

# Jackson County All Hazard Mitigation Plan

February

# 2016

*This multi-jurisdictional hazard mitigation plan includes Jackson County and the Cities of Alpha, Heron Lake, Jackson, Lakefield, Okabena, and Wilder. This project was supported by Grant Award awarded by the Federal Emergency Management Agency (FEMA).*

Prepared by  
Southwest  
Regional  
Development  
Commission  
and Jackson  
County  
Emergency  
Management

# JACKSON COUNTY ALL HAZARD MITIGATION PLAN

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February 2016

## Executive Summary

The purpose of the Jackson County All Hazard Mitigation Plan (AHMP) is to determine how to reduce property damage and loss of life resulting from natural and manmade hazards. The Jackson County AHMP includes resources and information to assist county residents, public and private sector organizations, and others interested in participating in planning for both natural and manmade hazards. This mitigation plan identifies hazards that pose a threat to Jackson County, as well as what is currently being done to mitigate their impacts. The plan also provides a list of actions and programs that may enable Jackson County to further reduce negative impacts caused by disasters. The implementation strategies address both natural and manmade hazards that include but are not limited to flooding, drought, severe summer and winter storms, fires, and tornados.

The Jackson County AHMP Planning Team identified the following natural and manmade hazards as High Rank Hazards for Jackson County:

- Blizzards, Winter Storms, and Extreme Cold Events
- Tornados and Straight-line Wind Events

This planning process has been conducted by the Southwest Regional Development Commission (SRDC) and Jackson County Emergency Management in accordance with current guidance provided by the State of Minnesota Department of Homeland Security and Emergency Management (HSEM) and the US Federal Emergency Management Agency (FEMA). This hazard mitigation plan documents the multi-jurisdictional, multi-hazard mitigation planning process in Jackson County, Minnesota, which is intended to meet the requirements of the Federal Emergency Management Agency (FEMA) Regulation 44 CFR 201.6 Local Mitigation Plans.

All participating jurisdictions in Jackson County have agreed to a joint administration and operation of the AHMP to help mitigate the effects of natural and manmade hazards. The project was undertaken so that all local units of government in Jackson County, that wished to participate, could participate and remain eligible for FEMA funding.

The first Jackson County AHMP was adopted in 2007. The current update reviewed and updated the original plan. The update utilized a great deal of data from many different sources and also relied on input and expertise from the Jackson County AHMP Planning Team. The plan resides with the Office of Emergency Management in Jackson County, who is responsible for maintenance and updates.

*Jackson County Mission:*

“Jackson County is committed to service, growth, and tradition in a diverse rural environment.”

*Jackson County’s All Hazard Mitigation Plan Mission:*

“Jackson County is committed to service, growth, and tradition in a diverse rural environment while protecting residents and infrastructure from natural and human caused hazards.”

*Participation in Plan Development*

The Jackson County All Hazard Mitigation Plan is a multiparty effort among Jackson County, Jackson County Emergency Management, Jackson County citizens, local public agencies, people in the private sector, and many people in regional and state organizations. Public participation plays a key role in the planning process. We also rely on the experience of elected and appointed volunteers. The Jackson County AHMP Planning Team (here after referred to as planning team) members comprised a broad representation of the county and their feedback was immensely useful in the development of the plan update.

Jackson County AHMP Planning Team:

- Jeff Johnson, Jackson County Emergency Management Director
- Tawn Hall, Jackson County Deputy Emergency Management Director
- George Tauer, City of Jackson Superintendent and Jackson City Emergency Manager
- Jennifer Bromeland, City of Jackson Administrator
- Joe Marthaler, Operations Manager Federated Rural Electric
- Kelly Rashe, Lakefield City Administrative /Clerk
- Andy Geiger, Jackson County Land Management Director
- Anthony Fauglid, Heron Lake Chief of Police and Heron Lake City Emergency Manager
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Minnesota Division of Homeland Security and Emergency Management



Federal Emergency Management Agency



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# CHAPTER 1: INTRODUCTION

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## I Mitigation Planning

Natural and manmade hazards present risks throughout Minnesota. Jackson County has to be ready at all times to respond to a number of natural and manmade disasters. Local units of government, first responders, and emergency managers have worked together to create the Jackson County All Hazard Mitigation Plan (AHMP). This plan helps Jackson County protect its population and infrastructure by planning for natural and manmade hazards before the disaster strikes.

What is Hazard Mitigation Planning? According to the U.S. Federal Emergency Management Agency (FEMA) State and Local Mitigation Planning Fact Sheet:

*Hazard mitigation planning is the process State, local, and tribal governments use to identify risks and vulnerabilities associated with natural disasters, and develop long-term strategies for protecting people, resources, and property in future hazard events. This planning process involves Tribal members and other affected stakeholders, and results in a mitigation plan with a strategy for breaking the cycle of disaster damage, reconstruction, and repeated damage. The mitigation plan also identifies mitigation actions and projects to implement the mitigation strategy. Under the Disaster Mitigation Act of 2000 (Public Law 106-390), State, local and tribal governments are required to develop a hazard mitigation plan as a condition for receiving certain types of non-emergency disaster assistance and FEMA grants to implement mitigation projects.*

A simpler description comes from James Schwab:

“Hazard mitigation essentially is the art and science of reducing risks of future losses.”<sup>1</sup>

## Purpose

- *Save lives, reduce injuries, sustain public health*

Identify properties that are in obvious need of protection and establish policies and practical actions that fortify these properties from the effects of natural and human caused hazards.

Reduce both economic and physical losses from repetitive damages caused from constant hazard events. Encourage county communities to participate in the National Flood Insurance Program (NFIP).

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<sup>1</sup>Planning Magazine. James Schwab. Accessed: 5/29/13. Available: <http://allhazards.wordpress.com/2010/03/02/mitigation-planning/>

Improve hazard assessment information to make recommendations for discouraging new development and encouraging preventative measures for existing development in areas vulnerable to natural hazards.

➤ *Minimize social dislocation and stress*

Where appropriate, develop and implement education and outreach programs to increase public awareness of the risks associated with natural hazards and the potential danger for human caused hazards.

Provide assistance in locating tools, partnership opportunities, and funding resources to assist in implementing mitigation activities.

➤ *Minimize agricultural losses*

Balance land use planning and natural resource management with hazard mitigation in order to protect life, property, and natural environment.

Preserve, rehabilitate, and enhance the county's natural infrastructure systems to serve hazard mitigation functions.

➤ *Protect critical infrastructure from damage*

Establish policy through the planning process to ensure mitigation projects for critical facilities and services.

Strengthen emergency operations by increasing collaboration and coordination among public agencies, non-profit organizations, businesses, and industries.

Coordinate and integrate hazard mitigation activities, where appropriate, with emergency operations plans and procedures.

## **II Justification & Legal Authority**

The rising costs of natural and human-caused disasters at the end of the 20<sup>th</sup> century led many leaders to consider how to better protect people and their communities. Congress passed the Disaster Mitigation Act of 2000 (DMA2K) (PL 106-390) to establish a unified national hazard mitigation program. DMA2K amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 (Stafford Act), which in turn had amended the Disaster Relief Act of 1974. DMA2K placed new emphasis on hazard mitigation planning in state and local units of government, requiring adoption of mitigation plans as a prerequisite for certain assistance programs.

A multi-hazard or "All-Hazards" approaches to mitigation planning encompasses both natural and manmade hazards. Following the 2001 attacks on New York City and Washington, DC, and the subsequent reorganization of FEMA and the nation's homeland security structure, many mitigation planning efforts explicitly incorporated technological hazards arising from human activities in the hazard

mitigation plans. While local hazard mitigation plans are only required to address natural hazards, the All-Hazards approach considers a comprehensive array of both risks and potential mitigation actions.

FEMA has implemented hazard mitigation planning requirements through federal regulations (44 CFR 201.6). In Minnesota, the Homeland Security and Emergency Management (HSEM) division of the Department of Public Safety (DPS) works with FEMA to implement disaster mitigation efforts. The Minnesota Department of Natural Resources (DNR) is also involved with mitigation as the agency responsible for implementation of FEMA's National Flood Insurance Program (NFIP) and floodplain management in the state.

Minnesota Governor's Executive Order 07 – 14 assigns responsibility for the creation and maintenance of the Minnesota Emergency Operation Plan, the State All Hazard Mitigation Plan and such other duties as may be requested by the HSEM.<sup>2</sup> The order also directs other state agencies to assist with the planning process.

Under 44 CFR 201.6, local governments must have a FEMA-approved Local All Hazard Mitigation Plan to be eligible for and receive project grants under the following hazard mitigation assistance programs: Hazard Mitigation Grant program (HMGP), Pre-Disaster Mitigation (PDM), Flood Mitigation Assistance (FMA), and Severe Repetitive Loss (SRL).

### **III Mitigation Funding Programs**

FEMA administers several different programs that provide hazard mitigation funding. Typically grants allow a cost-share of 75 to 90 percent federal funding for eligible projects. FEMA offers four hazard mitigation assistance programs which are described in detail at [www.fema.gov/hazard-mitigation-assistance](http://www.fema.gov/hazard-mitigation-assistance). Any projects funded by these programs must demonstrate a positive benefit-cost ratio. The four hazard mitigation assistance programs include: the Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM), Flood Mitigation Assistance (FMA), and Repetitive Flood Claims (RFC).

#### **Hazard Mitigation Grant Program (HMGP)**

HMGP provides funds in accordance with priorities identified in hazard mitigation plans to implement mitigation measures during disaster recovery. State and local governments, certain private non-profit organizations, and tribes are eligible sub-applicants through HSEM. Examples of eligible projects include:

- Acquiring and relocating structures from hazard-prone areas
- Retrofitting structures to protect them from floods, high winds, earthquakes, or other natural hazards
- Constructing certain types of minor and localized flood control projects
- Constructing safe rooms inside schools or other buildings in tornado-prone areas
- Hazard mitigation planning

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<sup>2</sup> State of Minnesota Executive Order 07-14. Accessed 5/29/13. Available: <http://www.leg.mn/archive/execorders/07-14.pdf>



### **Pre-Disaster Mitigation (PDM)**

PDM provides funds for hazard mitigation planning and implementation prior to a disaster event. State-level agencies, tribes, local government, and public colleges are eligible sub-applicants through HSEM. Examples of eligible projects include:

- Voluntary acquisition of real property for open space
- Elevation of existing public or private structures
- Retrofitting existing structures to meet building codes
- Construction of safe rooms for public or private structures that meet certain FEMA requirements
- Hydrologic and hydraulic studies/analyses, engineering and drainage studies for project design and feasibility
- Vegetation management
- Protective measures for utilities, water, sewer, roads and bridges
- Storm water management to reduce/eliminate long-term flood risk

### **Flood Mitigation Assistance (FMA)**

FMA implements cost-effective measures to reduce or eliminate long-term risk of flood damage to NFIP structures. State-level agencies, tribes, and local government are eligible sub-applicants through HSEM. Eligible projects include:

- Acquisition, structure demolition, or structure relocation with the property deed restricted for open space uses in perpetuity
- Elevation of structures
- Dry flood proofing of non-residential structures
- Minor structural flood control activities

### **Repetitive Flood Claims (RFC)**

RFC intends to reduce/eliminate long-term risk to structures with one or more NFIP claim. State-level agencies, tribes, and local government that cannot meet FMA requirements for cost-share or management capacity are eligible sub-applicants through HSEM. Project grants are available for acquisition, structure demolition, or structure relocation of insured structures, with the property deed restricted for open space uses in perpetuity. There are currently no RFC properties in Jackson County.<sup>3</sup>

### **Other Federal Disaster-related Funding Programs**

FEMA is probably more well-known for providing response and recovery assistance. Other programs such as FEMA's Public Assistance (PA) Grant Program provide assistance to State, Tribal and local governments, and certain Private-Nonprofit organizations, so that communities can quickly respond to and recover from major disasters or emergencies. Through the PA Program, FEMA provides supplemental Federal disaster grant assistance for debris removal, emergency protective measures, and the repair, replacement, or restoration of disaster-damaged, publicly owned facilities and the facilities of certain Private Non-Profit (PNP) organizations. The PA Program also encourages protection of these

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<sup>3</sup> FEMA, Date Request. Received 6/4/13.

damaged facilities from future events by providing assistance for hazard mitigation measures during the recovery process.

#### **IV FEMA Guidance**

FEMA has created the *Local Multi-Hazard Mitigation Planning Guidance* (the “Blue Book”) to provide guidance to local governments to meet the requirements of 44 CFR §201.6 *Local Mitigation Plans*. There are three main objectives of the Blue Book. First, the Blue Book is intended to help local jurisdictions develop new mitigation plans or update existing plans in accordance with the requirements of the regulations. Second, the Blue Book is designed to help Federal and State Reviewers evaluate mitigation plans from local jurisdictions in a fair and consistent manner. Third, the Blue Book is designed to help jurisdictions conduct comprehensive reviews and prepare updates to their plans to meet the requirements of 44 CFR Part 201.6.

The Jackson County All Hazard Mitigation Plan is going to follow the planning process outlined in the Blue Book. The Jackson County plan will also use the Local Mitigation Plan Review Tool to specify where in the plan and how the specific regulation requirements were met.

FEMA requires that ALL participating jurisdictions meet the requirements for mitigation planning in 44CFR§201.6. The Blue Book specifically requires that each participating jurisdiction address:

- Risks, where they differ from the county
- Mitigation actions (actions must be identified for each jurisdiction)
- Participation in the planning process (attending meetings, contributing research, data, or other information, commenting on drafts of the plan); and
- Adoption (each jurisdiction must formally adopt the plan).

