city stakeholders** is required:

- County departments
- City Governments
- Townships
- Schools
- Electric Coops

Opportunities for **public participation** is also required:

- News Releases
- Facebook, Twitter, Web
- Draft Plan Review
- 2 Public Meetings

*What Hazards are Addressed*

The MHMP addresses the prioritized natural hazards that pose risk to Crow Wing County.

Crow Wing County Hazard Risk Ranking	
Type	Risk Severity
Severe Summer Storms (Thunderstorms, Lightning, Hailstorms, Windstorms, Tornadoes)	High
Severe Winter Storms	High
Flash Flood & Riverine Flood	High
Wildfire	High
Extreme Heat & Extreme Cold	Moderate
Erosion / Land Subsidence (Sinkholes & Karst)	Low
Drought	Low
Dam Failure	Low

6/16/2017

*What Mitigation Strategies Will Be Used to Develop Mitigation Actions*

1. Local Planning & Regulations
2. Structure and Infrastructure Projects
3. Natural Systems Protection
4. Education and Awareness Programs
5. Mitigation Preparedness and Response Support

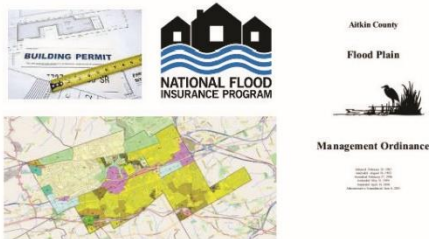
*These strategies help communities to identify and implement long-term risk-reduction activities that will protect people and property from future hazard events.*

**Mitigation Strategy #1:  
Local Planning and Regulations**

**Government, administrative, or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses.**

*Examples include planning and zoning, building codes, capital improvement programs, open space preservation, and stormwater management regulations.*

Local Planning & Regulations Examples



Acquisition of Flood Prone Properties and Conversion to Open Space



**Mitigation Strategy #2:  
Structure and Infrastructure Projects**

**Actions that involve the construction of structures to reduce the impact of a hazard, such as dams, levees, floodwalls, seawalls, retaining walls, and safe rooms; and actions that involve the modification of existing buildings or structures to protect them from a hazard or remove them from the hazard area.**

*Examples include acquisition, elevation, structural retrofits, storm shutters, and shatter-resistant glass. Climate Resilient Mitigation Actions include flood diversion and storage and green infrastructure. This mitigation strategy includes road/bridge/culvert projects for local flood mitigation.*

Community Safe Rooms  
Wadena-Deer Creek School, June 17 2010

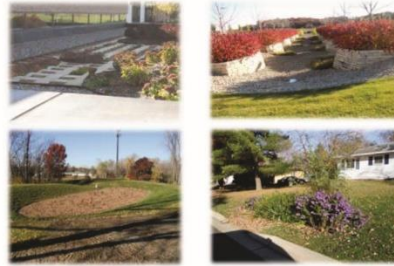


6/16/2017

August, 2012 – 1<sup>st</sup> school based tornado safe room (Wadena)



Green Infrastructure Projects



Power Line retrofit/burial



**Mitigation Strategy #3:**  
**Natural Systems Protection**

**Actions that, in addition to minimizing hazard losses, preserve or restore the functions of natural systems.**

*These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, wetland restoration and preservation, aquifer storage and recovery and floodplain and stream restoration.*

Natural Systems Protection examples



**Mitigation Strategy #4:**  
**Education and Awareness Programs**

**Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them.**

*Such actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.*

6/16/2017

### Education & Awareness Program Examples



### Mitigation Strategy #5: Mitigation Preparedness & Response Support

*(HSEM added strategy for use in the state)*

**Actions that protect people and property prior to, during and immediately after a disaster or hazard event. Services include warning systems and emergency response services.**

*These activities are not typically considered mitigation, but support reduction of the effects of damaging events.*

### Mitigation Preparedness & Response Support examples



### What Projects May be Eligible for FEMA HMA Funding

- Acquisition/Elevation/Relocation
  - Substantially or repetitively damaged (flood or erosion)
  - Threat of imminent danger (slope failure)
- Safe Room Construction/Retrofit
- Powerline strengthening/burying
- Wildfire Mitigation Activities
- Slope stabilization
- Flood risk reduction activities
- Additional Projects difficult to conduct a standard BCA



The Federal Emergency Management Agency (FEMA) provides grant funding to help communities to implement eligible mitigation projects that will help to reduce or eliminate the impact of future hazard or disaster events.

**Projects must be indicated in the local mitigation plan.**

### Mitigation Action Chart Overview

- The MHMP results in a "Mitigation Action Chart" that outlines the specific mitigation measures that the County and each jurisdiction will seek to implement over the course of the next 5 years.
- Mitigation actions are drawn from the previous plan, identified capability gaps and feedback from jurisdictions on mitigation measures important to their community.
- **Every city will have it's own separate mitigation action chart.** School districts and townships (as a group) may also have separate charts.

### "Hazard" column

↓

Hazard	Mitigation Strategy	Responsible Agency	Start	Final Planning	Cost Estimate	Completion	Responsible	Other Comments on Implementation	Priority Ranking
--------	---------------------	--------------------	-------	----------------	---------------	------------	-------------	----------------------------------	------------------

Each mitigation action **must** address a particular natural hazard.

"All-Hazard" mitigation actions relate to more than one type of natural hazard or may relate to other categories of technological and man-made threats/hazards.

### “Mitigation Strategy” column

#	Hazard	Mitigation Strategy	Mitigation Action	Date	Priority Ranking	Cost Estimate	Responsible Agency	Priority/Implementation Period	Priority Ranking
---	--------	---------------------	-------------------	------	------------------	---------------	--------------------	--------------------------------	------------------

Each mitigation action **must** identify which type(s) of mitigation strategies relate to the mitigation measure.

1. Local Planning & Regulations
2. Structure and Infrastructure Projects
3. Natural Systems Protection
4. Education and Awareness Programs
5. Mitigation Preparedness and Response Support

### “Mitigation Action” column

#	Hazard	Mitigation Strategy	Mitigation Action	Date	Priority Ranking	Cost Estimate	Responsible Agency	Priority/Implementation Period	Priority Ranking
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Each mitigation action **must** include a description of what effort is to be implemented. Mitigation actions should be written to be clear, concise, and action-oriented (start with a verb). The action should seek help to reduce or eliminate long-term risk to life safety and property damage from future natural hazard events.

### “Status” column

#	Hazard	Mitigation Strategy	Mitigation Action	Date	Priority Ranking	Cost Estimate	Responsible Agency	Priority/Implementation Period	Priority Ranking
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Each mitigation action **must** include an indication of current status. They are:

- “In-Progress” – a defined mitigation project or effort that is currently underway.
- “On-going” – a mitigation project or effort that continues without end.
- “New” – a new mitigation project or effort identified to include in the new plan.

### “Priority Ranking” column

#	Hazard	Mitigation Strategy	Mitigation Action	Date	Priority Ranking	Cost Estimate	Responsible Agency	Priority/Implementation Period	Priority Ranking
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Each mitigation action **must** be ranked as being of High, Moderate, or Low priority to help provide guidance in implementation. Priority rankings should be based on key considerations, such as:

- Known effectiveness of the mitigation measure.
- Local capability to implement the mitigation measure.
- Cost effectiveness of the mitigation measure. (Benefit vs. Cost)
- Longevity of the mitigation measure.
- Community support for the mitigation measure.
- Eligibility for federal grants (FEMA HMA Grant Program).

### “Timeline” column

#	Hazard	Mitigation Strategy	Mitigation Action	Date	Priority Ranking	Cost Estimate	Responsible Agency	Priority/Implementation Period	Priority Ranking
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Each mitigation action **must** indicate a timeframe for implementation.

- For mitigation actions that are “In-Progress” or “New” a known timeframe may be identified (i.e., 2017-2018).
- Some mitigation actions may be identified to be implemented within the 5 year period of the MHMP (2017-2021).

### “Jurisdictions” column

#	Hazard	Mitigation Strategy	Mitigation Action	Date	Priority Ranking	Cost Estimate	Responsible Agency	Priority/Implementation Period	Priority Ranking
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Important: During the MAC working session you will be asked to indicate where your jurisdiction should be included.

Each mitigation action **must** identify what jurisdictions will seek to implement that action.

- Some mitigation actions will be specific to only the County for implementation.
- Other mitigation actions are those that all cities (or only some cities) would agree are important to include in their own jurisdictions.
- Schools and townships may be identified as well.

6/16/2017

### “Responsibility” column



#	Hazard	Mitigation Strategy	Mitigation Action	Date	Priority Ranking	Cost Estimate	Jurisdiction	Responsibility	Priority/Comments on Planning Mechanisms for Implementation	Priority Ranking
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Each mitigation action **must** include a brief identification of what agency or department or specific personnel has lead responsibility to implement that project or effort, such as:

- “County/City Emergency Management”
- “Planning and Zoning Department”
- “County Highway Department”
- “SWCD in collaboration with MN DNR”
- “Public Works Department”

### “Comments on Planning Mechanisms for Implementation” column



#	Hazard	Mitigation Strategy	Mitigation Action	Date	Priority Ranking	Cost Estimate	Jurisdiction	Responsibility	Priority/Comments on Planning Mechanisms for Implementation	Priority Ranking
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Each mitigation action **must** include a description of how the mitigation measure will be incorporated into existing or future planning or project efforts by the jurisdiction provided. For example:

- Reference related plans or programs that relate to the mitigation measure (such as comprehensive land use plans, Capital Improvement Programs, public outreach and education programs)
- Reference existing partnerships that relate to the mitigation measure (such as “This is a standing effort of the County/City emergency management program in partnership with Public Health.”)

### “Possible Funding” column



#	Hazard	Mitigation Strategy	Mitigation Action	Date	Priority Ranking	Cost Estimate	Jurisdiction	Responsibility	Priority/Comments on Planning Mechanisms for Implementation	Priority Ranking
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Each mitigation action **must** include identification of what possible funding will be used to implement the mitigation action:

- In most cases, “County/City” budget generally implies staff time to work on the mitigation measure or internal funding to purchase equipment, etc.
- When applicable, other funding such as outside grants, state or federal funding that may support the mitigation measure should be identified.
- It is particularly important to identify mitigation measures that may be eligible for FEMA HMA grant funding.

### MAC Working Session

- We will go through the Master “MAC” together.
- We will discuss any changes or additions.
- Jurisdictions will confirm where they want to be listed for local implementation efforts.
- Cities without a draft MAC still have the opportunity to identify mitigation measures specific to their community.

**Following this meeting I will send out the new draft jurisdictional mitigation charts for review and completion.**

### Overview of Next Steps

- Draft MACs will be submitted to UMD.
- The draft MHMP will be completed.
- The draft plan will be posted for planning team and public review & comment. (News Release)
- Any resulting revisions will be made, and the plan will be submitted to HSEM and FEMA for review and approval.



# **Appendix F**

## **Public Outreach & Engagement Documentation**

DRAFT



## CROW WING COUNTY SHERIFF'S OFFICE

304 Laurel Street • Brainerd, MN 56401  
Phone: (218) 829-4749 • Fax: (218) 829-9459 • [www.crowwing.us](http://www.crowwing.us)

Office of  
**Todd Dahl, Sheriff**

### *CROW WING COUNTY PRESS RELEASE*

*March 1, 2017*

#### Public Feedback and Participation Invitation for Crow Wing County 2017 Multi-Hazard Mitigation Plan Update

The Crow Wing County Sheriff's Office Division of Emergency Management is currently working with the University of Minnesota Duluth – Geospatial Analysis Center (GAC) to prepare an update of the County's "Multi-Hazard Mitigation Plan" (MHMP). The plan is a requirement of the Federal Disaster Mitigation Act of 2000 (DMA 2000) and must be updated every five years in order to maintain eligibility for certain federal disaster assistance and hazard mitigation funding programs.

Development of the plan is under direction of the County's Emergency Manager in cooperation with a planning team of representatives from County departments, local municipalities (city and township), school districts, and other key stakeholders such as utility providers. The planning team is responsible to provide feedback required for the plan update, including the ranking of hazards and identification of strategic, cost-effective mitigation activities that may reduce future losses for the County and individual jurisdictions. Some mitigation activities may be eligible for future FEMA Hazard Mitigation Assistance (HMA) grant funding, such as: localized flood reduction measures, property acquisition and relocation/conversion to open space, infrastructure retrofits, wildfire mitigation, and safe room construction or retrofits to provide immediate life-safety protection for people vulnerable to tornado and severe wind events.

#### About the Plan

The Crow Wing County MHMP is a multi-jurisdictional plan that covers Crow Wing County, including the cities of Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lake, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald. The Crow Wing County MHMP also incorporates the concerns and needs of townships, school districts, and other stakeholders participating in the plan.

Crow Wing County is vulnerable to a variety of potential natural disasters, which threaten the loss of life and property in the county. Hazards such as tornadoes, flooding, wildfires, blizzards, straight-line winds, ice storms, and droughts have the potential for inflicting vast economic loss and personal hardship.

According to Crow Wing County Emergency Management Director, John Bowen, "Hazard mitigation planning is a central part of our emergency management program. Understanding the natural hazards that can cause serious impact to our communities and taking action to reduce or eliminate the impact of future

*With courage, honor and integrity, we protect the rights and dignity of all citizens. In partnership with our communities, we strive to preserve the peace and are dedicated to excellence in the delivery of public safety services.*



## CROW WING COUNTY SHERIFF'S OFFICE

304 Laurel Street • Brainerd, MN 56401  
Phone: (218) 829-4749 • Fax: (218) 829-9459 • [www.crowwing.us](http://www.crowwing.us)

Office of  
**Todd Dahl, Sheriff**

disasters make us more resilient. Hazard mitigation helps us to break the cycle of damage and repair caused by things like flooding, ice storms, and severe wind events that can damage property, stress economies, and threaten life safety in our county.”

Examples of hazard mitigation include actions such as improvement of roads and culverts that experience repetitive flooding; construction of safe rooms at campgrounds, parks, trailer parks or schools to protect lives in the event of tornados or severe wind events; burying power lines that may fail due to heavy snow, ice or wind storms; ensuring timely emergency communication to the public through warning sirens and mass notification systems, and conducting public awareness and education campaigns to help people to be prepared to take safe action before, during, or following a hazard event.

#### Public Feedback and Participation is Encouraged

As part of the planning process, gathering input from the public is an important and required step. Crow Wing County seeks to gather feedback from residents and businesses from across the County to incorporate into the plan:

- What are the natural hazards you feel pose the greatest risk to your community?
- Have you experienced a previous disaster event?
- What concerns do you have, and what sorts of mitigation actions or projects do you feel would help to reduce the damages of potential future events for your personal property, your community, or the County as a whole?

The public is strongly encouraged to submit your comments, concerns, or questions regarding natural disasters and potential mitigation actions to be included into the plan update process. Please submit your feedback to Crow Wing County Emergency Manager, John Bowen: (218) 829-4749 or [john.bowen@crowwing.us](mailto:john.bowen@crowwing.us). Comments will not be accepted via the Crow Wing County Facebook page where this article is posted.

The public will have a continued opportunity to participate in the MHMP update in the coming months. A draft of the plan will be posted on the County website for public review, which will be followed by two public meetings held within different parts of the county. Future news releases will be shared with the media to notify the public of these opportunities.

Contact  
John Bowen  
Crow Wing County Emergency Management Director  
Phone: (218) 829-4749  
Email: [john.bowen@crowwing.us](mailto:john.bowen@crowwing.us)

*With courage, honor and integrity, we protect the rights and dignity of all citizens. In partnership with our communities, we strive to preserve the peace and are dedicated to excellence in the delivery of public safety services.*



## Crow Wing County, Minnesota

Published by Danielle Ustruck [?] · March 2 at 2:09pm · 🌐

Crow Wing County is seeking feedback from residents and businesses from across the county to incorporate into the Hazard Mitigation Plan:

- What are the natural hazards you feel pose the greatest risk to your community?
- Have you experienced a previous disaster event? ... See More



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# **Appendix G**

## **Mitigation Actions by Jurisdiction**

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Table G - 1. Mitigation Actions Identified for Implementation by the City of Baxter (2017-2021) (From Crow Wing County Master Mitigation Action Chart)

#	Hazard	Mitigation Strategy	City of Baxter Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
1	All-Hazards	Education & Awareness Programs	Work to ensure that all Crow Wing County residents are aware of and sign-up for the County's Emergency Warning System (EWS).	Ongoing	High	2017-2021	Crow Wing County, <b>Baxter</b> , Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CW Emergency Management in coordination with local city government	The CWC Emergency Management Program regularly promotes sign-up for the EWS system via the County EM Facebook Page and during in-person events. Cities also work to promote sign-up by local residents by sharing information on city websites and announcements at public meetings.	County/City Budgets
5	All-Hazards	Education & Awareness Programs	Promote education & awareness of severe weather and personal emergency preparedness for individuals, families, and businesses.	Ongoing	High	2017-2021	Crow Wing County, <b>Baxter</b> , Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in coordination with city EM's.	CWC Emergency Management participates annually in the National Weather Service's spring and winter Severe Weather Awareness Weeks in April and November. We provide posters, brochures, and material on severe storms to the media and to property owners. Social media is also used to distribute the information. Local cities are encouraged to participate and share this information through their own local channels such as Facebook and city websites. <i>City Comment: The City has a website in which we send out information related to the NWS Severe Weather Awareness Weeks (spring &amp; fall). The School District also practices tornado drills on an annual basis. The City also sends out alerts on the PD Facebook page, which is currently at 3,500 viewers.</i>	County/City Budgets

#	Hazard	Mitigation Strategy	City of Baxter Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
9	Severe Winter Storms	Local Planning & Regulations	Continue providing snow removal, salting, and sanding to minimize the impacts of snow accumulations on motorists.	Ongoing	High	2017 - 2021	Crow Wing County, <b>Baxter</b> , Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept. in coordination with local cities	This is a standing effort of the CWC Highway Dept. and local City Public Works.	County/City Budgets
10	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Identify critical facilities or infrastructure that do not have backup power in the event of a major power outage resulting from severe winter or summer storms. <i>(Critical facilities may include police/fire departments, EOC, health care facilities, water &amp; sewer treatment facilities, and other facilities deemed as critical, i.e. public schools and sheltering facilities).</i>	New	High	2017-2021	Crow Wing County, <b>Baxter</b> , Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, City Admin & Public Works	Not all county & city government buildings and schools have backup power generators to ensure energy in the event of a severe power outage. CWC and each jurisdiction will work to identify their respective critical facilities that should have backup power.  <i>City Comment: City Hall added a backup generator in 2016 to support servers specific to the PD and other critical functions (phones &amp; building access) at City Hall.</i>	County/City Budgets
11	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Purchase and install generator hook-ups and encourage local generator purchases for identified critical facilities that require backup power.	New	High	2017-2021	Crow Wing County, <b>Baxter</b> , Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Emergency Management, City Admin & Public Works	CWC, local city governments, and schools will evaluate feasibility to purchase and install generators for key facilities, and will do so as funding allows.  <i>City Comment: The City installed generator at City Hall in 2016, fully functional in 2017.</i>	County/City Budgets, <b>Possible FEMA HMA 5% Initiative Funding for Generators</b>

#	Hazard	Mitigation Strategy	City of Baxter Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
12	Severe Winter & Summer Storms	Structure and Infrastructure Projects	Work with rural electrical and municipal coops to identify and address mitigation measures for above ground power lines that are susceptible to damage from severe winter or summer storms in order to reduce potential power outages.	New	High	2017-2021	Crow Wing County, <b>Baxter</b> , Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Emily Cooperative Telephone Company, Crow Wing Power Cooperative, Mille Lacs Energy Cooperative, Brainerd Public Utilities, and Consolidated Telephone Company (CTC) in cooperation with local cities	Loss of power due to extreme storm events in the County creates long outage times and costly repairs. There has been overhead power disruption in hard-hit areas of trees. There is a wind "tunnel" from Gull Lake in the Round Lake Area of CR 115. The County and cities will work with local utilities as needed. BCA studies will be conducted for potential project areas to see where underground wires are possible.  <i>City Comment: The City utilizes a Long Range Planning Commission along with a Utilities Commission. Both work on pre-development mitigation strategies.</i>	Rural or Municipal Electric Coop Funding, <b>Possible FEMA HMA funding for Infrastructure Retrofit</b>
13	Severe Winter & Summer Storms	Local Planning & Regulations	Promote inspection and trimming of trees that may pose risk to falling on power lines during severe storm events.	Ongoing	High	2017-2021	Crow Wing County, <b>Baxter</b> , Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Same as above.	Tree management in the right-of-way of roads is addressed by our CWC Highway Dept. and/or City Public Works and Utility Companies.  <i>City Comment: The City has used the services of a forester following storms in recent years. A mitigation plan was established and logging of clean-up of debris occurred.</i>	County/City Budgets



#	Hazard	Mitigation Strategy	City of Baxter Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
14	Severe Winter & Summer Storms	Education & Awareness Programs	Promote the use of NOAA weather radios as a key communications resource for residents, businesses, and facilities that house vulnerable populations (i.e., nursing homes, group homes, senior centers, and day care facilities).	Ongoing	High	2017-2021	Crow Wing County, <b>Baxter</b> , Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management and local city EM's	This is an Ongoing effort of emergency management programs at the county and local city level. We promote weather radios through PSA's, County Fair, National Night Out, NWS Severe Weather Awareness Weeks and through social media. CWC also continues to work with local vendors and State programs for rebates on NOAA Weather radios.	County/City Budgets
15	Severe Summer Storms	Mitigation Preparedness & Response Support	Provide/participate in the National Weather Service's SKYWARN "Storm Spotter" training in various parts of the County for first responders and community residents.	Ongoing	High	2017-2021	Crow Wing County, <b>Baxter</b> , Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in collaboration with local cities and NWS	Each year CWC Emergency Management Program works with the National Weather Service to provide this training to local fire departments and local community volunteers. We will continue to encourage more volunteers to become active in the severe storm spotters network. Local cities will continue to remain active in this program.	County Budget and NWS funding to deliver program
16	Severe Summer Storms	Structure and Infrastructure Projects	Identify areas where vulnerable populations are susceptible to tornadoes or extreme wind events (i.e. schools, campgrounds, or mobile home parks) and evaluate for construction or retrofit of safe rooms or storm shelters.	Ongoing	High	2017-2021	Crow Wing County, <b>Baxter</b> , Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	CWC Emergency Management continues to work with local cities that have experienced severe wind damage and recreational facilities on development of storm shelter areas. We are aware that there are two mobile home parks and the Crow Wing County Fairgrounds have been identified for having a need of a storm shelter or Safe Room.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Baxter Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
17	Severe Summer Storms	Structure and Infrastructure Projects	Implement construction or retrofit projects for safe rooms or storm shelters in identified vulnerable locations.	Ongoing	High	2017-2021	Crow Wing County, <b>Baxter</b> , Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	Any community safe room projects that the County is involved in will be part of the CWC Emergency Management program. FEMA grant funding may be sought to support an eligible safe room project.	County/City Budgets, <b>Possible FEMA HMA funding for Safe Room Construction</b>
27	Flooding	Local Planning & Regulations / Structure and Infrastructure Projects	Identify and improve potential and historical areas of road washout, and replace aging or failing bridges and culverts that are inadequate in order to reduce future flood damages.	Ongoing	High	2017-2021	Crow Wing County, <b>Baxter</b> , Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept, CW Land Services Dept., and local city and township public works	Crow Wing County and local jurisdictions maintain an annual inventory of problem areas due to flooding and plan for projects based on priority and available funding. CW County Highway Dept. has identified flood prone problematic areas on CR 105, CR 128, CSAH 11, CR 132, CR 106 & CR 144. In addition there are bridges that are scour sensitive and pose a hazard risk during high water. CR 128 has a shoreline improvement plan to reduce the risk of water over the road and erosion of the roadbed during high water.  <i>City Comment: The City of Baxter has a five-year transportation plan. The plan identifies and prioritizes transportation projects, including mitigation for areas that suffer from flood damage.</i>	County, and Township Budgets, <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>

#	Hazard	Mitigation Strategy	City of Baxter Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
28	Flooding	Local Planning & Regulations	Encourage municipalities to require the development of new storm sewer infrastructure capable of handling a ten to twenty year rain event in areas of new development (i.e., new subdivisions) and adoption of a Stormwater ordinance regulating onsite stormwater management for new construction.	Ongoing	High	2017-2021	Crow Wing County, <b>Baxter</b> , Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and SWCD in coordination with local City Admin and Public Works.	Facilitate adoption of stormwater ordinance through a series of workshops.  <i>City Comment: The City has a Comprehensive Plan developed and implemented in 2015 that addresses future use and development.</i>	County/City Budgets, SWCD Grants i.e Serpent Lake Project
29	Flooding	Structure and Infrastructure Projects	Develop stormwater management plans and improve stormwater management systems at the county and city level to address future high-impact rain events throughout the County.	Ongoing	New	2017-2021	Crow Wing County, <b>Baxter</b> , Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., CWC Highway Dept., CWC GIS, CWC SWCD and local city public works depts., MN DNR, MPCA	The County will seek outside grant funding where possible to fund eligible stormwater improvement projects, such as through MPCA and FEMA HMA funding for flood reduction projects. Local jurisdictions will be responsible for development of local stormwater management plans and identification of priority projects.  <i>City Comment: The City has implemented a flood control project in Section 6 of the City (Inglewood to Hwy. 371, and Excelsior Rd. to Woida Rd.). Ditching and other water management projects have been incorporated and the plan is now nearing completion.</i>	County/SWCD Budgets, Possible MPCA/PFA grant funding, <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>

#	Hazard	Mitigation Strategy	City of Baxter Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
30	Flooding	Local Planning & Regulations	Ensure that wellhead protection plans are in place to address flooding that may lead to contaminated drinking water.	New	High	2017-2021	Crow Wing County, <b>Baxter</b> , Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., MN Dept of Health and local city and township public works depts.	Cities work directly with the Minnesota Department of Health on the development or update of wellhead protection plans to ensure they meet State requirements.	MDH Source Water Protection grant funding for wellhead improvement projects
31	Flooding	Local Planning & Regulations	Adopt the 2017 updated floodplain maps for Crow Wing County and ensure the update of local ordinances.	New	High	2017	Crow Wing County, <b>Baxter</b> , Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Crow Wing County Land Services Dept. and City Admin	Crow Wing County has new maps that will go effective 8/15/2017. Communities participating in the NFIP will update their ordinances and adopt the new maps (and make other updates).  <i>City Comment: In July 2017, the City of Baxter adopted the new floodplain maps for Crow Wing County and updated our local floodplain ordinance.</i>	County/City Budgets
33	Flooding	Local Planning & Regulations / Structure & Infrastructure Systems	Keep culverts and drainage ditches free of debris to mitigate against over-the-road flooding.	Ongoing	High	2017-2021	Crow Wing County, <b>Baxter</b> , Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept., CWC Land Services Dept. in coordination with City Public Works	The maintenance of culverts and drainage ditches is done through our CWC Highway Department and City Public Works. We also have Ditch 13 that flows from Lake Edward to North Long Lake. Local municipalities' public works work to monitor and address any problem areas for drainage at the local level.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Baxter Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
34	Flooding	Local Planning & Regulations	Restrict building in floodplain areas that consistently flood.	Ongoing	High	2017-2021	Crow Wing County, <b>Baxter</b> , Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and Local City Admin.	This action is the responsibility of the CWC Land Services Department and local city ordinances as per NFIP requirements.  <i>City Comment: This is addressed in our local floodplain ordinance.</i>	County/City Budgets
35	Flooding	Local Planning & Regulations	Identify properties that experience damage from repetitive flooding, and work with property owners to buy out structures and turn into open-space.	New	High	2017-2021	Crow Wing County, <b>Baxter</b> , Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., and local City Admin	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.	County/City Funding, <b>Possible FEMA grant funding for Property Acquisition</b>
36	Flooding	Local Planning & Regulations	Encourage individual landowners who live within floodplain areas to participate in the FEMA National Flood Insurance Program (NFIP).	Ongoing	High	2017-2021	Crow Wing County, <b>Baxter</b> , Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., MN DNR, local City Admin, and FEMA	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.	County/City Budgets
40	Flooding	Education & Awareness Programs	Provide education and technical assistance to property owners on the application of green infrastructure methods to reduce localized flooding due to high rain events.	Ongoing	High	2017-2021	Crow Wing County, <b>Baxter</b> , Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and CWC SWCD	This task is done through our CWC Land Services Dept. as well as the SWCD. Possible green-infrastructure projects will be considered for eligible FEMA HMA grant funding.	County Budgets, <b>Possible FEMA HMA funding for 5% Initiative Projects</b>

#	Hazard	Mitigation Strategy	City of Baxter Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
50	Drought	Local Planning & Regulations / Education & Awareness Programs	Promote water conservation measures and fire safety awareness to residents during periods of drought. Enforce water conservation ordinances when needed (i.e., that prohibit watering lawns during drought).	Ongoing	High	2017-2021	Crow Wing County, <b>Baxter</b> , Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in collaboration with SWCD and local cities	Promoting water conservation during periods of drought is a standing effort of the County and local governments, as well as the USDA and FSA Office.	County/City Budgets

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Table G - 2. Mitigation Actions Identified for Implementation by the City of Brainerd (2017-2021) (From Crow Wing County Master Mitigation Action Chart)

#	Hazard	Mitigation Strategy	City of Brainerd Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
1	All-Hazards	Education & Awareness Programs	Work to ensure that all Crow Wing County residents are aware of and sign-up for the County's Emergency Warning System (EWS).	Ongoing	High	2017-2021	Crow Wing County, Baxter, <b>Brainerd</b> , Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CW Emergency Management in coordination with local city government	The CWC Emergency Management Program regularly promotes sign-up for the EWS system via the County EM Facebook Page and during in-person events. Cities also work to promote sign-up by local residents by sharing information on city websites and announcements at public meetings.	County/City Budgets
5	All-Hazards	Education & Awareness Programs	Promote education & awareness of severe weather and personal emergency preparedness for individuals, families, and businesses.	Ongoing	High	2017-2021	Crow Wing County, Baxter, <b>Brainerd</b> , Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in coordination with city EM's.	CWC Emergency Management participates annually in the National Weather Service's spring and winter Severe Weather Awareness Weeks in April and November. We provide posters, brochures, and material on severe storms to the media and to property owners. Social media is also used to distribute the information. Local cities are encouraged to participate and share this information through their own local channels such as Facebook and city websites.  <i>City Comment: The City will work to provide public education using social medial (i.e. Facebook) on what to do in case of severe summer or winter storms (i.e., tornado - don't go out on porch). Our city has a warning siren and we also participate in spring tornado drills.</i>	County/City Budgets

#	Hazard	Mitigation Strategy	City of Brainerd Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
9	Severe Winter Storms	Local Planning & Regulations	Continue providing snow removal, salting, and sanding to minimize the impacts of snow accumulations on motorists.	Ongoing	High	2017 -2021	Crow Wing County, Baxter, <b>Brainerd</b> , Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept. in coordination with local cities	This is a standing effort of the CWC Highway Dept. and local City Public Works.  <i>City Comment: The City will promote awareness of CWC road alert notification system and utilize Police Department Social media to advise public of local travel conditions and snow plowing schedule.</i>	County/City Budgets
10	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Identify critical facilities or infrastructure that do not have backup power in the event of a major power outage resulting from severe winter or summer storms. <i>(Critical facilities may include police/fire departments, EOC, health care facilities, water &amp; sewer treatment facilities, and other facilities deemed as critical, i.e. public schools and sheltering facilities).</i>	New	High	2017-2021	Crow Wing County, Baxter, <b>Brainerd</b> , Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, City Admin & Public Works	Not all county & city government buildings and schools have backup power generators to ensure energy in the event of a severe power outage. CWC and each jurisdiction will work to identify their respective critical facilities that should have backup power.	County/City Budgets



#	Hazard	Mitigation Strategy	City of Brainerd Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
11	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Purchase and install generator hook-ups and encourage local generator purchases for identified critical facilities that require backup power.	New	High	2017-2021	Crow Wing County, Baxter, <b>Brainerd</b> , Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Emergency Management, City Admin & Public Works	CWC, local city governments, and schools will evaluate feasibility to purchase and install generators for key facilities, and will do so as funding allows.  <i>City Comment: The Brainerd Police Department purchased a generator two years ago and moved all city computer and phone servers from City Hall to the Police Department to maintain operations &amp; service continuity during power outages.</i>	County/City Budgets, <b>Possible FEMA HMA 5% Initiative Funding for Generators</b>
12	Severe Winter & Summer Storms	Structure and Infrastructure Projects	Work with rural electrical and municipal coops to identify and address mitigation measures for above ground power lines that are susceptible to damage from severe winter or summer storms in order to reduce potential power outages.	New	High	2017-2021	Crow Wing County, Baxter, <b>Brainerd</b> , Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Emily Cooperative Telephone Company, Crow Wing Power Cooperative, Mille Lacs Energy Cooperative, Brainerd Public Utilities, and Consolidated Telephone Company (CTC) in cooperation with local cities	Loss of power due to extreme storm events in the County creates long outage times and costly repairs. There has been overhead power disruption in hard-hit areas of trees. There is a wind "tunnel" from Gull Lake in the Round Lake Area of CR 115. The County and cities will work with local utilities as needed. BCA studies will be conducted for potential project areas to see where underground wires are possible.	Rural or Municipal Electric Coop Funding, <b>Possible FEMA HMA funding for Infrastructure Retrofit</b>
13	Severe Winter & Summer Storms	Local Planning & Regulations	Promote inspection and trimming of trees that may pose risk to falling on power lines during severe storm events.	Ongoing	High	2017-2021	Crow Wing County, Baxter, <b>Brainerd</b> , Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Same as above.	Tree management in the right-of-way of roads is addressed by our CWC Highway Dept. and/or City Public Works and Utility Companies.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Brainerd Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
14	Severe Winter & Summer Storms	Education & Awareness Programs	Promote the use of NOAA weather radios as a key communications resource for residents, businesses, and facilities that house vulnerable populations (i.e., nursing homes, group homes, senior centers, and day care facilities).	Ongoing	High	2017-2021	Crow Wing County, Baxter, <b>Brainerd</b> , Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management and local city EM's	This is an ongoing effort of emergency management programs at the county and local city level. We promote weather radios through PSA's, County Fair, National Night Out, NWS Severe Weather Awareness Weeks and through social media. CWC also continues to work with local vendors and State programs for rebates on NOAA Weather radios.	County/City Budgets
15	Severe Summer Storms	Mitigation Preparedness & Response Support	Provide/participate in the National Weather Service's SKYWARN "Storm Spotter" training in various parts of the County for first responders and community residents.	Ongoing	High	2017-2021	Crow Wing County, Baxter, <b>Brainerd</b> , Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in collaboration with local cities and NWS	Each year CWC Emergency Management Program works with the National Weather Service to provide this training to local fire departments and local community volunteers. We will continue to encourage more volunteers to become active in the severe storm spotters network. Local cities will continue to remain active in this program.	County Budget and NWS funding to deliver program

#	Hazard	Mitigation Strategy	City of Brainerd Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
16	Severe Summer Storms	Structure and Infrastructure Projects	Identify areas where vulnerable populations are susceptible to tornadoes or extreme wind events (i.e. schools, campgrounds, or mobile home parks) and evaluate for construction or retrofit of safe rooms or storm shelters.	Ongoing	High	2017-2021	Crow Wing County, Baxter, <b>Brainerd</b> , Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	CWC Emergency Management continues to work with local cities that have experienced severe wind damage and recreational facilities on development of storm shelter areas. We are aware that there are two mobile home parks and the Crow Wing County Fairgrounds have been identified for having a need of a storm shelter or Safe Room.  <i>City Comment: We are in need of safe rooms at multiple trailer parks and elderly home communities in Brainerd. In addition, some of our parks have no brick structure, or no structure at all, for park users (sports teams, families, etc. to go to in case of tornados or damaging winds). The park office is also a wood/metal structure with no safe place. The campground may also be in need of a safe room to provide emergency shelter for campers.</i>	County/City Budgets
17	Severe Summer Storms	Structure and Infrastructure Projects	Implement construction or retrofit projects for safe rooms or storm shelters in identified vulnerable locations.	Ongoing	High	2017-2021	Crow Wing County, Baxter, <b>Brainerd</b> , Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	Any community safe room projects that the County is involved in will be part of the CWC Emergency Management program. FEMA grant funding may be sought to support an eligible safe room project.	County/City Budgets, <b>Possible FEMA HMA funding for Safe Room Construction</b>

#	Hazard	Mitigation Strategy	City of Brainerd Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
27	Flooding	Local Planning & Regulations / Structure and Infrastructure Projects	Identify and improve potential and historical areas of road washout, and replace aging or failing bridges and culverts that are inadequate in order to reduce future flood damages.	Ongoing	High	2017-2021	Crow Wing County, Baxter, <b>Brainerd</b> , Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept, CW Land Services Dept., and local city and township public works	Crow Wing County and local jurisdictions maintain an annual inventory of problem areas due to flooding and plan for projects based on priority and available funding. CW County Highway Dept. has identified flood prone problematic areas on CR 105, CR 128, CSAH 11, CR 132, CR 106 & CR 144. In addition there are bridges that are scour sensitive and pose a hazard risk during high water. CR 128 has a shoreline improvement plan to reduce the risk of water over the road and erosion of the roadbed during high water.  <i>City Comment: Our City Engineer works with Public Works collectively to address road maintenance issues for flooding (culverts, repetitive flooding).</i>	County, and Township Budgets, <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>
28	Flooding	Local Planning & Regulations	Encourage municipalities to require the development of new storm sewer infrastructure capable of handling a ten to twenty year rain event in areas of new development (i.e., new subdivisions) and adoption of a Stormwater ordinance regulating onsite stormwater management for new construction.	Ongoing	High	2017-2021	Crow Wing County, Baxter, <b>Brainerd</b> , Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and SWCD in coordination with local City Admin and Public Works.	Facilitate adoption of stormwater ordinance through a series of workshops.	County/City Budgets, SWCD Grants i.e Serpent Lake Project

#	Hazard	Mitigation Strategy	City of Brainerd Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
29	Flooding	Structure and Infrastructure Projects	Develop stormwater management plans and improve stormwater management systems at the county and city level to address future high-impact rain events throughout the County.	Ongoing	New	2017-2021	Crow Wing County, Baxter, <b>Brainerd</b> , Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., CWC Highway Dept., CWC GIS, CWC SWCD and local city public works depts., MN DNR, MPCA	The County will seek outside grant funding where possible to fund eligible stormwater improvement projects, such as through MPCA and FEMA HMA funding for flood reduction projects. Local jurisdictions will be responsible for development of local stormwater management plans and identification of priority projects.	County/SWCD budgets, Possible MPCA/PFA grant funding, <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>
30	Flooding	Local Planning & Regulations	Ensure that wellhead protection plans are in place to address flooding that may lead to contaminated drinking water.	New	High	2017-2021	Crow Wing County, Baxter, <b>Brainerd</b> , Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., MN Dept of Health and local city and township public works depts.	Cities work directly with the Minnesota Department of Health on the development or update of wellhead protection plans to ensure they meet State requirements.	MDH Source Water Protection grant funding for wellhead improvement projects
31	Flooding	Local Planning & Regulations	Adopt the 2017 updated floodplain maps for Crow Wing County and ensure the update of local ordinances.	New	High	2017	Crow Wing County, Baxter, <b>Brainerd</b> , Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Crow Wing County Land Services Dept. and City Admin	Crow Wing County has new maps that will go effective 8/15/2017. Communities participating in the NFIP will update their ordinances and adopt the new maps (and make other updates).	County/City Budgets

#	Hazard	Mitigation Strategy	City of Brainerd Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
33	Flooding	Local Planning & Regulations / Structure & Infrastructure Systems	Keep culverts and drainage ditches free of debris to mitigate against over-the-road flooding.	Ongoing	High	2017-2021	Crow Wing County, Baxter, <b>Brainerd</b> , Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept., CWC Land Services Dept. in coordination with City Public Works	The maintenance of culverts and drainage ditches is done through our CWC Highway Department and City Public Works. We also have Ditch 13 that flows from Lake Edward to North Long Lake. Local municipalities' public works work to monitor and address any problem areas for drainage at the local level.	County/City Budgets
34	Flooding	Local Planning & Regulations	Restrict building in floodplain areas that consistently flood.	Ongoing	High	2017-2021	Crow Wing County, Baxter, <b>Brainerd</b> , Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and Local City Admin.	This action is the responsibility of the CWC Land Services Department and local city ordinances as per NFIP requirements.	County/City Budgets
35	Flooding	Local Planning & Regulations	Identify properties that experience damage from repetitive flooding, and work with property owners to buy out structures and turn into open-space.	New	High	2017-2021	Crow Wing County, Baxter, <b>Brainerd</b> , Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., and local City Admin	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.	County/City Funding, <b>Possible FEMA grant funding for Property Acquisition</b>
36	Flooding	Local Planning & Regulations	Encourage individual landowners who live within floodplain areas to participate in the FEMA National Flood Insurance Program (NFIP).	Ongoing	High	2017-2021	Crow Wing County, Baxter, <b>Brainerd</b> , Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., MN DNR, local City Admin, and FEMA	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Brainerd Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
40	Flooding	Education & Awareness Programs	Provide education and technical assistance to property owners on the application of green infrastructure methods to reduce localized flooding due to high rain events.	Ongoing	High	2017-2021	Crow Wing County, Baxter, <b>Brainerd</b> , Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and CWC SWCD	This task is done through our CWC Land Services Dept. as well as the SWCD. Possible green-infrastructure projects will be considered for eligible FEMA HMA grant funding.	County Budgets, <b>Possible FEMA HMA funding for 5% Initiative Projects</b>
50	Drought	Local Planning & Regulations / Education & Awareness Programs	Promote water conservation measures and fire safety awareness to residents during periods of drought. Enforce water conservation ordinances when needed (i.e., that prohibit watering lawns during drought).	Ongoing	High	2017-2021	Crow Wing County, Baxter, <b>Brainerd</b> , Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in collaboration with SWCD and local cities	Promoting water conservation during periods of drought is a standing effort of the County and local governments, as well as the USDA and FSA Office.	County/City Budgets

Table G - 3. Mitigation Actions Identified for Implementation by the City of Breezy Point (2017-2021) (From Crow Wing County Master Mitigation Action Chart)

#	Hazard	Mitigation Strategy	City of Breezy Point Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
I	All-Hazards	Education & Awareness Programs	Work to ensure that all Crow Wing County residents are aware of and sign-up for the County's Emergency Warning System (EWS).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, <b>Breezy Point</b> , Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CW Emergency Management in coordination with local city government	The CWC Emergency Management Program regularly promotes sign-up for the EWS system via the County EM Facebook Page and during in-person events. Cities also work to promote sign-up by local residents by sharing information on city websites and announcements at public meetings.	County/City Budgets



#	Hazard	Mitigation Strategy	City of Breezy Point Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
5	All-Hazards	Education & Awareness Programs	Promote education & awareness of severe weather and personal emergency preparedness for individuals, families, and businesses.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, <b>Breezy Point</b> , Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in coordination with city EM's.	<p>CWC Emergency Management participates annually in the National Weather Service's spring and winter Severe Weather Awareness Weeks in April and November. We provide posters, brochures, and material on severe storms to the media and to property owners. Social media is also used to distribute the information. Local cities are encouraged to participate and share this information through their own local channels such as Facebook and city websites.</p> <p><i>City Comment: The City has installed two outdoor warning sirens and participates in the NWS annual Severe Weather Awareness Weeks. The Police Department educates and alerts residents using Facebook and other social media sites. The Eagle View Elementary School practices severe weather drills annually and Police Officers provide severe weather training to students. The City has also obtained Storm Ready designation from the National Weather Service.</i></p>	County/City Budgets

#	Hazard	Mitigation Strategy	City of Breezy Point Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
9	Severe Winter Storms	Local Planning & Regulations	Continue providing snow removal, salting, and sanding to minimize the impacts of snow accumulations on motorists.	Ongoing	High	2017 - 2021	Crow Wing County, Baxter, Brainerd, <b>Breezy Point</b> , Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept. in coordination with local cities	This is a standing effort of the CWC Highway Dept. and local City Public Works.	County/City Budgets
10	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Identify critical facilities or infrastructure that do not have backup power in the event of a major power outage resulting from severe winter or summer storms. <i>(Critical facilities may include police/fire departments, EOC, health care facilities, water &amp; sewer treatment facilities, and other facilities deemed as critical, i.e. public schools and sheltering facilities).</i>	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, <b>Breezy Point</b> , Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, City Admin & Public Works	Not all county & city government buildings and schools have backup power generators to ensure energy in the event of a severe power outage. CWC and each jurisdiction will work to identify their respective critical facilities that should have backup power.  <i>City Comment: Breezy Point Public Safety Building houses the police and satellite Pequot Lakes Fire Dept. and has a backup generator.</i>	County/City Budgets
11	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Purchase and install generator hook-ups and encourage local generator purchases for identified critical facilities that require backup power.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, <b>Breezy Point</b> , Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Emergency Management, City Admin & Public Works	CWC, local city governments, and schools will evaluate feasibility to purchase and install generators for key facilities, and will do so as funding allows.  <i>City Comment: The City has acquired a portable generator to power lift stations in the event of power outages.</i>	County/City Budgets, <b>Possible FEMA HMA 5% Initiative Funding for Generators</b>

#	Hazard	Mitigation Strategy	City of Breezy Point Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
12	Severe Winter & Summer Storms	Structure and Infrastructure Projects	Work with rural electrical and municipal coops to identify and address mitigation measures for above ground power lines that are susceptible to damage from severe winter or summer storms in order to reduce potential power outages.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, <b>Breezy Point</b> , Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Emily Cooperative Telephone Company, Crow Wing Power Cooperative, Mille Lacs Energy Cooperative, Brainerd Public Utilities, and Consolidated Telephone Company (CTC) in cooperation with local cities	Loss of power due to extreme storm events in the County creates long outage times and costly repairs. There has been overhead power disruption in hard-hit areas of trees. There is a wind "tunnel" from Gull Lake in the Round Lake Area of CR 115. The County and cities will work with local utilities as needed. BCA studies will be conducted for potential project areas to see where underground wires are possible.	Rural or Municipal Electric Coop Funding, <b>Possible FEMA HMA funding for Infrastructure Retrofit</b>
13	Severe Winter & Summer Storms	Local Planning & Regulations	Promote inspection and trimming of trees that may pose risk to falling on power lines during severe storm events.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, <b>Breezy Point</b> , Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Same as above.	Tree management in the right-of-way of roads is addressed by our CWC Highway Dept. and/or City Public Works and Utility Companies.	County/City Budgets
14	Severe Winter & Summer Storms	Education & Awareness Programs	Promote the use of NOAA weather radios as a key communications resource for residents, businesses, and facilities that house vulnerable populations (i.e., nursing homes, group homes, senior centers, and day care facilities).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, <b>Breezy Point</b> , Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management and local city EM's	This is an Ongoing effort of emergency management programs at the county and local city level. We promote weather radios through PSA's, County Fair, National Night Out, NWS Severe Weather Awareness Weeks and through social media. CWC also continues to work with local vendors and State programs for rebates on NOAA Weather radios.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Breezy Point Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
15	Severe Summer Storms	Mitigation Preparedness & Response Support	Provide/participate in the National Weather Service's SKYWARN "Storm Spotter" training in various parts of the County for first responders and community residents.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, <b>Breezy Point</b> , Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in collaboration with local cities and NWS	Each year CWC Emergency Management Program works with the National Weather Service to provide this training to local fire departments and local community volunteers. We will continue to encourage more volunteers to become active in the severe storm spotters network. Local cities will continue to remain active in this program.	County Budget and NWS funding to deliver program
16	Severe Summer Storms	Structure and Infrastructure Projects	Identify areas where vulnerable populations are susceptible to tornadoes or extreme wind events (i.e. schools, campgrounds, or mobile home parks) and evaluate for construction or retrofit of safe rooms or storm shelters.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, <b>Breezy Point</b> , Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	CWC Emergency Management continues to work with local cities that have experienced severe wind damage and recreational facilities on development of storm shelter areas. We are aware that there are two mobile home parks and the Crow Wing County Fairgrounds have been identified for having a need of a storm shelter or Safe Room.  <i>City Comment: The City has a large number of seasonal camping sites and patio homes without access to severe storm shelters. There is also a significant transient population as part of the Breezy Point Resort and three 18-hole golf courses which all should be evaluated for community storm shelters or safe rooms.</i>	County/City Budgets

#	Hazard	Mitigation Strategy	City of Breezy Point Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
17	Severe Summer Storms	Structure and Infrastructure Projects	Implement construction or retrofit projects for safe rooms or storm shelters in identified vulnerable locations.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, <b>Breezy Point</b> , Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	Any community safe room projects that the County is involved in will be part of the CWC Emergency Management program. FEMA grant funding may be sought to support an eligible safe room project.	County/City Budgets, <b>Possible FEMA HMA funding for Safe Room Construction</b>

#	Hazard	Mitigation Strategy	City of Breezy Point Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
27	Flooding	Local Planning & Regulations / Structure and Infrastructure Projects	Identify and improve potential and historical areas of road washout, and replace aging or failing bridges and culverts that are inadequate in order to reduce future flood damages.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, <b>Breezy Point</b> , Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept, CW Land Services Dept., and local city and township public works	<p>Crow Wing County and local jurisdictions maintain an annual inventory of problem areas due to flooding and plan for projects based on priority and available funding. CW County Highway Dept. has identified flood prone problematic areas on CR 105, CR 128, CSAH 11, CR 132, CR 106 &amp; CR 144. In addition, there are bridges that are scour sensitive and pose a hazard risk during high water. CR 128 has a shoreline improvement plan to reduce the risk of water over the road and erosion of the roadbed during high water.</p> <p><i>City Comment: The City Council has a road committee to plan future road projects, and contracts an engineer who works with Public Works Supervisor to address road maintenance and improved drainage. In areas where flash flooding of roadways has occurred, it is the City's policy to restore with improvements to drainage ways.</i></p>	County, and Township Budgets, <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>

#	Hazard	Mitigation Strategy	City of Breezy Point Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
28	Flooding	Local Planning & Regulations	Encourage municipalities to require the development of new storm sewer infrastructure capable of handling a ten to twenty year rain event in areas of new development (i.e., new subdivisions) and adoption of a Stormwater ordinance regulating onsite stormwater management for new construction.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, <b>Breezy Point</b> , Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and SWCD in coordination with local City Admin and Public Works.	Facilitate adoption of stormwater ordinance through a series of workshops.  <i>City Comment: The City subdivision ordinance addresses the need to establish drainage of sufficient design to meet a 100-year rain event. The City also has a 20-year Comprehensive Plan (2016) that is designed to plan for the future physical growth of the City and appropriate land uses.</i>	County/City Budgets, SWCD Grants i.e Serpent Lake Project
29	Flooding	Structure and Infrastructure Projects	Develop stormwater management plans and improve stormwater management systems at the county and city level to address future high-impact rain events throughout the County.	Ongoing	New	2017-2021	Crow Wing County, Baxter, Brainerd, <b>Breezy Point</b> , Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., CWC Highway Dept., CWC GIS, CWC SWCD and local city public works depts., MN DNR, MPCA	The County will seek outside grant funding where possible to fund eligible stormwater improvement projects, such as through MPCA and FEMA HMA funding for flood reduction projects. Local jurisdictions will be responsible for development of local stormwater management plans and identification of priority projects.  <i>City Comment: The City has acquired properties to increase storm water retention in areas where past local flooding has occurred.</i>	County/ SWCD budgets, Possible MPCA/PFA grant funding, <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>

#	Hazard	Mitigation Strategy	City of Breezy Point Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
30	Flooding	Local Planning & Regulations	Ensure that wellhead protection plans are in place to address flooding that may lead to contaminated drinking water.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, <b>Breezy Point</b> , Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., MN Dept of Health and local city and township public works depts.	Cities work directly with the Minnesota Department of Health on the development or update of wellhead protection plans to ensure they meet State requirements.	MDH Source Water Protection grant funding for wellhead improvement projects
31	Flooding	Local Planning & Regulations	Adopt the 2017 updated floodplain maps for Crow Wing County and ensure the update of local ordinances.	New	High	2017	Crow Wing County, Baxter, Brainerd, <b>Breezy Point</b> , Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Crow Wing County Land Services Dept. and City Admin	Crow Wing County has new maps that will go effective 8/15/2017. Communities participating in the NFIP will update their ordinances and adopt the new maps (and make other updates).  <i>City Comment: The City of Breezy Point has completed this update.</i>	County/City Budgets
33	Flooding	Local Planning & Regulations / Structure & Infrastructure Systems	Keep culverts and drainage ditches free of debris to mitigate against over-the-road flooding.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, <b>Breezy Point</b> , Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept., CWC Land Services Dept. in coordination with City Public Works	The maintenance of culverts and drainage ditches is done through our CWC Highway Department and City Public Works. We also have Ditch 13 that flows from Lake Edward to North Long Lake. Local municipalities' public works work to monitor and address any problem areas for drainage at the local level.	County/City Budgets
34	Flooding	Local Planning & Regulations	Restrict building in floodplain areas that consistently flood.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, <b>Breezy Point</b> , Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and Local City Admin.	This action is the responsibility of the CWC Land Services Department and local city ordinances as per NFIP requirements.  <i>City Comment: Addressed in #31.</i>	County/City Budgets



#	Hazard	Mitigation Strategy	City of Breezy Point Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
35	Flooding	Local Planning & Regulations	Identify properties that experience damage from repetitive flooding, and work with property owners to buy out structures and turn into open-space.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, <b>Breezy Point</b> , Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., and local City Admin	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.	County/City Funding, <b>Possible FEMA grant funding for Property Acquisition</b>
36	Flooding	Local Planning & Regulations	Encourage individual landowners who live within floodplain areas to participate in the FEMA National Flood Insurance Program (NFIP).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, <b>Breezy Point</b> , Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., MN DNR, local City Admin, and FEMA	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.	County/City Budgets
40	Flooding	Education & Awareness Programs	Provide education and technical assistance to property owners on the application of green infrastructure methods to reduce localized flooding due to high rain events.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, <b>Breezy Point</b> , Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and CWC SWCD	This task is done through our CWC Land Services Dept. as well as the SWCD. Possible green-infrastructure projects will be considered for eligible FEMA HMA grant funding.	County Budgets, <b>Possible FEMA HMA funding for 5% Initiative Projects</b>
50	Drought	Local Planning & Regulations / Education & Awareness Programs	Promote water conservation measures and fire safety awareness to residents during periods of drought. Enforce water conservation ordinances when needed (i.e., that prohibit watering lawns during drought).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, <b>Breezy Point</b> , Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in collaboration with SWCD and local cities	Promoting water conservation during periods of drought is a standing effort of the County and local governments, as well as the USDA and FSA Office.	County/City Budgets

Table G - 4. Mitigation Actions Identified for Implementation by the City of Crosby (2017-2021) (From Crow Wing County Master Mitigation Action Chart)

#	Hazard	Mitigation Strategy	City of Crosby Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
I	All-Hazards	Education & Awareness Programs	Work to ensure that all Crow Wing County residents are aware of and sign-up for the County's Emergency Warning System (EWS).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, <b>Crosby</b> , Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CW Emergency Management in coordination with local city government	<p>The CWC Emergency Management Program regularly promotes sign-up for the EWS system via the County EM Facebook Page and during in-person events. Cities also work to promote sign-up by local residents by sharing information on city websites and announcements at public meetings.</p> <p><i>City Comment: The City is able to disperse information to its residents through utility bill mailings, the City website, and the City and Police Department Facebook pages.</i></p>	County/City Budgets

#	Hazard	Mitigation Strategy	City of Crosby Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
5	All-Hazards	Education & Awareness Programs	Promote education & awareness of severe weather and personal emergency preparedness for individuals, families, and businesses.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, <b>Crosby</b> , Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in coordination with city EM's.	CWC Emergency Management participates annually in the National Weather Service's spring and winter Severe Weather Awareness Weeks in April and November. We provide posters, brochures, and material on severe storms to the media and to property owners. Social media is also used to distribute the information. Local cities are encouraged to participate and share this information through their own local channels such as Facebook and city websites.  <i>City Comment: The City is able to disperse information to its residents through utility bill mailings, the City website, and the City and Police Department Facebook pages.</i>	County/City Budgets
9	Severe Winter Storms	Local Planning & Regulations	Continue providing snow removal, salting, and sanding to minimize the impacts of snow accumulations on motorists.	Ongoing	High	2017 - 2021	Crow Wing County, Baxter, Brainerd, Breezy Point, <b>Crosby</b> , Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept. in coordination with local cities	This is a standing effort of the CWC Highway Dept. and local City Public Works.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Crosby Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
10	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Identify critical facilities or infrastructure that do not have backup power in the event of a major power outage resulting from severe winter or summer storms. <i>(Critical facilities may include police/fire departments, EOC, health care facilities, water &amp; sewer treatment facilities, and other facilities deemed as critical, i.e. public schools and sheltering facilities).</i>	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, <b>Crosby</b> , Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, City Admin & Public Works	Not all county & city government buildings and schools have backup power generators to ensure energy in the event of a severe power outage. CWC and each jurisdiction will work to identify their respective critical facilities that should have backup power.	County/City Budgets
11	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Purchase and install generator hook-ups and encourage local generator purchases for identified critical facilities that require backup power.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, <b>Crosby</b> , Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Emergency Management, City Admin & Public Works	CWC, local city governments, and schools will evaluate feasibility to purchase and install generators for key facilities, and will do so as funding allows.	County/City Budgets, <b>Possible FEMA HMA 5% Initiative Funding for Generators</b>

#	Hazard	Mitigation Strategy	City of Crosby Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
12	Severe Winter & Summer Storms	Structure and Infrastructure Projects	Work with rural electrical and municipal coops to identify and address mitigation measures for above ground power lines that are susceptible to damage from severe winter or summer storms in order to reduce potential power outages.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, <b>Crosby</b> , Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Emily Cooperative Telephone Company, Crow Wing Power Cooperative, Mille Lacs Energy Cooperative, Brainerd Public Utilities, and Consolidated Telephone Company (CTC) in cooperation with local cities	Loss of power due to extreme storm events in the County creates long outage times and costly repairs. There has been overhead power disruption in hard-hit areas of trees. There is a wind "tunnel" from Gull Lake in the Round Lake Area of CR 115. The County and cities will work with local utilities as needed. BCA studies will be conducted for potential project areas to see where underground wires are possible.	Rural or Municipal Electric Coop Funding, <b>Possible FEMA HMA funding for Infrastructure Retrofit</b>
13	Severe Winter & Summer Storms	Local Planning & Regulations	Promote inspection and trimming of trees that may pose risk to falling on power lines during severe storm events.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, <b>Crosby</b> , Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Same as above.	Tree management in the right-of-way of roads is addressed by our CWC Highway Dept. and/or City Public Works and Utility Companies.	County/City Budgets
14	Severe Winter & Summer Storms	Education & Awareness Programs	Promote the use of NOAA weather radios as a key communications resource for residents, businesses, and facilities that house vulnerable populations (i.e., nursing homes, group homes, senior centers, and day care facilities).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, <b>Crosby</b> , Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management and local city EM's	This is an ongoing effort of emergency management programs at the county and local city level. We promote weather radios through PSA's, County Fair, National Night Out, NWS Severe Weather Awareness Weeks and through social media. CWC also continues to work with local vendors and State programs for rebates on NOAA Weather radios.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Crosby Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
15	Severe Summer Storms	Mitigation Preparedness & Response Support	Provide/participate in the National Weather Service's SKYWARN "Storm Spotter" training in various parts of the County for first responders and community residents.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, <b>Crosby</b> , Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in collaboration with local cities and NWS	Each year CWC Emergency Management Program works with the National Weather Service to provide this training to local fire departments and local community volunteers. We will continue to encourage more volunteers to become active in the severe storm spotters network. Local cities will continue to remain active in this program.	County Budget and NWS funding to deliver program
16	Severe Summer Storms	Structure and Infrastructure Projects	Identify areas where vulnerable populations are susceptible to tornadoes or extreme wind events (i.e. schools, campgrounds, or mobile home parks) and evaluate for construction or retrofit of safe rooms or storm shelters.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, <b>Crosby</b> , Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	CWC Emergency Management continues to work with local cities that have experienced severe wind damage and recreational facilities on development of storm shelter areas. We are aware that there are two mobile home parks and the Crow Wing County Fairgrounds have been identified for having a need of a storm shelter or Safe Room.	County/City Budgets
17	Severe Summer Storms	Structure and Infrastructure Projects	Implement construction or retrofit projects for safe rooms or storm shelters in identified vulnerable locations.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, <b>Crosby</b> , Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	Any community safe room projects that the County is involved in will be part of the CWC Emergency Management program. FEMA grant funding may be sought to support an eligible safe room project.	County/City Budgets, <b>Possible FEMA HMA funding for Safe Room Construction</b>

#	Hazard	Mitigation Strategy	City of Crosby Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
27	Flooding	Local Planning & Regulations / Structure and Infrastructure Projects	Identify and improve potential and historical areas of road washout, and replace aging or failing bridges and culverts that are inadequate in order to reduce future flood damages.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, <b>Crosby</b> , Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept, CW Land Services Dept., and local city and township public works	<p>Crow Wing County and local jurisdictions maintain an annual inventory of problem areas due to flooding and plan for projects based on priority and available funding. CW County Highway Dept. has identified flood prone problematic areas on CR 105, CR 128, CSAH 11, CR 132, CR 106 &amp; CR 144. In addition there are bridges that are scour sensitive and pose a hazard risk during high water. CR 128 has a shoreline improvement plan to reduce the risk of water over the road and erosion of the roadbed during high water.</p> <p><i>City Comment: The City has flash flooding events in many areas of the city during significant rain storms. The City has a public works department that maintains city roads during storm events. Funding is an issue to implement improvement projects.</i></p>	County and Township Budgets, <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>

#	Hazard	Mitigation Strategy	City of Crosby Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
28	Flooding	Local Planning & Regulations	Encourage municipalities to require the development of new storm sewer infrastructure capable of handling a ten to twenty year rain event in areas of new development (i.e., new subdivisions) and adoption of a Stormwater ordinance regulating onsite stormwater management for new construction.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, <b>Crosby</b> , Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and SWCD in coordination with local City Admin and Public Works.	Facilitate adoption of stormwater ordinance through a series of workshops.  <i>City Comment: The City recently adopted a stormwater ordinance to establish regulatory requirements for land development and land disturbing activities aimed at minimizing the threats to public health, safety, public and private property, and natural resources within the City from construction site erosion and post-construction stormwater runoff.</i>	County/City Budgets, SWCD Grants i.e Serpent Lake Project
29	Flooding	Structure and Infrastructure Projects	Develop stormwater management plans and improve stormwater management systems at the county and city level to address future high-impact rain events throughout the County.	Ongoing	New	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, <b>Crosby</b> , Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., CWC Highway Dept., CWC GIS, CWC SWCD and local city public works depts., MN DNR, MPCA	The County will seek outside grant funding where possible to fund eligible stormwater improvement projects, such as through MPCA and FEMA HMA funding for flood reduction projects. Local jurisdictions will be responsible for development of local stormwater management plans and identification of priority projects.  <i>City Comment: The City recently adopted a comprehensive plan that is designed to plan for the future physical growth of the city and appropriate land uses.</i>	County/ SWCD Budgets, Possible MPCA/PFA grant funding, <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>



#	Hazard	Mitigation Strategy	City of Crosby Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
30	Flooding	Local Planning & Regulations	Ensure that wellhead protection plans are in place to address flooding that may lead to contaminated drinking water.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, <b>Crosby</b> , Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., MN Dept of Health and local city and township public works depts.	Cities work directly with the Minnesota Department of Health on the development or update of wellhead protection plans to ensure they meet State requirements.	MDH Source Water Protection grant funding for wellhead improvement projects
31	Flooding	Local Planning & Regulations	Adopt the 2017 updated floodplain maps for Crow Wing County and ensure the update of local ordinances.	New	High	2017	Crow Wing County, Baxter, Brainerd, Breezy Point, <b>Crosby</b> , Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Crow Wing County Land Services Dept. and City Admin	Crow Wing County has new maps that will go effective 8/15/2017. Communities participating in the NFIP will update their ordinances and adopt the new maps (and make other updates).  <i>City Comment: The City is in the process of adopting FEMA's floodplain ordinance. The MN DNR has identified one property located in the floodplain in the city.</i>	County/City Budgets
33	Flooding	Local Planning & Regulations / Structure & Infrastructure Systems	Keep culverts and drainage ditches free of debris to mitigate against over-the-road flooding.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, <b>Crosby</b> , Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept., CWC Land Services Dept. in coordination with City Public Works	The maintenance of culverts and drainage ditches is done through our CWC Highway Department and City Public Works. We also have Ditch 13 that flows from Lake Edward to North Long Lake. Local municipalities' public works work to monitor and address any problem areas for drainage at the local level.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Crosby Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
34	Flooding	Local Planning & Regulations	Restrict building in floodplain areas that consistently flood.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, <b>Crosby</b> , Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and Local City Admin.	This action is the responsibility of the CWC Land Services Department and local city ordinances as per NFIP requirements.  <i>City Comment: This will be addressed in our new floodplain ordinance.</i>	County/City Budgets
35	Flooding	Local Planning & Regulations	Identify properties that experience damage from repetitive flooding, and work with property owners to buy out structures and turn into open-space.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, <b>Crosby</b> , Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., and local City Admin	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.	County/City Funding, <b>Possible FEMA grant funding for Property Acquisition</b>
36	Flooding	Local Planning & Regulations	Encourage individual landowners who live within floodplain areas to participate in the FEMA National Flood Insurance Program (NFIP).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, <b>Crosby</b> , Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., MN DNR, local City Admin, and FEMA	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Crosby Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
40	Flooding	Education & Awareness Programs	Provide education and technical assistance to property owners on the application of green infrastructure methods to reduce localized flooding due to high rain events.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, <b>Crosby</b> , Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and CWC SWCD	This task is done through our CWC Land Services Dept. as well as the SWCD. Possible green-infrastructure projects will be considered for eligible FEMA HMA grant funding.	County Budgets, <b>Possible FEMA HMA funding for 5% Initiative Projects</b>
50	Drought	Local Planning & Regulations / Education & Awareness Programs	Promote water conservation measures and fire safety awareness to residents during periods of drought. Enforce water conservation ordinances when needed (i.e., that prohibit watering lawns during drought).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, <b>Crosby</b> , Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in collaboration with SWCD and local cities	Promoting water conservation during periods of drought is a standing effort of the County and local governments, as well as the USDA and FSA Office.	County/City Budgets

Table G - 5. Mitigation Actions Identified for Implementation by the City of Crosslake (2017-2021) (From Crow Wing County Master Mitigation Action Chart)

#	Hazard	Mitigation Strategy	City of Crosslake Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
1	All-Hazards	Education & Awareness Programs	Work to ensure that all Crow Wing County residents are aware of and sign-up for the County's Emergency Warning System (EWS).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, <b>Crosslake</b> , Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CW Emergency Management in coordination with local city government	The CWC Emergency Management Program regularly promotes sign-up for the EWS system via the County EM Facebook Page and during in-person events. Cities also work to promote sign-up by local residents by sharing information on city websites and announcements at public meetings.	County/City Budgets
5	All-Hazards	Education & Awareness Programs	Promote education & awareness of severe weather and personal emergency preparedness for individuals, families, and businesses.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, <b>Crosslake</b> , Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in coordination with city EM's.	CWC Emergency Management participates annually in the National Weather Service's spring and winter Severe Weather Awareness Weeks in April and November. We provide posters, brochures, and material on severe storms to the media and to property owners. Social media is also used to distribute the information. Local cities are encouraged to participate and share this information through their own local channels such as Facebook and city websites.  <i>City Comment: The City has emergency sirens throughout the area. The Crosslake Community School practices tornado drills annually. The City will work to educate the public on wildland fires and how to prepare individual home sites. Work with fire, DNR, and Firewise program.</i>	County/City Budgets