#### **V County Capabilities**

The Capabilities Worksheet identifies planning capabilities, policies and ordinances, programs, studies and reports, staff, and community partners that are relevant to hazard mitigation. The Worksheet is attached as Addendum I. Several documents were referenced extensively in the planning process, including the county comprehensive (land use) plan and development ordinance, transportation plans, and water management plans. Other policies and ordinances were referenced more generally in the planning process. Specific items, such as wellhead protection plans, watershed plans, and other local resources, helped the planning team develop mitigation goals, objectives, and strategies. County and city staff and representatives were consulted by the planning team throughout the planning process.

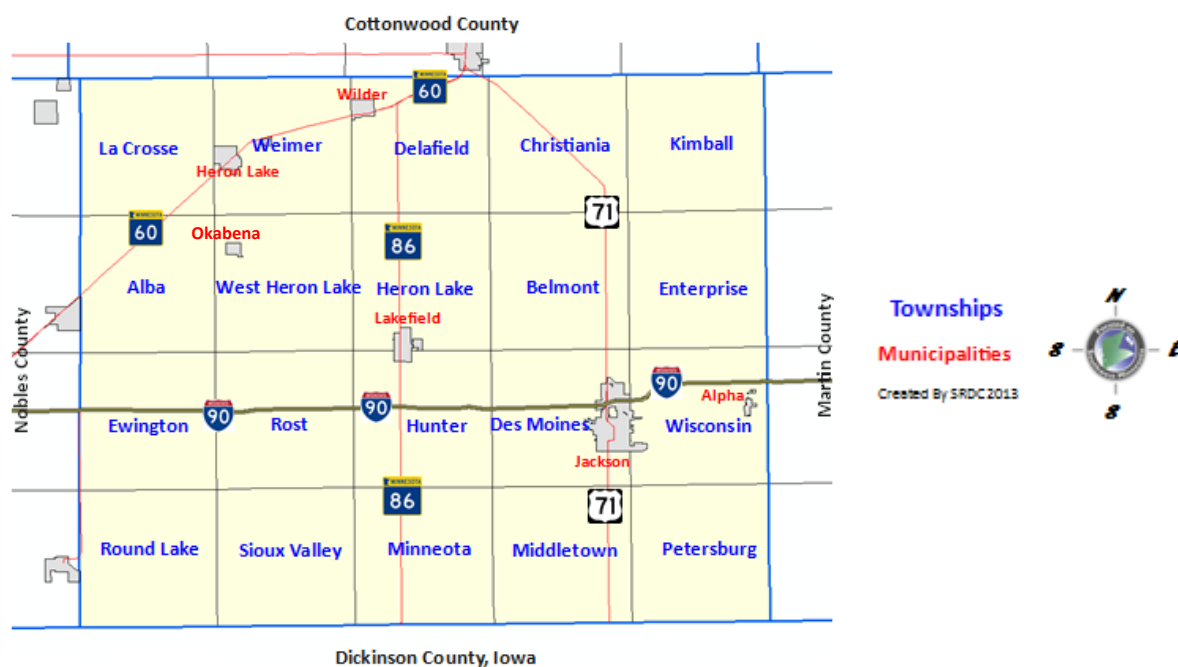
# CHAPTER 2: JACKSON COUNTY PROFILE

## I Location and Area

Jackson County is located in southwest Minnesota and has a land area of 696 square miles.<sup>4</sup> The county is bordered on the north by Cottonwood County, on the south by the State of Iowa, on the east by Martin County, and on the west by Nobles County. Cities within Jackson County include Alpha, Heron Lake, Lakefield, Jackson, Okabena, and Wilder. In addition, the county has four unincorporated communities—Bergen, Petersburg, Spafford, and Sioux Valley. The City of Jackson is the largest city in Jackson County and serves as the Jackson County seat. The city is along U.S. Highway 71 and Interstate 90. U.S. Highway 71 and Interstate 90 provide thoroughfares into and out of the county from the north and south and east and west respectively. Minnesota Trunk Highway (TH) 60 crosses the county from northeast to southwest, following the route of the Union Pacific railroad.

Jackson County has 20 townships. They include Alba, Belmont, Christiania, Delafield, Des Moines, Enterprise, Ewington, Heron Lake, Kimball, Middletown, Minneota, Rost, Petersburg, Round Lake, Sioux Valley, Weimer, West Heron Lake, Wisconsin, Hunter, and La Crosse. Jackson County is a rural county, so there are a number of shared services throughout the county.

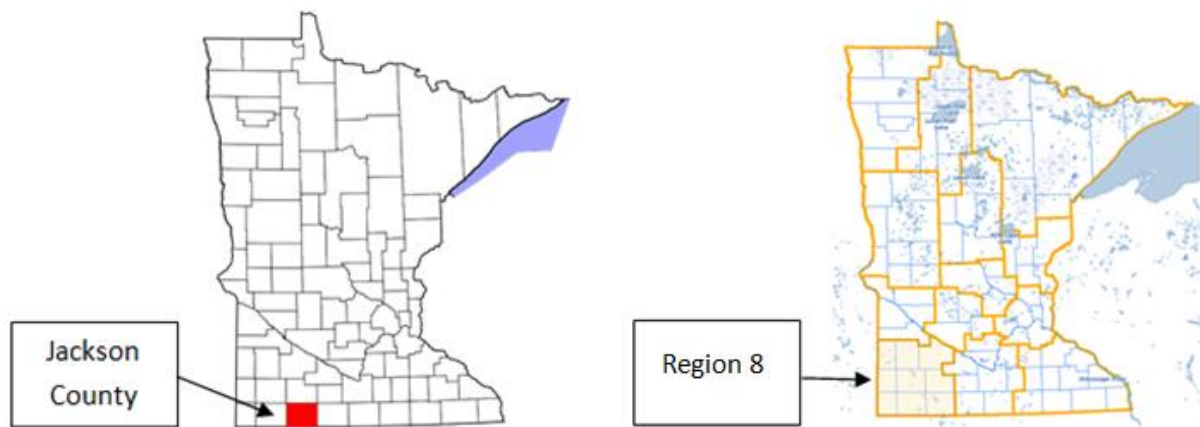
**G Figure #1** Minor Civil Divisions – Jackson County



<sup>4</sup> Department of Employment and Economic Development. Accessed: 5/29/13. Available: <http://www.positivelyminnesota.com/apps/lmi/rws/default.aspx>

**G Figure #2**

**Minnesota Counties & Region 8 Development Commission**



## **II History**

"In the 1830s Joseph Nicollet led an expedition that traversed the Des Moines River Valley. He provided one of the most accurate descriptions and maps of southwestern Minnesota. Nicollet noted an area slowly rising to several hundred feet above the surrounding open plains. This Coteau des Prairie, "highland of the prairie" held grand views of prairies, rivers and lakes surrounding the area. Kilen Woods lies on the eastern edge of this region he called the "Coteau des Prairies." The treaty of Traverse de Sioux of 1851 opened this hilly prairie country to the first pioneers and settlers."<sup>5</sup>

"The first white settlers in Jackson were brothers – William, George, and Charles Wood of Indiana, by way of Mankato. In July of 1856, they established a trading post and named the proposed town "Springfield" because there was a spring near where they built their cabin, a large one-room log building near the Des Moines River."<sup>6</sup> The early years of the settlement were very difficult. The winter of 1856-57 was one of the most severe due to the bitter cold, deep snow, and violent storms. Food was scarce and most of the provisions had to be hauled in from the nearest settlements of Webster City and Mankato. Springfield was later renamed Jackson.

The Territorial Legislature organized Jackson County in 1857. Jackson County was named after Henry Jackson, a Minneapolis merchant. The early settlers to Jackson County came from Iowa and Wisconsin. Later on, the settlers from Northern Europe settled in Jackson County.

Fort Belmont was the first permanent settlement. Fort Belmont was established near the current city of Jackson in the 1860s.<sup>7</sup> The fort was established to provide protection against hostile Indians. Twice the

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<sup>5</sup> Department of Natural Resources. Accessed: 9/19/13. Available: [http://www.dnr.state.mn.us/state\\_parks/kilen\\_woods/narrative.html](http://www.dnr.state.mn.us/state_parks/kilen_woods/narrative.html)

<sup>6</sup> Jackson Area Chamber of Commerce. Accessed 9/19/13. Available: <http://www.jacksonmn.com/pages/OurHistory1/>

<sup>7</sup> Fort Belmont Historical Society. Accessed 9/19/13. Available: <http://www.fortbelmont.org/>

City of Springfield was deserted due to settler's fear of an attack. In 1857, the hostile Dakota warrior Inkpaudta led an expedition against settlers at Fort Belmont. The Indians killed several settlers and drove the rest away. Some of the settlers did return to Fort Belmont, and the settlers were attacked again during the Dakota Conflict (Sioux Uprising) of 1862.

Settlement of Jackson County was slowed before and during the Civil War. Post-Civil War settlement of Jackson County was rapid and was spurred on by the advent of the railroad in the 1870s. The population would continue to increase until the 1910s. Since the 1920s, the rural populations have decreased while the cities have grown larger. In 1890, 181 residents made up a total of 52 families in Jackson County. The population continued to grow at a steady pace during the next few years. By 1900, there was an estimated 14,793 residents living in Jackson County.

The railroad came to Jackson County in 1871, but passenger train service did not begin until 1872 in the City of Heron Lake. Rail Service was expended from Fairmont to Jackson on November 27, 1878 the iron horse reached Jackson.<sup>8</sup> The railroad connected Jackson County to other markets, which helped to spur population growth and economic development in the area.

### III Physical Features

Land within Jackson County is typical of prairie environment. Areas in Jackson County along the West Fork of the Des Moines River are hilly in comparison with the gently rolling topography over the rest of the county. The highest elevation in Jackson County is in Round Lake Township. It is 1,570 feet above sea level. The low point is 1,280 feet located in Petersburg Township, where the West Fork of the Des Moines River exits Jackson County.

Land use within Jackson County is primarily used for agriculture with urbanization typically occurring in and around established communities. Jackson County has a great deal of prime agricultural land located in the county. Recent tillable land sales in Jackson County have gone for over \$9,500 an acre.<sup>9</sup>

A study by the University of Minnesota's Remote Sensing and Geospatial Analysis Laboratory found that 82 percent of the land area in Jackson County was cultivated, 8 percent was urban, 6 percent was covered by grass, shrubs, or wetlands, three percent was forest, and two percent was covered by water.

The future land use in Jackson County will likely remain predominately in agriculture production. It is essential to also have land allocated for conservation practices that will help to preserve the environment. Conservation measures like erosion control act as a buffer and help to preserve this valuable resource for future generations.

#### Open Water Sources

There are approximately 21,000 acres of open water in Jackson County. The open water is characterized in three categories: lakes, marshes, and rivers and streams. There are 70 open water sources covered

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<sup>8</sup> A.P. Rose. Jackson County Historical Society.

<sup>9</sup> Jackson County Assessor. Received: 9/23/13

by county and city shoreland ordinances. Of those 36 are suitable for natural environment purpose, but 6 have been found to be potentially attractive for recreation or general development. Jackson County's lakes and streams are some of its most significant resources.

### *Rivers*

Jackson County's Development Code and water plan discourages new development along rivers and streams, in part so that floodplains should continue to be free from uses other than agriculture, forestry, and recreation. This way, the natural overflowing of some streams and rivers will occur with minimal property damage and would eliminate the need to build costly dikes. Since Jackson County has one major river, the West Fork of the Des Moines River.

### *Lakes*

Jackson County has several lakes that provide recreational and natural resources. The ten lakes include: Independence, Fish, Loon, Clear, Little Spirit, Pearl, South Heron, Timber, Rush, and Round Lake. All of the lakes provide the opportunity to catch game fish. These lakes are generally shallow. Fish Lake is considered the deepest lake with a maximum depth of 26 feet. Rush Lake is the shallowest lake with a maximum depth of three feet.<sup>10</sup>

### *Watersheds*

There are two main watersheds in Jackson County that help drain surface water. The two main watersheds are the Mississippi River Watershed and the Missouri River Watershed. In addition, there are a number of other watersheds that drain into the two main watersheds that include: the west fork of the Des Moines River (upper and lower), Little Sioux River, East Fork of the Des Moines River, Blue Earth River, and the Watonwan River. There are also a number of small streams that flow into these waterways.

In and around these watersheds are wetlands. Wetlands refer to the low depressions in the landscape that is saturated with water either permanently or seasonally. The wetlands in Jackson County are classified under the Riverine and Palustrine systems. The wetlands are soils that are occasionally or frequently flooded and have a high water table. The wetlands are mostly stream segments, old oxbows, and low lying areas that make up the drainage system in Jackson County.

Wetlands in Jackson County not only serve as a water drainage system, they also provide immediate benefits to ecosystems that surround them. Wetlands act like a sponge and is described as "nature's hazard insurance."<sup>11</sup> Wetlands store runoff and allow for a natural filtration of the water before it enters the ground water. The benefits of a healthy wetland vary from improved water quality to economic development generated from increased hunting, fishing, and recreation spending.