#	Hazard	Mitigation Strategy	City of Crosslake Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
9	Severe Winter Storms	Local Planning & Regulations	Continue providing snow removal, salting, and sanding to minimize the impacts of snow accumulations on motorists.	Ongoing	High	2017 -2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, <b>Crosslake</b> , Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept. in coordination with local cities	This is a standing effort of the CWC Highway Dept. and local City Public Works.	County/City Budgets
10	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Identify critical facilities or infrastructure that do not have backup power in the event of a major power outage resulting from severe winter or summer storms. <i>(Critical facilities may include police/fire departments, EOC, health care facilities, water &amp; sewer treatment facilities, and other facilities deemed as critical, i.e. public schools and sheltering facilities).</i>	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, <b>Crosslake</b> , Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, City Admin & Public Works	Not all county & city government buildings and schools have backup power generators to ensure energy in the event of a severe power outage. CWC and each jurisdiction will work to identify their respective critical facilities that should have backup power.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Crosslake Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
11	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Purchase and install generator hook-ups and encourage local generator purchases for identified critical facilities that require backup power.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, <b>Crosslake</b> , Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Emergency Management, City Admin & Public Works	CWC, local city governments, and schools will evaluate feasibility to purchase and install generators for key facilities, and will do so as funding allows.  <i>City Comment: The Crosslake City Hall and The Crosslake/Crow Wing County Joint Maintenance Facility each have backup generators already installed.</i>	County/City Budgets, <b>Possible FEMA HMA 5% Initiative Funding for Generators</b>
12	Severe Winter & Summer Storms	Structure and Infrastructure Projects	Work with rural electrical and municipal coops to identify and address mitigation measures for above ground power lines that are susceptible to damage from severe winter or summer storms in order to reduce potential power outages.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, <b>Crosslake</b> , Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Emily Cooperative Telephone Company, Crow Wing Power Cooperative, Mille Lacs Energy Cooperative, Brainerd Public Utilities, and Consolidated Telephone Company (CTC) in cooperation with local cities	Loss of power due to extreme storm events in the County creates long outage times and costly repairs. There has been overhead power disruption in hard-hit areas of trees. There is a wind "tunnel" from Gull Lake in the Round Lake Area of CR 115. The County and cities will work with local utilities as needed. BCA studies will be conducted for potential project areas to see where underground wires are possible.	Rural or Municipal Electric Coop Funding, <b>Possible FEMA HMA funding for Infrastructure Retrofit</b>
13	Severe Winter & Summer Storms	Local Planning & Regulations	Promote inspection and trimming of trees that may pose risk to falling on power lines during severe storm events.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, <b>Crosslake</b> , Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Same as above.	Tree management in the right-of-way of roads is addressed by our CWC Highway Dept. and/or City Public Works and Utility Companies.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Crosslake Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
14	Severe Winter & Summer Storms	Education & Awareness Programs	Promote the use of NOAA weather radios as a key communications resource for residents, businesses, and facilities that house vulnerable populations (i.e., nursing homes, group homes, senior centers, and day care facilities).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, <b>Crosslake</b> , Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management and local city EM's	This is an ongoing effort of emergency management programs at the county and local city level. We promote weather radios through PSA's, County Fair, National Night Out, NWS Severe Weather Awareness Weeks and through social media. CWC also continues to work with local vendors and State programs for rebates on NOAA Weather radios.	County/City Budgets
15	Severe Summer Storms	Mitigation Preparedness & Response Support	Provide/participate in the National Weather Service's SKYWARN "Storm Spotter" training in various parts of the County for first responders and community residents.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, <b>Crosslake</b> , Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in collaboration with local cities and NWS	Each year CWC Emergency Management Program works with the National Weather Service to provide this training to local fire departments and local community volunteers. We will continue to encourage more volunteers to become active in the severe storm spotters network. Local cities will continue to remain active in this program.	County Budget and NWS funding to deliver program

#	Hazard	Mitigation Strategy	City of Crosslake Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
16	Severe Summer Storms	Structure and Infrastructure Projects	Identify areas where vulnerable populations are susceptible to tornadoes or extreme wind events (i.e. schools, campgrounds, or mobile home parks) and evaluate for construction or retrofit of safe rooms or storm shelters.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, <b>Crosslake</b> , Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	CWC Emergency Management continues to work with local cities that have experienced severe wind damage and recreational facilities on development of storm shelter areas. We are aware that there are two mobile home parks and the Crow Wing County Fairgrounds have been identified for having a need of a storm shelter or Safe Room.  <i>City Comment: The City has identified the following areas as priorities for construction of safe rooms: Campground in Crosslake, Trout Lake Camp, Camp Knutson, and Boy Scouts Camp.</i>	County/City Budgets
17	Severe Summer Storms	Structure and Infrastructure Projects	Implement construction or retrofit projects for safe rooms or storm shelters in identified vulnerable locations.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, <b>Crosslake</b> , Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	Any community safe room projects that the County is involved in will be part of the CWC Emergency Management program. FEMA grant funding may be sought to support an eligible safe room project.	County/City Budgets, <b>Possible FEMA HMA funding for Safe Room Construction</b>



#	Hazard	Mitigation Strategy	City of Crosslake Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
27	Flooding	Local Planning & Regulations / Structure and Infrastructure Projects	Identify and improve potential and historical areas of road washout, and replace aging or failing bridges and culverts that are inadequate in order to reduce future flood damages.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, <b>Crosslake</b> , Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept, CW Land Services Dept., and local city and township public works	Crow Wing County and local jurisdictions maintain an annual inventory of problem areas due to flooding and plan for projects based on priority and available funding. CW County Highway Dept. has identified flood prone problematic areas on CR 105, CR 128, CSAH 11, CR 132, CR 106 & CR 144. In addition there are bridges that are scour sensitive and pose a hazard risk during high water. CR 128 has a shoreline improvement plan to reduce the risk of water over the road and erosion of the roadbed during high water.  <i>City Comment: The City has a Public Works Director that is responsible for road maintenance issues.</i>	County, and Township Budgets, <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>
28	Flooding	Local Planning & Regulations	Encourage municipalities to require the development of new storm sewer infrastructure capable of handling a ten to twenty year rain event in areas of new development (i.e., new subdivisions) and adoption of a Stormwater ordinance regulating onsite stormwater management for new construction.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, <b>Crosslake</b> , Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and SWCD in coordination with local City Admin and Public Works.	Facilitate adoption of stormwater ordinance through a series of workshops.	County/City Budgets, SWCD Grants i.e Serpent Lake Project

#	Hazard	Mitigation Strategy	City of Crosslake Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
29	Flooding	Structure and Infrastructure Projects	Develop stormwater management plans and improve stormwater management systems at the county and city level to address future high-impact rain events throughout the County.	Ongoing	New	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, <b>Crosslake</b> , Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., CWC Highway Dept., CWC GIS, CWC SWCD and local city public works depts., MN DNR, MPCA	The County will seek outside grant funding where possible to fund eligible stormwater improvement projects, such as through MPCA and FEMA HMA funding for flood reduction projects. Local jurisdictions will be responsible for development of local stormwater management plans and identification of priority projects.	County/ SWCD budgets, Possible MPCA/PFA grant funding, <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>
30	Flooding	Local Planning & Regulations	Ensure that wellhead protection plans are in place to address flooding that may lead to contaminated drinking water.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, <b>Crosslake</b> , Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., MN Dept of Health and local city and township public works depts.	Cities work directly with the Minnesota Department of Health on the development or update of wellhead protection plans to ensure they meet State requirements.	MDH Source Water Protection grant funding for wellhead improvement projects
31	Flooding	Local Planning & Regulations	Adopt the 2017 updated floodplain maps for Crow Wing County and ensure the update of local ordinances.	New	High	2017	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, <b>Crosslake</b> , Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Crow Wing County Land Services Dept. and City Admin	Crow Wing County has new maps that will go effective 8/15/2017. Communities participating in the NFIP will update their ordinances and adopt the new maps (and make other updates).  <i>City Comment: The City's Planning &amp; Zoning will establish an updated floodplain ordinance.</i>	County/City Budgets

#	Hazard	Mitigation Strategy	City of Crosslake Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
33	Flooding	Local Planning & Regulations / Structure & Infrastructure Systems	Keep culverts and drainage ditches free of debris to mitigate against over-the-road flooding.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, <b>Crosslake</b> , Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept., CWC Land Services Dept. in coordination with City Public Works	The maintenance of culverts and drainage ditches is done through our CWC Highway Department and City Public Works. We also have Ditch 13 that flows from Lake Edward to North Long Lake. Local municipalities' public works work to monitor and address any problem areas for drainage at the local level.	County/City Budgets
34	Flooding	Local Planning & Regulations	Restrict building in floodplain areas that consistently flood.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, <b>Crosslake</b> , Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and Local City Admin.	This action is the responsibility of the CWC Land Services Department and local city ordinances as per NFIP requirements.	County/City Budgets
35	Flooding	Local Planning & Regulations	Identify properties that experience damage from repetitive flooding, and work with property owners to buy out structures and turn into open-space.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, <b>Crosslake</b> , Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., and local City Admin	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.	County/City Funding, <b>Possible FEMA grant funding for Property Acquisition</b>

#	Hazard	Mitigation Strategy	City of Crosslake Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
36	Flooding	Local Planning & Regulations	Encourage individual landowners who live within floodplain areas to participate in the FEMA National Flood Insurance Program (NFIP).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, <b>Crosslake</b> , Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., MN DNR, local City Admin, and FEMA	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.	County/City Budgets
40	Flooding	Education & Awareness Programs	Provide education and technical assistance to property owners on the application of green infrastructure methods to reduce localized flooding due to high rain events.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, <b>Crosslake</b> , Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and CWC SWCD	This task is done through our CWC Land Services Dept. as well as the SWCD. Possible green-infrastructure projects will be considered for eligible FEMA HMA grant funding.	County Budgets, <b>Possible FEMA HMA funding for 5% Initiative Projects</b>
50	Drought	Local Planning & Regulations / Education & Awareness Programs	Promote water conservation measures and fire safety awareness to residents during periods of drought. Enforce water conservation ordinances when needed (i.e., that prohibit watering lawns during drought).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, <b>Crosslake</b> , Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in collaboration with SWCD and local cities	Promoting water conservation during periods of drought is a standing effort of the County and local governments, as well as the USDA and FSA Office.	County/City Budgets

Table G - 6. Mitigation Actions Identified for Implementation by the City of Cuyuna (2017-2021) (From Crow Wing County Master Mitigation Action Chart)

#	Hazard	Mitigation Strategy	City of Cuyuna Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
1	All-Hazards	Education & Awareness Programs	Work to ensure that all Crow Wing County residents are aware of and sign-up for the County's Emergency Warning System (EWS).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, <b>Cuyuna</b> , Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CW Emergency Management in coordination with local city government	<p>The CWC Emergency Management Program regularly promotes sign-up for the EWS system via the County EM Facebook Page and during in-person events. Cities also work to promote sign-up by local residents by sharing information on city websites and announcements at public meetings.</p> <p><i>City Comment: The City would like to be able to tie County alerts to the City website. This is something we will explore with the CWC Emergency Manager.</i></p>	County/City Budgets
5	All-Hazards	Education & Awareness Programs	Promote education & awareness of severe weather and personal emergency preparedness for individuals, families, and businesses.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, <b>Cuyuna</b> , Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in coordination with city EM's.	<p>CWC Emergency Management participates annually in the National Weather Service's spring and winter Severe Weather Awareness Weeks in April and November. We provide posters, brochures, and material on severe storms to the media and to property owners. Social media is also used to distribute the information. Local cities are encouraged to participate and share this information through their own local channels such as Facebook and city websites.</p> <p><i>City Comment: The City participates in the annual Severe Winter/Spring Awareness Week.</i></p>	County/City Budgets

#	Hazard	Mitigation Strategy	City of Cuyuna Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
9	Severe Winter Storms	Local Planning & Regulations	Continue providing snow removal, salting, and sanding to minimize the impacts of snow accumulations on motorists.	Ongoing	High	2017 - 2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, <b>Cuyuna</b> , Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept. in coordination with local cities	This is a standing effort of the CWC Highway Dept. and local City Public Works.	County/City Budgets
10	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Identify critical facilities or infrastructure that do not have backup power in the event of a major power outage resulting from severe winter or summer storms. <i>(Critical facilities may include police/fire departments, EOC, health care facilities, water &amp; sewer treatment facilities, and other facilities deemed as critical, i.e. public schools and sheltering facilities).</i>	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, <b>Cuyuna</b> , Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, City Admin & Public Works	Not all county & city government buildings and schools have backup power generators to ensure energy in the event of a severe power outage. CWC and each jurisdiction will work to identify their respective critical facilities that should have backup power.	County/City Budgets
11	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Purchase and install generator hook-ups and encourage local generator purchases for identified critical facilities that require backup power.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, <b>Cuyuna</b> , Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Emergency Management, City Admin & Public Works	CWC, local city governments, and schools will evaluate feasibility to purchase and install generators for key facilities, and will do so as funding allows.	County/City Budgets, <b>Possible FEMA HMA 5% Initiative Funding for Generators</b>

#	Hazard	Mitigation Strategy	City of Cuyuna Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
12	Severe Winter & Summer Storms	Structure and Infrastructure Projects	Work with rural electrical and municipal coops to identify and address mitigation measures for above ground power lines that are susceptible to damage from severe winter or summer storms in order to reduce potential power outages.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, <b>Cuyuna</b> , Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Emily Cooperative Telephone Company, Crow Wing Power Cooperative, Mille Lacs Energy Cooperative, Brainerd Public Utilities, and Consolidated Telephone Company (CTC) in cooperation with local cities	Loss of power due to extreme storm events in the County creates long outage times and costly repairs. There has been overhead power disruption in hard-hit areas of trees. There is a wind "tunnel" from Gull Lake in the Round Lake Area of CR 115. The County and cities will work with local utilities as needed. BCA studies will be conducted for potential project areas to see where underground wires are possible.	Rural or Municipal Electric Coop Funding, <b>Possible FEMA HMA funding for Infrastructure Retrofit</b>
13	Severe Winter & Summer Storms	Local Planning & Regulations	Promote inspection and trimming of trees that may pose risk to falling on power lines during severe storm events.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, <b>Cuyuna</b> , Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Same as above.	Tree management in the right-of-way of roads is addressed by our CWC Highway Dept. and/or City Public Works and Utility Companies.	County/City Budgets
14	Severe Winter & Summer Storms	Education & Awareness Programs	Promote the use of NOAA weather radios as a key communications resource for residents, businesses, and facilities that house vulnerable populations (i.e., nursing homes, group homes, senior centers, and day care facilities).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, <b>Cuyuna</b> , Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management and local city EM's	This is an ongoing effort of emergency management programs at the county and local city level. We promote weather radios through PSA's, County Fair, National Night Out, NWS Severe Weather Awareness Weeks and through social media. CWC also continues to work with local vendors and State programs for rebates on NOAA Weather radios.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Cuyuna Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
15	Severe Summer Storms	Mitigation Preparedness & Response Support	Provide/participate in the National Weather Service's SKYWARN "Storm Spotter" training in various parts of the County for first responders and community residents.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, <b>Cuyuna</b> , Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in collaboration with local cities and NWS	Each year CWC Emergency Management Program works with the National Weather Service to provide this training to local fire departments and local community volunteers. We will continue to encourage more volunteers to become active in the severe storm spotters network. Local cities will continue to remain active in this program.	County Budget and NWS funding to deliver program
16	Severe Summer Storms	Structure and Infrastructure Projects	Identify areas where vulnerable populations are susceptible to tornadoes or extreme wind events (i.e. schools, campgrounds, or mobile home parks) and evaluate for construction or retrofit of safe rooms or storm shelters.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, <b>Cuyuna</b> , Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	CWC Emergency Management continues to work with local cities that have experienced severe wind damage and recreational facilities on development of storm shelter areas. We are aware that there are two mobile home parks and the Crow Wing County Fairgrounds have been identified for having a need of a storm shelter or Safe Room.  <i>City Comment: The City needs a storm shelter or safe room near the park.</i>	County/City Budgets
17	Severe Summer Storms	Structure and Infrastructure Projects	Implement construction or retrofit projects for safe rooms or storm shelters in identified vulnerable locations.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, <b>Cuyuna</b> , Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	Any community safe room projects that the County is involved in will be part of the CWC Emergency Management program. FEMA grant funding may be sought to support an eligible safe room project.	County/City Budgets, <b>Possible FEMA HMA funding for Safe Room Construction</b>



#	Hazard	Mitigation Strategy	City of Cuyuna Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
27	Flooding	Local Planning & Regulations / Structure and Infrastructure Projects	Identify and improve potential and historical areas of road washout, and replace aging or failing bridges and culverts that are inadequate in order to reduce future flood damages.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, <b>Cuyuna</b> , Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept, CW Land Services Dept., and local city and township public works	<p>Crow Wing County and local jurisdictions maintain an annual inventory of problem areas due to flooding and plan for projects based on priority and available funding. CW County Highway Dept. has identified flood prone problematic areas on CR 105, CR 128, CSAH 11, CR 132, CR 106 &amp; CR 144. In addition there are bridges that are scour sensitive and pose a hazard risk during high water. CR 128 has a shoreline improvement plan to reduce the risk of water over the road and erosion of the roadbed during high water.</p> <p><i>City Comment: The City performs an annual review to address road improvement projects that include culvert and drainage improvements to reduce over-the-road repetitive flooding. The City Engineer and City Council address road maintenance issues for flooding on an annual basis.</i></p>	County, and Township Budgets, <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>

#	Hazard	Mitigation Strategy	City of Cuyuna Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
28	Flooding	Local Planning & Regulations	Encourage municipalities to require the development of new storm sewer infrastructure capable of handling a ten to twenty year rain event in areas of new development (i.e., new subdivisions) and adoption of a Stormwater ordinance regulating onsite stormwater management for new construction.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, <b>Cuyuna</b> , Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and SWCD in coordination with local City Admin and Public Works.	Facilitate adoption of stormwater ordinance through a series of workshops.	County/City Budgets, SWCD Grants i.e Serpent Lake Project
29	Flooding	Structure and Infrastructure Projects	Develop stormwater management plans and improve stormwater management systems at the county and city level to address future high-impact rain events throughout the County.	Ongoing	New	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, <b>Cuyuna</b> , Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., CWC Highway Dept., CWC GIS, CWC SWCD and local city public works depts., MN DNR, MPCA	The County will seek outside grant funding where possible to fund eligible stormwater improvement projects, such as through MPCA and FEMA HMA funding for flood reduction projects. Local jurisdictions will be responsible for development of local stormwater management plans and identification of priority projects.	County/ SWCD budgets, Possible MPCA/PFA grant funding, <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>
30	Flooding	Local Planning & Regulations	Ensure that wellhead protection plans are in place to address flooding that may lead to contaminated drinking water.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, <b>Cuyuna</b> , Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., MN Dept of Health and local city and township public works depts.	Cities work directly with the Minnesota Department of Health on the development or update of wellhead protection plans to ensure they meet State requirements.  <i>City Comment: The City maintains a Wellhead Protection Plan.</i>	MDH Source Water Protection grant funding for wellhead improvement projects

#	Hazard	Mitigation Strategy	City of Cuyuna Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
31	Flooding	Local Planning & Regulations	Adopt the 2017 updated floodplain maps for Crow Wing County and ensure the update of local ordinances.	New	High	2017	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, <b>Cuyuna</b> , Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Crow Wing County Land Services Dept. and City Admin	Crow Wing County has new maps that will go effective 8/15/2017. Communities participating in the NFIP will update their ordinances and adopt the new maps (and make other updates).  <i>City Comment: The City's Planning and Zoning will update our floodplain ordinance. The City participates in the NFIP.</i>	County/City Budgets
33	Flooding	Local Planning & Regulations / Structure & Infrastructure Systems	Keep culverts and drainage ditches free of debris to mitigate against over-the-road flooding.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, <b>Cuyuna</b> , Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept., CWC Land Services Dept. in coordination with City Public Works	The maintenance of culverts and drainage ditches is done through our CWC Highway Department and City Public Works. We also have Ditch 13 that flows from Lake Edward to North Long Lake. Local municipalities' public works work to monitor and address any problem areas for drainage at the local level.	County/City Budgets
34	Flooding	Local Planning & Regulations	Restrict building in floodplain areas that consistently flood.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, <b>Cuyuna</b> , Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and Local City Admin.	This action is the responsibility of the CWC Land Services Department and local city ordinances as per NFIP requirements.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Cuyuna Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
35	Flooding	Local Planning & Regulations	Identify properties that experience damage from repetitive flooding, and work with property owners to buy out structures and turn into open-space.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, <b>Cuyuna</b> , Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., and local City Admin	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.	County/City Funding, <b>Possible FEMA grant funding for Property Acquisition</b>
36	Flooding	Local Planning & Regulations	Encourage individual landowners who live within floodplain areas to participate in the FEMA National Flood Insurance Program (NFIP).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, <b>Cuyuna</b> , Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., MN DNR, local City Admin, and FEMA	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.	County/City Budgets
40	Flooding	Education & Awareness Programs	Provide education and technical assistance to property owners on the application of green infrastructure methods to reduce localized flooding due to high rain events.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, <b>Cuyuna</b> , Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and CWC SWCD	This task is done through our CWC Land Services Dept. as well as the SWCD. Possible green-infrastructure projects will be considered for eligible FEMA HMA grant funding.	County Budgets, <b>Possible FEMA HMA funding for 5% Initiative Projects</b>

#	Hazard	Mitigation Strategy	City of Cuyuna Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
50	Drought	Local Planning & Regulations / Education & Awareness Programs	Promote water conservation measures and fire safety awareness to residents during periods of drought. Enforce water conservation ordinances when needed (i.e., that prohibit watering lawns during drought).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, <b>Cuyuna</b> , Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in collaboration with SWCD and local cities	Promoting water conservation during periods of drought is a standing effort of the County and local governments, as well as the USDA and FSA Office.	County/City Budgets

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Table G - 7. Mitigation Actions Identified for Implementation by the City of Deerwood (2017-2021) (From Crow Wing County Master Mitigation Action Chart)

#	Hazard	Mitigation Strategy	City of Deerwood Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
1	All-Hazards	Education & Awareness Programs	Work to ensure that all Crow Wing County residents are aware of and sign-up for the County's Emergency Warning System (EWS).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, <b>Deerwood</b> , Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CW Emergency Management in coordination with local city government	The CWC Emergency Management Program regularly promotes sign-up for the EWS system via the County EM Facebook Page and during in-person events. Cities also work to promote sign-up by local residents by sharing information on city websites and announcements at public meetings.	County/City Budgets
5	All-Hazards	Education & Awareness Programs	Promote education & awareness of severe weather and personal emergency preparedness for individuals, families, and businesses.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, <b>Deerwood</b> , Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in coordination with city EM's.	CWC Emergency Management participates annually in the National Weather Service's spring and winter Severe Weather Awareness Weeks in April and November. We provide posters, brochures, and material on severe storms to the media and to property owners. Social media is also used to distribute the information. Local cities are encouraged to participate and share this information through their own local channels such as Facebook and city websites.  <i>City Comment: The City is able to disperse information to its residents through the City website.</i>	County/City Budgets

#	Hazard	Mitigation Strategy	City of Deerwood Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
9	Severe Winter Storms	Local Planning & Regulations	Continue providing snow removal, salting, and sanding to minimize the impacts of snow accumulations on motorists.	Ongoing	High	2017 - 2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, <b>Deerwood</b> , Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept. in coordination with local cities	This is a standing effort of the CWC Highway Dept. and local City Public Works.	County/City Budgets
10	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Identify critical facilities or infrastructure that do not have backup power in the event of a major power outage resulting from severe winter or summer storms. <i>(Critical facilities may include police/fire departments, EOC, health care facilities, water &amp; sewer treatment facilities, and other facilities deemed as critical, i.e. public schools and sheltering facilities).</i>	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, <b>Deerwood</b> , Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, City Admin & Public Works	Not all county & city government buildings and schools have backup power generators to ensure energy in the event of a severe power outage. CWC and each jurisdiction will work to identify their respective critical facilities that should have backup power.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Deerwood Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
11	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Purchase and install generator hook-ups and encourage local generator purchases for identified critical facilities that require backup power.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, <b>Deerwood</b> , Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Emergency Management, City Admin & Public Works	CWC, local city governments, and schools will evaluate feasibility to purchase and install generators for key facilities, and will do so as funding allows.	County/City Budgets, <b>Possible FEMA HMA 5% Initiative Funding for Generators</b>
12	Severe Winter & Summer Storms	Structure and Infrastructure Projects	Work with rural electrical and municipal coops to identify and address mitigation measures for above ground power lines that are susceptible to damage from severe winter or summer storms in order to reduce potential power outages.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, <b>Deerwood</b> , Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Emily Cooperative Telephone Company, Crow Wing Power Cooperative, Mille Lacs Energy Cooperative, Brainerd Public Utilities, and Consolidated Telephone Company (CTC) in cooperation with local cities	Loss of power due to extreme storm events in the County creates long outage times and costly repairs. There has been overhead power disruption in hard-hit areas of trees. There is a wind "tunnel" from Gull Lake in the Round Lake Area of CR 115. The County and cities will work with local utilities as needed. BCA studies will be conducted for potential project areas to see where underground wires are possible.	Rural or Municipal Electric Coop Funding, <b>Possible FEMA HMA funding for Infrastructure Retrofit</b>
13	Severe Winter & Summer Storms	Local Planning & Regulations	Promote inspection and trimming of trees that may pose risk to falling on power lines during severe storm events.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, <b>Deerwood</b> , Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Same as above.	Tree management in the right-of-way of roads is addressed by our CWC Highway Dept. and/or City Public Works and Utility Companies.	County/City Budgets



#	Hazard	Mitigation Strategy	City of Deerwood Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
14	Severe Winter & Summer Storms	Education & Awareness Programs	Promote the use of NOAA weather radios as a key communications resource for residents, businesses, and facilities that house vulnerable populations (i.e., nursing homes, group homes, senior centers, and day care facilities).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, <b>Deerwood</b> , Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management and local city EM's	This is an ongoing effort of emergency management programs at the county and local city level. We promote weather radios through PSA's, County Fair, National Night Out, NWS Severe Weather Awareness Weeks and through social media. CWC also continues to work with local vendors and State programs for rebates on NOAA Weather radios.	County/City Budgets
15	Severe Summer Storms	Mitigation Preparedness & Response Support	Provide/participate in the National Weather Service's SKYWARN "Storm Spotter" training in various parts of the County for first responders and community residents.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, <b>Deerwood</b> , Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in collaboration with local cities and NWS	Each year CWC Emergency Management Program works with the National Weather Service to provide this training to local fire departments and local community volunteers. We will continue to encourage more volunteers to become active in the severe storm spotters network. Local cities will continue to remain active in this program.	County Budget and NWS funding to deliver program

#	Hazard	Mitigation Strategy	City of Deerwood Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
16	Severe Summer Storms	Structure and Infrastructure Projects	Identify areas where vulnerable populations are susceptible to tornadoes or extreme wind events (i.e. schools, campgrounds, or mobile home parks) and evaluate for construction or retrofit of safe rooms or storm shelters.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, <b>Deerwood</b> , Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	CWC Emergency Management continues to work with local cities that have experienced severe wind damage and recreational facilities on development of storm shelter areas. We are aware that there are two mobile home parks and the Crow Wing County Fairgrounds have been identified for having a need of a storm shelter or Safe Room.	County/City Budgets
17	Severe Summer Storms	Structure and Infrastructure Projects	Implement construction or retrofit projects for safe rooms or storm shelters in identified vulnerable locations.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, <b>Deerwood</b> , Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	Any community safe room projects that the County is involved in will be part of the CWC Emergency Management program. FEMA grant funding may be sought to support an eligible safe room project.	County/City Budgets, <b>Possible FEMA HMA funding for Safe Room Construction</b>

#	Hazard	Mitigation Strategy	City of Deerwood Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
27	Flooding	Local Planning & Regulations / Structure and Infrastructure Projects	Identify and improve potential and historical areas of road washout, and replace aging or failing bridges and culverts that are inadequate in order to reduce future flood damages.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, <b>Deerwood</b> , Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept, CW Land Services Dept., and local city and township public works	Crow Wing County and local jurisdictions maintain an annual inventory of problem areas due to flooding and plan for projects based on priority and available funding. CW County Highway Dept. has identified flood prone problematic areas on CR 105, CR 128, CSAH 11, CR 132, CR 106 & CR 144. In addition there are bridges that are scour sensitive and pose a hazard risk during high water. CR 128 has a shoreline improvement plan to reduce the risk of water over the road and erosion of the roadbed during high water.	County, and Township Budgets, <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>
28	Flooding	Local Planning & Regulations	Encourage municipalities to require the development of new storm sewer infrastructure capable of handling a ten to twenty year rain event in areas of new development (i.e., new subdivisions) and adoption of a Stormwater ordinance regulating onsite stormwater management for new construction.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, <b>Deerwood</b> , Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and SWCD in coordination with local City Admin and Public Works.	Facilitate adoption of stormwater ordinance through a series of workshops.  <i>City Comment: The City recently adopted a stormwater ordinance to establish regulatory requirements for land development and land disturbing activities aimed at minimizing the threats to public health, safety, public and private property, and natural resources within the City from construction site erosion and post-construction stormwater runoff.</i>	County/City Budgets, SWCD Grants i.e Serpent Lake Project

#	Hazard	Mitigation Strategy	City of Deerwood Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
29	Flooding	Structure and Infrastructure Projects	Develop stormwater management plans and improve stormwater management systems at the county and city level to address future high-impact rain events throughout the County.	Ongoing	New	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, <b>Deerwood</b> , Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., CWC Highway Dept., CWC GIS, CWC SWCD and local city public works depts., MN DNR, MPCA	The County will seek outside grant funding where possible to fund eligible stormwater improvement projects, such as through MPCA and FEMA HMA funding for flood reduction projects. Local jurisdictions will be responsible for development of local stormwater management plans and identification of priority projects.  <i>City Comment: The City recently adopted a comprehensive plan that is designed to plan for the future physical growth of the city and appropriate land uses.</i>	County/SWCD budgets, Possible MPCA/PFA grant funding, <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>
30	Flooding	Local Planning & Regulations	Ensure that wellhead protection plans are in place to address flooding that may lead to contaminated drinking water.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, <b>Deerwood</b> , Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., MN Dept of Health and local city and township public works depts.	Cities work directly with the Minnesota Department of Health on the development or update of wellhead protection plans to ensure they meet State requirements.	MDH Source Water Protection grant funding for wellhead improvement projects

#	Hazard	Mitigation Strategy	City of Deerwood Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
31	Flooding	Local Planning & Regulations	Adopt the 2017 updated floodplain maps for Crow Wing County and ensure the update of local ordinances.	New	High	2017	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, <b>Deerwood</b> , Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Crow Wing County Land Services Dept. and City Admin	Crow Wing County has new maps that will go effective 8/15/2017. Communities participating in the NFIP will update their ordinances and adopt the new maps (and make other updates).  <i>City Comment: The City is in the process of adopting FEMA's floodplain regulations and enrolling in the NFIP.</i>	County/City Budgets
33	Flooding	Local Planning & Regulations / Structure & Infrastructure Systems	Keep culverts and drainage ditches free of debris to mitigate against over-the-road flooding.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, <b>Deerwood</b> , Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept., CWC Land Services Dept. in coordination with City Public Works	The maintenance of culverts and drainage ditches is done through our CWC Highway Department and City Public Works. We also have Ditch 13 that flows from Lake Edward to North Long Lake. Local municipalities' public works work to monitor and address any problem areas for drainage at the local level.	County/City Budgets
34	Flooding	Local Planning & Regulations	Restrict building in floodplain areas that consistently flood.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, <b>Deerwood</b> , Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and Local City Admin.	This action is the responsibility of the CWC Land Services Department and local city ordinances as per NFIP requirements.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Deerwood Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
35	Flooding	Local Planning & Regulations	Identify properties that experience damage from repetitive flooding, and work with property owners to buy out structures and turn into open-space.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, <b>Deerwood</b> , Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., and local City Admin	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.	County/City Funding, <b>Possible FEMA grant funding for Property Acquisition</b>
36	Flooding	Local Planning & Regulations	Encourage individual landowners who live within floodplain areas to participate in the FEMA National Flood Insurance Program (NFIP).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, <b>Deerwood</b> , Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., MN DNR, local City Admin, and FEMA	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.	County/City Budgets
40	Flooding	Education & Awareness Programs	Provide education and technical assistance to property owners on the application of green infrastructure methods to reduce localized flooding due to high rain events.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, <b>Deerwood</b> , Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and CWC SWCD	This task is done through our CWC Land Services Dept. as well as the SWCD. Possible green-infrastructure projects will be considered for eligible FEMA HMA grant funding.	County Budgets, <b>Possible FEMA HMA funding for 5% Initiative Projects</b>

#	Hazard	Mitigation Strategy	City of Deerwood Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
50	Drought	Local Planning & Regulations / Education & Awareness Programs	Promote water conservation measures and fire safety awareness to residents during periods of drought. Enforce water conservation ordinances when needed (i.e., that prohibit watering lawns during drought).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, <b>Deerwood</b> , Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in collaboration with SWCD and local cities	Promoting water conservation during periods of drought is a standing effort of the County and local governments, as well as the USDA and FSA Office.	County/City Budgets

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Table G - 8. Mitigation Actions Identified for Implementation by the City of Emily (2017-2021) (From Crow Wing County Master Mitigation Action Chart)