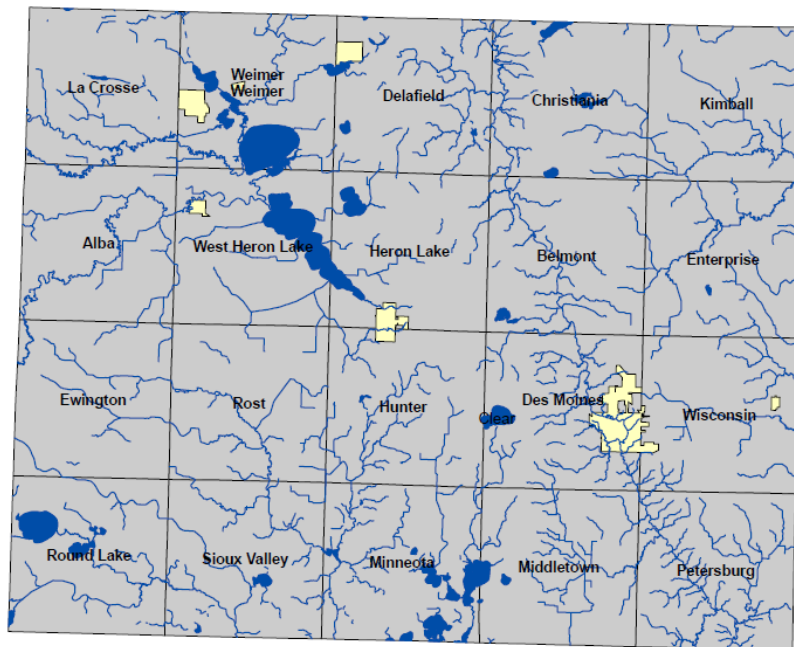
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<sup>10</sup> Department of Natural Resources. Accessed 9/19/13. Available:  
<http://www.dnr.state.mn.us/lakefind/index.html>

<sup>11</sup> Wisconsin Wetland Association. Accessed: 5/29/13. Available:  
<http://www.wisconsinwetlands.org/HowWetlandsBenefitYourCommunity.pdf>

**G Figure #3**

**Shoreline, Lakes, & Streams - Jackson County**



**Legend**

- county lakes
- cities
- township

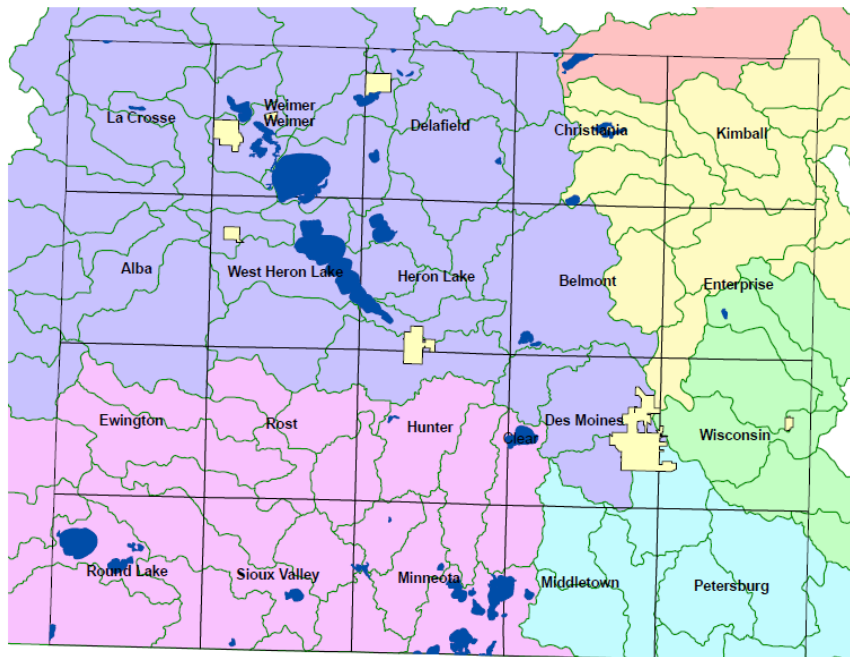
Data from MSU

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**G Figure #4**

**Watersheds - Jackson County**



**Legend**

- county lakes
- cities
- township
- Blue Earth River
- East Fork Des Moines River
- Little Sioux River
- Lower W Fork Des Moines River
- Watonwan River
- West Fork Des Moines River
- msghda

Data from MSU

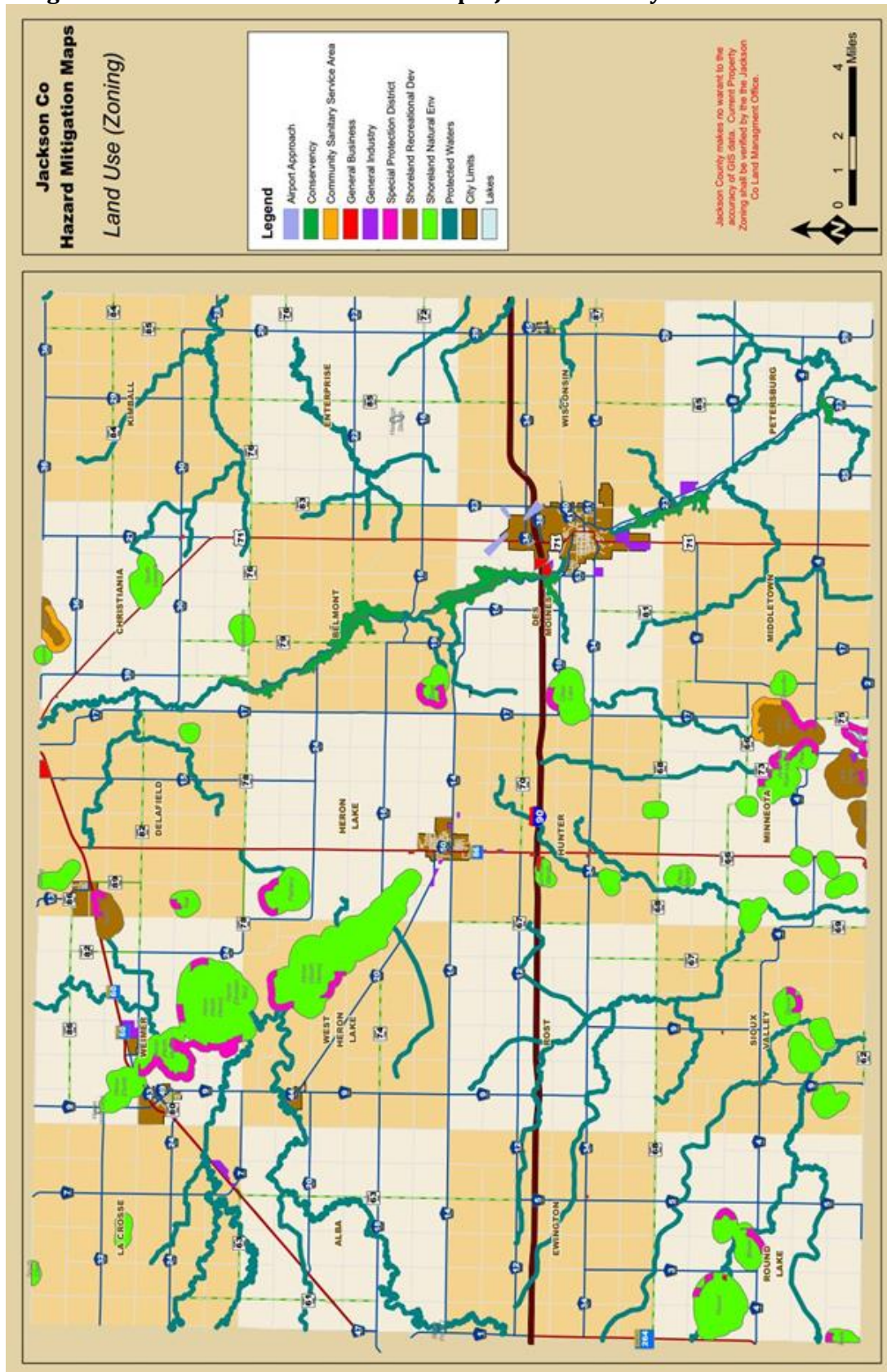
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G Figure #5

Land Use Map - Jackson County





In addition, the wetlands in Jackson County provide the following benefits:

- Floodwater Storage and Detention
- Nutrient Assimilation
- Sediment Entrapment
- Groundwater Recharge and Discharge
- Low-Flow Augmentation
- Aesthetics and Recreation
- Shore land Anchoring and Erosion Control
- Wildlife Habitat
- Fisheries Habitat

As the landscape in Jackson County has changed over the years due to increased agricultural activities, the wetlands have also changed. Changes in the wetlands are due in part to tiling, changes in vegetation, and impervious surfaces. The exact amount of wetlands drained in Jackson County since increased agricultural activities is unknown. The majority of the remaining wetlands in Jackson County have been identified in the National Wetlands Inventory. The inventory classifies all wetlands into eight different wetland types based on the depth of water and type of vegetation. Identifying and classifying wetlands along with regulations protecting wetlands help to preserve our wetlands into the future.

Land use and management practices that have occurred in Jackson County have caused water quality degradation in the lakes. Due to the increase of nutrients, Jackson County's lakes have seen an increase in algae blooms and other suspended sediments. With this decrease in water clarity, sunlight is not able to reach all areas of the lakes and this restricts many different kinds of plant growth. This not only eliminates a food supply for many game fish, but it also favors the growth of less desirable species like carp and black bullhead. Those fish then cause greater destruction to the lakes by uprooting other vegetation types and sending more debris into the water column.

### **Surficial Geology**

There are six geomorphic regions found in Jackson County. Different types of parent materials and topography characterize each region. The Altamont moraine trends north and south through central Jackson County. This region has formed mainly by glacial till and local material deposits from water. The glacial till has a high content of shale and calcium carbonate. Part of Jackson County east of the Des Moines River is ground moraine made up of clay loam glacial till. The voluminous sediment-laden glacial meltwater often is dammed by ice and superglacial till. This caused temporary glacial lakes forms and sediments deposited in the basins. Extensive glacioulacustrine deposits characterize southwestern Jackson County. These sediments were deposited into smaller lakes that were formed in the disintegrating glacial ice. The ice-walked lakes eventually turned into flat-topped hills. Rapidly moving glacial meltwater removed fine textured particles from the glacial till and deposited the coarse textured material in areas where they current slowed. Sand and gravel deposits are along the present day streams and rivers. The former glacial streams and beaches contain sand and gravel deposits. The postglacial landscape has numerous closed depressions that are filled with water. These shallow bodies

of water begin to fill with organic detritus, and if the water levels drop far enough soils will be formed from these organic or limnic deposits.

### **Bedrock Geology**

Underlying the surface at a distance from 100 to 300 feet is Sioux Quartzite. The quartzite is located in two parts of Jackson County. One part in the northwest corner comes to within 100 feet of the surface and is part of a larger rock structure extending down from Murray County and Nobles County. This is related to but not part of the prominent rock ridge found in Rock County and Pipestone County. Sioux Quartzite is also found in the northeast corner of Jackson County.

### **Soils**

There are seven soil associations within Jackson County according to the Soil Survey of Jackson County. Three of the soil associations make up about 76 percent of Jackson County. The first, Lura-Collinwood Association, which is nearly level, makes up 17 percent of the county's soil. The second, Clarion-Delft, which is nearly level to hilly, makes up 43 percent of the county's soil. The third, Canisteo-Glencoe-Nicollet Association, which is nearly level, makes up 16% of the county soil. The four remaining associations are Estherville-Dickman Association, Collinwood-Waldof-Clarion Association, Clarion-Lura-Collinwood Association, and Coland-Terrill-Swanlake Association.

The soils formed were from several types of parent materials: loess; loess over glacial till; loess over Sioux quartzite bedrock, some of which is exposed at the surface; sand (and gravel) glacial outwash; alluvium; lacustrine and lacustrine-modified glacial till; and glacial till.

## **IV Climate**

The continental climate of Jackson County is characterized by cold winters and warm (often hot) summers. The weather is extremely variable during the year. During the winter months, precipitation is in the form of snowstorms, some which may be severe. During the summer months, precipitation is in the form of showers (occasionally heavy) when warm moist air leaves the Gulf region and meets cooler air over Jackson County. Weather patterns circulate counter-clockwise and generally enter Jackson County from the west to southwest and sometimes from the south.

### **Precipitation**

According to the State Climatologist, the average precipitation in Jackson County is 28.67 inches. Annual precipitation has ranged from a low of 12.76 inches in 1976 to a high of 43.14 inches in 1993. The average seasonal snow fall in Jackson County was not recorded. The average seasonal snow fall in the City of Windom, which borders Jackson County to the North, is 43.0 inches. The average seasonal snow fall in the City of Worthington, which is east of Jackson County, is 37.8 inches.

**G Table #1****Average Precipitation: 1981 – 2010**

Month	Precipitation in Inches – Lakefield	Snowfall in Inches – Lakefield	Snowfall in Inches – Windom	Snowfall in Inches – Worthington
January	0.49	NA	8.4	7.0
February	0.50	NA	7.0	6.1
March	1.72	NA	8.6	6.7
April	2.99	NA	3.4	3.9
May	3.72	NA	0.0	0.0
June	4.28	NA	0.0	0.0
July	3.78	NA	0.0	0.0
August	4.04	NA	0.0	0.0
September	3.09	NA	0.0	0.0
October	2.10	NA	0.7	1.0
November	1.27	NA	6.0	5.7
December	0.69	NA	8.9	7.4
<b>Annual Average</b>	<b>2.3</b>	<b>NA</b>	<b>43.0</b>	<b>37.8</b>

Source: National Climatic Data Center (<http://ggweather.com/normals/>)

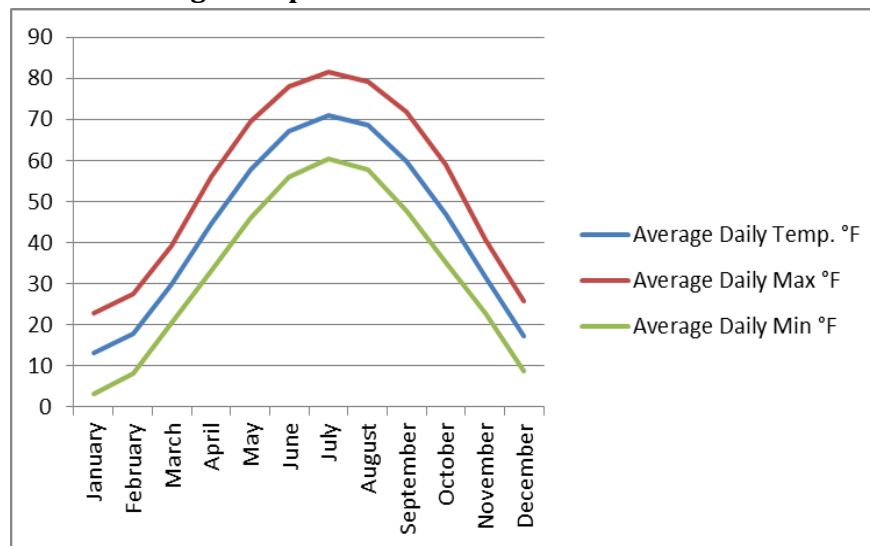
**Temperature**

In Jackson County, the average daily temperature is 43.9° F, the average annual maximum temp is 54.4° F, and the average annual minimum temp is 33.4° F. The hottest month on average in Jackson County is July with an annual average temperature of 71.0°F. The coolest month on average is January with an annual average temperature of 13.0°F. The lowest temperature (-34 °F) on record was recorded in Jackson County on January 19, 1970. The highest temperature (106°F) on record was recorded in Jackson County on July 9, 1979.