#	Hazard	Mitigation Strategy	City of Emily Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
1	All-Hazards	Education & Awareness Programs	Work to ensure that all Crow Wing County residents are aware of and sign-up for the County's Emergency Warning System (EWS).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, <b>Emily</b> , Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CW Emergency Management in coordination with local city government	The CWC Emergency Management Program regularly promotes sign-up for the EWS system via the County EM Facebook Page and during in-person events. Cities also work to promote sign-up by local residents by sharing information on city websites and announcements at public meetings.  <i>City Comment: Social media and the City website is used to get information out to residents.</i>	County/City Budgets
5	All-Hazards	Education & Awareness Programs	Promote education & awareness of severe weather and personal emergency preparedness for individuals, families, and businesses.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, <b>Emily</b> , Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in coordination with city EM's.	CWC Emergency Management participates annually in the National Weather Service's spring and winter Severe Weather Awareness Weeks in April and November. We provide posters, brochures, and material on severe storms to the media and to property owners. Social media is also used to distribute the information. Local cities are encouraged to participate and share this information through their own local channels such as Facebook and city websites.  <i>City Comment: The City operates a website providing emergency and other information to citizens.</i>	County/City Budgets



#	Hazard	Mitigation Strategy	City of Emily Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
9	Severe Winter Storms	Local Planning & Regulations	Continue providing snow removal, salting, and sanding to minimize the impacts of snow accumulations on motorists.	Ongoing	High	2017 - 2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, <b>Emily</b> , Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept. in coordination with local cities	This is a standing effort of the CWC Highway Dept. and local City Public Works.  <i>City Comment: The City's Maintenance Department are on call 24/7 for responding to emergencies, including plowing in winter.</i>	County/City Budgets
10	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Identify critical facilities or infrastructure that do not have backup power in the event of a major power outage resulting from severe winter or summer storms. <i>(Critical facilities may include police/fire departments, EOC, health care facilities, water &amp; sewer treatment facilities, and other facilities deemed as critical, i.e. public schools and sheltering facilities).</i>	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, <b>Emily</b> , Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, City Admin & Public Works	Not all county & city government buildings and schools have backup power generators to ensure energy in the event of a severe power outage. CWC and each jurisdiction will work to identify their respective critical facilities that should have backup power.  <i>City Comment: The City is a member of MnWARN and has emergency contracts in the case of a power outage.</i>	County/City Budgets

#	Hazard	Mitigation Strategy	City of Emily Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
11	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Purchase and install generator hook-ups and encourage local generator purchases for identified critical facilities that require backup power.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, <b>Emily</b> , Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Emergency Management, City Admin & Public Works	CWC, local city governments, and schools will evaluate feasibility to purchase and install generators for key facilities, and will do so as funding allows.  <i>City Comment: The City contracts with Ritter and Ritter for emergency response for city sewer issues, including generators.</i>	County/City Budgets, <b>Possible FEMA HMA 5% Initiative Funding for Generators</b>
12	Severe Winter & Summer Storms	Structure and Infrastructure Projects	Work with rural electrical and municipal coops to identify and address mitigation measures for above ground power lines that are susceptible to damage from severe winter or summer storms in order to reduce potential power outages.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, <b>Emily</b> , Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Emily Cooperative Telephone Company, Crow Wing Power Cooperative, Mille Lacs Energy Cooperative, Brainerd Public Utilities, and Consolidated Telephone Company (CTC) in cooperation with local cities	Loss of power due to extreme storm events in the County creates long outage times and costly repairs. There has been overhead power disruption in hard-hit areas of trees. There is a wind "tunnel" from Gull Lake in the Round Lake Area of CR 115. The County and cities will work with local utilities as needed. BCA studies will be conducted for potential project areas to see where underground wires are possible.  <i>City Comment: The City will work with Emily Cooperative Telephone Company and Crow Wing Power to install underground facilities for telephone and power lines.</i>	Rural or Municipal Electric Coop Funding, <b>Possible FEMA HMA funding for Infrastructure Retrofit</b>

#	Hazard	Mitigation Strategy	City of Emily Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
13	Severe Winter & Summer Storms	Local Planning & Regulations	Promote inspection and trimming of trees that may pose risk to falling on power lines during severe storm events.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, <b>Emily</b> , Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Same as above.	Tree management in the right-of-way of roads is addressed by our CWC Highway Dept. and/or City Public Works and Utility Companies.	County/City Budgets
14	Severe Winter & Summer Storms	Education & Awareness Programs	Promote the use of NOAA weather radios as a key communications resource for residents, businesses, and facilities that house vulnerable populations (i.e., nursing homes, group homes, senior centers, and day care facilities).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, <b>Emily</b> , Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management and local city EM's	This is an Ongoing effort of emergency management programs at the county and local city level. We promote weather radios through PSA's, County Fair, National Night Out, NWS Severe Weather Awareness Weeks and through social media. CWC also continues to work with local vendors and State programs for rebates on NOAA Weather radios.  <i>City Comment: Social media and the City website is used to get information out to residents.</i>	County/City Budgets

#	Hazard	Mitigation Strategy	City of Emily Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
15	Severe Summer Storms	Mitigation Preparedness & Response Support	Provide/participate in the National Weather Service's SKYWARN "Storm Spotter" training in various parts of the County for first responders and community residents.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, <b>Emily</b> , Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in collaboration with local cities and NWS	Each year CWC Emergency Management Program works with the National Weather Service to provide this training to local fire departments and local community volunteers. We will continue to encourage more volunteers to become active in the severe storm spotters network. Local cities will continue to remain active in this program.	County Budget and NWS funding to deliver program
16	Severe Summer Storms	Structure and Infrastructure Projects	Identify areas where vulnerable populations are susceptible to tornadoes or extreme wind events (i.e. schools, campgrounds, or mobile home parks) and evaluate for construction or retrofit of safe rooms or storm shelters.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, <b>Emily</b> , Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	CWC Emergency Management continues to work with local cities that have experienced severe wind damage and recreational facilities on development of storm shelter areas. We are aware that there are two mobile home parks and the Crow Wing County Fairgrounds have been identified for having a need of a storm shelter or Safe Room.  <i>City Comment: The City will encourage safe room construction in identified areas that are vulnerable.</i>	County/City Budgets

#	Hazard	Mitigation Strategy	City of Emily Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
17	Severe Summer Storms	Structure and Infrastructure Projects	Implement construction or retrofit projects for safe rooms or storm shelters in identified vulnerable locations.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, <b>Emily</b> , Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	Any community safe room projects that the County is involved in will be part of the CWC Emergency Management program. FEMA grant funding may be sought to support an eligible safe room project.	County/City Budgets, <b>Possible FEMA HMA funding for Safe Room Construction</b>

#	Hazard	Mitigation Strategy	City of Emily Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
27	Flooding	Local Planning & Regulations / Structure and Infrastructure Projects	Identify and improve potential and historical areas of road washout, and replace aging or failing bridges and culverts that are inadequate in order to reduce future flood damages.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, <b>Emily</b> , Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept, CW Land Services Dept., and local city and township public works	<p>Crow Wing County and local jurisdictions maintain an annual inventory of problem areas due to flooding and plan for projects based on priority and available funding. CW County Highway Dept. has identified flood prone problematic areas on CR 105, CR 128, CSAH 11, CR 132, CR 106 &amp; CR 144. In addition there are bridges that are scour sensitive and pose a hazard risk during high water. CR 128 has a shoreline improvement plan to reduce the risk of water over the road and erosion of the roadbed during high water.</p> <p><i>City Comment: The City has a Road Committee comprised of two Council members, a Maintenance staff member and the City Engineer to address all road-related issues. The City also provides culverts at cost to residents to reduce flooding and improve drainage. The City's road work is engineered to provide for proper drainage.</i></p>	County, and Township Budgets, <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>

#	Hazard	Mitigation Strategy	City of Emily Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
28	Flooding	Local Planning & Regulations	Encourage municipalities to require the development of new storm sewer infrastructure capable of handling a ten to twenty year rain event in areas of new development (i.e., new subdivisions) and adoption of a Stormwater ordinance regulating onsite stormwater management for new construction.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, <b>Emily</b> , Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and SWCD in coordination with local City Admin and Public Works.	Facilitate adoption of stormwater ordinance through a series of workshops.	County/City Budgets, SWCD Grants i.e Serpent Lake Project
29	Flooding	Structure and Infrastructure Projects	Develop stormwater management plans and improve stormwater management systems at the county and city level to address future high-impact rain events throughout the County.	Ongoing	New	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, <b>Emily</b> , Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., CWC Highway Dept., CWC GIS, CWC SWCD and local city public works depts., MN DNR, MPCA	The County will seek outside grant funding where possible to fund eligible stormwater improvement projects, such as through MPCA and FEMA HMA funding for flood reduction projects. Local jurisdictions will be responsible for development of local stormwater management plans and identification of priority projects.	County/SWCD budgets, Possible MPCA/PFA grant funding, <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>

#	Hazard	Mitigation Strategy	City of Emily Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
30	Flooding	Local Planning & Regulations	Ensure that wellhead protection plans are in place to address flooding that may lead to contaminated drinking water.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, <b>Emily</b> , Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., MN Dept of Health and local city and township public works depts.	Cities work directly with the Minnesota Department of Health on the development or update of wellhead protection plans to ensure they meet State requirements.	MDH Source Water Protection grant funding for wellhead improvement projects
31	Flooding	Local Planning & Regulations	Adopt the 2017 updated floodplain maps for Crow Wing County and ensure the update of local ordinances.	New	High	2017	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, <b>Emily</b> , Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Crow Wing County Land Services Dept. and City Admin	Crow Wing County has new maps that will go effective 8/15/2017. Communities participating in the NFIP will update their ordinances and adopt the new maps (and make other updates).  <i>City Comment: The City's Planning and Zoning Commission will be working to establish the new floodplain ordinance.</i>	County/City Budgets
33	Flooding	Local Planning & Regulations / Structure & Infrastructure Systems	Keep culverts and drainage ditches free of debris to mitigate against over-the-road flooding.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, <b>Emily</b> , Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept., CWC Land Services Dept. in coordination with City Public Works	The maintenance of culverts and drainage ditches is done through our CWC Highway Department and City Public Works. We also have Ditch 13 that flows from Lake Edward to North Long Lake. Local municipalities' public works work to monitor and address any problem areas for drainage at the local level.	County/City Budgets



#	Hazard	Mitigation Strategy	City of Emily Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
34	Flooding	Local Planning & Regulations	Restrict building in floodplain areas that consistently flood.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, <b>Emily</b> , Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and Local City Admin.	This action is the responsibility of the CWC Land Services Department and local city ordinances as per NFIP requirements.	County/City Budgets
35	Flooding	Local Planning & Regulations	Identify properties that experience damage from repetitive flooding, and work with property owners to buy out structures and turn into open-space.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, <b>Emily</b> , Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., and local City Admin	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.	County/City Funding, <b>Possible FEMA grant funding for Property Acquisition</b>
36	Flooding	Local Planning & Regulations	Encourage individual landowners who live within floodplain areas to participate in the FEMA National Flood Insurance Program (NFIP).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, <b>Emily</b> , Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., MN DNR, local City Admin, and FEMA	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Emily Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
40	Flooding	Education & Awareness Programs	Provide education and technical assistance to property owners on the application of green infrastructure methods to reduce localized flooding due to high rain events.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, <b>Emily</b> , Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and CWC SWCD	This task is done through our CWC Land Services Dept. as well as the SWCD. Possible green-infrastructure projects will be considered for eligible FEMA HMA grant funding.	County Budgets, <b>Possible FEMA HMA funding for 5% Initiative Projects</b>
50	Drought	Local Planning & Regulations / Education & Awareness Programs	Promote water conservation measures and fire safety awareness to residents during periods of drought. Enforce water conservation ordinances when needed (i.e., that prohibit watering lawns during drought).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, <b>Emily</b> , Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in collaboration with SWCD and local cities	Promoting water conservation during periods of drought is a standing effort of the County and local governments, as well as the USDA and FSA Office.	County/City Budgets

Table G - 9. Mitigation Actions Identified for Implementation by the City of Fifty Lakes (2017-2021) (From Crow Wing County Master Mitigation Action Chart)

#	Hazard	Mitigation Strategy	City of Fifty Lakes Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
1	All-Hazards	Education & Awareness Programs	Work to ensure that all Crow Wing County residents are aware of and sign-up for the County's Emergency Warning System (EWS).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, <b>Fifty Lakes</b> , Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CW Emergency Management in coordination with local city government	The CWC Emergency Management Program regularly promotes sign-up for the EWS system via the County EM Facebook Page and during in-person events. Cities also work to promote sign-up by local residents by sharing information on city websites and announcements at public meetings.  <i>City Comment: Press releases may also be sent to the local news outlets regarding the County's EWS.</i>	County/City Budgets
5	All-Hazards	Education & Awareness Programs	Promote education & awareness of severe weather and personal emergency preparedness for individuals, families, and businesses.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, <b>Fifty Lakes</b> , Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in coordination with city EM's.	CWC Emergency Management participates annually in the National Weather Service's spring and winter Severe Weather Awareness Weeks in April and November. We provide posters, brochures, and material on severe storms to the media and to property owners. Social media is also used to distribute the information. Local cities are encouraged to participate and share this information through their own local channels such as Facebook and city websites.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Fifty Lakes Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
9	Severe Winter Storms	Local Planning & Regulations	Continue providing snow removal, salting, and sanding to minimize the impacts of snow accumulations on motorists.	Ongoing	High	2017 - 2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, <b>Fifty Lakes</b> , Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept. in coordination with local cities	This is a standing effort of the CWC Highway Dept. and local City Public Works.	County/City Budgets
10	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Identify critical facilities or infrastructure that do not have backup power in the event of a major power outage resulting from severe winter or summer storms. <i>(Critical facilities may include police/fire departments, EOC, health care facilities, water &amp; sewer treatment facilities, and other facilities deemed as critical, i.e. public schools and sheltering facilities).</i>	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, <b>Fifty Lakes</b> , Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, City Admin & Public Works	Not all county & city government buildings and schools have backup power generators to ensure energy in the event of a severe power outage. CWC and each jurisdiction will work to identify their respective critical facilities that should have backup power.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Fifty Lakes Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
11	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Purchase and install generator hook-ups and encourage local generator purchases for identified critical facilities that require backup power.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, <b>Fifty Lakes</b> , Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Emergency Management, City Admin & Public Works	CWC, local city governments, and schools will evaluate feasibility to purchase and install generators for key facilities, and will do so as funding allows.	County/City Budgets, <b>Possible FEMA HMA 5% Initiative Funding for Generators</b>
12	Severe Winter & Summer Storms	Structure and Infrastructure Projects	Work with rural electrical and municipal coops to identify and address mitigation measures for above ground power lines that are susceptible to damage from severe winter or summer storms in order to reduce potential power outages.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, <b>Fifty Lakes</b> , Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Emily Cooperative Telephone Company, Crow Wing Power Cooperative, Mille Lacs Energy Cooperative, Brainerd Public Utilities, and Consolidated Telephone Company (CTC) in cooperation with local cities	Loss of power due to extreme storm events in the County creates long outage times and costly repairs. There has been overhead power disruption in hard-hit areas of trees. There is a wind "tunnel" from Gull Lake in the Round Lake Area of CR 115. The County and cities will work with local utilities as needed. BCA studies will be conducted for potential project areas to see where underground wires are possible.	Rural or Municipal Electric Coop Funding, <b>Possible FEMA HMA funding for Infrastructure Retrofit</b>
13	Severe Winter & Summer Storms	Local Planning & Regulations	Promote inspection and trimming of trees that may pose risk to falling on power lines during severe storm events.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, <b>Fifty Lakes</b> , Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Same as above.	Tree management in the right-of-way of roads is addressed by our CWC Highway Dept. and/or City Public Works and Utility Companies.  <i>City Comment: The Fifty Lakes Maintenance Department will continue to closely monitor potential road hazards on a routine basis.</i>	County/City Budgets

#	Hazard	Mitigation Strategy	City of Fifty Lakes Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
14	Severe Winter & Summer Storms	Education & Awareness Programs	Promote the use of NOAA weather radios as a key communications resource for residents, businesses, and facilities that house vulnerable populations (i.e., nursing homes, group homes, senior centers, and day care facilities).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, <b>Fifty Lakes</b> , Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management and local city EM's	This is an Ongoing effort of emergency management programs at the county and local city level. We promote weather radios through PSA's, County Fair, National Night Out, NWS Severe Weather Awareness Weeks and through social media. CWC also continues to work with local vendors and State programs for rebates on NOAA Weather radios.	County/City Budgets
15	Severe Summer Storms	Mitigation Preparedness & Response Support	Provide/participate in the National Weather Service's SKYWARN "Storm Spotter" training in various parts of the County for first responders and community residents.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, <b>Fifty Lakes</b> , Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in collaboration with local cities and NWS	Each year CWC Emergency Management Program works with the National Weather Service to provide this training to local fire departments and local community volunteers. We will continue to encourage more volunteers to become active in the severe storm spotters network. Local cities will continue to remain active in this program.	County Budget and NWS funding to deliver program

#	Hazard	Mitigation Strategy	City of Fifty Lakes Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
16	Severe Summer Storms	Structure and Infrastructure Projects	Identify areas where vulnerable populations are susceptible to tornadoes or extreme wind events (i.e. schools, campgrounds, or mobile home parks) and evaluate for construction or retrofit of safe rooms or storm shelters.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, <b>Fifty Lakes</b> , Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	CWC Emergency Management continues to work with local cities that have experienced severe wind damage and recreational facilities on development of storm shelter areas. We are aware that there are two mobile home parks and the Crow Wing County Fairgrounds have been identified for having a need of a storm shelter or Safe Room.  <i>City Comment: The City would like to explore storm shelter options for the manufactured home park and the campground.</i>	County/City Budgets
17	Severe Summer Storms	Structure and Infrastructure Projects	Implement construction or retrofit projects for safe rooms or storm shelters in identified vulnerable locations.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, <b>Fifty Lakes</b> , Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	Any community safe room projects that the County is involved in will be part of the CWC Emergency Management program. FEMA grant funding may be sought to support an eligible safe room project.	County/City Budgets, <b>Possible FEMA HMA funding for Safe Room Construction</b>

#	Hazard	Mitigation Strategy	City of Fifty Lakes Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
27	Flooding	Local Planning & Regulations / Structure and Infrastructure Projects	Identify and improve potential and historical areas of road washout, and replace aging or failing bridges and culverts that are inadequate in order to reduce future flood damages.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, <b>Fifty Lakes</b> , Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept, CW Land Services Dept., and local city and township public works	Crow Wing County and local jurisdictions maintain an annual inventory of problem areas due to flooding and plan for projects based on priority and available funding. CW County Highway Dept. has identified flood prone problematic areas on CR 105, CR 128, CSAH 11, CR 132, CR 106 & CR 144. In addition there are bridges that are scour sensitive and pose a hazard risk during high water. CR 128 has a shoreline improvement plan to reduce the risk of water over the road and erosion of the roadbed during high water.	County, and Township Budgets, <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>
28	Flooding	Local Planning & Regulations	Encourage municipalities to require the development of new storm sewer infrastructure capable of handling a ten to twenty year rain event in areas of new development (i.e., new subdivisions) and adoption of a Stormwater ordinance regulating onsite stormwater management for new construction.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, <b>Fifty Lakes</b> , Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and SWCD in coordination with local City Admin and Public Works.	Facilitate adoption of stormwater ordinance through a series of workshops.  <i>City Comment: The City has a Comprehensive Plan designed to plan for the future physical growth of the City and appropriate land uses. The document was adopted in 1998 and is in the process of being reviewed. Considerations for flooding will be included in the Comp Plan update.</i>	County/City Budgets, SWCD Grants i.e Serpent Lake Project



#	Hazard	Mitigation Strategy	City of Fifty Lakes Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
29	Flooding	Structure and Infrastructure Projects	Develop stormwater management plans and improve stormwater management systems at the county and city level to address future high-impact rain events throughout the County.	Ongoing	New	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, <b>Fifty Lakes</b> , Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., CWC Highway Dept., CWC GIS, CWC SWCD and local city public works depts., MN DNR, MPCA	The County will seek outside grant funding where possible to fund eligible stormwater improvement projects, such as through MPCA and FEMA HMA funding for flood reduction projects. Local jurisdictions will be responsible for development of local stormwater management plans and identification of priority projects.  <i>City Comment: The city will continue to closely review stormwater management plans for new development in the city.</i>	County/SWCD budgets, Possible MPCA/PFA grant funding, <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>
30	Flooding	Local Planning & Regulations	Ensure that wellhead protection plans are in place to address flooding that may lead to contaminated drinking water.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, <b>Fifty Lakes</b> , Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., MN Dept of Health and local city and township public works depts.	Cities work directly with the Minnesota Department of Health on the development or update of wellhead protection plans to ensure they meet State requirements.	MDH Source Water Protection grant funding for wellhead improvement projects

#	Hazard	Mitigation Strategy	City of Fifty Lakes Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
31	Flooding	Local Planning & Regulations	Adopt the 2017 updated floodplain maps for Crow Wing County and ensure the update of local ordinances.	New	High	2017	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, <b>Fifty Lakes</b> , Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Crow Wing County Land Services Dept. and City Admin	<p>Crow Wing County has new maps that will go effective 8/15/2017. Communities participating in the NFIP will update their ordinances and adopt the new maps (and make other updates).</p> <p><i>City Comment: The City has reviewed and is working on adopting the model DNR floodplain ordinance.</i></p>	County/City Budgets
33	Flooding	Local Planning & Regulations / Structure & Infrastructure Systems	Keep culverts and drainage ditches free of debris to mitigate against over-the-road flooding.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, <b>Fifty Lakes</b> , Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept., CWC Land Services Dept. in coordination with City Public Works	<p>The maintenance of culverts and drainage ditches is done through our CWC Highway Department and City Public Works. We also have Ditch 13 that flows from Lake Edward to North Long Lake. Local municipalities' public works work to monitor and address any problem areas for drainage at the local level.</p> <p><i>City Comment: The City has a public works supervisor that addresses road maintenance issues for flooding (culverts, repetitive flooding).</i></p>	County/City Budgets

#	Hazard	Mitigation Strategy	City of Fifty Lakes Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
34	Flooding	Local Planning & Regulations	Restrict building in floodplain areas that consistently flood.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, <b>Fifty Lakes</b> , Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and Local City Admin.	This action is the responsibility of the CWC Land Services Department and local city ordinances as per NFIP requirements.  <i>City Comment: The City addresses proposed development in floodplain areas by reference to Statute in our current zoning ordinance. The City has reviewed and is working on adopting the model DNR floodplain ordinance.</i>	County/City Budgets
35	Flooding	Local Planning & Regulations	Identify properties that experience damage from repetitive flooding, and work with property owners to buy out structures and turn into open-space.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, <b>Fifty Lakes</b> , Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., and local City Admin	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.  <i>City Comment: There are no known properties in the Fifty Lakes that experience repetitive flooding.</i>	County/City Funding, <b>Possible FEMA grant funding for Property Acquisition</b>
36	Flooding	Local Planning & Regulations	Encourage individual landowners who live within floodplain areas to participate in the FEMA National Flood Insurance Program (NFIP).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, <b>Fifty Lakes</b> , Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., MN DNR, local City Admin, and FEMA	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Fifty Lakes Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
40	Flooding	Education & Awareness Programs	Provide education and technical assistance to property owners on the application of green infrastructure methods to reduce localized flooding due to high rain events.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, <b>Fifty Lakes</b> , Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and CWC SWCD	This task is done through our CWC Land Services Dept. as well as the SWCD. Possible green-infrastructure projects will be considered for eligible for FEMA HMA grant funding.	County Budgets, <b>Possible FEMA HMA funding for 5% Initiative Projects</b>
50	Drought	Local Planning & Regulations / Education & Awareness Programs	Promote water conservation measures and fire safety awareness to residents during periods of drought. Enforce water conservation ordinances when needed (i.e., that prohibit watering lawns during drought).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, <b>Fifty Lakes</b> , Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in collaboration with SWCD and local cities	Promoting water conservation during periods of drought is a standing effort of the County and local governments, as well as the USDA and FSA Office.	County/City Budgets

Table G - 10. Mitigation Actions Identified for Implementation by the City of Fort Ripley (2017-2021) (From Crow Wing County Master Mitigation Action Chart)

#	Hazard	Mitigation Strategy	City of Fort Ripley Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
1	All-Hazards	Education & Awareness Programs	Work to ensure that all Crow Wing County residents are aware of and sign-up for the County's Emergency Warning System (EWS).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, <b>Fort Ripley</b> , Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CW Emergency Management in coordination with local city government	The CWC Emergency Management Program regularly promotes sign-up for the EWS system via the County EM Facebook Page and during in-person events. Cities also work to promote sign-up by local residents by sharing information on city websites and announcements at public meetings.	County/City Budgets
5	All-Hazards	Education & Awareness Programs	Promote education & awareness of severe weather and personal emergency preparedness for individuals, families, and businesses.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, <b>Fort Ripley</b> , Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in coordination with city EM's.	CWC Emergency Management participates annually in the National Weather Service's spring and winter Severe Weather Awareness Weeks in April and November. We provide posters, brochures, and material on severe storms to the media and to property owners. Social media is also used to distribute the information. Local cities are encouraged to participate and share this information through their own local channels such as Facebook and city websites.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Fort Ripley Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
9	Severe Winter Storms	Local Planning & Regulations	Continue providing snow removal, salting, and sanding to minimize the impacts of snow accumulations on motorists.	Ongoing	High	2017 - 2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, <b>Fort Ripley</b> , Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept. in coordination with local cities	This is a standing effort of the CWC Highway Dept. and local City Public Works.	County/City Budgets
10	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Identify critical facilities or infrastructure that do not have backup power in the event of a major power outage resulting from severe winter or summer storms. <i>(Critical facilities may include police/fire departments, EOC, health care facilities, water &amp; sewer treatment facilities, and other facilities deemed as critical, i.e. public schools and sheltering facilities).</i>	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, <b>Fort Ripley</b> , Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, City Admin & Public Works	Not all county & city government buildings and schools have backup power generators to ensure energy in the event of a severe power outage. CWC and each jurisdiction will work to identify their respective critical facilities that should have backup power.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Fort Ripley Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
11	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Purchase and install generator hook-ups and encourage local generator purchases for identified critical facilities that require backup power.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, <b>Fort Ripley</b> , Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Emergency Management, City Admin & Public Works	CWC, local city governments, and schools will evaluate feasibility to purchase and install generators for key facilities, and will do so as funding allows.	County/City Budgets, <b>Possible FEMA HMA 5% Initiative Funding for Generators</b>
12	Severe Winter & Summer Storms	Structure and Infrastructure Projects	Work with rural electrical and municipal coops to identify and address mitigation measures for above ground power lines that are susceptible to damage from severe winter or summer storms in order to reduce potential power outages.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, <b>Fort Ripley</b> , Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Emily Cooperative Telephone Company, Crow Wing Power Cooperative, Mille Lacs Energy Cooperative, Brainerd Public Utilities, and Consolidated Telephone Company (CTC) in cooperation with local cities	Loss of power due to extreme storm events in the County creates long outage times and costly repairs. There has been overhead power disruption in hard-hit areas of trees. There is a wind "tunnel" from Gull Lake in the Round Lake Area of CR 115. The County and cities will work with local utilities as needed. BCA studies will be conducted for potential project areas to see where underground wires are possible.	Rural or Municipal Electric Coop Funding, <b>Possible FEMA HMA funding for Infrastructure Retrofit</b>
13	Severe Winter & Summer Storms	Local Planning & Regulations	Promote inspection and trimming of trees that may pose risk to falling on power lines during severe storm events.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, <b>Fort Ripley</b> , Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Same as above.	Tree management in the right-of-way of roads is addressed by our CWC Highway Dept. and/or City Public Works and Utility Companies.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Fort Ripley Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
14	Severe Winter & Summer Storms	Education & Awareness Programs	Promote the use of NOAA weather radios as a key communications resource for residents, businesses, and facilities that house vulnerable populations (i.e., nursing homes, group homes, senior centers, and day care facilities).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, <b>Fort Ripley</b> , Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management and local city EM's	This is an ongoing effort of emergency management programs at the county and local city level. We promote weather radios through PSA's, County Fair, National Night Out, NWS Severe Weather Awareness Weeks and through social media. CWC also continues to work with local vendors and State programs for rebates on NOAA Weather radios.	County/City Budgets
15	Severe Summer Storms	Mitigation Preparedness & Response Support	Provide/participate in the National Weather Service's SKYWARN "Storm Spotter" training in various parts of the County for first responders and community residents.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, <b>Fort Ripley</b> , Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in collaboration with local cities and NWS	Each year CWC Emergency Management Program works with the National Weather Service to provide this training to local fire departments and local community volunteers. We will continue to encourage more volunteers to become active in the severe storm spotters network. Local cities will continue to remain active in this program.	County Budget and NWS funding to deliver program



#	Hazard	Mitigation Strategy	City of Fort Ripley Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
16	Severe Summer Storms	Structure and Infrastructure Projects	Identify areas where vulnerable populations are susceptible to tornadoes or extreme wind events (i.e. schools, campgrounds, or mobile home parks) and evaluate for construction or retrofit of safe rooms or storm shelters.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, <b>Fort Ripley</b> , Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	CWC Emergency Management continues to work with local cities that have experienced severe wind damage and recreational facilities on development of storm shelter areas. We are aware that there are two mobile home parks and the Crow Wing County Fairgrounds have been identified for having a need of a storm shelter or Safe Room.	County/City Budgets
17	Severe Summer Storms	Structure and Infrastructure Projects	Implement construction or retrofit projects for safe rooms or storm shelters in identified vulnerable locations.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, <b>Fort Ripley</b> , Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	Any community safe room projects that the County is involved in will be part of the CWC Emergency Management program. FEMA grant funding may be sought to support an eligible safe room project.	County/City Budgets, <b>Possible FEMA HMA funding for Safe Room Construction</b>

#	Hazard	Mitigation Strategy	City of Fort Ripley Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
27	Flooding	Local Planning & Regulations / Structure and Infrastructure Projects	Identify and improve potential and historical areas of road washout, and replace aging or failing bridges and culverts that are inadequate in order to reduce future flood damages.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, <b>Fort Ripley</b> , Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept, CW Land Services Dept., and local city and township public works	Crow Wing County and local jurisdictions maintain an annual inventory of problem areas due to flooding and plan for projects based on priority and available funding. CW County Highway Dept. has identified flood prone problematic areas on CR 105, CR 128, CSAH 11, CR 132, CR 106 & CR 144. In addition there are bridges that are scour sensitive and pose a hazard risk during high water. CR 128 has a shoreline improvement plan to reduce the risk of water over the road and erosion of the roadbed during high water.	County, and Township Budgets, <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>
28	Flooding	Local Planning & Regulations	Encourage municipalities to require the development of new storm sewer infrastructure capable of handling a ten to twenty year rain event in areas of new development (i.e., new subdivisions) and adoption of a Stormwater ordinance regulating onsite stormwater management for new construction.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, <b>Fort Ripley</b> , Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and SWCD in coordination with local City Admin and Public Works.	Facilitate adoption of stormwater ordinance through a series of workshops.	County/City Budgets, SWCD Grants i.e Serpent Lake Project

#	Hazard	Mitigation Strategy	City of Fort Ripley Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
29	Flooding	Structure and Infrastructure Projects	Develop stormwater management plans and improve stormwater management systems at the county and city level to address future high-impact rain events throughout the County.	Ongoing	New	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, <b>Fort Ripley</b> , Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., CWC Highway Dept., CWC GIS, CWC SWCD and local city public works depts., MN DNR, MPCA	The County will seek outside grant funding where possible to fund eligible stormwater improvement projects, such as through MPCA and FEMA HMA funding for flood reduction projects. Local jurisdictions will be responsible for development of local stormwater management plans and identification of priority projects.	County/SWCD budgets, Possible MPCA/PFA grant funding, <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>
30	Flooding	Local Planning & Regulations	Ensure that wellhead protection plans are in place to address flooding that may lead to contaminated drinking water.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, <b>Fort Ripley</b> , Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., MN Dept of Health and local city and township public works depts.	Cities work directly with the Minnesota Department of Health on the development or update of wellhead protection plans to ensure they meet State requirements.	MDH Source Water Protection grant funding for wellhead improvement projects
31	Flooding	Local Planning & Regulations	Adopt the 2017 updated floodplain maps for Crow Wing County and ensure the update of local ordinances.	New	High	2017	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, <b>Fort Ripley</b> , Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Crow Wing County Land Services Dept. and City Admin	Crow Wing County has new maps that will go effective 8/15/2017. Communities participating in the NFIP will update their ordinances and adopt the new maps (and make other updates).	County/City Budgets

#	Hazard	Mitigation Strategy	City of Fort Ripley Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
33	Flooding	Local Planning & Regulations / Structure & Infrastructure Systems	Keep culverts and drainage ditches free of debris to mitigate against over-the-road flooding.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, <b>Fort Ripley</b> , Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept., CWC Land Services Dept. in coordination with City Public Works	The maintenance of culverts and drainage ditches is done through our CWC Highway Department and City Public Works. We also have Ditch 13 that flows from Lake Edward to North Long Lake. Local municipalities' public works work to monitor and address any problem areas for drainage at the local level.	County/City Budgets
34	Flooding	Local Planning & Regulations	Restrict building in floodplain areas that consistently flood.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, <b>Fort Ripley</b> , Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and Local City Admin.	This action is the responsibility of the CWC Land Services Department and local city ordinances as per NFIP requirements.	County/City Budgets
35	Flooding	Local Planning & Regulations	Identify properties that experience damage from repetitive flooding, and work with property owners to buy out structures and turn into open-space.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, <b>Fort Ripley</b> , Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., and local City Admin	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.	County/City Funding, <b>Possible FEMA grant funding for Property Acquisition</b>