**G Table #2****Average Temperature: 1981 – 2010 – Lakefield**

Month	Average Daily Temp. °F	Average Daily Max °F	Average Daily Min °F
January	13.0	22.8	3.2
February	17.8	27.4	8.3
March	29.9	39.4	20.4
April	44.6	56.1	33.2
May	57.8	69.5	46.1
June	67.0	77.9	56.1
July	71.0	81.6	60.4
August	68.6	79.2	57.9
September	59.8	71.8	47.7
October	47.0	59.0	35.1
November	31.7	40.8	22.7
December	17.3	25.9	8.8
<b>Annual Average</b>	<b>43.9</b>	<b>54.4</b>	<b>33.4</b>

Source: National Climatic Data Center (<http://ggweather.com/normals/>)

**G Figure #6****Average Temperature: 1981 - 2010 - Lakefield**

## V Population

Jackson County is the 67<sup>th</sup> most populous county in the State of Minnesota.<sup>12</sup> Population growth trends have an effect on the needs and demands of services such as transportation, law enforcement, and emergency response personnel. It is important to analyze past population trends to attempt to make valid projections. However, it should be recognized that population projections are dependent upon a number of factors, a number of which are beyond county control.

The 2010 Census shows that Jackson County has a population of 10,266. The two largest communities are Jackson with a population of 3,299 in 2010 and Lakefield with a population of 1,694 in 2010. From 2000 to 2010, Jackson's population decreased by 5.8 percent and Lakefield's population decreased by 1.6 percent. As a whole, Jackson County experienced a decline in population of (-8.9) percent from 2000 to 2010. As with other rural counties, the population of Jackson County has been moving steadily off the farm and out of the rural areas into nearby communities, or out of the county altogether.

**G Table #3****Distribution of Population – Jackson County**

	1940	1950	1960	1970	1980	1990	2000	2010
Cities	5,957	6,385	6,569	6,695	6,988	6,988	6,364	6,055
Townships	10,848	9,921	8,941	7,657	6,702	5,313	4,898	4,211
Jackson County	16,805	16,306	15,510	14,352	13,690	11,677	11,268	10,266

Source: U.S. Census 2000, 2010

While 64.6 percent of Jackson County's population lived in the rural areas (townships) in 1940, only 41 percent did so in 2010. The loss in population numbers from the rural areas is seen in the decline of farm operator numbers. Populations in rural farming communities, like Jackson County, are

<sup>12</sup> Department of Employment and Economic Development. Accessed: 5/29/14. Available: <http://www.positivelyminnesota.com/apps/lmi/rws/default.aspx>

interconnected to the agricultural economy. Agriculture is a competitive industry and is often used in economics as an example of a perfectly competitive market. Competition in the agriculture industry has lead agricultural businesses to specialize and exploit economies of scale to stay competitive in the market place. Innovation, specialization, and economies of scale have resulted in an agriculture industry that has been able to supply our agriculture needs with less workers.

The overwhelming majority of county subdivision saw a decline in population from 2000 to 2010. The only county subdivisions that did not see a population decline from 2000 to 2010 was Ewington Township (4.7 percent) and the City of Okabena (1.6 percent). The largest population decline was in Christiania Township with a 24.8 percent decrease.

**G Table #4      Distribution of Population by County Subdivision – Jackson County**

County Subdivision	2000	2010	Percent Change 2000 - 2010
Alba Twp	200	170	-15.0%
Alpha City	126	116	-7.9%
Belmont Twp	223	218	-2.2%
Christiania Twp	331	249	-24.8%
Delafield Twp	281	226	-19.6%
Des Moines Twp	273	232	-15.0%
Enterprise Twp	204	187	-8.3%
Ewington Twp	233	244	4.7%
Heron Lake City	768	698	-9.1%
Heron Lake Twp	401	333	-17.0%
Hunter Twp	258	224	-13.2%
Jackson City	3501	3299	-5.8%
Kimball Twp	158	129	-18.4%
La Cross Twp	180	156	-13.3%
Lakefield City	1721	1,694	-1.6%
Middletown Twp	243	227	-6.6%
Minneota Twp	285	259	-9.1%
Okabena City	185	188	1.6%
Petersburg Twp	269	232	-13.8%
Rost Twp	250	211	-15.6%
Round Lake Twp	204	166	-18.6%
Sioux Valley Twp	270	192	-28.9%
Weimer Twp	172	142	-17.4%
West Heron Lake Twp	202	181	-10.4%
Wilder City	69	60	-13.0%
Wisconsin Twp	263	233	-11.4%
<b>Total</b>	<b>11268</b>	<b>10266</b>	<b>-8.9%</b>

Source: U.S. Census 2000, 2010

Population by age cohort can help planners identify trends and make predictions based on these trends. Changes in age cohorts can also help government plan for changes in demand for services. If the childbearing cohorts decline, government can make predictions that student enrollments may decline in the near future. The largest gain in population by age cohort was the age group 55 to 64 with 32.2 percent. The largest loss in population by age cohort was 35 to 44 with (–22.4) percent.

**G Table #5**

**Population by Age Cohort – Jackson County**

Age Group	2000	Percent of Total	2010	Percent of Total	Percent Change 2000 - 2010
0-9	1,299	11.5%	1,239	12.1%	-4.6%
10-19	1,778	15.8%	1,324	12.9%	-25.5%
20-24	477	4.2%	474	4.6%	-0.6%
25-34	1,141	10.1%	1,056	10.3%	-7.4%
35-44	1,715	15.2%	1,162	11.3%	-32.2%
45-54	1,516	13.5%	1,609	15.7%	6.1%
55-64	1,034	9.2%	1,358	13.2%	31.3%
65-74	1,031	9.1%	884	8.6%	-14.3%
75-84	891	7.9%	738	7.2%	-17.2%
85+	386	3.4%	422	4.1%	9.3%

Source: U.S. Census 2000, 2010

In cities in Jackson County the median age increased by 4.5 percent from 1990 to 2010. The largest increase in the median age was in the City of Heron Lake, and the increase was 16.6 percent. The largest decrease in the median age was in the City of Okabena and Wilder, and the decrease was 9.1 percent in both cities. The City of Lakefield had the smallest change in median age, which was a 4.3 percent increase.

**G Table #6**

**Median Age by City – Jackson County**

City	1990	2000	2010	Percent Change 1990 - 2010
Alpha	36.9	38.3	43.0	16.5%
Heron Lake	35.6	38.8	41.5	16.6%
Jackson	36.5	40.4	40.8	11.8%
Lakefield	39.7	42.7	41.4	4.3%
Okabena	41.6	35.1	37.8	-9.1%
Wilder	41.8	44.5	38.0	-9.1%
<b>Cities</b>	<b>38.7</b>	<b>40.0</b>	<b>40.4</b>	<b>4.5%</b>

Source: U.S. Census 1990, 2000, 2010

In townships in Jackson County the median age increased by 27.4 percent from 1990 to 2010. The largest increase in the median age was in Sioux Valley Township, and the increase was 46.9 percent. There were no townships that had a decrease in the median age.

**G Table #7****Median Age by Township – Jackson County**

Township	1990	2000	2010	Percent Change 1990 - 2010
Alba	36.9	42	50.5	36.9%
Belmont	38	39.5	44.2	16.3%
Christiania	34.8	42.6	50.3	44.5%
Delafield	37.6	42.8	50.3	33.8%
Des Moines	37.2	41.7	49.4	32.8%
Enterprise	32.7	40.7	42.5	30.0%
Ewington	34.5	41.5	45.8	32.8%
Heron Lake	34	37.8	46.9	37.9%
Kimball	39	40.5	41.3	5.9%
Middletown	37	41.5	43.8	18.4%
Minneota	41.9	42.3	50.6	20.8%
Petersburg	38	42.1	46.6	22.6%
Rost	32.7	40.4	42.3	29.4%
Round Lake	36.6	42	47.0	28.4%
Sioux Valley	32	39	47.0	46.9%
Weimer	43.9	44	49.0	11.6%
West Heron Lake	37.4	37.2	46.8	25.1%
Wisconsin	37.5	39.5	44.9	19.7%
<b>Townships</b>	<b>36.8</b>	<b>41.0</b>	<b>46.6</b>	<b>27.4%</b>

Source: U.S. Census 1990, 2000, 2010

In Jackson County the median age increased from 36.9 to 44.1 from 1990 to 2010. The median age in Jackson County is 2.6 years higher than Region 8. Region 8 has a median age that is 4.1 years higher than the State of Minnesota.

**G Table #8****Median Age by County/Region/State**

	1990	2000	2010	Percent Change 1990 - 2010
<i>Jackson County</i>	36.9	41.1	44.1	19.5%
<i>Region 8</i>	36.9	39.9	41.5	12.5%
<i>Minnesota</i>	32.5	35.4	37.4	15.1%

Source: U.S. Census 1990, 2000, 2010

Jackson County is predominately white with 95.8 percent of the population in 2010. There has been a shift towards a more diverse population. From 2000 to 2010 the percent of the population that is Black or African American grew by 370 percent. The population cohort two or more races grew by 141.9 percent from 2000 to 2010.

**G Table #9****Population by One Race – Jackson County**

	2000 Number	Percent	2010 Number	Percent	Percent Change 2000 - 2010
White	10,938	97.1	9,830	95.8	-10.1%
Black or African American	10	0.1	47	0.5	370.0%
American Indian and Alaska Native	13	0.1	24	0.2	84.6%
Asian	155	1.4	140	1.4	-9.7%
Native Hawaiian and other Pacific Islander	0	0.0	1	0.0	0.0%
Some Other Race	109	1.0	120	1.2	10.1%
Two or More Races	43	0.4	104	1.0	141.9%
<b>Total Population</b>	<b>11,268</b>	<b>100.1</b>	<b>10,266</b>	<b>100.1</b>	<b>-8.9%</b>

Source: U.S. Census 2000, 2010

Population projections from the MN Department of Administration show that the population in Jackson County is projected to decrease by 9.8 percent from 2015 to 2030. The projections show an increase in the age cohorts 15-29 and 65-84 from 2015 to 2030. All of the other population cohorts are expected to decrease of the same time period. Jackson County communities will undoubtedly be impacted by the changing age structure of their communities. Jackson County must insure that services and needs are met as the population gradually becomes older and the demands for public services change. In the next 15 years, local governments throughout the State will find themselves dealing with an aging population and attempting to improve the safety and welfare of an older and a more diverse community.

**G Table #10****Population Projections – Jackson County**

	2015		2020		2025		2030		Percent Change 2015- 2030
<i>Age</i>	Male	Female	Male	Female	Male	Female	Male	Female	
0-4	281	267	252	240	249	237	258	245	-8.2%
5-9	342	344	318	303	285	271	280	266	-20.4%
10-14	367	327	379	384	352	338	314	302	-11.2%
15-19	342	283	367	301	379	354	353	312	6.4%
20-24	258	217	254	203	272	215	278	249	10.9%
25-29	223	189	226	200	224	188	238	199	6.1%
30-34	295	293	243	205	245	215	243	203	-24.1%
35-39	274	237	284	292	233	202	234	212	-12.7%
40-44	264	280	261	244	271	302	221	208	-21.1%
45-49	296	279	252	267	246	231	259	285	-5.4%
50-54	371	313	277	259	238	246	235	214	-34.4%
55-59	424	401	346	303	259	250	222	238	-44.2%
60-64	368	350	386	379	316	287	236	237	-34.1%
65-69	267	259	329	315	347	341	284	259	3.2%
70-74	204	204	233	235	289	286	305	310	50.7%
75-79	158	212	175	184	201	212	250	259	37.6%



80-84	151	175	131	179	147	157	169	181	7.4%
85+	153	246	167	226	162	226	172	213	-3.5%
<i>Totals</i>									
<i>Gender</i>	5,038	4,876	4,880	4,719	4,715	4,558	4,551	4,392	
<b>Totals Population</b>	<b>9,914</b>		<b>9,599</b>		<b>9,273</b>		<b>8,943</b>		<b>-9.8%</b>

Source: Minnesota Department of Administration

## VI Housing

Household characteristics have a direct impact on land use, demand for housing, government services, and public education. Changes in demographics are part of the driving forces that contribute to changes in housing characteristics and demand for housing. Planning and consideration needs to take place at the local levels to ensure the supply of housing is adequate to meet the demand.

The age cohorts that include 65 through 85+ are projected to increase by 95.4 percent from 2015 to 2030. This population change requires different housing needs than younger cohorts. Assisted living facilities and nursing homes are two types of facilities that will help to accommodate this population change. The 65 plus age cohorts also have to be considered in emergency planning, since a number of persons in this cohort may have trouble evacuating a building and performing other safety protocol. This cohort and youth cohorts have to have special considerations when it comes to emergency planning.

There are a number of other considerations that have to be made when it comes to emergency planning. The age of a structure is one variable that impacts how well a structure will withstand a disaster. The age of a structure is also one variable that impacts the ability to repair a structure after a disaster. The building materials used to construct the structure and the maintenance of the structure are two other variables in whether a structure can withstand a disaster. There are a number of other variables that impact the ability of a structure to withstand the stresses of a disaster.

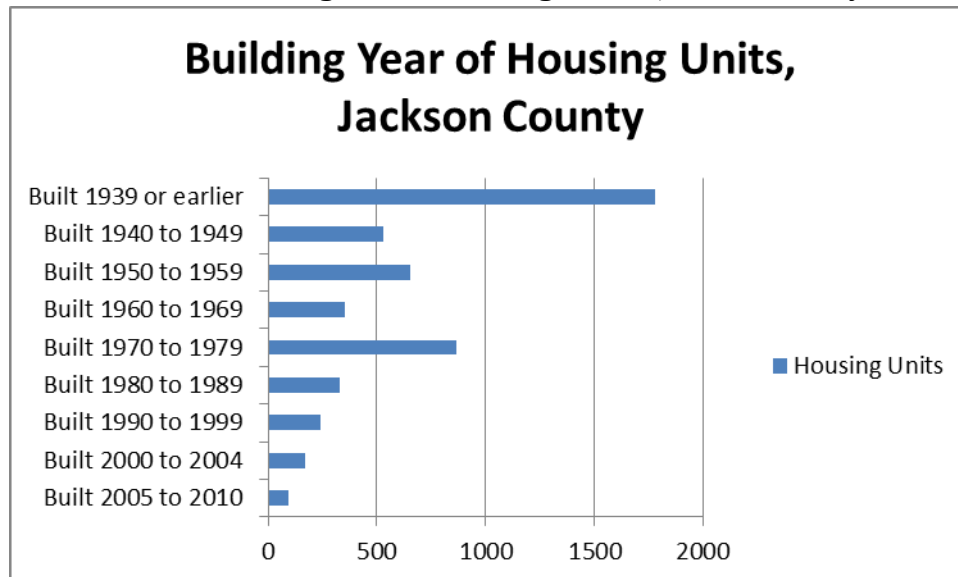
In Jackson County 35.5 percent of housing units were built in 1939 or earlier. Only one-third of the housing units in Jackson County were built in 1970 to 2010. Jackson County has an older housing stock which impacts the county's ability to withstand a disaster.

**G Table #11 Build Year of Housing Units – Jackson County**

Year Built	Housing Units	Percent
<i>Built 2005 to 2010</i>	93	1.9%
<i>Built 2000 to 2004</i>	170	3.4%
<i>Built 1990 to 1999</i>	238	4.8%
<i>Built 1980 to 1989</i>	330	6.6%
<i>Built 1970 to 1979</i>	864	17.3%
<i>Built 1960 to 1969</i>	353	7.0%
<i>Built 1950 to 1959</i>	652	13.0%
<i>Built 1940 to 1949</i>	531	10.6%
<i>Built 1939 or earlier</i>	1,777	35.5%
<i>Total Housing Units</i>	5,008	100.0%

Source: U.S. Census 2010

**G Figure #7 Building Year of Housing Units – Jackson County**



In Jackson County the population in households decreased 28.3 percent from 1990 to 2010. The U.S. Census defines households as the total number of occupied housing units, and household units as the total number of livable dwellings that are available. This population decrease in households was not the result of a decrease in the number of households. The number of households only decreased 3.5 percent from 1990 to 2010.

The persons per household also decreased from 1990 to 2010. The decrease over that time period was 12.2 percent. This is partially due to the number of elderly living alone, which poses a number of concerns in regards to emergency preparedness.

The Housing Summary Table shows the number of householders living alone and the number of householders 65 years and over living alone. There are 1,140 householders living alone and 570 householders 65 years and over living alone.

**G Table #12 Population by Household – Jackson County**

	1990	2000	2010	Percent Change 1990 - 2010
<i>Population in Households</i>	11,466	10,955	8,221	-28.3%
<i>Households</i>	4,590	4,556	4,429	-3.5%
<i>Persons Per Household</i>	2.7	2.5	2.37	-12.2%

Source: U.S. Census 1990, 2000, 2010

There were a total of 46,762 housing units in Region 8 in 1970. Region 8 experienced a 12.98 percent increase in housing units from 1970 to 1980. From 1970 to 2000, there was a 12.13 percent increase in housing units for Region 8. From 2000 to 2010, there was a 1.73 percent increasing in housing units for Region 8. In total, there was a 14.9 percent increase in housing units from 1970 through 2010.

For Jackson County, the total number of housing units increased by 12.3 percent from 1970 to 1980, but declined over the next 3 decades. From 1980 to 1990 the total number of housing units declined by 7.3 percent (-404 actual units); from 1990 to 2010 the total number of housing units declined by only 0.6 percent (29 actual units); and from 2000 to 2010 the total number of housing units declined by 2.0 percent (102 actual units). Jackson County saw an overall increase in housing units of 1.5 percent from 1970 to 2010.

**G Table #13 Housing Unit Trends – Region 8**

County	1970	1980	1990	2000	2010	Percent Change 1970 - 2010
Cottonwood	5,130	5,804	5,495	5,376	5,419	5.6%
Jackson	4,918	5,525	5,121	5,092	4,990	1.5%
Lincoln	2,882	3,298	3,050	3,043	3,108	7.8%
Lyon	7,526	9,196	9,675	10,298	11,098	47.5%
Murray	4,236	4,679	4,611	4,357	4,556	7.6%
Nobles	7,386	8,212	8,094	8,465	8,535	15.6%
Pipestone	4,286	4,636	4,387	4,434	4,483	4.6%
Redwood	6,718	7,388	7,144	7,230	7,272	8.2%
Jackson	3,680	4,095	3,963	4,137	4,262	15.8%
<b>Region 8</b>	<b>46,762</b>	<b>52,833</b>	<b>51,540</b>	<b>52,432</b>	<b>53,723</b>	<b>14.9%</b>

Source: U.S. Census 1970, 1980, 1990, 2000, 2010

In Jackson County 78.3 percent of occupied housing units are owner-occupied. In Region 8, 76.7 percent of occupied housing units are owner-occupied. Jackson County has seen relatively small increases and decreases in the number of owner-occupied housing units over the past four decades. From 1970 to 2010, Jackson County has seen a 3.3 percent increase in owner-occupied housing units. During that same time period, Region 8 saw a 4.6 percent decrease in owner-occupied housing units.

**G Table #14 Housing Occupancy – Region 8**

	Total Occupied	Owner - Occupied
County	2010	2010(%)
Cottonwood	4,912	79.6%
Jackson	4,429	78.3%
Lincoln	2,574	80.2%
Lyon	10,227	66.5%
Murray	3,717	82.6%
Nobles	7,946	72.8%
Pipestone	4,054	74.9%
Redwood	6,580	78.0%
Jackson	3,918	77.4%
<b>Region 8</b>	<b>48,357</b>	<b>76.7%</b>

Source: U.S. Census 2010

**G Table #15 Owner-Occupied Housing Occupancy – Region 8**

County	1970	1980	1990	2000	2010	Percent Change 1970 – 2010
Cottonwood	3,760	4,243	3,925	3,955	3,757	-0.1%
Jackson	3,356	3,781	3,477	3,601	3,466	3.3%
Lincoln	2,131	2,323	2,161	2,130	2,063	-3.2%
Lyon	5,107	6,203	6,207	6,643	6,799	33.1%
Murray	2,821	3,181	2,982	3,135	3,070	8.8%
Nobles	5,161	5,928	5,791	5,955	5,783	12.1%
Pipestone	3,066	3,358	3,129	3,173	3,035	-1.0%
Redwood	4,587	5,252	5,055	5,328	5	11.9%
Jackson	2,519	2,868	2,826	2,994	3,031	20.3%
<b>Region 8</b>	<b>32,508</b>	<b>37,137</b>	<b>35,553</b>	<b>36,914</b>	<b>31,009</b>	<b>-4.6%</b>

Source: U.S. Census 2010

The number of renter-occupied units in Jackson County has decreased substantially over the past four decades. From 1970 to 2010, the percentage change in renter-occupied housing units decreased by 19.3 percent (230 actual units). The demand for rent-occupied housing units may increase as the population ages and moves from owner-occupied housing units to assistant living facilities and other rental facilities.

**G Table #16 Renter-Occupied Housing Occupancy – Region 8**

County	1970	1980	1990	2000	2010	Percent Change 1970 - 2010
Cottonwood	1,053	1,233	1,134	962	1,003	-4.7%
Jackson	1,193	1,207	1,083	955	963	-19.3%
Lincoln	448	605	543	523	511	14.1%
Lyon	1,930	2,476	2,866	3,072	3,428	77.6%
Murray	897	855	776	587	647	-27.9%
Nobles	1,864	1,886	1,892	1,984	2,163	16.0%
Pipestone	996	999	949	896	1,019	2.3%
Redwood	1,579	1,600	1,499	1,346	1,445	-8.5%
Jackson	975	987	928	849	887	-9.0%
<b>Region 8</b>	<b>10,935</b>	<b>11,848</b>	<b>11,670</b>	<b>11,174</b>	<b>10,622</b>	<b>-2.9%</b>

Source: U.S. Census 1970, 1980, 1990, 2000, 2010

The 1970 U.S. Census reported that Jackson County had 322 vacant housing units. This number increased by 57 to 379 units from 1970 to 1980. The number of vacant housing units increased again from 1980 to 1990 by 182 units to 561. The number of vacant housing units stabilized and dropped by 25 units between 1990 and 2000. Between 2000 and 2010, the number rose slightly back up to 561 units.

In 1990, the Census Bureau began to separate owner and renter vacant housing units. The combined percentages of the new data are higher than the actual vacant units year round. The numbers include

unoccupied units for sale and housing used for seasonal, recreational, or occasional use. The rise of vacant housing units from 1970 to 1990 is mainly contributed to the decrease in population in Jackson County and other rural counties.

**G Table #17** **Vacant Housing – Region 8**

County	1970	1980	1990	2000	2010	Percent Change 1970 - 2010
Cottonwood	317	318	435	459	507	59.9%
Jackson	322	379	561	536	561	74.2%
Lincoln	280	324	346	390	534	90.7%
Lyon	484	512	602	583	871	80.0%
Murray	463	445	853	635	839	81.2%
Nobles	350	383	411	526	589	68.3%
Pipestone	224	278	309	365	429	91.5%
Redwood	520	523	590	556	692	33.1%
Jackson	182	239	209	294	344	89.0%
<b>Region 8</b>	<b>3,142</b>	<b>3,401</b>	<b>4,316</b>	<b>4,344</b>	<b>5,366</b>	<b>70.8%</b>

Source: U.S. Census 1970, 1980, 1990, 2000, 2010

In 2010, 12.2 percent of the housing units in Jackson County were vacant. In Region 8, only 10.9 percent of the housing units were vacant in 2010. Jackson County has had a high percent vacancy than Region 8. Having a higher percentage of a county's housing units being vacant adversely affects preparing for and cleaning up after a disaster.

**G Table #18** **Percent Vacant – Region 8**

County	1970	1980	1990	2000	2010
Cottonwood	6.6%	5.8%	8.6%	8.5%	9.4%
Jackson	7.1%	7.6%	12.3%	10.5%	11.2%
Lincoln	10.9%	11.1%	12.8%	12.8%	17.2%
Lyon	6.9%	5.9%	6.6%	5.7%	7.8%
Murray	12.5%	11.0%	22.7%	14.6%	18.4%
Nobles	5.0%	4.9%	5.3%	6.2%	6.9%
Pipestone	5.5%	6.4%	7.6%	8.2%	9.6%
Redwood	8.4%	7.6%	9.0%	7.7%	9.5%
Jackson	5.2%	6.2%	5.6%	7.1%	8.1%
<b>Region 8</b>	<b>7.2%</b>	<b>6.9%</b>	<b>9.2%</b>	<b>8.3%</b>	<b>10.9%</b>

Source: U.S. Census 1970, 1980, 1990, 2000, 2010

Damage to housing units can be a large portion of the monetary cost of a disaster. The median value for a housing unit in Jackson County was \$100,300 in 2010. Fifty percent of the housing units in Jackson County have a value under \$100,000.

**G Table #19** **Housing Unit Value – Jackson County**

Value	1980	1990	2000	2010
<\$50,000	1,629	1,693	1,110	594

\$50,000 - \$99,999	504	473	1,118	1,181
\$100,000 - \$149,999	26	18	246	625
\$150,000 - \$199,999	1	1	91	554
\$200,000 +	1	3	67	606
<b>Median Dollars</b>	<b>\$34,800</b>	<b>\$32,100</b>	<b>\$56,800</b>	<b>\$100,300</b>

Source: U.S. Census 2010

Jackson County has a higher median housing unit value and median rent than the Region 8 average. Jackson County has the second highest median housing unit value behind Lyon County. The median rent is only 11 dollars more than the Region 8 average. The cost of a disaster is potentially higher in Jackson County when compared to Region 8 averages.