#	Hazard	Mitigation Strategy	City of Fort Ripley Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
36	Flooding	Local Planning & Regulations	Encourage individual landowners who live within floodplain areas to participate in the FEMA National Flood Insurance Program (NFIP).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, <b>Fort Ripley</b> , Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., MN DNR, local City Admin, and FEMA	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.	County/City Budgets
40	Flooding	Education & Awareness Programs	Provide education and technical assistance to property owners on the application of green infrastructure methods to reduce localized flooding due to high rain events.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, <b>Fort Ripley</b> , Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and CWC SWCD	This task is done through our CWC Land Services Dept. as well as the SWCD. Possible green-infrastructure projects will be considered for eligible for FEMA HMA grant funding.	County Budgets, <b>Possible FEMA HMA funding for 5% Initiative Projects</b>
50	Drought	Local Planning & Regulations / Education & Awareness Programs	Promote water conservation measures and fire safety awareness to residents during periods of drought. Enforce water conservation ordinances when needed (i.e., that prohibit watering lawns during drought).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, <b>Fort Ripley</b> , Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in collaboration with SWCD and local cities	Promoting water conservation during periods of drought is a standing effort of the County and local governments, as well as the USDA and FSA Office.	County/City Budgets

Table G - 11. Mitigation Actions Identified for Implementation by the City of Garrison (2017-2021) (From Crow Wing County Master Mitigation Action Chart)

#	Hazard	Mitigation Strategy	City of Garrison Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
1	All-Hazards	Education & Awareness Programs	Work to ensure that all Crow Wing County residents are aware of and sign-up for the County's Emergency Warning System (EWS).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, <b>Garrison</b> , Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CW Emergency Management in coordination with local city government	The CWC Emergency Management Program regularly promotes sign-up for the EWS system via the County EM Facebook Page and during in-person events. Cities also work to promote sign-up by local residents by sharing information on city websites and announcements at public meetings.	County/City Budgets
5	All-Hazards	Education & Awareness Programs	Promote education & awareness of severe weather and personal emergency preparedness for individuals, families, and businesses.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, <b>Garrison</b> , Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in coordination with city EM's.	CWC Emergency Management participates annually in the National Weather Service's spring and winter Severe Weather Awareness Weeks in April and November. We provide posters, brochures, and material on severe storms to the media and to property owners. Social media is also used to distribute the information. Local cities are encouraged to participate and share this information through their own local channels such as Facebook and city websites.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Garrison Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
9	Severe Winter Storms	Local Planning & Regulations	Continue providing snow removal, salting, and sanding to minimize the impacts of snow accumulations on motorists.	Ongoing	High	2017 - 2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, <b>Garrison</b> , Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept. in coordination with local cities	This is a standing effort of the CWC Highway Dept. and local City Public Works.	County/City Budgets
10	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Identify critical facilities or infrastructure that do not have backup power in the event of a major power outage resulting from severe winter or summer storms. <i>(Critical facilities may include police/fire departments, EOC, health care facilities, water &amp; sewer treatment facilities, and other facilities deemed as critical, i.e. public schools and sheltering facilities).</i>	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, <b>Garrison</b> , Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, City Admin & Public Works	Not all county & city government buildings and schools have backup power generators to ensure energy in the event of a severe power outage. CWC and each jurisdiction will work to identify their respective critical facilities that should have backup power.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Garrison Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
11	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Purchase and install generator hook-ups and encourage local generator purchases for identified critical facilities that require backup power.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, <b>Garrison</b> , Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Emergency Management, City Admin & Public Works	CWC, local city governments, and schools will evaluate feasibility to purchase and install generators for key facilities, and will do so as funding allows.	County/City Budgets, <b>Possible FEMA HMA 5% Initiative Funding for Generators</b>
12	Severe Winter & Summer Storms	Structure and Infrastructure Projects	Work with rural electrical and municipal coops to identify and address mitigation measures for above ground power lines that are susceptible to damage from severe winter or summer storms in order to reduce potential power outages.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, <b>Garrison</b> , Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Emily Cooperative Telephone Company, Crow Wing Power Cooperative, Mille Lacs Energy Cooperative, Brainerd Public Utilities, and Consolidated Telephone Company (CTC) in cooperation with local cities	Loss of power due to extreme storm events in the County creates long outage times and costly repairs. There has been overhead power disruption in hard-hit areas of trees. There is a wind "tunnel" from Gull Lake in the Round Lake Area of CR 115. The County and cities will work with local utilities as needed. BCA studies will be conducted for potential project areas to see where underground wires are possible.	Rural or Municipal Electric Coop Funding, <b>Possible FEMA HMA funding for Infrastructure Retrofit</b>
13	Severe Winter & Summer Storms	Local Planning & Regulations	Promote inspection and trimming of trees that may pose risk to falling on power lines during severe storm events.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, <b>Garrison</b> , Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Same as above.	Tree management in the right-of-way of roads is addressed by our CWC Highway Dept. and/or City Public Works and Utility Companies.	County/City Budgets



#	Hazard	Mitigation Strategy	City of Garrison Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
14	Severe Winter & Summer Storms	Education & Awareness Programs	Promote the use of NOAA weather radios as a key communications resource for residents, businesses, and facilities that house vulnerable populations (i.e., nursing homes, group homes, senior centers, and day care facilities).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, <b>Garrison</b> , Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management and local city EM's	This is an ongoing effort of emergency management programs at the county and local city level. We promote weather radios through PSA's, County Fair, National Night Out, NWS Severe Weather Awareness Weeks and through social media. CWC also continues to work with local vendors and State programs for rebates on NOAA Weather radios.	County/City Budgets
15	Severe Summer Storms	Mitigation Preparedness & Response Support	Provide/participate in the National Weather Service's SKYWARN "Storm Spotter" training in various parts of the County for first responders and community residents.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, <b>Garrison</b> , Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in collaboration with local cities and NWS	Each year CWC Emergency Management Program works with the National Weather Service to provide this training to local fire departments and local community volunteers. We will continue to encourage more volunteers to become active in the severe storm spotters network. Local cities will continue to remain active in this program.	County Budget and NWS funding to deliver program

#	Hazard	Mitigation Strategy	City of Garrison Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
16	Severe Summer Storms	Structure and Infrastructure Projects	Identify areas where vulnerable populations are susceptible to tornadoes or extreme wind events (i.e. schools, campgrounds, or mobile home parks) and evaluate for construction or retrofit of safe rooms or storm shelters.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, <b>Garrison</b> , Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	CWC Emergency Management continues to work with local cities that have experienced severe wind damage and recreational facilities on development of storm shelter areas. We are aware that there are two mobile home parks and the Crow Wing County Fairgrounds have been identified for having a need of a storm shelter or Safe Room.  <i>City Comment: The City had explored building a safe room/fire department but were put on a waiting list by FEMA.</i>	County/City Budgets
17	Severe Summer Storms	Structure and Infrastructure Projects	Implement construction or retrofit projects for safe rooms or storm shelters in identified vulnerable locations.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, <b>Garrison</b> , Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	Any community safe room projects that the County is involved in will be part of the CWC Emergency Management program. FEMA grant funding may be sought to support an eligible safe room project.	County/City Budgets, <b>Possible FEMA HMA funding for Safe Room Construction</b>

#	Hazard	Mitigation Strategy	City of Garrison Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
27	Flooding	Local Planning & Regulations / Structure and Infrastructure Projects	Identify and improve potential and historical areas of road washout, and replace aging or failing bridges and culverts that are inadequate in order to reduce future flood damages.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, <b>Garrison</b> , Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept, CW Land Services Dept., and local city and township public works	Crow Wing County and local jurisdictions maintain an annual inventory of problem areas due to flooding and plan for projects based on priority and available funding. CW County Highway Dept. has identified flood prone problematic areas on CR 105, CR 128, CSAH 11, CR 132, CR 106 & CR 144. In addition there are bridges that are scour sensitive and pose a hazard risk during high water. CR 128 has a shoreline improvement plan to reduce the risk of water over the road and erosion of the roadbed during high water.	County, and Township Budgets, <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>
28	Flooding	Local Planning & Regulations	Encourage municipalities to require the development of new storm sewer infrastructure capable of handling a ten to twenty year rain event in areas of new development (i.e., new subdivisions) and adoption of a Stormwater ordinance regulating onsite stormwater management for new construction.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, <b>Garrison</b> , Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and SWCD in coordination with local City Admin and Public Works.	Facilitate adoption of stormwater ordinance through a series of workshops.  <i>City Comment: The City recently adopted a comprehensive plan that is designed to plan for the future physical growth of the city and appropriate land uses.</i>	County/City Budgets, SWCD Grants i.e Serpent Lake Project

#	Hazard	Mitigation Strategy	City of Garrison Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
29	Flooding	Structure and Infrastructure Projects	Develop stormwater management plans and improve stormwater management systems at the county and city level to address future high-impact rain events throughout the County.	Ongoing	New	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, <b>Garrison</b> , Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., CWC Highway Dept., CWC GIS, CWC SWCD and local city public works depts., MN DNR, MPCA	The County will seek outside grant funding where possible to fund eligible stormwater improvement projects, such as through MPCA and FEMA HMA funding for flood reduction projects. Local jurisdictions will be responsible for development of local stormwater management plans and identification of priority projects.	County/SWCD budgets, Possible MPCA/PFA grant funding, <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>
30	Flooding	Local Planning & Regulations	Ensure that wellhead protection plans are in place to address flooding that may lead to contaminated drinking water.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, <b>Garrison</b> , Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., MN Dept of Health and local city and township public works depts.	Cities work directly with the Minnesota Department of Health on the development or update of wellhead protection plans to ensure they meet State requirements.	MDH Source Water Protection grant funding for wellhead improvement projects
31	Flooding	Local Planning & Regulations	Adopt the 2017 updated floodplain maps for Crow Wing County and ensure the update of local ordinances.	New	High	2017	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, <b>Garrison</b> , Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Crow Wing County Land Services Dept. and City Admin	Crow Wing County has new maps that will go effective 8/15/2017. Communities participating in the NFIP will update their ordinances and adopt the new maps (and make other updates).	County/City Budgets

#	Hazard	Mitigation Strategy	City of Garrison Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
33	Flooding	Local Planning & Regulations / Structure & Infrastructure Systems	Keep culverts and drainage ditches free of debris to mitigate against over-the-road flooding.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, <b>Garrison</b> , Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept., CWC Land Services Dept. in coordination with City Public Works	The maintenance of culverts and drainage ditches is done through our CWC Highway Department and City Public Works. We also have Ditch 13 that flows from Lake Edward to North Long Lake. Local municipalities' public works work to monitor and address any problem areas for drainage at the local level.	County/City Budgets
34	Flooding	Local Planning & Regulations	Restrict building in floodplain areas that consistently flood.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, <b>Garrison</b> , Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and Local City Admin.	This action is the responsibility of the CWC Land Services Department and local city ordinances as per NFIP requirements.	County/City Budgets
35	Flooding	Local Planning & Regulations	Identify properties that experience damage from repetitive flooding, and work with property owners to buy out structures and turn into open-space.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, <b>Garrison</b> , Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., and local City Admin	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.	County/City Funding, <b>Possible FEMA grant funding for Property Acquisition</b>

#	Hazard	Mitigation Strategy	City of Garrison Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
36	Flooding	Local Planning & Regulations	Encourage individual landowners who live within floodplain areas to participate in the FEMA National Flood Insurance Program (NFIP).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, <b>Garrison</b> , Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., MN DNR, local City Admin, and FEMA	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.	County/City Budgets
40	Flooding	Education & Awareness Programs	Provide education and technical assistance to property owners on the application of green infrastructure methods to reduce localized flooding due to high rain events.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, <b>Garrison</b> , Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and CWC SWCD	This task is done through our CWC Land Services Dept. as well as the SWCD. Possible green-infrastructure projects will be considered for eligible for FEMA HMA grant funding.	County Budgets, <b>Possible FEMA HMA funding for 5% Initiative Projects</b>
50	Drought	Local Planning & Regulations / Education & Awareness Programs	Promote water conservation measures and fire safety awareness to residents during periods of drought. Enforce water conservation ordinances when needed (i.e., that prohibit watering lawns during drought).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, <b>Garrison</b> , Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in collaboration with SWCD and local cities	Promoting water conservation during periods of drought is a standing effort of the County and local governments, as well as the USDA and FSA Office.	County/City Budgets

Table G - 12. Mitigation Actions Identified for Implementation by the City of Ironton (2017-2021) (From Crow Wing County Master Mitigation Action Chart)

#	Hazard	Mitigation Strategy	City of Ironton Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
1	All-Hazards	Education & Awareness Programs	Work to ensure that all Crow Wing County residents are aware of and sign-up for the County's Emergency Warning System (EWS).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, <b>Ironton</b> , Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CW Emergency Management in coordination with local city government	The CWC Emergency Management Program regularly promotes sign-up for the EWS system via the County EM Facebook Page and during in-person events. Cities also work to promote sign-up by local residents by sharing information on city websites and announcements at public meetings.  <i>City Comment: We can send information through our website and Facebook page.</i>	County/City Budgets
5	All-Hazards	Education & Awareness Programs	Promote education & awareness of severe weather and personal emergency preparedness for individuals, families, and businesses.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, <b>Ironton</b> , Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in coordination with city EM's.	CWC Emergency Management participates annually in the National Weather Service's spring and winter Severe Weather Awareness Weeks in April and November. We provide posters, brochures, and material on severe storms to the media and to property owners. Social media is also used to distribute the information. Local cities are encouraged to participate and share this information through their own local channels such as Facebook and city websites.  <i>City Comment: We can send information through our website and Facebook page. The City would like to train/inform our residents what their options are, what to do, and who to contact during an emergency.</i>	County/City Budgets

#	Hazard	Mitigation Strategy	City of Ironton Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
9	Severe Winter Storms	Local Planning & Regulations	Continue providing snow removal, salting, and sanding to minimize the impacts of snow accumulations on motorists.	Ongoing	High	2017 - 2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, <b>Ironton</b> , Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept. in coordination with local cities	This is a standing effort of the CWC Highway Dept. and local City Public Works.	County/City Budgets
10	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Identify critical facilities or infrastructure that do not have backup power in the event of a major power outage resulting from severe winter or summer storms. <i>(Critical facilities may include police/fire departments, EOC, health care facilities, water &amp; sewer treatment facilities, and other facilities deemed as critical, i.e. public schools and sheltering facilities).</i>	New	High	2017- 2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, <b>Ironton</b> , Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, City Admin & Public Works	Not all county & city government buildings and schools have backup power generators to ensure energy in the event of a severe power outage. CWC and each jurisdiction will work to identify their respective critical facilities that should have backup power.	County/City Budgets



#	Hazard	Mitigation Strategy	City of Ironton Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
11	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Look into purchasing and install generator hook-ups and encourage local generator purchases for identified critical facilities that require backup power.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, <b>Ironton</b> , Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Emergency Management, City Admin & Public Works	CWC, local city governments, and schools will evaluate feasibility to purchase and install generators for key facilities, and will do so as funding allows.	County/City Budgets, <b>Possible FEMA HMA 5% Initiative Funding for Generators</b>
12	Severe Winter & Summer Storms	Structure and Infrastructure Projects	Work with rural electrical and municipal coops to identify and address mitigation measures for above ground power lines that are susceptible to damage from severe winter or summer storms in order to reduce potential power outages.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, <b>Ironton</b> , Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Emily Cooperative Telephone Company, Crow Wing Power Cooperative, Mille Lacs Energy Cooperative, Brainerd Public Utilities, and Consolidated Telephone Company (CTC) in cooperation with local cities	Loss of power due to extreme storm events in the County creates long outage times and costly repairs. There has been overhead power disruption in hard-hit areas of trees. There is a wind "tunnel" from Gull Lake in the Round Lake Area of CR 115. The County and cities will work with local utilities as needed. BCA studies will be conducted for potential project areas to see where underground wires are possible.	Rural or Municipal Electric Coop Funding, <b>Possible FEMA HMA funding for Infrastructure Retrofit</b>
13	Severe Winter & Summer Storms	Local Planning & Regulations	Promote inspection and trimming of trees that may pose risk to falling on power lines during severe storm events.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, <b>Ironton</b> , Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Same as above.	Tree management in the right-of-way of roads is addressed by our CWC Highway Dept. and/or City Public Works and Utility Companies.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Ironton Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
14	Severe Winter & Summer Storms	Education & Awareness Programs	Promote the use of NOAA weather radios as a key communications resource for residents, businesses, and facilities that house vulnerable populations (i.e., nursing homes, group homes, senior centers, and day care facilities).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, <b>Ironton</b> , Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management and local city EM's	This is an Ongoing effort of emergency management programs at the county and local city level. We promote weather radios through PSA's, County Fair, National Night Out, NWS Severe Weather Awareness Weeks and through social media. CWC also continues to work with local vendors and State programs for rebates on NOAA Weather radios.	County/City Budgets
15	Severe Summer Storms	Mitigation Preparedness & Response Support	Provide/participate in the National Weather Service's SKYWARN "Storm Spotter" training in various parts of the County for first responders and community residents.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, <b>Ironton</b> , Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in collaboration with local cities and NWS	Each year CWC Emergency Management Program works with the National Weather Service to provide this training to local fire departments and local community volunteers. We will continue to encourage more volunteers to become active in the severe storm spotters network. Local cities will continue to remain active in this program.	County Budget and NWS funding to deliver program

#	Hazard	Mitigation Strategy	City of Ironton Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
16	Severe Summer Storms	Structure and Infrastructure Projects	Identify areas where vulnerable populations are susceptible to tornadoes or extreme wind events (i.e. schools, campgrounds, or mobile home parks) and evaluate for construction or retrofit of safe rooms or storm shelters.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, <b>Ironton</b> , Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	CWC Emergency Management continues to work with local cities that have experienced severe wind damage and recreational facilities on development of storm shelter areas. We are aware that there are two mobile home parks and the Crow Wing County Fairgrounds have been identified for having a need of a storm shelter or Safe Room.	County/City Budgets
17	Severe Summer Storms	Structure and Infrastructure Projects	Implement construction or retrofit projects for safe rooms or storm shelters in identified vulnerable locations.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, <b>Ironton</b> , Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	Any community safe room projects that the County is involved in will be part of the CWC Emergency Management program. FEMA grant funding may be sought to support an eligible safe room project.	County/City Budgets, <b>Possible FEMA HMA funding for Safe Room Construction</b>

#	Hazard	Mitigation Strategy	City of Ironton Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
27	Flooding	Local Planning & Regulations / Structure and Infrastructure Projects	Identify and improve potential and historical areas of road washout, and replace aging or failing bridges and culverts that are inadequate in order to reduce future flood damages.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, <b>Ironton</b> , Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept, CW Land Services Dept., and local city and township public works	<p>Crow Wing County and local jurisdictions maintain an annual inventory of problem areas due to flooding and plan for projects based on priority and available funding. CW County Highway Dept. has identified flood prone problematic areas on CR 105, CR 128, CSAH 11, CR 132, CR 106 &amp; CR 144. In addition there are bridges that are scour sensitive and pose a hazard risk during high water. CR 128 has a shoreline improvement plan to reduce the risk of water over the road and erosion of the roadbed during high water.</p> <p><i>City Comment: Our City Public Works is constantly maintaining and checking the roads during hazardous events.</i></p>	<p>County, and Township Budgets,  <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b></p>

#	Hazard	Mitigation Strategy	City of Ironton Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
28	Flooding	Local Planning & Regulations	Encourage municipalities to require the development of new storm sewer infrastructure capable of handling a ten to twenty year rain event in areas of new development (i.e., new subdivisions) and adoption of a Stormwater ordinance regulating onsite stormwater management for new construction.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, <b>Ironton</b> , Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and SWCD in coordination with local City Admin and Public Works.	Facilitate adoption of stormwater ordinance through a series of workshops.  <i>City Comment: The City recently adopted a comprehensive plan that is designed to plan for the future physical growth of the city and appropriate land uses.</i>	County/City Budgets, SWCD Grants i.e Serpent Lake Project
29	Flooding	Structure and Infrastructure Projects	Develop stormwater management plans and improve stormwater management systems at the county and city level to address future high-impact rain events throughout the County.	Ongoing	New	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, <b>Ironton</b> , Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., CWC Highway Dept., CWC GIS, CWC SWCD and local city public works depts., MN DNR, MPCA	The County will seek outside grant funding where possible to fund eligible stormwater improvement projects, such as through MPCA and FEMA HMA funding for flood reduction projects. Local jurisdictions will be responsible for development of local stormwater management plans and identification of priority projects.	County/SWCD budgets, Possible MPCA/PFA grant funding, <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>

#	Hazard	Mitigation Strategy	City of Ironton Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
30	Flooding	Local Planning & Regulations	Ensure that wellhead protection plans are in place to address flooding that may lead to contaminated drinking water.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, <b>Ironton</b> , Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., MN Dept of Health and local city and township public works depts.	Cities work directly with the Minnesota Department of Health on the development or update of wellhead protection plans to ensure they meet State requirements.	MDH Source Water Protection grant funding for wellhead improvement projects
31	Flooding	Local Planning & Regulations	Adopt the 2017 updated floodplain maps for Crow Wing County and ensure the update of local ordinances.	New	High	2017	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, <b>Ironton</b> , Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Crow Wing County Land Services Dept. and City Admin	Crow Wing County has new maps that will go effective 8/15/2017. Communities participating in the NFIP will update their ordinances and adopt the new maps (and make other updates).  <i>City Comment: The City is currently discussing the option to join the National Flood Program and the option to approve the Floodplain Ordinance. If we join the flood program, we could possibly to draw from the FEMA Hazard Mitigation Assistance Program for eligible local flood mitigation projects.</i>	County/City Budgets
33	Flooding	Local Planning & Regulations / Structure & Infrastructure Systems	Keep culverts and drainage ditches free of debris to mitigate against over-the-road flooding.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, <b>Ironton</b> , Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept., CWC Land Services Dept. in coordination with City Public Works	The maintenance of culverts and drainage ditches is done through our CWC Highway Department and City Public Works. We also have Ditch 13 that flows from Lake Edward to North Long Lake. Local municipalities' public works work to monitor and address any problem areas for drainage at the local level.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Ironton Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
34	Flooding	Local Planning & Regulations	Restrict building in floodplain areas that consistently flood.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, <b>Ironton</b> , Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and Local City Admin.	This action is the responsibility of the CWC Land Services Department and local city ordinances as per NFIP requirements.	County/City Budgets
35	Flooding	Local Planning & Regulations	Identify properties that experience damage from repetitive flooding, and work with property owners to buy out structures and turn into open-space.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, <b>Ironton</b> , Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., and local City Admin	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.	County/City funding, <b>Possible FEMA grant funding for Property Acquisition</b>
36	Flooding	Local Planning & Regulations	Encourage individual landowners who live within floodplain areas to participate in the FEMA National Flood Insurance Program (NFIP).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, <b>Ironton</b> , Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., MN DNR, local City Admin, and FEMA	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Ironton Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
40	Flooding	Education & Awareness Programs	Provide education and technical assistance to property owners on the application of green infrastructure methods to reduce localized flooding due to high rain events.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, <b>Ironton</b> , Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and CWC SWCD	This task is done through our CWC Land Services Dept. as well as the SWCD. Possible green-infrastructure projects will be considered for eligible for FEMA HMA grant funding.	County Budgets, <b>Possible FEMA HMA funding for 5% Initiative Projects</b>
50	Drought	Local Planning & Regulations / Education & Awareness Programs	Promote water conservation measures and fire safety awareness to residents during periods of drought. Enforce water conservation ordinances when needed (i.e., that prohibit watering lawns during drought).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, <b>Ironton</b> , Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in collaboration with SWCD and local cities	Promoting water conservation during periods of drought is a standing effort of the County and local governments, as well as the USDA and FSA Office.	County/City Budgets



Table G - 13. Mitigation Actions Identified for Implementation by the City of Jenkins (2017-2021) (From Crow Wing County Master Mitigation Action Chart)

#	Hazard	Mitigation Strategy	City of Jenkins Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
1	All-Hazards	Education & Awareness Programs	Work to ensure that all Crow Wing County residents are aware of and sign-up for the County's Emergency Warning System (EWS).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, <b>Jenkins</b> , Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CW Emergency Management in coordination with local city government	The CWC Emergency Management Program regularly promotes sign-up for the EWS system via the County EM Facebook Page and during in-person events. Cities also work to promote sign-up by local residents by sharing information on city websites and announcements at public meetings.	County/City Budgets
5	All-Hazards	Education & Awareness Programs	Promote education & awareness of severe weather and personal emergency preparedness for individuals, families, and businesses.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, <b>Jenkins</b> , Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in coordination with city EM's.	CWC Emergency Management participates annually in the National Weather Service's spring and winter Severe Weather Awareness Weeks in April and November. We provide posters, brochures, and material on severe storms to the media and to property owners. Social media is also used to distribute the information. Local cities are encouraged to participate and share this information through their own local channels such as Facebook and city websites.	County/City Budgets
9	Severe Winter Storms	Local Planning & Regulations	Continue providing snow removal, salting, and sanding to minimize the impacts of snow accumulations on motorists.	Ongoing	High	2017 - 2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, <b>Jenkins</b> , Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept. in coordination with local cities	This is a standing effort of the CWC Highway Dept. and local City Public Works.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Jenkins Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
10	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Identify critical facilities or infrastructure that do not have backup power in the event of a major power outage resulting from severe winter or summer storms. <i>(Critical facilities may include police/fire departments, EOC, health care facilities, water &amp; sewer treatment facilities, and other facilities deemed as critical, i.e. public schools and sheltering facilities).</i>	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, <b>Jenkins</b> , Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, City Admin & Public Works	Not all county & city government buildings and schools have backup power generators to ensure energy in the event of a severe power outage. CWC and each jurisdiction will work to identify their respective critical facilities that should have backup power.	County/City Budgets
11	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Purchase and install generator hook-ups and encourage local generator purchases for identified critical facilities that require backup power.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, <b>Jenkins</b> , Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Emergency Management, City Admin & Public Works	CWC, local city governments, and schools will evaluate feasibility to purchase and install generators for key facilities, and will do so as funding allows.	County/City Budgets, <b>Possible FEMA HMA 5% Initiative Funding for Generators</b>

#	Hazard	Mitigation Strategy	City of Jenkins Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
12	Severe Winter & Summer Storms	Structure and Infrastructure Projects	Work with rural electrical and municipal coops to identify and address mitigation measures for above ground power lines that are susceptible to damage from severe winter or summer storms in order to reduce potential power outages.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, <b>Jenkins</b> , Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Emily Cooperative Telephone Company, Crow Wing Power Cooperative, Mille Lacs Energy Cooperative, Brainerd Public Utilities, and Consolidated Telephone Company (CTC) in cooperation with local cities	Loss of power due to extreme storm events in the County creates long outage times and costly repairs. There has been overhead power disruption in hard-hit areas of trees. There is a wind "tunnel" from Gull Lake in the Round Lake Area of CR 115. The County and cities will work with local utilities as needed. BCA studies will be conducted for potential project areas to see where underground wires are possible.	Rural or Municipal Electric Coop Funding, <b>Possible FEMA HMA funding for Infrastructure Retrofit</b>
13	Severe Winter & Summer Storms	Local Planning & Regulations	Promote inspection and trimming of trees that may pose risk to falling on power lines during severe storm events.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, <b>Jenkins</b> , Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Same as above.	Tree management in the right-of-way of roads is addressed by our CWC Highway Dept. and/or City Public Works and Utility Companies.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Jenkins Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
14	Severe Winter & Summer Storms	Education & Awareness Programs	Promote the use of NOAA weather radios as a key communications resource for residents, businesses, and facilities that house vulnerable populations (i.e., nursing homes, group homes, senior centers, and day care facilities).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, <b>Jenkins</b> , Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management and local city EM's	This is an Ongoing effort of emergency management programs at the county and local city level. We promote weather radios through PSA's, County Fair, National Night Out, NWS Severe Weather Awareness Weeks and through social media. CWC also continues to work with local vendors and State programs for rebates on NOAA Weather radios.	County/City Budgets
15	Severe Summer Storms	Mitigation Preparedness & Response Support	Provide/participate in the National Weather Service's SKYWARN "Storm Spotter" training in various parts of the County for first responders and community residents.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, <b>Jenkins</b> , Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in collaboration with local cities and NWS	Each year CWC Emergency Management Program works with the National Weather Service to provide this training to local fire departments and local community volunteers. We will continue to encourage more volunteers to become active in the severe storm spotters network. Local cities will continue to remain active in this program.	County Budget and NWS funding to deliver program

#	Hazard	Mitigation Strategy	City of Jenkins Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
16	Severe Summer Storms	Structure and Infrastructure Projects	Identify areas where vulnerable populations are susceptible to tornadoes or extreme wind events (i.e. schools, campgrounds, or mobile home parks) and evaluate for construction or retrofit of safe rooms or storm shelters.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, <b>Jenkins</b> , Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	CWC Emergency Management continues to work with local cities that have experienced severe wind damage and recreational facilities on development of storm shelter areas. We are aware that there are two mobile home parks and the Crow Wing County Fairgrounds have been identified for having a need of a storm shelter or Safe Room.	County/City Budgets
17	Severe Summer Storms	Structure and Infrastructure Projects	Implement construction or retrofit projects for safe rooms or storm shelters in identified vulnerable locations.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, <b>Jenkins</b> , Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	Any community safe room projects that the County is involved in will be part of the CWC Emergency Management program. FEMA grant funding may be sought to support an eligible safe room project.	County/City Budgets, <b>Possible FEMA HMA funding for Safe Room Construction</b>

#	Hazard	Mitigation Strategy	City of Jenkins Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
27	Flooding	Local Planning & Regulations / Structure and Infrastructure Projects	Identify and improve potential and historical areas of road washout, and replace aging or failing bridges and culverts that are inadequate in order to reduce future flood damages.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, <b>Jenkins</b> , Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept, CW Land Services Dept., and local city and township public works	Crow Wing County and local jurisdictions maintain an annual inventory of problem areas due to flooding and plan for projects based on priority and available funding. CW County Highway Dept. has identified flood prone problematic areas on CR 105, CR 128, CSAH 11, CR 132, CR 106 & CR 144. In addition there are bridges that are scour sensitive and pose a hazard risk during high water. CR 128 has a shoreline improvement plan to reduce the risk of water over the road and erosion of the roadbed during high water.	County, and Township Budgets, <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>
28	Flooding	Local Planning & Regulations	Encourage municipalities to require the development of new storm sewer infrastructure capable of handling a ten to twenty year rain event in areas of new development (i.e., new subdivisions) and adoption of a Stormwater ordinance regulating onsite stormwater management for new construction.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, <b>Jenkins</b> , Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and SWCD in coordination with local City Admin and Public Works.	Facilitate adoption of stormwater ordinance through a series of workshops.  <i>City Comment: The City recently adopted a comprehensive plan that is designed to plan for the future physical growth of the city and appropriate land uses.</i>	County/City Budgets, SWCD Grants i.e Serpent Lake Project

#	Hazard	Mitigation Strategy	City of Jenkins Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
29	Flooding	Structure and Infrastructure Projects	Develop stormwater management plans and improve stormwater management systems at the county and city level to address future high-impact rain events throughout the County.	Ongoing	New	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, <b>Jenkins</b> , Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., CWC Highway Dept., CWC GIS, CWC SWCD and local city public works depts., MN DNR, MPCA	The County will seek outside grant funding where possible to fund eligible stormwater improvement projects, such as through MPCA and FEMA HMA funding for flood reduction projects. Local jurisdictions will be responsible for development of local stormwater management plans and identification of priority projects.	County/SWCD budgets, Possible MPCA/PFA grant funding, <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>
30	Flooding	Local Planning & Regulations	Ensure that wellhead protection plans are in place to address flooding that may lead to contaminated drinking water.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, <b>Jenkins</b> , Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., MN Dept of Health and local city and township public works depts.	Cities work directly with the Minnesota Department of Health on the development or update of wellhead protection plans to ensure they meet State requirements.	MDH Source Water Protection grant funding for wellhead improvement projects
31	Flooding	Local Planning & Regulations	Adopt the 2017 updated floodplain maps for Crow Wing County and ensure the update of local ordinances.	New	High	2017	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, <b>Jenkins</b> , Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	Crow Wing County Land Services Dept. and City Admin	Crow Wing County has new maps that will go effective 8/15/2017. Communities participating in the NFIP will update their ordinances and adopt the new maps (and make other updates).  <i>City Comment: The City has a Planning and Zoning Commission that has established a floodplain ordinance.</i>	County/City Budgets

#	Hazard	Mitigation Strategy	City of Jenkins Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
33	Flooding	Local Planning & Regulations / Structure & Infrastructure Systems	Keep culverts and drainage ditches free of debris to mitigate against over-the-road flooding.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, <b>Jenkins</b> , Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept., CWC Land Services Dept. in coordination with City Public Works	The maintenance of culverts and drainage ditches is done through our CWC Highway Department and City Public Works. We also have Ditch 13 that flows from Lake Edward to North Long Lake. Local municipalities' public works work to monitor and address any problem areas for drainage at the local level.  <i>City Comment: The City has a City Engineer and a Public Works Director that address road maintenance issues for flooding (culverts, repetitive flooding).</i>	County/City Budgets
34	Flooding	Local Planning & Regulations	Restrict building in floodplain areas that consistently flood.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, <b>Jenkins</b> , Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and Local City Admin.	This action is the responsibility of the CWC Land Services Department and local city ordinances as per NFIP requirements.	County/City Budgets
35	Flooding	Local Planning & Regulations	Identify properties that experience damage from repetitive flooding, and work with property owners to buy out structures and turn into open-space.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, <b>Jenkins</b> , Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., and local City Admin	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.	County/City Funding, <b>Possible FEMA grant funding for Property Acquisition</b>



#	Hazard	Mitigation Strategy	City of Jenkins Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
36	Flooding	Local Planning & Regulations	Encourage individual landowners who live within floodplain areas to participate in the FEMA National Flood Insurance Program (NFIP).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, <b>Jenkins</b> , Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., MN DNR, local City Admin, and FEMA	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.	County/City Budgets
40	Flooding	Education & Awareness Programs	Provide education and technical assistance to property owners on the application of green infrastructure methods to reduce localized flooding due to high rain events.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, <b>Jenkins</b> , Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and CWC SWCD	This task is done through our CWC Land Services Dept. as well as the SWCD. Possible green-infrastructure projects will be considered for eligible for FEMA HMA grant funding.	County Budgets, <b>Possible FEMA HMA funding for 5% Initiative Projects</b>
50	Drought	Local Planning & Regulations / Education & Awareness Programs	Promote water conservation measures and fire safety awareness to residents during periods of drought. Enforce water conservation ordinances when needed (i.e., that prohibit watering lawns during drought).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, <b>Jenkins</b> , Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in collaboration with SWCD and local cities	Promoting water conservation during periods of drought is a standing effort of the County and local governments, as well as the USDA and FSA Office.	County/City Budgets

Table G - 14. Mitigation Actions Identified for Implementation by the City of Manhattan Beach (2017-2021) (From Crow Wing County Master Mitigation Action Chart)

#	Hazard	Mitigation Strategy	City of Manhattan Beach Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
1	All-Hazards	Education & Awareness Programs	Work to ensure that all Crow Wing County residents are aware of and sign-up for the County's Emergency Warning System (EWS).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, <b>Manhattan Beach</b> , Nisswa, Pequot Lakes, Riverton, and Trommald	CW Emergency Management in coordination with local city government	The CWC Emergency Management Program regularly promotes sign-up for the EWS system via the County EM Facebook Page and during in-person events. Cities also work to promote sign-up by local residents by sharing information on city websites and announcements at public meetings.	County/City Budgets
5	All-Hazards	Education & Awareness Programs	Promote education & awareness of severe weather and personal emergency preparedness for individuals, families, and businesses.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, <b>Manhattan Beach</b> , Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in coordination with city EM's.	CWC Emergency Management participates annually in the National Weather Service's spring and winter Severe Weather Awareness Weeks in April and November. We provide posters, brochures, and material on severe storms to the media and to property owners. Social media is also used to distribute the information. Local cities are encouraged to participate and share this information through their own local channels such as Facebook and city websites.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Manhattan Beach Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
9	Severe Winter Storms	Local Planning & Regulations	Continue providing snow removal, salting, and sanding to minimize the impacts of snow accumulations on motorists.	Ongoing	High	2017 - 2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, <b>Manhattan Beach</b> , Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept. in coordination with local cities	This is a standing effort of the CWC Highway Dept. and local City Public Works.	County/City Budgets
10	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Identify critical facilities or infrastructure that do not have backup power in the event of a major power outage resulting from severe winter or summer storms. <i>(Critical facilities may include police/fire departments, EOC, health care facilities, water &amp; sewer treatment facilities, and other facilities deemed as critical, i.e. public schools and sheltering facilities).</i>	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, <b>Manhattan Beach</b> , Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, City Admin & Public Works	Not all county & city government buildings and schools have backup power generators to ensure energy in the event of a severe power outage. CWC and each jurisdiction will work to identify their respective critical facilities that should have backup power.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Manhattan Beach Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
11	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Purchase and install generator hook-ups and encourage local generator purchases for identified critical facilities that require backup power.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, <b>Manhattan Beach</b> , Nisswa, Pequot Lakes, Riverton, and Trommald	Emergency Management, City Admin & Public Works	CWC, local city governments, and schools will evaluate feasibility to purchase and install generators for key facilities, and will do so as funding allows.	County/City Budgets, <b>Possible FEMA HMA 5% Initiative Funding for Generators</b>
12	Severe Winter & Summer Storms	Structure and Infrastructure Projects	Work with rural electrical and municipal coops to identify and address mitigation measures for above ground power lines that are susceptible to damage from severe winter or summer storms in order to reduce potential power outages.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, <b>Manhattan Beach</b> , Nisswa, Pequot Lakes, Riverton, and Trommald	Emily Cooperative Telephone Company, Crow Wing Power Cooperative, Mille Lacs Energy Cooperative, Brainerd Public Utilities, and Consolidated Telephone Company (CTC) in cooperation with local cities	Loss of power due to extreme storm events in the County creates long outage times and costly repairs. There has been overhead power disruption in hard-hit areas of trees. There is a wind "tunnel" from Gull Lake in the Round Lake Area of CR 115. The County and cities will work with local utilities as needed. BCA studies will be conducted for potential project areas to see where underground wires are possible.	Rural or Municipal Electric Coop Funding, <b>Possible FEMA HMA funding for Infrastructure Retrofit</b>

#	Hazard	Mitigation Strategy	City of Manhattan Beach Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
13	Severe Winter & Summer Storms	Local Planning & Regulations	Promote inspection and trimming of trees that may pose risk to falling on power lines during severe storm events.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, <b>Manhattan Beach</b> , Nisswa, Pequot Lakes, Riverton, and Trommald	Same as above.	Tree management in the right-of-way of roads is addressed by our CWC Highway Dept. and/or City Public Works and Utility Companies.	County/City Budgets
14	Severe Winter & Summer Storms	Education & Awareness Programs	Promote the use of NOAA weather radios as a key communications resource for residents, businesses, and facilities that house vulnerable populations (i.e., nursing homes, group homes, senior centers, and day care facilities).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, <b>Manhattan Beach</b> , Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management and local city EM's	This is an ongoing effort of emergency management programs at the county and local city level. We promote weather radios through PSA's, County Fair, National Night Out, NWS Severe Weather Awareness Weeks and through social media. CWC also continues to work with local vendors and State programs for rebates on NOAA Weather radios.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Manhattan Beach Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
15	Severe Summer Storms	Mitigation Preparedness & Response Support	Provide/participate in the National Weather Service's SKYWARN "Storm Spotter" training in various parts of the County for first responders and community residents.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, <b>Manhattan Beach</b> , Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in collaboration with local cities and NWS	Each year CWC Emergency Management Program works with the National Weather Service to provide this training to local fire departments and local community volunteers. We will continue to encourage more volunteers to become active in the severe storm spotters network. Local cities will continue to remain active in this program.	County Budget and NWS funding to deliver program
16	Severe Summer Storms	Structure and Infrastructure Projects	Identify areas where vulnerable populations are susceptible to tornadoes or extreme wind events (i.e. schools, campgrounds, or mobile home parks) and evaluate for construction or retrofit of safe rooms or storm shelters.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, <b>Manhattan Beach</b> , Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	CWC Emergency Management continues to work with local cities that have experienced severe wind damage and recreational facilities on development of storm shelter areas. We are aware that there are two mobile home parks and the Crow Wing County Fairgrounds have been identified for having a need of a storm shelter or Safe Room.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Manhattan Beach Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
17	Severe Summer Storms	Structure and Infrastructure Projects	Implement construction or retrofit projects for safe rooms or storm shelters in identified vulnerable locations.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, <b>Manhattan Beach</b> , Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	Any community safe room projects that the County is involved in will be part of the CWC Emergency Management program. FEMA grant funding may be sought to support an eligible safe room project.	County/City Budgets, <b>Possible FEMA HMA funding for Safe Room Construction</b>
27	Flooding	Local Planning & Regulations / Structure and Infrastructure Projects	Identify and improve potential and historical areas of road washout, and replace aging or failing bridges and culverts that are inadequate in order to reduce future flood damages.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, <b>Manhattan Beach</b> , Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept, CW Land Services Dept., and local city and township public works	Crow Wing County and local jurisdictions maintain an annual inventory of problem areas due to flooding and plan for projects based on priority and available funding. CW County Highway Dept. has identified flood prone problematic areas on CR 105, CR 128, CSAH 11, CR 132, CR 106 & CR 144. In addition there are bridges that are scour sensitive and pose a hazard risk during high water. CR 128 has a shoreline improvement plan to reduce the risk of water over the road and erosion of the roadbed during high water.  <i>City Comment: The City contracts for street maintenance, engineering, and zoning services.</i>	County, and Township Budgets, <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>

#	Hazard	Mitigation Strategy	City of Manhattan Beach Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
28	Flooding	Local Planning & Regulations	Encourage municipalities to require the development of new storm sewer infrastructure capable of handling a ten to twenty year rain event in areas of new development (i.e., new subdivisions) and adoption of a Stormwater ordinance regulating onsite stormwater management for new construction.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, <b>Manhattan Beach</b> , Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and SWCD in coordination with local City Admin and Public Works.	Facilitate adoption of stormwater ordinance through a series of workshops.  <i>City Comment: The City recently adopted a comprehensive plan that is designed to plan for the future physical growth of the city and appropriate land uses.</i>	County/City Budgets, SWCD Grants i.e Serpent Lake Project
29	Flooding	Structure and Infrastructure Projects	Develop stormwater management plans and improve stormwater management systems at the county and city level to address future high-impact rain events throughout the County.	Ongoing	New	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, <b>Manhattan Beach</b> , Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., CWC Highway Dept., CWC GIS, CWC SWCD and local city public works depts., MN DNR, MPCA	The County will seek outside grant funding where possible to fund eligible stormwater improvement projects, such as through MPCA and FEMA HMA funding for flood reduction projects. Local jurisdictions will be responsible for development of local stormwater management plans and identification of priority projects.	County/SWCD budgets, Possible MPCA/PFA grant funding, <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>



#	Hazard	Mitigation Strategy	City of Manhattan Beach Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
30	Flooding	Local Planning & Regulations	Ensure that wellhead protection plans are in place to address flooding that may lead to contaminated drinking water.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, <b>Manhattan Beach</b> , Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., MN Dept of Health and local city and township public works depts.	Cities work directly with the Minnesota Department of Health on the development or update of wellhead protection plans to ensure they meet State requirements.	MDH Source Water Protection grant funding for wellhead improvement projects
31	Flooding	Local Planning & Regulations	Adopt the 2017 updated floodplain maps for Crow Wing County and ensure the update of local ordinances.	New	High	2017	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, <b>Manhattan Beach</b> , Nisswa, Pequot Lakes, Riverton, and Trommald	Crow Wing County Land Services Dept. and City Admin	Crow Wing County has new maps that will go effective 8/15/2017. Communities participating in the NFIP will update their ordinances and adopt the new maps (and make other updates).  <i>City Comment: The City currently adopted a floodplain ordinance and is working on participating in the NFIP.</i>	County/City Budgets
33	Flooding	Local Planning & Regulations / Structure & Infrastructure Systems	Keep culverts and drainage ditches free of debris to mitigate against over-the-road flooding.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, <b>Manhattan Beach</b> , Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Highway Dept., CWC Land Services Dept. in coordination with City Public Works	The maintenance of culverts and drainage ditches is done through our CWC Highway Department and City Public Works. We also have Ditch 13 that flows from Lake Edward to North Long Lake. Local municipalities' public works work to monitor and address any problem areas for drainage at the local level.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Manhattan Beach Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
34	Flooding	Local Planning & Regulations	Restrict building in floodplain areas that consistently flood.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, <b>Manhattan Beach</b> , Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and Local City Admin.	This action is the responsibility of the CWC Land Services Department and local city ordinances as per NFIP requirements.	County/City Budgets
35	Flooding	Local Planning & Regulations	Identify properties that experience damage from repetitive flooding, and work with property owners to buy out structures and turn into open-space.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, <b>Manhattan Beach</b> , Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., and local City Admin	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.	County/City Funding, <b>Possible FEMA grant funding for Property Acquisition</b>
36	Flooding	Local Planning & Regulations	Encourage individual landowners who live within floodplain areas to participate in the FEMA National Flood Insurance Program (NFIP).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, <b>Manhattan Beach</b> , Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., MN DNR, local City Admin, and FEMA	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Manhattan Beach Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
40	Flooding	Education & Awareness Programs	Provide education and technical assistance to property owners on the application of green infrastructure methods to reduce localized flooding due to high rain events.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, <b>Manhattan Beach</b> , Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and CWC SWCD	This task is done through our CWC Land Services Dept. as well as the SWCD. Possible green-infrastructure projects will be considered for eligible for FEMA HMA grant funding.	County Budgets, <b>Possible FEMA HMA funding for 5% Initiative Projects</b>
50	Drought	Local Planning & Regulations / Education & Awareness Programs	Promote water conservation measures and fire safety awareness to residents during periods of drought. Enforce water conservation ordinances when needed (i.e., that prohibit watering lawns during drought).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, <b>Manhattan Beach</b> , Nisswa, Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in collaboration with SWCD and local cities	Promoting water conservation during periods of drought is a standing effort of the County and local governments, as well as the USDA and FSA Office.	County/City Budgets

Table G - 15. Mitigation Actions Identified for Implementation by the City of Nisswa (2017-2021) (From Crow Wing County Master Mitigation Action Chart)

#	Hazard	Mitigation Strategy	City of Nisswa Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
1	All-Hazards	Education & Awareness Programs	Work to ensure that all Crow Wing County residents are aware of and sign-up for the County's Emergency Warning System (EWS).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, <b>Nisswa</b> , Pequot Lakes, Riverton, and Trommald	CW Emergency Management in coordination with local city government	The CWC Emergency Management Program regularly promotes sign-up for the EWS system via the County EM Facebook Page and during in-person events. Cities also work to promote sign-up by local residents by sharing information on city websites and announcements at public meetings.	County/City Budgets
5	All-Hazards	Education & Awareness Programs	Promote education & awareness of severe weather and personal emergency preparedness for individuals, families, and businesses.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, <b>Nisswa</b> , Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in coordination with city EM's.	CWC Emergency Management participates annually in the National Weather Service's spring and winter Severe Weather Awareness Weeks in April and November. We provide posters, brochures, and material on severe storms to the media and to property owners. Social media is also used to distribute the information. Local cities are encouraged to participate and share this information through their own local channels such as Facebook and city websites.  <i>City Comment: The City has emergency sirens throughout the area. The Nisswa Elementary School also practices tornado drills annually.</i>	County/City Budgets

#	Hazard	Mitigation Strategy	City of Nisswa Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
9	Severe Winter Storms	Local Planning & Regulations	Continue providing snow removal, salting, and sanding to minimize the impacts of snow accumulations on motorists.	Ongoing	High	2017 - 2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, <b>Nisswa</b> , Pequot Lakes, Riverton, and Trommald	CWC Highway Dept. in coordination with local cities	This is a standing effort of the CWC Highway Dept. and local City Public Works.	County/City Budgets
10	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Identify critical facilities or infrastructure that do not have backup power in the event of a major power outage resulting from severe winter or summer storms. <i>(Critical facilities may include police/fire departments, EOC, health care facilities, water &amp; sewer treatment facilities, and other facilities deemed as critical, i.e. public schools and sheltering facilities).</i>	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, <b>Nisswa</b> , Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, City Admin & Public Works	Not all county & city government buildings and schools have backup power generators to ensure energy in the event of a severe power outage. CWC and each jurisdiction will work to identify their respective critical facilities that should have backup power.  <i>City Comment: The City needs generator hook-ups and a second backup generator that would provide power to City Hall and additional city structures.</i>	County/City Budgets

#	Hazard	Mitigation Strategy	City of Nisswa Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
11	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Purchase and install generator hook-ups and encourage local generator purchases for identified critical facilities that require backup power.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, <b>Nisswa</b> , Pequot Lakes, Riverton, and Trommald	Emergency Management, City Admin & Public Works	CWC, local city governments, and schools will evaluate feasibility to purchase and install generators for key facilities, and will do so as funding allows.	County/City Budgets, <b>Possible FEMA HMA 5% Initiative Funding for Generators</b>
12	Severe Winter & Summer Storms	Structure and Infrastructure Projects	Work with rural electrical and municipal coops to identify and address mitigation measures for above ground power lines that are susceptible to damage from severe winter or summer storms in order to reduce potential power outages.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, <b>Nisswa</b> , Pequot Lakes, Riverton, and Trommald	Emily Cooperative Telephone Company, Crow Wing Power Cooperative, Mille Lacs Energy Cooperative, Brainerd Public Utilities, and Consolidated Telephone Company (CTC) in cooperation with local cities	Loss of power due to extreme storm events in the County creates long outage times and costly repairs. There has been overhead power disruption in hard-hit areas of trees. There is a wind "tunnel" from Gull Lake in the Round Lake Area of CR 115. The County and cities will work with local utilities as needed. BCA studies will be conducted for potential project areas to see where underground wires are possible.  <i>City Comment: The City needs to either move trees away from power lines or power put underground in more places to prevent them from coming down in the event of high winds and/or heavy snow/ice. We have had difficulty re-opening roads and restoring services after storms due to downed power lines.</i>	Rural or Municipal Electric Coop Funding, <b>Possible FEMA HMA funding for Infrastructure Retrofit</b>

#	Hazard	Mitigation Strategy	City of Nisswa Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
13	Severe Winter & Summer Storms	Local Planning & Regulations	Promote inspection and trimming of trees that may pose risk to falling on power lines during severe storm events.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, <b>Nisswa</b> , Pequot Lakes, Riverton, and Trommald	Same as above.	Tree management in the right-of-way of roads is addressed by our CWC Highway Dept. and/or City Public Works and Utility Companies.  <i>City Comment: The City needs to either move trees away from power lines or power put underground in more places to prevent them from coming down in the event of high winds and/or heavy snow/ice. We have had difficulty re-opening roads and restoring services after storms due to downed power lines. We need a big pay loader for tree removal. We are currently using a tractor that is too light at doing emergency use.</i>	County/City Budgets
14	Severe Winter & Summer Storms	Education & Awareness Programs	Promote the use of NOAA weather radios as a key communications resource for residents, businesses, and facilities that house vulnerable populations (i.e., nursing homes, group homes, senior centers, and day care facilities).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, <b>Nisswa</b> , Pequot Lakes, Riverton, and Trommald	CWC Emergency Management and local city EM's	This is an ongoing effort of emergency management programs at the county and local city level. We promote weather radios through PSA's, County Fair, National Night Out, NWS Severe Weather Awareness Weeks and through social media. CWC also continues to work with local vendors and State programs for rebates on NOAA Weather radios.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Nisswa Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
15	Severe Summer Storms	Mitigation Preparedness & Response Support	Provide/participate in the National Weather Service's SKYWARN "Storm Spotter" training in various parts of the County for first responders and community residents.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, <b>Nisswa</b> , Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in collaboration with local cities and NWS	Each year CWC Emergency Management Program works with the National Weather Service to provide this training to local fire departments and local community volunteers. We will continue to encourage more volunteers to become active in the severe storm spotters network. Local cities will continue to remain active in this program.	County Budget and NWS funding to deliver program
16	Severe Summer Storms	Structure and Infrastructure Projects	Identify areas where vulnerable populations are susceptible to tornadoes or extreme wind events (i.e. schools, campgrounds, or mobile home parks) and evaluate for construction or retrofit of safe rooms or storm shelters.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, <b>Nisswa</b> , Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	CWC Emergency Management continues to work with local cities that have experienced severe wind damage and recreational facilities on development of storm shelter areas. We are aware that there are two mobile home parks and the Crow Wing County Fairgrounds have been identified for having a need of a storm shelter or Safe Room.  <i>City Comment: The City needs a safe room /rooms for tornadoes or severe wind events located downtown, and maybe other areas throughout for tourists/public visiting. We currently only have small rooms available that are not well marked.</i>	County/City Budgets



#	Hazard	Mitigation Strategy	City of Nisswa Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
17	Severe Summer Storms	Structure and Infrastructure Projects	Implement construction or retrofit projects for safe rooms or storm shelters in identified vulnerable locations.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, <b>Nisswa</b> , Pequot Lakes, Riverton, and Trommald	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	Any community safe room projects that the County is involved in will be part of the CWC Emergency Management program. FEMA grant funding may be sought to support an eligible safe room project.	County/City Budgets, <b>Possible FEMA HMA funding for Safe Room Construction</b>
27	Flooding	Local Planning & Regulations / Structure and Infrastructure Projects	Identify and improve potential and historical areas of road washout, and replace aging or failing bridges and culverts that are inadequate in order to reduce future flood damages.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, <b>Nisswa</b> , Pequot Lakes, Riverton, and Trommald	CWC Highway Dept, CW Land Services Dept., and local city and township public works	Crow Wing County and local jurisdictions maintain an annual inventory of problem areas due to flooding and plan for projects based on priority and available funding. CW County Highway Dept. has identified flood prone problematic areas on CR 105, CR 128, CSAH 11, CR 132, CR 106 & CR 144. In addition there are bridges that are scour sensitive and pose a hazard risk during high water. CR 128 has a shoreline improvement plan to reduce the risk of water over the road and erosion of the roadbed during high water.  <i>City Comment: The City Public Works Director is responsible for road maintenance issues.</i>	County, and Township Budgets, <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>

#	Hazard	Mitigation Strategy	City of Nisswa Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
28	Flooding	Local Planning & Regulations	Encourage municipalities to require the development of new storm sewer infrastructure capable of handling a ten to twenty year rain event in areas of new development (i.e., new subdivisions) and adoption of a Stormwater ordinance regulating onsite stormwater management for new construction.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, <b>Nisswa</b> , Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and SWCD in coordination with local City Admin and Public Works.	Facilitate adoption of stormwater ordinance through a series of workshops.  <i>City Comment: We have a 10-year Comprehensive Plan (2007) that is designed to plan for the future physical growth of the city and appropriate land uses. City of Nisswa is currently updating the Comprehensive Plan and anticipates completion by the end of 2017.</i>	County/City Budgets, SWCD Grants i.e Serpent Lake Project
29	Flooding	Structure and Infrastructure Projects	Develop stormwater management plans and improve stormwater management systems at the county and city level to address future high-impact rain events throughout the County.	Ongoing	New	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, <b>Nisswa</b> , Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., CWC Highway Dept., CWC GIS, CWC SWCD and local city public works depts., MN DNR, MPCA	The County will seek outside grant funding where possible to fund eligible stormwater improvement projects, such as through MPCA and FEMA HMA funding for flood reduction projects. Local jurisdictions will be responsible for development of local stormwater management plans and identification of priority projects.  <i>City Comment: The city has stormwater Zoning Ordinance provisions for commercial and subdivision development.</i>	County/SWCD budgets, Possible MPCA/PFA grant funding, <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>

#	Hazard	Mitigation Strategy	City of Nisswa Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
30	Flooding	Local Planning & Regulations	Ensure that wellhead protection plans are in place to address flooding that may lead to contaminated drinking water.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, <b>Nisswa</b> , Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., MN Dept of Health and local city and township public works depts.	Cities work directly with the Minnesota Department of Health on the development or update of wellhead protection plans to ensure they meet State requirements.	MDH Source Water Protection grant funding for wellhead improvement projects
31	Flooding	Local Planning & Regulations	Adopt the 2017 updated floodplain maps for Crow Wing County and ensure the update of local ordinances.	New	High	2017	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, <b>Nisswa</b> , Pequot Lakes, Riverton, and Trommald	Crow Wing County Land Services Dept. and City Admin	Crow Wing County has new maps that will go effective 8/15/2017. Communities participating in the NFIP will update their ordinances and adopt the new maps (and make other updates).  <i>City Comment: We have a City Planning and Zoning Commission that has established a Floodplain Ordinance. The City participates in the National Flood Insurance Program (NFIP).</i>	County/City Budgets
33	Flooding	Local Planning & Regulations / Structure & Infrastructure Systems	Keep culverts and drainage ditches free of debris to mitigate against over-the-road flooding.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, <b>Nisswa</b> , Pequot Lakes, Riverton, and Trommald	CWC Highway Dept., CWC Land Services Dept. in coordination with City Public Works	The maintenance of culverts and drainage ditches is done through our CWC Highway Department and City Public Works. We also have Ditch 13 that flows from Lake Edward to North Long Lake. Local municipalities' public works work to monitor and address any problem areas for drainage at the local level.  <i>City Comment: The City Public Works Director is responsible for road maintenance issues.</i>	County/City Budgets

#	Hazard	Mitigation Strategy	City of Nisswa Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
34	Flooding	Local Planning & Regulations	Restrict building in floodplain areas that consistently flood.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, <b>Nisswa</b> , Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and Local City Admin.	This action is the responsibility of the CWC Land Services Department and local city ordinances as per NFIP requirements.	County/City Budgets
35	Flooding	Local Planning & Regulations	Identify properties that experience damage from repetitive flooding, and work with property owners to buy out structures and turn into open-space.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, <b>Nisswa</b> , Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., and local City Admin	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.	County/City Funding, <b>Possible FEMA grant funding for Property Acquisition</b>
36	Flooding	Local Planning & Regulations	Encourage individual landowners who live within floodplain areas to participate in the FEMA National Flood Insurance Program (NFIP).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, <b>Nisswa</b> , Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept., MN DNR, local City Admin, and FEMA	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.	County/City Budgets
40	Flooding	Education & Awareness Programs	Provide education and technical assistance to property owners on the application of green infrastructure methods to reduce localized flooding due to high rain events.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, <b>Nisswa</b> , Pequot Lakes, Riverton, and Trommald	CWC Land Services Dept. and CWC SWCD	This task is done through our CWC Land Services Dept. as well as the SWCD. Possible green-infrastructure projects will be considered for eligible for FEMA HMA grant funding.	County Budgets, <b>Possible FEMA HMA funding for 5% Initiative Projects</b>

#	Hazard	Mitigation Strategy	City of Nisswa Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
50	Drought	Local Planning & Regulations / Education & Awareness Programs	Promote water conservation measures and fire safety awareness to residents during periods of drought. Enforce water conservation ordinances when needed (i.e., that prohibit watering lawns during drought).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, <b>Nisswa</b> , Pequot Lakes, Riverton, and Trommald	CWC Emergency Management in collaboration with SWCD and local cities	Promoting water conservation during periods of drought is a standing effort of the County and local governments, as well as the USDA and FSA Office.	County/City Budgets

Table G - 16. Mitigation Actions Identified for Implementation by the City of Pequot Lakes (2017-2021) (From Crow Wing County Master Mitigation Action Chart)

#	Hazard	Mitigation Strategy	City of Pequot Lakes Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
1	All-Hazards	Education & Awareness Programs	Work to ensure that all Crow Wing County residents are aware of and sign-up for the County's Emergency Warning System (EWS).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, <b>Pequot Lakes</b> , Riverton, and Trommald	CW Emergency Management in coordination with local city government	The CWC Emergency Management Program regularly promotes sign-up for the EWS system via the County EM Facebook Page and during in-person events. Cities also work to promote sign-up by local residents by sharing information on city websites and announcements at public meetings.	County/City Budgets
5	All-Hazards	Education & Awareness Programs	Promote education & awareness of severe weather and personal emergency preparedness for individuals, families, and businesses.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, <b>Pequot Lakes</b> , Riverton, and Trommald	CWC Emergency Management in coordination with city EM's.	CWC Emergency Management participates annually in the National Weather Service's spring and winter Severe Weather Awareness Weeks in April and November. We provide posters, brochures, and material on severe storms to the media and to property owners. Social media is also used to distribute the information. Local cities are encouraged to participate and share this information through their own local channels such as Facebook and city websites.  <i>City Comment: The City's Police Department hosts an Annual Night Out event where educational information can be discussed and distributed. The City's Fire Department also hosts an annual Open House to discuss fire safety. Tornado and fire drills also occur with our school district.</i>	County/City Budgets

#	Hazard	Mitigation Strategy	City of Pequot Lakes Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
9	Severe Winter Storms	Local Planning & Regulations	Continue providing snow removal, salting, and sanding to minimize the impacts of snow accumulations on motorists.	Ongoing	High	2017 - 2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, <b>Pequot Lakes</b> , Riverton, and Trommald	CWC Highway Dept. in coordination with local cities	This is a standing effort of the CWC Highway Dept. and local City Public Works.	County/City Budgets
10	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Identify critical facilities or infrastructure that do not have backup power in the event of a major power outage resulting from severe winter or summer storms. <i>(Critical facilities may include police/fire departments, EOC, health care facilities, water &amp; sewer treatment facilities, and other facilities deemed as critical, i.e. public schools and sheltering facilities).</i>	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, <b>Pequot Lakes</b> , Riverton, and Trommald	CWC Emergency Management, City Admin & Public Works	Not all county & city government buildings and schools have backup power generators to ensure energy in the event of a severe power outage. CWC and each jurisdiction will work to identify their respective critical facilities that should have backup power.  <i>City Comment: The City has the purchase of a generator for City Hall scheduled in our Capital Improvement Plan for 2019.</i>	County/City Budgets

#	Hazard	Mitigation Strategy	City of Pequot Lakes Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
11	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Purchase and install generator hook-ups and encourage local generator purchases for identified critical facilities that require backup power.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, <b>Pequot Lakes</b> , Riverton, and Trommald	Emergency Management, City Admin & Public Works	CWC, local city governments, and schools will evaluate feasibility to purchase and install generators for key facilities, and will do so as funding allows.  <i>City Comment: See #10 above.</i>	County/City Budgets, <b>Possible FEMA HMA 5% Initiative Funding for Generators</b>
12	Severe Winter & Summer Storms	Structure and Infrastructure Projects	Work with rural electrical and municipal coops to identify and address mitigation measures for above ground power lines that are susceptible to damage from severe winter or summer storms in order to reduce potential power outages.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, <b>Pequot Lakes</b> , Riverton, and Trommald	Emily Cooperative Telephone Company, Crow Wing Power Cooperative, Mille Lacs Energy Cooperative, Brainerd Public Utilities, and Consolidated Telephone Company (CTC) in cooperation with local cities	Loss of power due to extreme storm events in the County creates long outage times and costly repairs. There has been overhead power disruption in hard-hit areas of trees. There is a wind "tunnel" from Gull Lake in the Round Lake Area of CR 115. The County and cities will work with local utilities as needed. BCA studies will be conducted for potential project areas to see where underground wires are possible.	Rural or Municipal Electric Coop Funding, <b>Possible FEMA HMA funding for Infrastructure Retrofit</b>
13	Severe Winter & Summer Storms	Local Planning & Regulations	Promote inspection and trimming of trees that may pose risk to falling on power lines during severe storm events.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, <b>Pequot Lakes</b> , Riverton, and Trommald	Same as above.	Tree management in the right-of-way of roads is addressed by our CWC Highway Dept. and/or City Public Works and Utility Companies.	County/City Budgets



#	Hazard	Mitigation Strategy	City of Pequot Lakes Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
14	Severe Winter & Summer Storms	Education & Awareness Programs	Promote the use of NOAA weather radios as a key communications resource for residents, businesses, and facilities that house vulnerable populations (i.e., nursing homes, group homes, senior centers, and day care facilities).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, <b>Pequot Lakes</b> , Riverton, and Trommald	CWC Emergency Management and local city EM's	<p>This is an ongoing effort of emergency management programs at the county and local city level. We promote weather radios through PSA's, County Fair, National Night Out, NWS Severe Weather Awareness Weeks and through social media. CWC also continues to work with local vendors and State programs for rebates on NOAA Weather radios.</p> <p><i>City Comment: The City's Police Department hosts an Annual Night Out event and the Fire Department hosts an annual Open House where this information can be discussed and distributed.</i></p>	County/City Budgets
15	Severe Summer Storms	Mitigation Preparedness & Response Support	Provide/participate in the National Weather Service's SKYWARN "Storm Spotter" training in various parts of the County for first responders and community residents.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, <b>Pequot Lakes</b> , Riverton, and Trommald	CWC Emergency Management in collaboration with local cities and NWS	<p>Each year CWC Emergency Management Program works with the National Weather Service to provide this training to local fire departments and local community volunteers. We will continue to encourage more volunteers to become active in the severe storm spotters network. Local cities will continue to remain active in this program.</p>	County Budget and NWS funding to deliver program

#	Hazard	Mitigation Strategy	City of Pequot Lakes Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
16	Severe Summer Storms	Structure and Infrastructure Projects	Identify areas where vulnerable populations are susceptible to tornadoes or extreme wind events (i.e. schools, campgrounds, or mobile home parks) and evaluate for construction or retrofit of safe rooms or storm shelters.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, <b>Pequot Lakes</b> , Riverton, and Trommald	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	CWC Emergency Management continues to work with local cities that have experienced severe wind damage and recreational facilities on development of storm shelter areas. We are aware that there are two mobile home parks and the Crow Wing County Fairgrounds have been identified for having a need of a storm shelter or Safe Room.  <i>City Comment: The City needs to determine a community storm shelter location and inform our residents. Construction of a safe room will be evaluated.</i>	County/City Budgets
17	Severe Summer Storms	Structure and Infrastructure Projects	Implement construction or retrofit projects for safe rooms or storm shelters in identified vulnerable locations.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, <b>Pequot Lakes</b> , Riverton, and Trommald	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	Any community safe room projects that the County is involved in will be part of the CWC Emergency Management program. FEMA grant funding may be sought to support an eligible safe room project.	County/City Budgets, <b>Possible FEMA HMA funding for Safe Room Construction</b>

#	Hazard	Mitigation Strategy	City of Pequot Lakes Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
27	Flooding	Local Planning & Regulations / Structure and Infrastructure Projects	Identify and improve potential and historical areas of road washout, and replace aging or failing bridges and culverts that are inadequate in order to reduce future flood damages.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, <b>Pequot Lakes</b> , Riverton, and Trommald	CWC Highway Dept, CW Land Services Dept., and local city and township public works	<p>Crow Wing County and local jurisdictions maintain an annual inventory of problem areas due to flooding and plan for projects based on priority and available funding. CW County Highway Dept. has identified flood prone problematic areas on CR 105, CR 128, CSAH 11, CR 132, CR 106 &amp; CR 144. In addition there are bridges that are scour sensitive and pose a hazard risk during high water. CR 128 has a shoreline improvement plan to reduce the risk of water over the road and erosion of the roadbed during high water.</p> <p><i>City Comment: The City has a Public Works Supervisor that addresses road maintenance issues.</i></p>	County, and Township Budgets, <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>