**G Table #20** **Median Housing Unit Value – Region 8**

County	Median Housing Unit Value	Median Rent
Cottonwood	\$81,800	\$454
Jackson	\$100,300	\$543
Lincoln	\$76,300	\$477
Lyon	\$136,300	\$543
Murray	\$90,000	\$521
Nobles	\$97,200	\$554
Pipestone	\$85,100	\$576
Redwood	\$88,300	\$557
Jackson	\$99,200	\$567
<b>Region 8</b>	<b>\$94,944</b>	<b>\$532</b>

Source: U.S. Census 2010

**G Table #21** **Housing Summary: 2010 – Jackson County**

Subject	Number	Percent
<b>Total Population</b>		
In Households	10,156	98.9%
In Group Quarters	110	1.1%
<b>Total Households</b>		
Family Households	2,902	65.5
Non Family Households	1,527	34.5
Householder Living Alone	1,396	30.9
Households 65 years and over living Alone	639	14.4
Households with Individuals under 18	1,213	27.4
Households with Individuals 65 and over	1,399	31.6
Average Household Size	2.29	(X)
<b>Units in Structure</b>		

1 unit, detached	4,366	87.2%
1 unit, attached	29	0.6%
2 units	108	2.2%
3 or 4 units	59	1.2%
5 to 9 units	25	0.5%
10 to 19 units	71	1.4%
20 or more units	273	5.5%
Mobile Home	77	1.5%
<b>Vehicles Available</b>		
None	222	4.9%
1 Vehicle	1,153	25.4%
2 Vehicles	1,860	41.1%
3 or more	1,296	28.6%
<b>House Heating Fuel</b>		
Utility Gas	1,994	44.0%
Bottled, tank, or LP gas	1,421	31.4%
Electricity	558	12.3%
Fuel oil, kerosene, etc.	397	8.8%
Coal or coke	5	0.1%
Wood	91	2.0%
Solar Energy	0	0.0%
Other fuel	60	1.3%
No fuel used	5	0.1%
<b>Selected Characteristics</b>		
Lacking complete plumbing facilities	17	0.4%
Lacking complete kitchen facilities	14	0.3%
No telephone service	146	3.2%

Source: U.S. Census 2010

## VII Employment

Jackson County had an estimated labor force of 5,137 persons in 2010. The largest employer by industry was the Education and Health Services Industry, followed by the Manufacturing Industry. The industry cohort Ag Services is estimated to be higher, but self-employed farms workers are not reported in Department of Employment and Economic Development figures.

**G Table #22**

**Employment by Industry - Jackson County**

Industry	2000	2010
Ag Services*	152	121
Construction	168	123
Manufacturing	847	1,293
TTU**	811	785

Financial Activities	145	123
Education and Health Services	851	1,677
Leisure and Hospitality	373	325
Professional and Business Services	NA	237
Public Administration	313	316
<b>All Industries</b>	<b>4382</b>	<b>5137</b>

Source: Department of Employment and Economic Development

\*Ag Services includes Forestry, Fishing, and Mining

\*\*TCPU includes Transportation, Communication, and Public Utilities

The unemployment rate in Jackson County was 3.8 percent in 2012, while the State of Minnesota had an unemployment rate of 5.7. From 2000 through 2012, the average unemployment rate was 4.0 for Jackson County, 4.9 for Region 8, 5.2 for Minnesota, and 6.3 for the United States.

During the economic downturn of Obama's first term as President (2009-2012), the average unemployment rate was 4.7 for Jackson County, 6.2 for Region 8, 6.9 for the State of Minnesota, and 9.0 for the United States. Jackson County fared significantly better during Obama's first term than Region 8, the State of Minnesota, and the United States. One explanation for Jackson County not seeing significantly higher unemployment rates was the agriculture industry. The agriculture industry partially insulated Jackson County during the downturn.

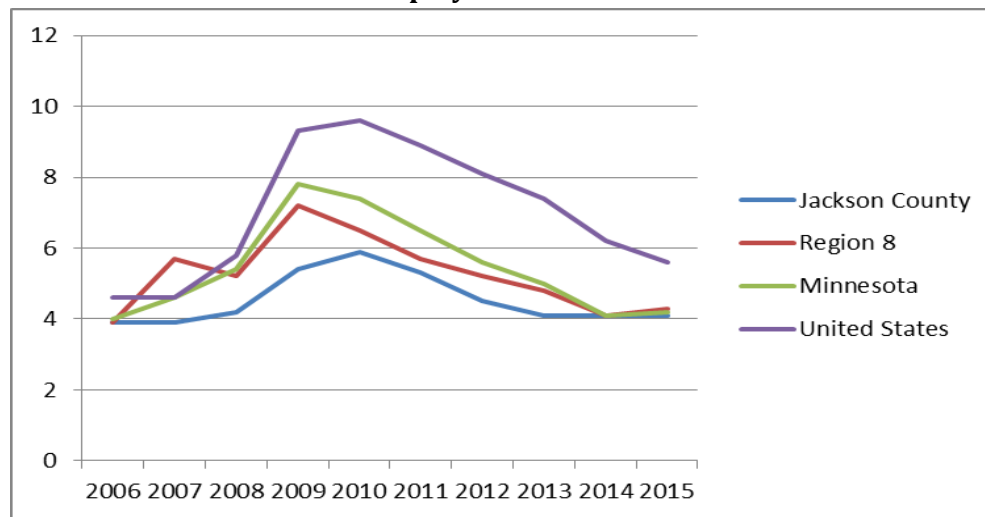
**G Table #23 Unemployment Trends**

Year	Jackson County	Region 8	Minnesota	United States
2015-05	4.1	4.3	4.2	5.6
2014	4.1	4.1	4.1	6.2
2013	4.1	4.8	5.0	7.4
2012	4.5	5.2	5.6	8.1
2011	5.3	5.7	6.5	8.9
2010	5.9	6.5	7.4	9.6
2009	5.4	7.2	7.8	9.3
2008	4.2	5.2	5.4	5.8
2007	3.9	5.7	4.6	4.6
2006	3.9	3.9	4.0	4.6

Department of Employment and Economic Development<sup>13</sup>

<sup>13</sup> MN Department of Employment and Economic Development. Unemployment Statistics. Access: 6/29/15.  
Available: <https://apps.deed.state.mn.us/lmi/laus/Default.aspx>



**G Figure #8****Unemployment Trends**

Agriculture is a significant driving force in Jackson County. The USDA 2007 Census of Agriculture showed that there were 400,531 acres of farm land in production in Jackson County.<sup>14</sup> In 2007, the market value of agricultural products sold in Jackson County was \$267,276,000. Since 2007, the prices for agricultural products have been favorable. The upcoming USDA Census of Agriculture is suspected to top the value of agricultural products sold in Jackson County in 2007.

A number of residents in Jackson do not work in the community they live in. The average travel time or commute to work in Jackson County was 16.4 minutes in 2010.<sup>15</sup> A number of workers in Jackson County also commute to work from a neighboring county to Jackson County. Time on the road can increase the risk of certain hazards like winter storms and transportation crashes.

Changes in income are an indicator of Jackson County's economic condition. Per Capita income is the mean income computed for every person in a specified geographic area. For household income, the median is based on the distribution of the total number of housing units, including those occupants with no income. According to the 2010 Census information, the median household income for Jackson County was \$46,869, while the Region 8 average was \$44,176. Per capita income in Jackson County was \$25,144, while Region 8 was \$23,433. The median family income was \$59,238, while Region 8 was \$56,697. In all three income comparisons, Jackson County ranked higher than the Region 8 average.

**G Table #24****Comparative County Income Levels – Region 8**

County	2000 Median Household Income	2010 Median Household Income	2000 Per Capita Income	2010 Per Capita Income	2000 Median Family Income	2010 Median Family Income
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<sup>14</sup> USDA Census 2007. Accessed: 5/29/13. Available:

[http://www.agcensus.usda.gov/Publications/2007/Online\\_Highlights/County\\_Profiles/Minnesota/cp27063.pdf](http://www.agcensus.usda.gov/Publications/2007/Online_Highlights/County_Profiles/Minnesota/cp27063.pdf)

<sup>15</sup> 2006 – 2010 American Community Survey: <http://factfinder2.census.gov>

Cottonwood	31,943	40,292	16,647	23,162	40,237	51,705
Jackson	36,746	46,869	17,499	25,144	43,426	59,238
Lincoln	31,607	44,672	16,009	24,922	38,605	58,953
Lyon	38,996	46,872	18,013	23,755	48,512	63,793
Murray	34,966	45,657	17,936	24,045	40,893	54,647
Nobles	35,684	43,040	16,987	20,953	43,076	52,356
Pipestone	31,909	40,589	16,450	22,289	40,133	55,609
Redwood	37,352	44,181	18,903	23,548	46,250	55,829
Jackson	38,102	45,411	17,411	23,079	44,296	58,147
<b>Region 8</b>	<b>35,256</b>	<b>44,176</b>	<b>17,317</b>	<b>23,433</b>	<b>42,825</b>	<b>56,697</b>

Source: U.S. Census 2000, 2010

# CHAPTER 3: PREREQUISITES

This Chapter covers prerequisites for eligibility to adopt this multi-hazard mitigation plan in multiple jurisdictions. Section II describes the plan adoption process. Section III describes Participation Provisions Post-Approval of the All Hazard Mitigation Plan by HSEM and FEMA.

## I Jurisdictions Represented in this Plan

For the purpose of hazard mitigation, FEMA considers a Local Government having jurisdiction as “any county, municipality, city, town, township, public authority, school district, special district, intrastate district, council of governments..., regional or interstate government entity, or agency or instrumentality of a local government.” (44CFR§201.2) Special considerations are given by FEMA for school districts, private nonprofit organizations, and multi-jurisdictional private nonprofit utilities (such as Rural Electric Cooperatives).

Jackson County has the land use authority over the townships, so Jackson County will represent the townships in the All Hazard Mitigation Plan (AHMP). The Jackson County AHMP will cover all the townships in the county. Representatives from the townships were asked to participate in the planning process. Jackson County and the following cities passed resolutions of intention to participate in the process. Land use authority within city limits is controlled by the local jurisdiction.

Jackson County is a rural county. A number of resources and responsibilities are shared throughout the county. The Jackson County Sheriff’s Office provides law enforcement throughout the county. The Cities of Heron Lake and Lakefield also have a separate police department. Additional resources and responsibilities are shared regional. Jackson County is part of the Des Moines Valley Health and Human Services (DVHHS) service area, which includes the following counties: Cottonwood, Jackson, and Nobles. A representative from the Jackson County Sheriff’s office and DVHHS were members of the planning team. This ensured a regional prospective was taken when analyzing natural and manmade hazards.

Resolutions of Participation from each participating jurisdiction can be found in Addendum II. Resolutions of Adoption from each participating jurisdiction that chooses to adopt this plan will be appended in Addendum III. The Resolutions of Adoption will be added after FEMA approval.

**G Table #25 a** **Multi-Jurisdictional Participation**  
**Jackson County All Hazard Mitigation Plan**

Local Unit of Government	Statement of Interest	Formal Adoption
City of Alpha	Yes	
City of Jackson	Yes	
City of Okabena	Yes	
City of Heron Lake	Yes	
City of Lakefield	Yes	
City of Wilder	Yes	

**G Table #25 b****Summary of Jurisdiction Participation**

<b>Name</b>	<b>Worksheet</b>	<b>Goals</b>	<b>Attended Meeting</b>
Jackson County Emergency Management; Director*	Y	Y	Y
Jackson County Emergency Management; Assistant*	Y	Y	Y
City of Jackson; Emergency Manager / Superintendent*	Y	Y	Y
Federated Rural Electric; Operations Manager*	Y	Y	Y
Jackson County Land Management Office; Director*	Y	Y	Y
City of Heron Lake; Emergency Manager/ Chief of Police*	Y	Y	Y
Des Moines Valley Health and Human Services; Emergency Planner*	Y	Y	Y
Jackson County Public Works; Assistant County Engineer*	Y	Y	Y
Jackson County; Administrator*	Y	Y	Y
City of Alpha; City Clerk	Y	Y	Y
City of Jackson; City Administrator*	Y	Y	Y
City of Okabena; City Clerk	Y	Y	N
City of Heron Lake; City Clerk	Y	Y	Y
City of Lakefield; City Clerk*	Y	Y	Y
City of Wilder; City Clerk	Y	Y	N
Jackson County Board of Commissioners; Commissioners	Y	NA	Y
Jackson County Sheriff's Department	N	Y	Y
Township Representatives**	N	Y	Y

*Worksheet:* A representative complete the Hazard Identification Worksheet

*Goals:* A representative reviewed the Goals and provided feedback

Denotes Planning Team Member: \*

NA: was not specifically listed in any goals

Denotes Jackson County Township Representative on Region Development Commission: \*\*

**G Table #25 c Emergency Response, Schools, and Organization Participation**

<b>Name</b>	<b>Goals</b>	<b>Attended Meeting</b>
Alpha Fire Department	Y	N
Brewster Fire Department	Y	N
Dunnell Fire Department	Y	N
Heron Lake Fire Department	Y	N
Jackson Fire Department	Y	N
Lake Park Fire Department , IA	Y	N
Lakefield Fire Department	Y	Y
Mountain Lake Fire Department	Y	N
Okabena Fire Department	Y	

Round Lake Fire Department	Y	N
Spirit Lake Fire Department, IA	Y	N
Trimont Fire Department	Y	N
Windom Fire Department	Y	N
Heron Lake Ambulance District	Y	N
Jackson Ambulance District	Y	N
Lakefield Ambulance District	Y	N
Mountain Lake Ambulance District	Y	N
Trimont Ambulance District	Y	N
Windom Ambulance District	Y	N
Worthington Ambulance District	Y	N
Sanford Jackson Medical Center – Emergency Planner	Y	N
Heron Lake – Okabena Public Schools; Superintendent	Y	N
Jackson County Central Public Schools; Superintendent	Y	N
Jackson County SWCD; Assistant Director	Y	N
Lincoln Pipestone Rural Water; System Manager	Y	N
Iowa Lakes Rural Water; System Manager	Y	N
Red Rock Rural Water; System Manager	Y	N
Minnesota Board of Water and Soil Resources; Southwest Region Representative	Y	N
Minnesota Department of Agricultural; Acting Director – Inspection Division	Y	N
Minnesota Department of Health; Public Health Preparedness Consultant	Y	N
Minnesota Department of Transportation; District 7 Planner	Y	N
Minnesota Board of Animal Health; Assistant Director	Y	N
University of Minnesota Extension; Regional Director	Y	N
Minnesota Pollution Control Agency; Region Representative	Y	N
Minnesota Department of Natural Resources; Area Representative	Y	N
American Red Cross; Disaster Program Manager	Y	N
Jackson Airport; City Representative	Y	Y

*Goals:* A representative reviewed the Goals and provided feedback

## II Adoption Procedure

Each jurisdiction participating in the plan must formally adopt the plan after FEMA provisionally approves the document (Section 1.B.1). This plan must be adopted within one year of provisional FEMA approval, or else be updated and re-submitted to FEMA again. Minnesota Statutes §375.51 Subd.1

requires that a “public hearing shall be held before the enactment of any ordinance adopting or amending a comprehensive plan or official control...”

Once the planning team finalized the draft All Hazard Mitigation Plan (AHMP), copies were made available to the public, local governments, and county departments for comment. The feedback period for the plan was 31 days. The planning team reviewed comments, modifications were made, and the draft was sent to Jackson County Board of Commission for their review.

As part of the planning team’s review, a public hearing was held to obtain any additional comments that the public or others wished to make. When satisfied with the plan, the planning team recommends the Jackson County Board of Commissioners forward the plan the State of Minnesota Division of Homeland Security & Emergency Management (HSEM) for review. Federal rules require that this plan be submitted to HSEM for initial review and coordination, with the State then forwarding the plan to FEMA’s Regional Office in Chicago for formal review and approval. Upon approval by FEMA, the Jackson County Board of Commissioners will consider a Resolution of Adoption. After County approval, staff will work with each participating local unit of government to facilitate the local adoption of the plan.

Local jurisdictions with Comprehensive Plans and Land Use Plans are encouraged to incorporate applicable strategies, goals, and policies from the Jackson County AHMP into their local plans upon next adoption. Local jurisdictions should utilize applicable zoning, subdivision control, and other ordinances to enforce the policies described in this plan. The Jackson County Emergency Management Department will work with local jurisdiction to help incorporate the applicable strategies, goals, and policies from the Jackson County AHMP into their local plans. The SRDC sent all entities the goals, objectives, and strategies that their entity was named in. These entities had the opportunity to provide feedback and acknowledged the goals, objectives, and strategies that they were named in.

### **III Participation Provisions Post-Approval**

FEMA guidance explains a process that jurisdictions can follow to become part of the planning process, or “join” the mitigation plan, after FEMA approval. Any jurisdiction wishing to join the plan at a later date should contact Jackson County Emergency Management.

# CHAPTER 4: PLANNING PROCESS

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The planning process for the All Hazard Mitigation Plan (AHMP) is as important as the plan itself. The planning process forces the community to analyze the strengths and weaknesses of Jackson County's preparedness for a natural or manmade disaster. This Chapter describes the planning process, the AHMP Team, public involvement, and existing plans, studies, reports and technical information used in the planning process.

## I Description of the Planning Process

### Preplanning

Since the original Jackson County AHMP was approved and adopted in 2008, Jackson County Emergency Manager and the Southwest Regional Development Commission (SRDC) have collected information on hazards that occurred in Jackson County. This information gathering helped in updating the risk assessment section of the plan. It also helped to initiate conversations during the planning process regarding strategies to mitigate the effects caused from hazards over the five year update cycle.

In the fall of 2013, the planning process began for the update of the Jackson County AHMP. Every five years the Jackson County AHMP has a planned update. "A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within five years in order to continue to be eligible for mitigation project grant funding."<sup>16</sup> Jackson County Emergency Manager initiated the planning process by applying for a planning grant from FEMA and contacting the Southwest Minnesota Regional Development Commission (SRDC) to assist with the grant and update to the plan.

The Jackson County AHMP Planning Team was reformed to assist with the update. The planning team consists of a number of elected officials, county staff, city staff, and emergency personnel.

Jackson County AHMP Planning Team:

- Jeff Johnson, Jackson County Emergency Management Director
- Tawn Hall, Jackson County Deputy Emergency Management Director
- George Tauer, City of Jackson Superintendent and Jackson City Emergency Manager
- Jennifer Bromeland, City of Jackson Administrator
- Joe Marthaler, Operations Manager Federated Rural Electric
- Kelly Rashe, Lakefield City Administrative /Clerk
- Andy Geiger, Jackson County Land Management Director
- Anthony Fauglid, Heron Lake Chief of Police and Heron Lake City Emergency Manager
- Rick VanderWoude, Emergency Planner DVHHS

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<sup>16</sup> FEMA. 44 CFR 201.6 - Local Mitigation Plans. Accessed: 9/25/14. Available: <http://www.law.cornell.edu/cfr/text/44/201.6>

- Bob Hummel, Jackson County Public Works Maintenance Supervisor
- Jan Fransen, Jackson County Administrator

#### Geographic Information System (GIS) Maps:

- Jared Baloun, Jackson County GIS Specialist

#### Southwest Regional Development Commission:

- Drew Hage, Planner

The SRDC contacted all of the cities within Jackson County that the update to the Jackson County AHMP was taking place. This original outreach also asked the cities to participate in the planning process to update the Plan. All of the six cities in Jackson County signed Statement of Interest Letters for the Jackson County AHMP update. These six cities include: Alpha, Heron Lake, Jackson, Lakefield, Okabena, and Wilder. Outreach was also done to the townships in Jackson County and multiple planning team members also represent townships in Jackson County.

### Planning Meeting

The first All Hazard Mitigation Plan Meeting was held on September 24<sup>th</sup>, 2014. This meeting was an introduction to the Jackson County AHMP Planning Team. The SRDC presented on the AHMP planning process, the purpose of the plan, the benefits of having a plan, and the participation in the development of the plan.

The planning process started with a review of the timeline and the information that needed to be gathered as part of the update and included in the plan. The Local Mitigation Plan Review Tool was presented to the planning team as master guide to the materials that are required to be included in the Jackson County AHMP. There will be a total four planning meetings, including the first meeting, to gather information, analyze the natural and manmade hazards that pose a risk in Jackson County, and outline mitigation strategies to mitigate the risk of the hazards that were identified.

There were also resources allocated to have up to three subcommittee meetings. These subcommittee meetings are used to help gather additional information, analyze potential hazards, and identify mitigation measures. These subcommittee meetings help SRDC staff to prepare and present information to the larger planning team during Jackson County AHMP planning meetings.

The Hazard Identification Worksheet was also discussed during the presentation regarding the planning process. The Hazard Identification Worksheet is an important part of the planning process. The Hazard Identification Worksheet helps the planning team rank and quantify the natural and manmade hazards in Jackson County. The planning team and city involvement is needed to help identify hazards and provide feedback in regards to potential frequency, spatial extent, potential severity, warning time, risk level, and hazard rank.

The Hazard Identification Worksheet outlined the natural and manmade hazards that were included in the original Jackson County AHMP. SRDC staff presented other hazards that are typical to Minnesota



and were included in the Minnesota AHMP and other county AHMPs. After thoroughly discussing each statewide hazard, the planning team updated the list of hazards that will be included in the plan. The planning team identified the following hazards (not in a specific order):

Natural Hazards affecting the jurisdiction include:

- Agricultural Disease (animal or crop)
- Blizzards, Winter Storms, and Extreme Cold Events
- Drought
- Fire—Wildfire
- Flooding
- Severe Summer Storms, Lightning and Hail, and Extreme Warm Events
- Tornadoes and Straight-line Winds
- Earthquakes

Manmade hazards affecting the jurisdiction include:

- Fire—Structure (combined with wildfire for analysis)
- Civil Disturbance and Terrorism
- Hazardous Materials
- Public Health Emergencies
- Transportation Infrastructure and Transportation Crashes
- Water Supply Contamination
- Utility Failure
- Dam Failure

Certain statewide hazards were eliminated from the discussion since the planning team thought the risk of the hazard was minimal or non-existent in Jackson County. These hazards included:

- Coastal Erosion—Jackson County's lakes and lakeshore are typically stable, so FEMA has not identified any significant 100-year floodplain areas around any of the county's major lakes.
- Sinkholes and Land Subsidence—Maps provided by the State of Minnesota show this is not an issue in Jackson County. This is an issue in counties in eastern Minnesota.
- Nuclear Generating Plants—none are located in or near Jackson County.

Public participation is a critical component in the development of the Jackson County AHMP. The planning team is critical in helping to engage the public and to garner feedback in regards to the plan. The planning team recognizes the importance of public involvement during the planning process. Participation in the development of the Jackson County AHMP needs to come from county staff, township and city representatives, and the general public. Efforts were discussed to actively include these groups in the update of the Jackson County AHMP.

### **Planning Meeting / Risk Assessment Meeting**

The second All Hazard Mitigation Plan Meeting was held on December 1<sup>st</sup>, 2014. The meeting agenda covered hazard identification, the hazard identification worksheet, and hazard profile. Hazard identification was used to finalize the list of hazards that would be included in the plan. Planning Team members were given the opportunity to revisit the list of identified hazards to make sure no hazards were overlooked.

The hazard identification worksheets were distributed during the meeting. Planning team members were asked to complete the worksheets after the risk assessment meetings concluded. This will allow planning team members to draw on personal expertise and the hazard profile that was discussed during the risk assessment meetings.

All of the identified hazards were individually profiled during the risk assessment meetings. The profile included: locations affected by the hazard, extent of the hazard, previous occurrences of the hazard, probability of future events of this hazard, and vulnerability which covers plans and programs, gaps and deficiencies, and existing mitigation measures.

The risk assessment meetings helped to educate the planning team, local government representatives, and other meeting attendees. Profiling the natural and manmade hazards also helped to facilitate conversation regarding the hazards. The conversations helped to fill in gaps in the research related to the hazards. There was also a chance for meeting attendees to identify and discuss gaps that they identified.

### **Risk Assessment Meeting #2**

The third All Hazard Mitigation Plan Meeting was held on January 8<sup>th</sup>, 2015. The meeting agenda was to finishing profiling the identified hazards. The profile included: locations affected by the hazard, extent of the hazard, previous occurrences of the hazard, probability of future events of this hazard, and vulnerability which covers plans and programs, gaps and deficiencies, and existing mitigation measures.

### **Mitigation Strategies Meeting**

The forth All Hazard Mitigation Plan Meeting was held on August 27<sup>th</sup>, 2015. The Mitigation Strategies meeting started with a summary of the existing Vision and Mitigation Goals outline in the previous Jackson County AHMP. The presentation highlighted the previously identified goals, objectives, and strategies. Strategies that were already accomplished were added to the list of existing mitigation actions and new goals, objectives, and strategies were added to address identified gaps and deficiencies that were identified during the risk assessment meetings.

SRDC staff outlined the importance of Goals to be specific, measurable, attainable, relevant, and time bound (SMART Goals). The planning team analyzed and updated the Goal Section in a manor to reflect SMART Goals. Draft goals were developed during the mitigation strategies meeting.

### **Mitigation Strategies & STAPLEE Process – Subcommittee Meeting**

The fifth All Hazard Mitigation Plan Meeting was held on October 13<sup>th</sup>, 2015. A subcommittee meeting was held to farther discuss the goals, objectives, and strategies that were identified at the previous

meeting. The Mitigation Strategies Subcommittee referred to the Risk Assessment Section to confirm that the goals, objectives, and strategies addressed the needs outlined in the plan. By reviewing the Risk Assessment Section, the Mitigation Strategies Subcommittee was better able to finalize and prioritize mitigation goals, objectives, and strategies to address the specific natural and manmade hazards outlined in the plan update.

The Mitigation Strategies Subcommittee finalized and prioritized the goals, objectives, and strategies through the STAPLEE Process. STAPLEE stands for Social, Technical, Administrative, Political, Legal, Economic, and Environmental. The STAPLEE Process takes all seven criteria into consideration when finalizing and prioritizing the mitigation goals, objectives, and strategies.

A qualitative approach was used by the Mitigation Strategies Subcommittee. The qualitative approach judged and prioritized the mitigation goals, objectives, and strategies based on perceived costs and benefits. Only half of the goals, objectives, and strategies were discussed during the first subcommittee meeting.

Mitigation Strategies Subcommittee:

- Jeff Johnson, Jackson County Emergency Management Director
- Tawn Hall, Jackson County Deputy Emergency Management Director
- George Tauer, City of Jackson Superintendent and Jackson City Emergency Manager
- Jared Baloun, Jackson County GIS Specialist
- Drew Hage, SRDC Planner

### **Mitigation Strategies & STAPLEE Process – Subcommittee Meeting**

The sixth All Hazard Mitigation Plan Meeting was held on October 22<sup>nd</sup>, 2015. During the second subcommittee meeting the Mitigation Strategies Subcommittee finished finalizing and prioritizing the goals, objectives, and strategies through the STAPLEE Process. Through this process the strategies were prioritized on a scale of one through five, one being the least important and five being most important.

### **Plan Review Meeting**

The finished plan was first sent the Jackson County Emergency Management Director for review.

A Draft Plan Review Meeting was held via email and phone calls during December 2015 and January 2016. During this time the Jackson County AHMP Planning Team reviewed the entirety of the Jackson County AHMP. Modifications were made via email and phone to the SRDC. A subcommittee committee was also held on December 18th, 2015, to finalize the suggested changes. The Draft Plan Review Subcommittee was composed of the Emergency Management Director, Deputy Emergency Manager, and SRDC staff. The Jackson County Emergency Manager, Deputy, and SRDC staff reviewed each section of the plan and analyzed how the existing document meets current FEMA requirements. Each section was revised and re-formatted as part of the update process.