#	Hazard	Mitigation Strategy	City of Pequot Lakes Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
28	Flooding	Local Planning & Regulations	Encourage municipalities to require the development of new storm sewer infrastructure capable of handling a ten to twenty year rain event in areas of new development (i.e., new subdivisions) and adoption of a Stormwater ordinance regulating onsite stormwater management for new construction.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, <b>Pequot Lakes</b> , Riverton, and Trommald	CWC Land Services Dept. and SWCD in coordination with local City Admin and Public Works.	Facilitate adoption of stormwater ordinance through a series of workshops.  <i>City Comment: The City recently adopted a comprehensive plan that is designed to plan for the future physical growth of the City and appropriate land uses. Our planning and zoning department takes stormwater management into consideration with new construction and we upgrade our stormwater utilities as street improvement projects occur.</i>	County/City Budgets, SWCD Grants i.e Serpent Lake Project
29	Flooding	Structure and Infrastructure Projects	Develop stormwater management plans and improve stormwater management systems at the county and city level to address future high-impact rain events throughout the County.	Ongoing	New	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, <b>Pequot Lakes</b> , Riverton, and Trommald	CWC Land Services Dept., CWC Highway Dept., CWC GIS, CWC SWCD and local city public works depts., MN DNR, MPCA	The County will seek outside grant funding where possible to fund eligible stormwater improvement projects, such as through MPCA and FEMA HMA funding for flood reduction projects. Local jurisdictions will be responsible for development of local stormwater management plans and identification of priority projects.  <i>City Comment: See #28 above.</i>	County/SWCD budgets, Possible MPCA/PFA grant funding, <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>

#	Hazard	Mitigation Strategy	City of Pequot Lakes Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
30	Flooding	Local Planning & Regulations	Ensure that wellhead protection plans are in place to address flooding that may lead to contaminated drinking water.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, <b>Pequot Lakes</b> , Riverton, and Trommald	CWC Land Services Dept., MN Dept of Health and local city and township public works depts.	Cities work directly with the Minnesota Department of Health on the development or update of wellhead protection plans to ensure they meet State requirements.  <i>City Comment: The City has a wellhead protection plan in place and recently adopted a floodplain management ordinance. We will continually monitor these documents and update them accordingly.</i>	MDH Source Water Protection grant funding for wellhead improvement projects
31	Flooding	Local Planning & Regulations	Adopt the 2017 updated floodplain maps for Crow Wing County and ensure the update of local ordinances.	New	High	2017	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, <b>Pequot Lakes</b> , Riverton, and Trommald	Crow Wing County Land Services Dept. and City Admin	Crow Wing County has new maps that will go effective 8/15/2017. Communities participating in the NFIP will update their ordinances and adopt the new maps (and make other updates).  <i>City Comment: The City adopted a floodplain management ordinance in accordance with FEMA regulations.</i>	County/City Budgets
33	Flooding	Local Planning & Regulations / Structure & Infrastructure Systems	Keep culverts and drainage ditches free of debris to mitigate against over-the-road flooding.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, <b>Pequot Lakes</b> , Riverton, and Trommald	CWC Highway Dept., CWC Land Services Dept. in coordination with City Public Works	The maintenance of culverts and drainage ditches is done through our CWC Highway Department and City Public Works. We also have Ditch 13 that flows from Lake Edward to North Long Lake. Local municipalities' public works work to monitor and address any problem areas for drainage at the local level.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Pequot Lakes Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
34	Flooding	Local Planning & Regulations	Restrict building in floodplain areas that consistently flood.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, <b>Pequot Lakes</b> , Riverton, and Trommald	CWC Land Services Dept. and Local City Admin.	This action is the responsibility of the CWC Land Services Department and local city ordinances as per NFIP requirements.  <i>City Comment: The City adopted a floodplain management ordinance.</i>	County/City Budgets
35	Flooding	Local Planning & Regulations	Identify properties that experience damage from repetitive flooding, and work with property owners to buy out structures and turn into open-space.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, <b>Pequot Lakes</b> , Riverton, and Trommald	CWC Land Services Dept., and local City Admin	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.	County/City Funding, <b>Possible FEMA grant funding for Property Acquisition</b>
36	Flooding	Local Planning & Regulations	Encourage individual landowners who live within floodplain areas to participate in the FEMA National Flood Insurance Program (NFIP).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, <b>Pequot Lakes</b> , Riverton, and Trommald	CWC Land Services Dept., MN DNR, local City Admin, and FEMA	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.  <i>City Comment: The City adopted a floodplain management ordinance.</i>	County/City Budgets

#	Hazard	Mitigation Strategy	City of Pequot Lakes Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
40	Flooding	Education & Awareness Programs	Provide education and technical assistance to property owners on the application of green infrastructure methods to reduce localized flooding due to high rain events.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, <b>Pequot Lakes</b> , Riverton, and Trommald	CWC Land Services Dept. and CWC SWCD	This task is done through our CWC Land Services Dept. as well as the SWCD. Possible green-infrastructure projects will be considered for eligible for FEMA HMA grant funding.  <i>City Comment: The City is currently researching the allowance of porous pavement as a means of complying with our impervious coverage requirements.</i>	County Budgets, <b>Possible FEMA HMA funding for 5% Initiative Projects</b>
50	Drought	Local Planning & Regulations / Education & Awareness Programs	Promote water conservation measures and fire safety awareness to residents during periods of drought. Enforce water conservation ordinances when needed (i.e., that prohibit watering lawns during drought).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, <b>Pequot Lakes</b> , Riverton, and Trommald	CWC Emergency Management in collaboration with SWCD and local cities	Promoting water conservation during periods of drought is a standing effort of the County and local governments, as well as the USDA and FSA Office.  <i>City Comment: In 2016, the City adopted an ordinance and plan regulating non-essential water usage upon critical water deficiency. We recently adopted water and sewer utility rates taking this into consideration as well.</i>	County/City Budgets

Table G - 17. Mitigation Actions Identified for Implementation by the City of Riverton (2017-2021) (From Crow Wing County Master Mitigation Action Chart)

#	Hazard	Mitigation Strategy	City of Riverton Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
1	All-Hazards	Education & Awareness Programs	Work to ensure that all Crow Wing County residents are aware of and sign-up for the County's Emergency Warning System (EWS).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, <b>Riverton</b> , and Trommald	CW Emergency Management in coordination with local city government	The CWC Emergency Management Program regularly promotes sign-up for the EWS system via the County EM Facebook Page and during in-person events. Cities also work to promote sign-up by local residents by sharing information on city websites and announcements at public meetings.	County/City Budgets
5	All-Hazards	Education & Awareness Programs	Promote education & awareness of severe weather and personal emergency preparedness for individuals, families, and businesses.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, <b>Riverton</b> , and Trommald	CWC Emergency Management in coordination with city EM's.	CWC Emergency Management participates annually in the National Weather Service's spring and winter Severe Weather Awareness Weeks in April and November. We provide posters, brochures, and material on severe storms to the media and to property owners. Social media is also used to distribute the information. Local cities are encouraged to participate and share this information through their own local channels such as Facebook and city websites.	County/City Budgets
9	Severe Winter Storms	Local Planning & Regulations	Continue providing snow removal, salting, and sanding to minimize the impacts of snow accumulations on motorists.	Ongoing	High	2017 - 2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, <b>Riverton</b> , and Trommald	CWC Highway Dept. in coordination with local cities	This is a standing effort of the CWC Highway Dept. and local City Public Works.	County/City Budgets



#	Hazard	Mitigation Strategy	City of Riverton Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
10	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Identify critical facilities or infrastructure that do not have backup power in the event of a major power outage resulting from severe winter or summer storms. <i>(Critical facilities may include police/fire departments, EOC, health care facilities, water &amp; sewer treatment facilities, and other facilities deemed as critical, i.e. public schools and sheltering facilities).</i>	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, <b>Riverton</b> , and Trommald	CWC Emergency Management, City Admin & Public Works	Not all county & city government buildings and schools have backup power generators to ensure energy in the event of a severe power outage. CWC and each jurisdiction will work to identify their respective critical facilities that should have backup power.	County/City Budgets
11	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Purchase and install generator hook-ups and encourage local generator purchases for identified critical facilities that require backup power.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, <b>Riverton</b> , and Trommald	Emergency Management, City Admin & Public Works	CWC, local city governments, and schools will evaluate feasibility to purchase and install generators for key facilities, and will do so as funding allows.  <i>City Comment: Riverton's Wellhouse does not have backup power at this time, but the City is going to apply for a grant to assist with connection of a generator to the Wellhouse to provide City water in emergencies. The City already has a portable generator.</i>	County/City Budgets, <b>Possible FEMA HMA 5% Initiative Funding for Generators</b>

#	Hazard	Mitigation Strategy	City of Riverton Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
12	Severe Winter & Summer Storms	Structure and Infrastructure Projects	Work with rural electrical and municipal coops to identify and address mitigation measures for above ground power lines that are susceptible to damage from severe winter or summer storms in order to reduce potential power outages.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, <b>Riverton</b> , and Trommald	Emily Cooperative Telephone Company, Crow Wing Power Cooperative, Mille Lacs Energy Cooperative, Brainerd Public Utilities, and Consolidated Telephone Company (CTC) in cooperation with local cities	Loss of power due to extreme storm events in the County creates long outage times and costly repairs. There has been overhead power disruption in hard-hit areas of trees. There is a wind "tunnel" from Gull Lake in the Round Lake Area of CR 115. The County and cities will work with local utilities as needed. BCA studies will be conducted for potential project areas to see where underground wires are possible.	Rural or Municipal Electric Coop Funding, <b>Possible FEMA HMA funding for Infrastructure Retrofit</b>
13	Severe Winter & Summer Storms	Local Planning & Regulations	Promote inspection and trimming of trees that may pose risk to falling on power lines during severe storm events.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, <b>Riverton</b> , and Trommald	Same as above.	Tree management in the right-of-way of roads is addressed by our CWC Highway Dept. and/or City Public Works and Utility Companies.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Riverton Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
14	Severe Winter & Summer Storms	Education & Awareness Programs	Promote the use of NOAA weather radios as a key communications resource for residents, businesses, and facilities that house vulnerable populations (i.e., nursing homes, group homes, senior centers, and day care facilities).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, <b>Riverton</b> , and Trommald	CWC Emergency Management and local city EM's	This is an Ongoing effort of emergency management programs at the county and local city level. We promote weather radios through PSA's, County Fair, National Night Out, NWS Severe Weather Awareness Weeks and through social media. CWC also continues to work with local vendors and State programs for rebates on NOAA Weather radios.	County/City Budgets
15	Severe Summer Storms	Mitigation Preparedness & Response Support	Provide/participate in the National Weather Service's SKYWARN "Storm Spotter" training in various parts of the County for first responders and community residents.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, <b>Riverton</b> , and Trommald	CWC Emergency Management in collaboration with local cities and NWS	Each year CWC Emergency Management Program works with the National Weather Service to provide this training to local fire departments and local community volunteers. We will continue to encourage more volunteers to become active in the severe storm spotters network. Local cities will continue to remain active in this program.	County Budget and NWS funding to deliver program

#	Hazard	Mitigation Strategy	City of Riverton Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
16	Severe Summer Storms	Structure and Infrastructure Projects	Identify areas where vulnerable populations are susceptible to tornadoes or extreme wind events (i.e. schools, campgrounds, or mobile home parks) and evaluate for construction or retrofit of safe rooms or storm shelters.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, <b>Riverton</b> , and Trommald	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	CWC Emergency Management continues to work with local cities that have experienced severe wind damage and recreational facilities on development of storm shelter areas. We are aware that there are two mobile home parks and the Crow Wing County Fairgrounds have been identified for having a need of a storm shelter or Safe Room.  <i>City Comment: The Riverton City Hall is the storm shelter for Riverton and the surrounding area.</i>	County/City Budgets
17	Severe Summer Storms	Structure and Infrastructure Projects	Implement construction or retrofit projects for safe rooms or storm shelters in identified vulnerable locations.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, <b>Riverton</b> , and Trommald	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	Any community safe room projects that the County is involved in will be part of the CWC Emergency Management program. FEMA grant funding may be sought to support an eligible safe room project.	County/City Budgets, <b>Possible FEMA HMA funding for Safe Room Construction</b>

#	Hazard	Mitigation Strategy	City of Riverton Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
27	Flooding	Local Planning & Regulations / Structure and Infrastructure Projects	Identify and improve potential and historical areas of road washout, and replace aging or failing bridges and culverts that are inadequate in order to reduce future flood damages.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, <b>Riverton</b> , and Trommald	CWC Highway Dept, CW Land Services Dept., and local city and township public works	Crow Wing County and local jurisdictions maintain an annual inventory of problem areas due to flooding and plan for projects based on priority and available funding. CW County Highway Dept. has identified flood prone problematic areas on CR 105, CR 128, CSAH 11, CR 132, CR 106 & CR 144. In addition there are bridges that are scour sensitive and pose a hazard risk during high water. CR 128 has a shoreline improvement plan to reduce the risk of water over the road and erosion of the roadbed during high water.	County, and Township Budgets, <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>
28	Flooding	Local Planning & Regulations	Encourage municipalities to require the development of new storm sewer infrastructure capable of handling a ten to twenty year rain event in areas of new development (i.e., new subdivisions) and adoption of a Stormwater ordinance regulating onsite stormwater management for new construction.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, <b>Riverton</b> , and Trommald	CWC Land Services Dept. and SWCD in coordination with local City Admin and Public Works.	Facilitate adoption of stormwater ordinance through a series of workshops.  <i>City Comment: The City of Riverton has adopted a Stormwater Ordinance.</i>	County/City Budgets, SWCD Grants i.e Serpent Lake Project

#	Hazard	Mitigation Strategy	City of Riverton Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
29	Flooding	Structure and Infrastructure Projects	Develop stormwater management plans and improve stormwater management systems at the county and city level to address future high-impact rain events throughout the County.	Ongoing	New	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, <b>Riverton</b> , and Trommald	CWC Land Services Dept., CWC Highway Dept., CWC GIS, CWC SWCD and local city public works depts., MN DNR, MPCA	The County will seek outside grant funding where possible to fund eligible stormwater improvement projects, such as through MPCA and FEMA HMA funding for flood reduction projects. Local jurisdictions will be responsible for development of local stormwater management plans and identification of priority projects.	County/SWCD budgets, possible MPCA/PFA grant funding, <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>
30	Flooding	Local Planning & Regulations	Ensure that wellhead protection plans are in place to address flooding that may lead to contaminated drinking water.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, <b>Riverton</b> , and Trommald	CWC Land Services Dept., MN Dept of Health and local city and township public works depts.	Cities work directly with the Minnesota Department of Health on the development or update of wellhead protection plans to ensure they meet State requirements.  <i>City Comment: The City needs an emergency plan, which is planned to be developed through the Wellhead Protection Plan.</i>	MDH Source Water Protection grant funding for wellhead improvement projects
31	Flooding	Local Planning & Regulations	Adopt the 2017 updated floodplain maps for Crow Wing County and ensure the update of local ordinances.	New	High	2017	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, <b>Riverton</b> , and Trommald	Crow Wing County Land Services Dept. and City Admin	Crow Wing County has new maps that will go effective 8/15/2017. Communities participating in the NFIP will update their ordinances and adopt the new maps (and make other updates).  <i>City Comment: The City has recently revised and adopted the floodplain management ordinance, adopted the maps, and participates in the NFIP.</i>	County/City Budgets

#	Hazard	Mitigation Strategy	City of Riverton Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
33	Flooding	Local Planning & Regulations / Structure & Infrastructure Systems	Keep culverts and drainage ditches free of debris to mitigate against over-the-road flooding.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, <b>Riverton</b> , and Trommald	CWC Highway Dept., CWC Land Services Dept. in coordination with City Public Works	The maintenance of culverts and drainage ditches is done through our CWC Highway Department and City Public Works. We also have Ditch 13 that flows from Lake Edward to North Long Lake. Local municipalities' public works work to monitor and address any problem areas for drainage at the local level.	County/City Budgets
34	Flooding	Local Planning & Regulations	Restrict building in floodplain areas that consistently flood.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, <b>Riverton</b> , and Trommald	CWC Land Services Dept. and Local City Admin.	This action is the responsibility of the CWC Land Services Department and local city ordinances as per NFIP requirements.  <i>City Comment: The City has a floodplain management ordinance.</i>	County/City Budgets
35	Flooding	Local Planning & Regulations	Identify properties that experience damage from repetitive flooding, and work with property owners to buy out structures and turn into open-space.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, <b>Riverton</b> , and Trommald	CWC Land Services Dept., and local City Admin	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.	County/City Funding, <b>Possible FEMA grant funding for Property Acquisition</b>

#	Hazard	Mitigation Strategy	City of Riverton Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
36	Flooding	Local Planning & Regulations	Encourage individual landowners who live within floodplain areas to participate in the FEMA National Flood Insurance Program (NFIP).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, <b>Riverton</b> , and Trommald	CWC Land Services Dept., MN DNR, local City Admin, and FEMA	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.	County/City Budgets
40	Flooding	Education & Awareness Programs	Provide education and technical assistance to property owners on the application of green infrastructure methods to reduce localized flooding due to high rain events.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, <b>Riverton</b> , and Trommald	CWC Land Services Dept. and CWC SWCD	This task is done through our CWC Land Services Dept. as well as the SWCD. Possible green-infrastructure projects will be considered for eligible for FEMA HMA grant funding.	County Budgets, <b>Possible FEMA HMA funding for 5% Initiative Projects</b>
50	Drought	Local Planning & Regulations / Education & Awareness Programs	Promote water conservation measures and fire safety awareness to residents during periods of drought. Enforce water conservation ordinances when needed (i.e., that prohibit watering lawns during drought).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, <b>Riverton</b> , and Trommald	CWC Emergency Management in collaboration with SWCD and local cities	Promoting water conservation during periods of drought is a standing effort of the County and local governments, as well as the USDA and FSA Office.	County/City Budgets



Table G - 18. Mitigation Actions Identified for Implementation by the City of Trommald (2017-2021) (From Crow Wing County Master Mitigation Action Chart)

#	Hazard	Mitigation Strategy	City of Trommald Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
1	All-Hazards	Education & Awareness Programs	Work to ensure that all Crow Wing County residents are aware of and sign-up for the County's Emergency Warning System (EWS).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and <b>Trommald</b>	CW Emergency Management in coordination with local city government	The CWC Emergency Management Program regularly promotes sign-up for the EWS system via the County EM Facebook Page and during in-person events. Cities also work to promote sign-up by local residents by sharing information on city websites and announcements at public meetings.	County/City Budgets
5	All-Hazards	Education & Awareness Programs	Promote education & awareness of severe weather and personal emergency preparedness for individuals, families, and businesses.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and <b>Trommald</b>	CWC Emergency Management in coordination with city EM's.	CWC Emergency Management participates annually in the National Weather Service's spring and winter Severe Weather Awareness Weeks in April and November. We provide posters, brochures, and material on severe storms to the media and to property owners. Social media is also used to distribute the information. Local cities are encouraged to participate and share this information through their own local channels such as Facebook and city websites.	County/City Budgets
9	Severe Winter Storms	Local Planning & Regulations	Continue providing snow removal, salting, and sanding to minimize the impacts of snow accumulations on motorists.	Ongoing	High	2017 - 2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and <b>Trommald</b>	CWC Highway Dept. in coordination with local cities	This is a standing effort of the CWC Highway Dept. and local City Public Works.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Trommald Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
10	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Identify critical facilities or infrastructure that do not have backup power in the event of a major power outage resulting from severe winter or summer storms. <i>(Critical facilities may include police/fire departments, EOC, health care facilities, water &amp; sewer treatment facilities, and other facilities deemed as critical, i.e. public schools and sheltering facilities).</i>	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and <b>Trommald</b>	CWC Emergency Management, City Admin & Public Works	Not all county & city government buildings and schools have backup power generators to ensure energy in the event of a severe power outage. CWC and each jurisdiction will work to identify their respective critical facilities that should have backup power.	County/City Budgets
11	Severe Winter & Summer Storms	Mitigation Preparedness and Response Support	Purchase and install generator hook-ups and encourage local generator purchases for identified critical facilities that require backup power.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and <b>Trommald</b>	Emergency Management, City Admin & Public Works	CWC, local city governments, and schools will evaluate feasibility to purchase and install generators for key facilities, and will do so as funding allows.	County/City Budgets, <b>Possible FEMA HMA 5% Initiative Funding for Generators</b>

#	Hazard	Mitigation Strategy	City of Trommald Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
12	Severe Winter & Summer Storms	Structure and Infrastructure Projects	Work with rural electrical and municipal coops to identify and address mitigation measures for above ground power lines that are susceptible to damage from severe winter or summer storms in order to reduce potential power outages.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and <b>Trommald</b>	Emily Cooperative Telephone Company, Crow Wing Power Cooperative, Mille Lacs Energy Cooperative, Brainerd Public Utilities, and Consolidated Telephone Company (CTC) in cooperation with local cities	Loss of power due to extreme storm events in the County creates long outage times and costly repairs. There has been overhead power disruption in hard-hit areas of trees. There is a wind "tunnel" from Gull Lake in the Round Lake Area of CR 115. The County and cities will work with local utilities as needed. BCA studies will be conducted for potential project areas to see where underground wires are possible.	Rural or Municipal Electric Coop Funding, <b>Possible FEMA HMA funding for Infrastructure Retrofit</b>
13	Severe Winter & Summer Storms	Local Planning & Regulations	Promote inspection and trimming of trees that may pose risk to falling on power lines during severe storm events.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and <b>Trommald</b>	Same as above.	Tree management in the right-of-way of roads is addressed by our CWC Highway Dept. and/or City Public Works and Utility Companies.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Trommald Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
14	Severe Winter & Summer Storms	Education & Awareness Programs	Promote the use of NOAA weather radios as a key communications resource for residents, businesses, and facilities that house vulnerable populations (i.e., nursing homes, group homes, senior centers, and day care facilities).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and <b>Trommald</b>	CWC Emergency Management and local city EM's	This is an ongoing effort of emergency management programs at the county and local city level. We promote weather radios through PSA's, County Fair, National Night Out, NWS Severe Weather Awareness Weeks and through social media. CWC also continues to work with local vendors and State programs for rebates on NOAA Weather radios.	County/City Budgets
15	Severe Summer Storms	Mitigation Preparedness & Response Support	Provide/participate in the National Weather Service's SKYWARN "Storm Spotter" training in various parts of the County for first responders and community residents.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and <b>Trommald</b>	CWC Emergency Management in collaboration with local cities and NWS	Each year CWC Emergency Management Program works with the National Weather Service to provide this training to local fire departments and local community volunteers. We will continue to encourage more volunteers to become active in the severe storm spotters network. Local cities will continue to remain active in this program.	County Budget and NWS funding to deliver program

#	Hazard	Mitigation Strategy	City of Trommald Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
16	Severe Summer Storms	Structure and Infrastructure Projects	Identify areas where vulnerable populations are susceptible to tornadoes or extreme wind events (i.e. schools, campgrounds, or mobile home parks) and evaluate for construction or retrofit of safe rooms or storm shelters.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and <b>Trommald</b>	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	CWC Emergency Management continues to work with local cities that have experienced severe wind damage and recreational facilities on development of storm shelter areas. We are aware that there are two mobile home parks and the Crow Wing County Fairgrounds have been identified for having a need of a storm shelter or Safe Room.	County/City Budgets
17	Severe Summer Storms	Structure and Infrastructure Projects	Implement construction or retrofit projects for safe rooms or storm shelters in identified vulnerable locations.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and <b>Trommald</b>	CWC Emergency Management, CWC Community Services, in coordination with townships and local cities	Any community safe room projects that the County is involved in will be part of the CWC Emergency Management program. FEMA grant funding may be sought to support an eligible safe room project.	County/City Budgets, <b>Possible FEMA HMA funding for Safe Room Construction</b>

#	Hazard	Mitigation Strategy	City of Trommald Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
27	Flooding	Local Planning & Regulations / Structure and Infrastructure Projects	Identify and improve potential and historical areas of road washout, and replace aging or failing bridges and culverts that are inadequate in order to reduce future flood damages.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and <b>Trommald</b>	CWC Highway Dept, CW Land Services Dept., and local city and township public works	Crow Wing County and local jurisdictions maintain an annual inventory of problem areas due to flooding and plan for projects based on priority and available funding. CW County Highway Dept. has identified flood prone problematic areas on CR 105, CR 128, CSAH 11, CR 132, CR 106 & CR 144. In addition there are bridges that are scour sensitive and pose a hazard risk during high water. CR 128 has a shoreline improvement plan to reduce the risk of water over the road and erosion of the roadbed during high water.	County, and Township Budgets, <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>
28	Flooding	Local Planning & Regulations	Encourage municipalities to require the development of new storm sewer infrastructure capable of handling a ten to twenty year rain event in areas of new development (i.e., new subdivisions) and adoption of a Stormwater ordinance regulating onsite stormwater management for new construction.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and <b>Trommald</b>	CWC Land Services Dept. and SWCD in coordination with local City Admin and Public Works.	Facilitate adoption of stormwater ordinance through a series of workshops.	County/City Budgets, SWCD Grants i.e Serpent Lake Project

#	Hazard	Mitigation Strategy	City of Trommald Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
29	Flooding	Structure and Infrastructure Projects	Develop stormwater management plans and improve stormwater management systems at the county and city level to address future high-impact rain events throughout the County.	Ongoing	New	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and <b>Trommald</b>	CWC Land Services Dept., CWC Highway Dept., CWC GIS, CWC SWCD and local city public works depts., MN DNR, MPCA	The County will seek outside grant funding where possible to fund eligible stormwater improvement projects, such as through MPCA and FEMA HMA funding for flood reduction projects. Local jurisdictions will be responsible for development of local stormwater management plans and identification of priority projects.	County/SWCD budgets, Possible MPCA/PFA grant funding, <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>
30	Flooding	Local Planning & Regulations	Ensure that wellhead protection plans are in place to address flooding that may lead to contaminated drinking water.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and <b>Trommald</b>	CWC Land Services Dept., MN Dept of Health and local city and township public works depts.	Cities work directly with the Minnesota Department of Health on the development or update of wellhead protection plans to ensure they meet State requirements.	MDH Source Water Protection grant funding for wellhead improvement projects

#	Hazard	Mitigation Strategy	City of Trommald Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
31	Flooding	Local Planning & Regulations	Adopt the 2017 updated floodplain maps for Crow Wing County and ensure the update of local ordinances.	New	High	2017	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and <b>Trommald</b>	Crow Wing County Land Services Dept. and City Admin	Crow Wing County has new maps that will go effective 8/15/2017. Communities participating in the NFIP will update their ordinances and adopt the new maps (and make other updates).  <i>City Comment: The City has an established floodplain ordinance and participates in the NFIP. We are currently updating all of the City maps to coincide with the NFIP.</i>	County/City Budgets
33	Flooding	Local Planning & Regulations / Structure & Infrastructure Systems	Keep culverts and drainage ditches free of debris to mitigate against over-the-road flooding.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and <b>Trommald</b>	CWC Highway Dept., CWC Land Services Dept. in coordination with City Public Works	The maintenance of culverts and drainage ditches is done through our CWC Highway Department and City Public Works. We also have Ditch 13 that flows from Lake Edward to North Long Lake. Local municipalities' public works work to monitor and address any problem areas for drainage at the local level.	County/City Budgets
34	Flooding	Local Planning & Regulations	Restrict building in floodplain areas that consistently flood.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and <b>Trommald</b>	CWC Land Services Dept. and Local City Admin.	This action is the responsibility of the CWC Land Services Department and local city ordinances as per NFIP requirements.	County/City Budgets



#	Hazard	Mitigation Strategy	City of Trommald Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
35	Flooding	Local Planning & Regulations	Identify properties that experience damage from repetitive flooding, and work with property owners to buy out structures and turn into open-space.	New	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and <b>Trommald</b>	CWC Land Services Dept., and local City Admin	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.	County/City Funding, <b>Possible FEMA grant funding for Property Acquisition</b>
36	Flooding	Local Planning & Regulations	Encourage individual landowners who live within floodplain areas to participate in the FEMA National Flood Insurance Program (NFIP).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and <b>Trommald</b>	CWC Land Services Dept., MN DNR, local City Admin, and FEMA	This is an ongoing effort of Crow Wing County Land Services in conjunction with local jurisdictions that have experience repetitive flooding.	County/City Budgets
40	Flooding	Education & Awareness Programs	Provide education and technical assistance to property owners on the application of green infrastructure methods to reduce localized flooding due to high rain events.	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and <b>Trommald</b>	CWC Land Services Dept. and CWC SWCD	This task is done through our CWC Land Services Dept. as well as the SWCD. Possible green-infrastructure projects will be considered for eligible for FEMA HMA grant funding.	County Budgets, <b>Possible FEMA HMA funding for 5% Initiative Projects</b>

#	Hazard	Mitigation Strategy	City of Trommald Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
50	Drought	Local Planning & Regulations / Education & Awareness Programs	Promote water conservation measures and fire safety awareness to residents during periods of drought. Enforce water conservation ordinances when needed (i.e., that prohibit watering lawns during drought).	Ongoing	High	2017-2021	Crow Wing County, Baxter, Brainerd, Breezy Point, Crosby, Crosslake, Cuyuna, Deerwood, Emily, Fifty Lakes, Fort Ripley, Garrison, Ironton, Jenkins, Manhattan Beach, Nisswa, Pequot Lakes, Riverton, and <b>Trommald</b>	CWC Emergency Management in collaboration with SWCD and local cities	Promoting water conservation during periods of drought is a standing effort of the County and local governments, as well as the USDA and FSA Office.	County/City Budgets

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# **Appendix H**

## **Past Mitigation Action Review**

### **Status Report (2011-2016)**

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## Crow Wing County – Past Mitigation Action Review Status Report (2011-2016)

Following is a report on the status of each of the mitigation actions that were included in the 2011 Crow Wing County multi-hazard mitigation plan. This report meets the following FEMA crosswalk requirement:

### **D2. Was the plan revised to reflect progress in local mitigation efforts? (44 CFR 201.6 (d)(3))**

The plan **must** describe the status of hazard mitigation actions in the previous plan by identifying those that have been completed or not completed. For actions that have not been completed, the plan **must** either describe whether the action is no longer relevant or be included as part of the updated action plan.

### **COMPLETED**

The following mitigation actions from the past MHMP have been completed and will be removed from the plan update.

- (Tornado) Require all warning systems to be radio activated by dispatch and have battery backup. *(All of the outdoor warning sirens are activated by dispatch and have battery backup.)*
- (Flood) Review D-Firm Maps. *(This action was reviewed in 2015.)*

### **NOT COMPLETED (DELETE)**

The following mitigation actions from the past MHMP have been deemed as not relevant and will be removed from the plan update.

- (Severe Summer Storms) Require storm shelters for all mobile home parks, multiple family dwellings. *(The encouragement of the shelter construction in all mobile home parks throughout Crow Wing County has been made, but due to the seasonal & low income tenant in the parks, the return on investment is not equal to the cost of installation.)*
- (Tornado) Distribute educational materials with County mailings. *(Information on tornados is given out through our CWC website, local media and the use of social media to residents, property owners and business.)*
- (Tornado) Provide information on making structures safer, materials, building storm shelters, etc. *(Information on this task can be found on FEMA, NWS Duluth and HSEM websites.)*
- (Tornado) Establish neighborhood calling trees. *(We have encouraged residents and property owners to do this with their neighborhoods.)*
- (Drought) Promote area support groups. *(Responsibility of the USDA Office.)*

### **NOT COMPLETED (ONGOING/KEEP FOR PLAN UPDATE)**

The following mitigation actions from the past MHMP have not been completed, have been deemed as still relevant and will be carried over into the plan update. Actions will be revised as necessary.

#### **SEVERE SUMMER STORMS**

- Continue to provide posters, brochures, media materials. *(During severe weather*

*awareness week and throughout the summer we provide posters, brochures, and material on severe storms to the media and to property owners. Social media is also used to distribute the information.)*

- Enhance building codes to prevent damage from high winds. *(Building codes are enforced by Crow Wing County Land Department and Local municipalities.)*
- Designate community shelters for evacuees. *(We encourage all cities to identify and designate community storm shelters.)*
- Establish storm shelters in area recreational facilities. *(Continue to work with recreational facilities on storm shelter areas.)*
- Encourage NOAA weather radio use. *(Continue to promote Weather radios through PSA's, County Fair, National Night Out, Severe Weather Awareness Weeks and through social media.)*
- Promote NOAA weather radio use through rebates programs. *(Continue to work with local vendors and State programs for rebates on NOAA Weather radios.)*
- Continue to upgrade and improve Emergency Warning Systems. *(Improvement to EWS system has been made with the ability to send alerts out via the county web page, Facebook, Twitter and IPAWS through our DLAN software.)*
- Install new or upgraded siren warning systems. *(This action has improved with the addition and replacement of new outdoor warning sirens throughout Crow Wing County in the communities of Baxter, Nisswa, Pequot Lakes, Breezy Point, Emily, Riverton, Ideal Township, and Fairfield Township.)*
- Encourage cities to participate in state programs. *(Encouragement is ongoing for the 18 Cities in CWC to participate in HSEM emergency management training programs when available.)*
- Provide education on what causes storm damage. *(During severe weather awareness week and throughout the summer we provide information on severe storms to the media and to property owners. Social media is also used to distribute the information and can be found on the CWC webpage along with NWS Duluth and HSEM webpages.)*
- Recommend a list of building materials capable of handling high winds in areas without natural windbreaks. *(This task is done through our CWC Land Services Dept. or local Cities. Information is can be found on FEMA, NWS Duluth and HSEM websites.)*
- Recommend the use of windbreaks in all new development where natural or man-made windbreaks do not exist. *(Information on this task can be found on FEMA, NWS Duluth and HSEM websites.)*
- Provide public education on the dangers of wind, especially winds associated with thunderstorm activity. *(During severe weather awareness week and throughout the summer we provide information on severe storms to the media and to property owners. Social media is also*

*used to distribute the information and can be found on the CWC webpage along with NWS Duluth and HSEM webpages. Crow Wing County also conducts annual SKYWARN classes with an average of 100 participants every year.)*

- Provide information on reinforcement measures that can be taken by landowners to prevent damage caused by wind. *(During severe weather awareness week and throughout the summer we provide information on severe storms to the media and to property owners. Social media is also used to distribute the information and can be found on the CWC webpage along with NWS Duluth and HSEM webpages.)*
- Identify potential areas of repeating road washout. *(The Crow Wing County Highway Department along with City Public Works are responsible for this task.)*
- Replace aging/failing bridges and culverts that are inadequate. *(The Crow Wing County Highway Department along with City Public Works are responsible for this task.)*

## **TORNADO**

- Continue to provide posters, brochures, media materials. *(During severe weather awareness week and throughout the summer we provide information on severe storms to the media and to property owners. Social media is also used to distribute the information.)*
- Require storm shelters for all mobile home parks, multiple family dwellings. *(The encouragement of the storm shelter construction in all mobile home parks throughout Crow Wing County and has been made. Almost all of the parks do have storm shelters with the exception of a few that we encourage to build. Due to the seasonal & low income tenant in the parks, the return on investment is not equal to the cost of installation. All parks are required by the MDH to have a storm shelter plan in place.)*
- Encourage NOAA weather radio use. *(This is an ongoing task which we encourage year around and promote during Severe Weather Awareness Week.)*
- Continue to upgrade and improve Emergency Warning Systems. *(Improvement to EWS system has been made with the ability to send alerts out via the county web page, Facebook, Twitter and IPAWS through our DLAN software.)*

## **WIND STORMS (SUSTAINED)**

- Recommend a list of building materials capable of handling high winds in areas without natural windbreaks. *(This task is done through our CWC Land Services Dept. or local Cities.)*
- Encourage property owners to trim trees that are near buildings. *(This task is done through our CWC Land Services Dept. or local Cities.)*
- Encourage property owners to remove dead and diseased trees. *(This task is done through our CWC Land Services Dept. or local Cities and the MN DNR.)*

- Encourage landowners to keep lakeshore in natural state. *(This task is done through the CWC Land Services Dept. or local Cities and the MN DNR.)*
- Explore other methods of shoreline retention, such as the use of transition mats, grout bags, footings, and tetrapods. *(This task is done through the CWC Land Services Dept. or local Cities and the MN DNR.)*

## FLOODING

- Restrict building in floodplain areas that consistently flood – Includes cities. *(This action is the responsibility of the CWC Land Services Department and local city ordinances.)*
- Encourage development of parks and open space areas along floodplain areas that consistently flood. *(This action is the responsibility of the CWC Land Services Department and local city ordinances.)*
- Continue to update Emergency Operation Plan yearly. *(CWC Emergency Operations Plan is updated on an annual basis.)*
- Encourage early participation of individual landowners in the FEMA National Flood Insurance Program by persons within floodplain areas. *(This task is encouraged through CWC Land Services, MN DNR and FEMA.)*
- Develop a schedule to regularly patrol streams and rivers for beaver dams. *(This action is carried out by the CWC Land Services Dept., Crow Wing County Highway Dept.)*
- Maintain sandbags and flood fighting equipment. *(CWC does maintain 10,000 sandbags and flood fighting equipment. Sandbags are stored at the CWC Highway garage.)*
- Review current NFIP model ordinance. Task Leader: Local Flood Plan. *(This task is done through our CWC Land Services Dept.)*
- Determine if a new NFIP ordinance needs to be adopted. *(This task is done through our CWC Land Services Dept. and local municipalities.)*
- Provide public education on dangers of flash flooding. *(During severe weather awareness week and throughout the summer we provide information on flash flooding to the media and to property owners. Social media is also used to distribute the information.)*
- Encourage municipalities to require the development of new storm sewer infrastructure capable of handling a ten to twenty year rain event in new subdivisions. *(This task is done through our CWC Land Services Dept.)*
- Educate property owners on landscaping methods. *(This task is done through our CWC Land Services Dept.)*

- Identify and improve potential and historical areas of road washout. *(This task is done through our CWC Highway Department and City Public Works.)*
- Keep culverts and drainage ditches free of debris. *(This task is done through our CWC Highway Department and City Public Works.)*
- Replace aging/failing bridges and culverts that are inadequate. *(This task is done through our CWC Highway Department and City Public Works.)*

## WINTER STORMS

- Encourage through education, event preparedness; i.e. Furnace inspection. *(During Winter Weather Awareness week and throughout the winter we provide information on winter storm preparedness to residents, businesses, and to property owners. Social media, TV, radio and newspaper are used to distribute the information.)*
- Encourage the review of winter driving techniques. *(During Winter Weather Awareness Week and throughout the winter the CWC Highway Department, CWC Sheriff's Office and the Brainerd Lakes Towards Zero Death's encourages all drivers to review their winter driving techniques.)*
- Continue to promote the need for emergency supplies and blankets in traveling vehicles. *(During Winter Weather Awareness week and throughout the winter we provide information on winter storm preparedness to residents, businesses, and to property owners. Social media, TV, radio and newspaper are used to distribute the information.)*
- Encourage the elderly and those that care for the elderly, to keep an ample supply of medication. *(Same as above)*
- Establish "Good Neighbor" programs. *(This action is done through National Night Out.)*
- Provide information on building materials and practices that increase structural safety, and increase energy conservation in cold weather conditions. *(This task is done through our CWC Land Services Dept. or local City's.)*
- Encourage the planting of trees and natural vegetation in new development to minimize large snow accumulation. *(This task is done through our CWC Highway Dept. and/or City Public Works.)*
- Promote inspection and trimming of trees that potentially could fall onto power lines. *(This task is done through our CWC Highway Dept. and/or City Public Works and Utility Companies.)*
- Draw upon local and hazard mitigation funding to ensure power infrastructure can withstand ice storm conditions. *(Continue to work with Utility Companies when funds are available.)*
- Provide information to landowners with Individual Septic Treatment Systems on ways to protect their systems from extreme cold. *(This task is done through our CWC Land Services Dept. or local Cities.)*



- Encourage the planting of natural vegetation or the placement of snow fences or similar devices along roadways to minimize snow accumulation. *(This task is done through our CWC Highway Dept., CWC Land Service Dept. and Cities.)*
- Continue providing exceptional snow removal, salting, and sanding to minimize the impacts of snow accumulations on motorists. *(This action is done through our CWC Highway Dept. and/or City Public Works.)*
- Promote the use of snow fencing, including “living snow fencing”. *(This task is done through our CWC Highway Dept., CWC Land Service Dept. and Cities.)*

## **EXTREME TEMPS**

- Publish a special section with emergency information on extreme heat / extreme cold; include the phone numbers of emergency services offices and hospitals. *(This action is done through CWC Emergency Management and CWC Community Services/Public Health and local Hospitals and Clinics.)*
- Sponsor a "Helping Your Neighbors" program through your local school system to encourage children to think of those persons who require special assistance such as elderly people, infants or people with disabilities during severe weather conditions. *(This task is done through the School Districts.)*

## **WILDFIRE**

- Continue to provide public education materials related to the prevention of forest fires and wildfire. *(Public education is provide on this action through CW Emergency Management, local Fire Departments and MN DNR.)*
- Continue to conduct controlled burns as necessary to prevent the spread of wildfires. *(This action is done through local Fire Departments and MN DNR.)*
- Ensure the strong coordination between local fire departments and associations as well as those from outside areas to provide fire protection, which will reduce the impact of wildfires. *(This action is done through Cuyuna Range Fire Chief Association, Crow Wing County Fire Chiefs and MN DNR.)*
- Promote positive forestry management techniques including the removal of dead, dry vegetation and trees which may ignite as a result of lightning or human related causes. *(This action is done through Cuyuna Range Fire Chief Association, Crow Wing County Fire Chiefs, MN DNR, CWC Emergency Management and CWC Land Services Dept.)*
- Encourage the use of landscape design that will minimize the risk of wildfire. *(This task is done through Local Fire Departments and MN DNR.)*
- Continue to monitor the removal of trees and vegetation around electrical lines and if possible bury electrical lines. *(This task is done through Local Fire Departments, MN DNR and Utility Companies.)*

- Continue to enforce burning restrictions when necessary. *(This action is done through local Fire Departments, MN DNR and Law Enforcement.)*

## **DROUGHT**

- Encourage the wise utilization of water resources regardless of time of year. *(This task is done through local cities and the USDA and FSA Office.)*
- Encourage crop rotation and planting crops according to water needs. *(This action is done through the Minnesota Extension Office, USDA and FSA Office.)*
- Promote mulch gardens. *(This task is done through CWC Land Services Dept. and Minnesota Extension.)*
- Promote shelter belts. *(This task is done through the USDA and FSA Office.)*
- Recommend sprinklers to cool animals. *(This task is done through the USDA and FSA Office.)*

## **DAM FAILURE**

- Maintain contact and coordination with the Minnesota Dam Safety Official. *(Continue to have contact and coordination with the Crosslake and Brainerd Public Utility's Hydro dam operators.)*

# Appendix I

## Works Cited

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# **Appendix J**

## **Crow Wing County Plans & Programs in Place**

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*Planning & Regulatory*

<b>Plans/Programs</b>	<b>Yes/No</b>
Comprehensive/Master Plan	Yes
Capital Improvements Plan	Yes
Economic Development Plan	N/A
Emergency Operations Plan	Yes
Continuity of Operations Plan	Yes (certain areas)
Transportation Plan	Yes
Stormwater Management Plan	Yes
Community Wildfire Protection Plan	No
FireWise Program	Yes
Water Conservation/Emergency Preparedness Plan	N/A
Wellhead Protection Plan	Yes (certain cities)
Database of dry hydrants/well access	No – master plan
Burning permits/restrictions	Yes – follow DNR
Water Management Plan	Yes
Zoning ordinance	Yes
Subdivision ordinance	Yes
Floodplain ordinance	Yes
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	No
Flood insurance rate maps	N/A (FEMA is working on them)
Acquisition of land for open space and public recreation uses	No
School closing policy/communications plan in event of inclement weather/temperatures	Yes
Storm shelters (list all locations)	No
Warning sirens (list all locations)	Yes
SKYWARN Program	Yes
CodeRED Mass Notification System	Yes (IPAWS)
Severe Weather Awareness Week	Yes
Winter Weather Awareness Week	Yes
NOAA Weather Radios	Yes
THIRA	Yes

*Administrative & Technical*

<b>Administration</b>	<b>Yes/No</b>
Planning Commission	Yes
Mitigation Planning Committee	Yes
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	N/A
Mutual aid agreements	Yes
<b>Staff</b>	<b>Yes/No</b>
Chief Building Official	No
Floodplain Administrator	Yes
Emergency Manager	Yes
Community Planner	Yes
Civil Engineer	Yes
GIS Coordinator	Yes
<b>Technical</b>	<b>Yes/No</b>
Warning systems/services (Reverse 911, outdoor warning signals)	Yes (Outdoor Warning Sirens)
Hazard data and information	Yes

*Education & Outreach*

<b>Program/Organization</b>	<b>Yes/No</b>
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Yes
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Yes
Natural disaster or safety related school programs	Yes
StormReady certification	Yes (Breezy Point)
Firewise Communities certification	No
Public-private partnership initiatives addressing disaster-related issues	Yes

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**Appendix K**  
**Local Mitigation Capabilities**  
**Assessment Report**

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# CROW WING COUNTY

## 2017 Local Mitigation Capabilities Assessment Report

As part of the 2017 Crow Wing County Multi-Hazard Mitigation Plan update, City and township jurisdictions as well as County departments were invited to respond to a “Local Mitigation Capabilities Assessment” (LMCA) questionnaire to provide information about the current capabilities they have in place to support hazard mitigation, as well as any identified gaps or deficiencies. Information from the LMCAs was used to assist in developing new mitigation actions for the 2017 plan update. Following are the responses from those departments or jurisdictions that participated.

### CITY OF BAXTER, MN

Submitted By: James Exsted, Chief of Police

**Q1. What plans, authorities, or policies are in place to help accomplish mitigation in your community?**

- The City of Baxter has a Comprehensive Plan developed and implemented in 2015 that addresses future growth and development.
- The City participates in the National Flood Insurance Program.
- The City has a five-year transportation plan.
- The City has implemented a flood control project in section 6 of the City (Inglewood to Hwy371 and Excelsior Rd to Woida Rd.) Ditching and other water management projects have been incorporated and the plan is now nearing completion.

**Q2. What staff (organizational capacity) are in place to help accomplish mitigation in your community?**

- The City utilizes a Long Range Planning Commission along with a Utilities Commission. Both work on pre-development mitigation strategies.
- Chief of Police is Emergency Manager for the City.
- The City has its own GIS Specialist.

**Q3. What programs are in place to help accomplish mitigation in your community?**

**Examples:**

- The City is looking to partner in the near future on a notification system for residents.
- The City has a website in which we send out information related to severe weather awareness weeks.
- School district practices tornado drills on an annual basis.

**Q4. What funding or other resources are available to help accomplish mitigation in your community?**

- The City has used the services of a forester following storms in recent years. A mitigation plan was established and logging and clean-up of debris occurred.

**Q5. What program gaps or deficiencies do you feel exist that are a barrier to accomplishing mitigation in your community?**

- None listed.

**CITY OF BRAINERD, MN**

*Submitted By: Corkey McQuiston, Police Chief*

**Q1. What plans, authorities, or policies are in place to help accomplish mitigation in your community?**

- We work with local partners in planning and staffing high profile annual events like the local 4<sup>th</sup> of July Festivities that involve an increase of our normal population x5, discussing strategies for crowd management and emergency response actions.
- We work with the regional airport and emergency response partners annually on the emergency action plan and participate in drilling an incident at the airport every other year.

**Q2. What staff (organizational capacity) are in place to help accomplish mitigation in your community?**

- Our Fire Chief is the City's designated Emergency Manager.
- The City has its own GIS Specialist.
- Our City Engineer works with Public Works collectively to addresses road maintenance issues for flooding (culverts, repetitive flooding).

**Q3. What programs are in place to help accomplish mitigation in your community?**

- Our City has a civil defense siren system and we participate in Spring Tornado Drills.

**Q4. What funding or other resources are available to help accomplish mitigation in your community?**

- We could have possible funding from Region 5 NJPA for assistance to implement new services through their Innovative Funding annual grants.

**Q5. What program gaps or deficiencies do you feel exist that are a barrier to accomplishing mitigation in your community?**

- I don't know if our Comprehensive Plan addresses hazard mitigation.

**CITY OF BREEZY POINT, MN**

*Submitted By: Chief Kevin Merschman*

**Q1. What plans, authorities, or policies are in place to help accomplish mitigation in your community?**

- The City adopted the state building code and enforces its requirements.
- The City has a 20-year Comprehensive Plan (2016) that is designed to plan for the future physical growth of the City and appropriate land uses.
- The City subdivision ordinance addresses the need to establish drainage of sufficient design to meet a 100 year rain event.
- The City has acquired properties to increase storm water retention in areas where past local flooding has occurred.
- In areas where flash flooding of roadways has occurred it is the policy to restore with improvements to drainage ways.

**Q2. What staff (organizational capacity) are in place to help accomplish mitigation in your community?**

- Our Police Chief is designated Emergency Manager.
- City contracts an engineer who works with Public Works supervisor to address road maintenance and improved drainage.
- City council has a road committee to plan future road projects.
- The City contracts with the Pequot Lakes Fire Department for these services.
- The City contracts for building code inspection.

**Q3. What programs are in place to help accomplish mitigation in your community?**

- The Police Department has taken steps to certify the City Storm Ready by the National Weather Service.
- The City has installed two outdoor warning sirens and participates in the annual weather awareness week.
- The Eagle View Elementary School practices severe weather drills annually and Police Officers provide severe weather training annually to students.
- The Police Department educates and alerts residents using Facebook and other social media sites.
- The City has acquired a portable generator to power lift stations in the event of power outages.

**Q4. What funding or other resources are available to help accomplish mitigation in your community?**

- The City has worked with state, federal and county partners to address mitigation efforts following past disaster events such as the July, 2016 severe wind event.

**Q5. What program gaps or deficiencies do you feel exist that are a barrier to accomplishing mitigation in your community?**

- The City has a large number of seasonal camping sites and patio homes without access to severe storm shelters. There is also a significant transient population as part of the Breezy Point Resort and three 18-hole golf courses making a community storm shelter a need.

**CITY OF CROSBY, MN**

*Submitted By: Lisa Sova, Clerk Treasurer*

**Q1. What plans, authorities, or policies are in place to help accomplish mitigation in your community?**

- The city recently adopted a comprehensive plan that is designed to plan for the future physical growth of the city and appropriate land uses
- The city is in the process of adopting FEMA's floodplain ordinance. The DNR has identified one property located in the floodplain in the city.
- The city recently adopted a stormwater ordinance to establish regulatory requirements for land development and land disturbing activities aimed at minimizing the threats to public health, safety, public and private property, and natural resources within the City from construction site erosion and post-construction stormwater runoff.

**Q2. What staff (organizational capacity) are in place to help accomplish mitigation in your community?**

- The city has a public works department that maintains city roads during storm events.
- The city has fire and police departments to handle emergencies.
- The city contracts its building code enforcement, city engineering and zoning administration.

**Q3. What programs are in place to help accomplish mitigation in your community?**

- The city is able to disperse information to its residents through utility billing mailings and the city website.

**Q4. What funding or other resources are available to help accomplish mitigation in your community?**



- Unknown.

**Q5. What program gaps or deficiencies do you feel exist that are a barrier to accomplishing mitigation in your community?**

- The city has flash flooding events in many areas of the city during significant rain storms. This issue should be studied and remedied but funds are not available.

## CITY OF CROSSLAKE, MN

*Submitted By: Robert G. Hartman Police Chief, City Emergency Manager*

**Q1. What plans, authorities, or policies are in place to help accomplish mitigation in your community?**

- The Crosslake Planning and Zoning has established a floodplain.

**Q2. What staff (organizational capacity) are in place to help accomplish mitigation in your community?**

- The Police Chief is the Emergency Manager, the Public Works Director is responsible for road maintenance issues.

**Q3. What programs are in place to help accomplish mitigation in your community?**

- The City has emergency sirens throughout the area. The Crosslake Community School practices tornado drills annually.

**Q4. What funding or other resources are available to help accomplish mitigation in your community?**

- Unknown.

**Q5. What program gaps or deficiencies do you feel exist that are a barrier to accomplishing mitigation in your community?**

- None at this time.

## CITY OF CUYUNA, MN

*Submitted By: William F. Bedard, Clerk-Treasurer*

**Q1. What plans, authorities, or policies are in place to help accomplish mitigation in your community?**

- The City has a City Planning and Zoning Commission and has established a Floodplain Ordinance.
- The City also participates in the National Flood Insurance Program (NFIP).
- The City performs an annual review to address road improvement projects that include culvert and drainage improvements to reduce over-the-road repetitive flooding.
- The city addresses additional potential hazards in its Well Head Protection Plan.

**Q2. What staff (organizational capacity) are in place to help accomplish mitigation in your community?**

- Our Fire Chief is the City's designated Emergency Manager.
- The City Engineer and council addresses road maintenance issues for flooding (culverts, repetitive flooding).

**Q3. What programs are in place to help accomplish mitigation in your community?**

- The City participates in the annual Severe Winter/Spring Weather Awareness Week.
- The City's fire department conducts a spring review and controlled burn in areas adjacent to woodland areas for wildland fire safety.

**Q4. What funding or other resources are available to help accomplish mitigation in your community?**

- HMA grants and FEMA Hazard Mitigation Assistance Programs.

**Q5. What program gaps or deficiencies do you feel exist that are a barrier to accomplishing mitigation in your community?**

- Emergency warning sirens.
- Tie county alerts to the City website.
- Storm shelter near park.

**CITY OF DEERWOOD, MN**

*Submitted By: Jeff Turk, Clerk Treasurer*

**Q1. What plans, authorities, or policies are in place to help accomplish mitigation in your community?**

- The city recently adopted a new comprehensive plan that addresses future growth of the city.

- The city is in the process of adopting FEMA's floodplain regulations and enrolling in the National Flood Insurance Program.
- The city recently adopted a stormwater ordinance to establish regulatory requirements for land development and land disturbing activities aimed at minimizing the threats to public health, safety, public and private property, and natural resources within the City from construction site erosion and post-construction stormwater runoff.

**Q2. What staff (organizational capacity) are in place to help accomplish mitigation in your community?**

- The city has a police, fire and public works department and two clerks on staff.
- The city contracts its engineering, building code enforcement and zoning services.

**Q3. What programs are in place to help accomplish mitigation in your community?**

- The city is able to disperse information to its residents through the city website.

**Q4. What funding or other resources are available to help accomplish mitigation in your community?**

- Unknown.

**Q5. What program gaps or deficiencies do you feel exist that are a barrier to accomplishing mitigation in your community?**

- Unknown.

**CITY OF EMILY, MN**

*Submitted By: Christa Andrews, Clerk/Treasurer*

**Q1. What plans, authorities, or policies are in place to help accomplish mitigation in your community?**

- We have a City Planning and Zoning Commission currently working to establish a Floodplain Ordinance.
- We have recently updated the City's Emergency Plan.
- We have been part of MnWARN since November of 2010.
- Last year, we upgraded our warning siren.
- The City provides culverts at cost to residents to reduce flooding and improve drainage.
- We have a comprehensive plan for future growth and city needs.
- We recently finished the update to the Zoning map.
- Road work is engineered to provide for proper drainage

**Q2. What staff (organizational capacity) are in place to help accomplish mitigation in your community?**

- The City has an Emergency Management Director, as well as a Councilmember who covers the winter months as acting Emergency Management Director.
- Our Maintenance Department staff are on call 24/7 for responding to emergencies, including but not limited to plowing, tree removal and drainage issues.
- The City's Fire Department is trained and equipped to fight wildfires as mutual aid to the DNR.
- The City has a Road Committee comprised of two Council members, a Maintenance staff member and the City Engineer to address all road related issues.
- The City's First Response Unit and Fire Department is active in the City and two adjoining townships.

**Q3. What programs are in place to help accomplish mitigation in your community?**

- The City operates a website providing emergency and other information to citizens.
- The City Hall as well as a local church are defined as Emergency shelters.

**Q4. What funding or other resources are available to help accomplish mitigation in your community?**

- The City has previously worked with the County, State and FEMA for help funding for repairs during natural disasters.
- The City also has savings for immediate repairs needed.
- We partner with MnWARN for emergency response.
- We contract with Ritter and Ritter for emergency response for City Sewer issues, including generators.
- The City Emergency response departments provide mutual aid as needed and also receives mutual aid from surrounding communities.

**Q5. What program gaps or deficiencies do you feel exist that are a barrier to accomplishing mitigation in your community?**

- We need to regularly update all policies and plans for mitigation to better serve the community.
- Completion of the Floodplain Ordinance needs to occur.
- A Safety Committee needs to be established.

**CITY OF FIFTY LAKES, MN**

*Submitted By: Karen Stern, City Clerk/ Justin Burslie, Zoning Administrator (contracted with NJPA)*

**Q1. What plans, authorities, or policies are in place to help accomplish mitigation in your community?**

- We have a comprehensive plan designed to plan for the future physical growth of the City and appropriate land uses. This document was adopted in 1998 and is in the process of being reviewed/updated.
- We address proposed development in Floodplain areas by reference to Statute in our current zoning ordinance. The City has reviewed and is working on adopting the model DNR floodplain ordinance.
- The City has an Emergency Operations Plan (EOP) in place.

**Q2. What staff (organizational capacity) are in place to help accomplish mitigation in your community?**

- Our Mayor and a community liaison are the principal contacts for the EOC
- We have a primary contact person for search and rescue, evacuation/traffic control, fire protection, debris clearance, utilities restoration and emergency medical services.
- The City contracts with National Joint Powers Alliance to administer its zoning regulations.
- We have a public works supervisor that addresses road maintenance issues for flooding (culverts, repetitive flooding).

**Q3. What programs are in place to help accomplish mitigation in your community?**

- Implementation of an Emergency Operations Plan.

**Q4. What funding or other resources are available to help accomplish mitigation in your community?**

- None that we are aware of.

**Q5. What program gaps or deficiencies do you feel exist that are a barrier to accomplishing mitigation in your community?**

- Funds are needed to implement an emergency alert system (multiple sirens). A plan had been devised but the City but it was not implemented due to lack of funding.
- Funds could be utilized to explore storm shelter options for the manufactured home park and campground.
- The City could use additional funding to update its land use ordinance with Flood Plain regulations.
- Additional funds could be used to review/update the EOC and hold community training sessions.

## CITY OF FORT RIPLEY, MN

Submitted By: *Gerald Tschida, Mayor*

**Q1. What plans, authorities, or policies are in place to help accomplish mitigation in your community?**

- The City does not have its own plan. We would work with Crow Wing County Emergency Management Personnel.

**Q2. What staff (organizational capacity) are in place to help accomplish mitigation in your community?**

- The City does not have professional staff. We are a population of 72 with only a Mayor, Council and part-time clerk and treasurer. We would rely on County professional staff.

**Q3. What programs are in place to help accomplish mitigation in your community?**

- None in the City.

**Q4. What funding or other resources are available to help accomplish mitigation in your community?**

- None

**Q5. What program gaps or deficiencies do you feel exist that are a barrier to accomplishing mitigation in your community?**

- Unknown

## CITY OF GARRISON, MN

Submitted By: *Amy Vukelich, Deputy Clerk*

**Q1. What plans, authorities, or policies are in place to help accomplish mitigation in your community?**

- The City has a long-range comprehensive plan to plan for future growth of the city.

**Q2. What staff (organizational capacity) are in place to help accomplish mitigation in your community?**

- The City has a Deputy Clerk on staff.

- The City has a fire department, a public works guy
- Street maintenance, engineering and zoning services are contracted.

**Q3. What programs are in place to help accomplish mitigation in your community?**

- The City had explored building a safe room/fire department but we were put on a waiting list by FEMA

**Q4. What funding or other resources are available to help accomplish mitigation in your community?**

- Unknown.

**Q5. What program gaps or deficiencies do you feel exist that are a barrier to accomplishing mitigation in your community?**

- The city is exploring the possibility of adopting the state building code.

## CITY OF IRONTON, MN

*Submitted By: Amy Baratto-Clerk/Treasurer*

**Q1. What plans, authorities, or policies are in place to help accomplish mitigation in your community?**

- The City recently adopted a comprehensive plan that is designed to plan for the future physical growth of the City and appropriate land uses.
- The City is currently discussing the option to join the National Flood Program and the option to approve the Floodplain Ordinance.

**Q2. What staff (organizational capacity) are in place to help accomplish mitigation in your community?**

- Our Mayor is currently our designated Emergency Services Manager
- We have our Clerk, Public Works, and the Fire Department to help with mitigation
- Public Works is constantly maintaining and checking the roads during hazardous events

**Q3. What programs are in place to help accomplish mitigation in your community?**

- The City has a siren that we can manually turn on in case of an emergency.
- The Fire Department at City Hall is currently a community storm shelter if needed.
- We can send information through our website and Facebook page.

**Q4. What funding or other resources are available to help accomplish mitigation in your community?**

- If we join the flood program, we could possibly to draw from the FEMA Hazard Mitigation Assistance Program.

**Q5. What program gaps or deficiencies do you feel exist that are a barrier to accomplishing mitigation in your community?**

- Funding opportunities to help mitigate the emergency plans in our community
- Train/inform our residents what their options are, what to do, and who to contact during an emergency.

**CITY OF JENKINS, MN**

*Submitted By: Krista Okerman, City Clerk-Treasurer*

**Q1. What plans, authorities, or policies are in place to help accomplish mitigation in your community?**

- We have a Comprehensive Plan that is designed to plan for the future physical growth of the city and appropriate land uses.
- We have a City Planning and Zoning Commission that has established a Floodplain Ordinance.

**Q2. What staff (organizational capacity) are in place to help accomplish mitigation in your community?**

- We belong to a Regional Safety Group that holds monthly safety meeting. Some topics of the meeting include emergency preparedness.
- We have a City Engineer and a Public Works worker that addresses road maintenance issues for flooding (culverts, repetitive flooding).

**Q3. What programs are in place to help accomplish mitigation in your community?**

- We currently do not have any programs in place.

**Q4. What funding or other resources are available to help accomplish mitigation in your community?**

- We currently do not have specific funding in place. However, the City does have reserve funds available.



- We contract our fire and police protection with the City of Pequot Lakes and would use them for additional resources.

**Q5. What program gaps or deficiencies do you feel exist that are a barrier to accomplishing mitigation in your community?**

- We need to have “test” drills for responding to emergencies.
- We need to educate staff, Council and residents on what do, who to contact, etc. in the event of an emergency.

## CITY OF MANHATTAN BEACH, MN

*Submitted By: Amy Wannebo, Clerk*

**Q1. What plans, authorities, or policies are in place to help accomplish mitigation in your community?**

- The city has a long-range comprehensive plan to plan for future growth of the city.
- The City currently adopted a floodplain ordinance and is working on participating in the NFIP.

**Q2. What staff (organizational capacity) are in place to help accomplish mitigation in your community?**

- The city has a clerk.
- Street maintenance, engineering and zoning services are contracted.

**Q3. What programs are in place to help accomplish mitigation in your community?**

- Emergency information can be dispersed through the city’s website.

**Q4. What funding or other resources are available to help accomplish mitigation in your community?**

- Unknown.

**Q5. What program gaps or deficiencies do you feel exist that are a barrier to accomplishing mitigation in your community?**

- Unknown.

## CITY OF NISSWA, MN

Submitted By: Desmond McGeough, AICP, Planning and Zoning Administrator

**Q1. What plans, authorities, or policies are in place to help accomplish mitigation in your community?**

- We have a 10-year Comprehensive Plan (2007) that is designed to plan for the future physical growth of the city and appropriate land uses. City of Nisswa is currently updating the Comprehensive Plan and anticipates completion by the end of 2017.
- We have a City Planning and Zoning Commission that has established a Floodplain Ordinance. The City participates in the National Flood Insurance Program (NFIP).
- The city has stormwater Zoning Ordinance provisions for commercial and subdivision development.

**Q2. What staff (organizational capacity) are in place to help accomplish mitigation in your community?**

- The Police Chief is the Emergency Manager; the Public Works Director is responsible for road maintenance issues.

**Q3. What programs are in place to help accomplish mitigation in your community?**

- The City has emergency sirens throughout the area.
- Nisswa Elementary School practices tornado drills annually.

**Q4. What funding or other resources are available to help accomplish mitigation in your community?**

- Unknown at this time.

**Q5. What program gaps or deficiencies do you feel exist that are a barrier to accomplishing mitigation in your community?**

- None at this time.

## CITY OF PEQUOT LAKES, MN

Submitted By: Nancy Malecha, City Administrator/Clerk

**Q1. What plans, authorities, or policies are in place to help accomplish mitigation in your community?**

- We have a Comprehensive Plan in place to plan for the future growth of our City and appropriate land uses.
- We have a joint powers agreement with Crow Wing County for mutual public safety services.
- We have an Emergency Operations Plan (EOP) in place that was revised in 2016.
- In 2016, we adopted an ordinance and plan regulating nonessential water usage upon critical water deficiency.
- We are in the process of establishing a floodplain ordinance in accordance with FEMA regulations.

**Q2. What staff (organizational capacity) are in place to help accomplish mitigation in your community?**

- Our Police Chief and Fire Chief are designated as Emergency Management Directors.
- We have a safety committee consisting of our Police Chief or Sergeant, Fire Chief, Public Works Supervisor, Zoning Specialist, City Administrator/Clerk, and City Council Liaison that reviews safety standards and trainings.
- We have a Public Works Supervisor that address road maintenance issues.

**Q3. What programs are in place to help accomplish mitigation in your community?**

- Emergency Alert System is in place with Crow Wing County.
- We have three warning sirens installed within our City limits.
- Our Fire Department hosts an annual open house where educational information is discussed and distributed regarding fire safety.
- Our Police Department hosts an annual National Night Out event where educational information on public safety can be discussed and distributed.
- Tornado and fire drills occur within our school district.

**Q4. What funding or other resources are available to help accomplish mitigation in your community?**

- The City has worked with state and federal partners to address mitigation efforts following past disaster events such as the 2016 severe wind event.
- Our Fire Department collaborates with the DNR to determine wildfire target areas.

**Q5. What program gaps or deficiencies do you feel exist that are a barrier to accomplishing mitigation in your community?**

- Funding deficiencies are the biggest barrier in accomplishing mitigation in our community.
- We need to determine a community storm shelter location and inform our residents.

## CITY OF RIVERTON, MN

Submitted By: Cari Johnson, City Clerk

**Q1. What plans, authorities, or policies are in place to help accomplish mitigation in your community?**

- Riverton has established a Floodplain Ordinance. The City participates in the National Flood Insurance Program (NFIP).
- The City is a member of MNWARN.

**Q2. What staff (organizational capacity) are in place to help accomplish mitigation in your community?**

- Maintenance staff (2) and Crosby Fire Department.

**Q3. What programs are in place to help accomplish mitigation in your community?**

- MNWARN

**Q4. What funding or other resources are available to help accomplish mitigation in your community?**

- MNWARN would assist with resources.

**Q5. What program gaps or deficiencies do you feel exist that are a barrier to accomplishing mitigation in your community?**

- Riverton needs an emergency plan, which is planned to be developed through the Wellhead Protection Plan.

## CITY OF TROMMALD, MN

Submitted By: Rob Geskel/ Water Dept. Emergency Disaster Contact

**Q1. What plans, authorities, or policies are in place to help accomplish mitigation in your community?**

- Our City has a Planning & Zoning Commission that works on potential emergency procedures. We do work with FEMA and have established a plan and our participation in the National Flood Insurance Program.
- Our City has established an Emergency plan with recommendations from the Minnesota Department of Health that also includes our Wellhead Protection Plan.

**Q2. What staff (organizational capacity) are in place to help accomplish mitigation in your community?**

- The City has an established Emergency manager to coordinate issues as needed.

**Q3. What programs are in place to help accomplish mitigation in your community?**

- Our City utilizes the Ironton Fire Department for our City fire protection and they annually present a program for local residents to educate about safety measures that residents should implement.

**Q4. What funding or other resources are available to help accomplish mitigation in your community?**

- Our City has worked with other agencies after previous disaster events within our jurisdiction.

**Q5. What program gaps or deficiencies do you feel exist that are a barrier to accomplishing mitigation in your community?**

- Our City has a very limited budget and find funding very difficult at times to implement some items that should be addressed.