This subcommittee meeting was held to review of comments and suggestions. Modifications were agreed upon and the updated Jackson County AHMP was sent to the Jackson County AHMP Planning Team. Entities listed in specific goals were also sent the goals they were listed in.

The Public Review Meeting was held January 25<sup>th</sup>, 2016, from 3:30pm to 5:30pm. The event was intended as an opportunity for local residents as well as neighboring communities, agencies, businesses, academia, nonprofits, and other interested parties to be involved in the planning process. Entities had the opportunity to ask questions and discuss specific goals with Planning Team members and SRDC staff. The Jackson County AHMP was available online on the Jackson County's website and SRDC website for three weeks prior to the Public Review Meeting.

Interested entities could prepare feedback and recommendations before the public review meeting. Attendees were also able to come and go at their convenience, review the material sections of the plan, provide feedback, and make recommendations. A press release for the Public Review Meeting was advertised in the following newspapers: Jackson County Pilot, Lakefield Standard, and Tri County News. A flyer was also provided to local units of government and a press release was distributed to media in the region. The open comment period provided a great opportunity for garnering input and feedback in regards to the Jackson County AHMP.

## **II Public Involvement**

Intergovernmental coordination was essential in the development of the Jackson County AHMP. The SRDC and Jackson County Emergency Manager provided information to all local units of government in the county regarding the Jackson County AHMP planning process and opportunities for participation. Meeting participation was solicited, but smaller local units of government opted for participating via phone, email, and mail. All incorporated municipalities approved statements of intent to participate (Addendum II). Public Notice of all planning team meetings was posted at various government offices in Jackson County. Email notices were also sent to local units of government, local organizations, and other entities involved in hazard mitigation. Subcommittee Meetings were not publicized.

All local units of government in Jackson County were invited to review and comment on mitigation goals, objectives and strategies. Public and private entities were sent the mitigation strategies that their representing entity was listed in. Feedback and recommendations were requested regarding the mitigation goals, objectives, and strategies. Refer to the General Table #25 for more information regarding jurisdictions, emergency response departments, schools, and organizations that reviewed and approved the goals section of the Jackson County AHMP.

## **III Other Opportunity for Involvement**

Hazard mitigation has been a regional effort in Southwest Minnesota, with many opportunities for involvement provided for neighboring communities, agencies involved in hazard mitigation, and businesses, academia, and other relevant private and non-profit interests. SRDC has worked with the following Minnesota counties on their hazard mitigation plans:

- Cottonwood County (2011)
- Jackson County (2008, update in progress)
- Lincoln County (2010)
- Lyon County (2010)
- Murray County (2012)
- Nobles County (2005; update 2011)
- Pipestone County (2010)
- Redwood County (2005; update 2012)
- Rock County (2007; update 2014)

#### **IV Existing Plans, Studies, Reports, and Technical information**

Many sources of local, state, federal, and private information were used during the AHMP update. Various plans, programs, and policies were reviewed by SRDC staff. The literature review was a critical step in updating the Jackson County AHMP. The coordinated use and consideration of these diverse data sources provided a sound basis for this plan and implementation activities. The following references were specifically consulted during the planning process.

- Jackson County Emergency Operations Plan
- Jackson County Comprehensive Plan
- The Jackson County Water Management Plan
- Jackson County Land Use Map
- Jackson County Zoning Ordinances
- Local Water Plans
- Minnesota Department of Health (MDH) regulations regarding water systems and routine inspection of public water systems
- The Minnesota Pollution Control Agency (MPCA) regulations regarding wastewater systems
- Clean Water, Land and Legacy Amendment of 2008
- Minnesota Well Code
- NOAA Weather Radio All Hazards (NWR) weather broadcasts system
- The National Flood Insurance Program
- FIRM maps identifying flood hazard areas
- Fire District and Ambulance District Maps
- Mutual Aid Agreements between police forces, fire districts and ambulance districts
- Response Plans: HAZMAT
- MNDOT's Towards Zero Deaths (TZD) Program
- Traffic safety publications: the National Cooperative Highway Research Program (NCHRP), MnDOT Road Design Manual, ADA Tool Kit, MnDOT Bikeways Facility Design Manual, Minnesota Manual on Uniform Traffic Control Devices, and multiple Safe Routes to School Resources.
- The Minnesota DNR dam safety program
- The Minnesota DNR drafts Emergency Action Plan
- City of Jackson Land Use Map
- City of Lakefield Land Use Map
- FEMA Planning Aids and Tools
- County All Hazard Mitigation Plans

The Capabilities Worksheet identifies planning capabilities, policies and ordinances, programs, studies and reports, staff, and community partners that are relevant to hazard mitigation. The Worksheet is attached as Addendum I. All of the above documents are incorporated into this planning document by reference. The maps selected and included in this plan have been created by Jackson County and the SRDC utilizing data from Jackson County GIS and the State of Minnesota's Land Management Information Center (LMIC).

# CHAPTER 5: RISK ASSESSMENT

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## I Introduction

This Chapter profiles hazards facing Jackson County. Section I lists the natural and manmade hazards identified by the Jackson County All Hazard Mitigation Plan (AHMP) Planning Team that have been included in this plan and the methodology used in assessing the risk of each hazard. Section II provides a profile of identified hazards including locations affected by the hazard, extent of the hazard and relationship to other hazards, previous occurrences of the hazard, probability of future events of this hazard, and vulnerability which includes plans and program, gaps and deficiencies, and existing mitigation measures. Section III provides an analysis of the Hazard Identification Worksheet including methodology and findings. Section IV addresses Repetitive Flood Claim properties and Severe Repetitive Loss properties. Section V provides an analysis of development trends for jurisdictions within Jackson County.

Natural Hazards affecting the jurisdiction include:

- Agricultural Disease (animal or crop)
- Blizzards, Winter Storms, and Extreme Cold Events
- Drought
- Earthquakes
- Fire—Wildfire
- Flooding
- Severe Summer Storms, Lightning and Hail, and Extreme Warm Events
- Tornadoes and Straight-line Winds

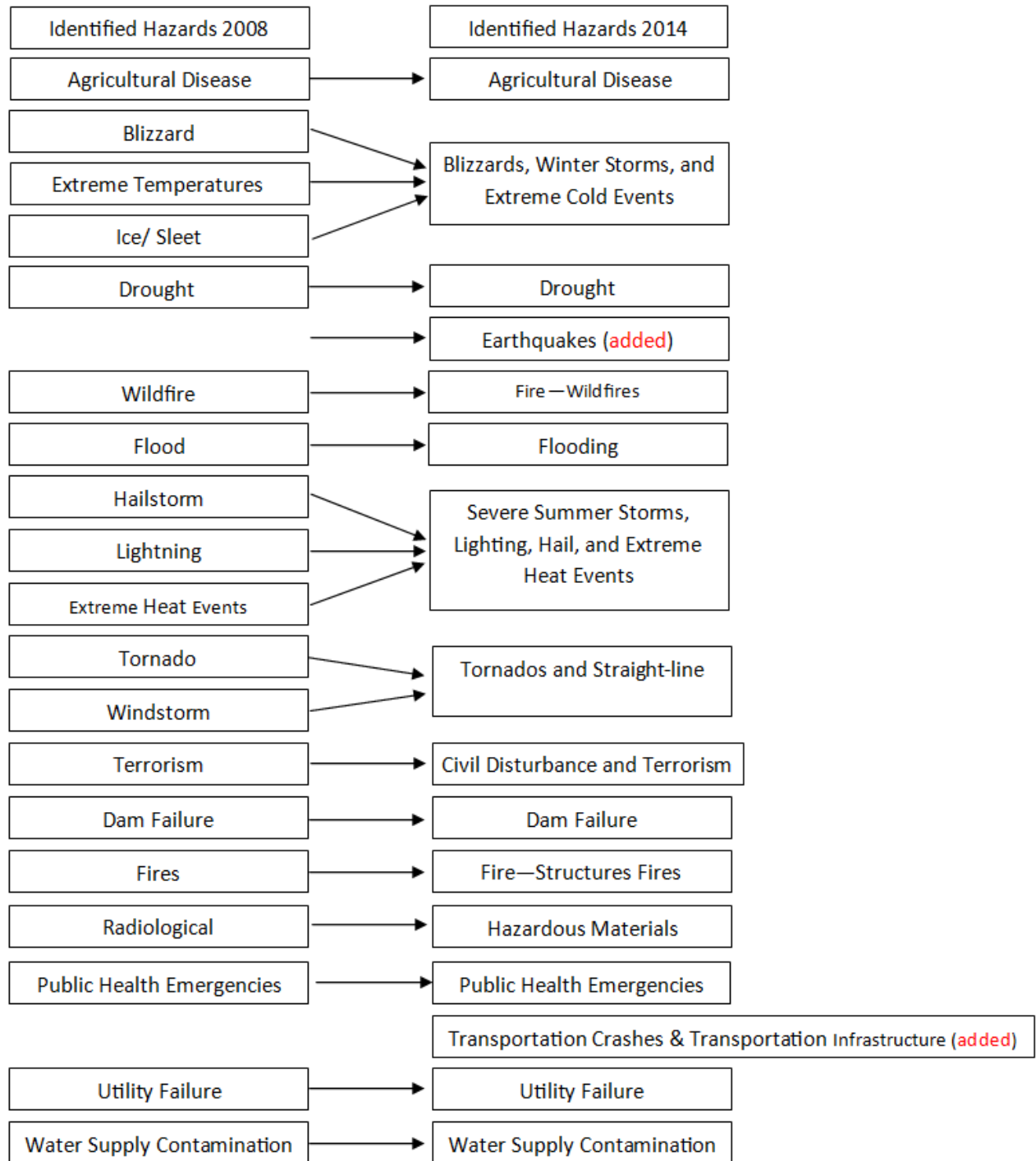
Manmade Hazards affecting the jurisdiction include:

- Civil Disturbance and Terrorism
- Dam Failure
- Fire—Structure (combined with wildfire for analysis)
- Hazardous Materials
- Public Health Emergencies
- Transportation Infrastructure and Transportation Crashes
- Utility Failure
- Water Supply Contamination

There have been some additions in the 2014 update in regards to the hazards identified by the planning team. Earthquakes, dam failure, and transportation crashes & Transportation Infrastructure were added as an identified hazard. Some hazards were combined for analysis due to their similarity. Refer to RA Figure #1 for which hazards were combined for analysis.

**RA Figure #1**

**Identified Hazards**



## Methodology

Much of the data in the Risk Assessment Chapter of this plan comes from the National Climatic Data Center (NCDC) Storm Events database. This data is gathered by the National Oceanic and Atmospheric Administration (NOAA) Satellite and Information Service. NCDC also receives Storm Data from the National Weather Service. Jackson County is covered by the Sioux Falls office of the National Weather Service. The National Weather service receives their information from a variety of sources, which includes but is not limited to: county, state and federal emergency management officials, local law enforcement officials, severe weather spotters, NWS damage surveys, newspaper clipping services, the insurance industry and the general public. Jackson County is also in the Sioux Falls major media market, so the county benefits from receiving news of impending weather events from the West.

All of the identified natural and manmade hazards are profiled individually. The hazard profiles include: locations affected by the hazard, extent of the hazard, previous occurrences of the hazard, probability of future events of this hazard, and vulnerability which covers plans and programs, gaps and deficiencies, and existing mitigation measures.

The hazard profiles also reference the Planning Team's Hazard Identification Worksheet. The Planning Team's Hazard Identification Worksheet is an accumulative summary of the individual planning team members Hazard identification Worksheet. The Hazard Identification Worksheet is a tool to help profile the natural and manmade hazard individually and rank them in regards to potential frequency, spatial extent, potential severity, warning time, risk level, and hazard rank. The sorting criteria for categories in the Hazard Identification Worksheet are as follows:

Potential Frequency:	Unlikely if <1% chance in the next 100 years, Occasional = 1% and 10% in next year, Likely =between 10% and 100% in next year, Highly Likely =greater than 10% in next year.
Spatial Extent:	Countywide or Local
Potential Severity:	Limited =<10% area affected destroyed, Minor =10% to 25% area affected, Major =25% to 50% area affected, Substantial =>50% area affected.
Warning Time:	Minimal, 6 – 12 hours, 12- 24 hours, 24+ hours
Risk Level:	Subjective ranking by planning team based on previous categories
Hazard Rank:	Subjective ranking by planning team based on previous categories



**RA Table #1****Hazard Rankings – Planning Team**

High Hazard Ranking	Hazard
Blizzards, Winter Storms, and Extreme Cold Events	Natural
Tornados and Straight-line Wind Events	Natural
Moderate Hazard Ranking	
Drought	Natural
Fire – Structure Fires (combined with wildfires for analysis)	Man-made
Flooding	Natural
Severe Summer Storms, Lightning and Hail, and Extreme Heat Events	Natural
Hazardous Materials	Man-made
Transportation Infrastructure	Man-made
Low Hazard Ranking	
Agricultural Disease (animal or crop)	Natural
Fire – Wildfires (combined with structure fire for analysis)	Natural
Earthquakes	Natural
Dam Failure	Man-made
Civil Disturbance and Terrorism	Man-made
Public Health Emergencies	Man-made
Transportation Crashes	Man-made
Water Supply Contamination	Man-made
Utility Failure	Man-made

Refer to RA Table #27 for the Planning Team’s Hazard identification Worksheet. There was also an accumulative summary of cities Hazard Identification Worksheets. Refer to RA Table #28 for the Cities Hazard Identification Worksheet.

### Plans and Programs

A number of plans and programs were identified and discussed as part of the Profiling Hazards and Assessing Vulnerability Section. A number of these plans and programs overlap from one hazard to another. Plans and programs will generally only be listed once. This listing helps to document what was discussed.

A number of these plans and programs contain in-depth information and procedures. The plans and programs subsection only identifies the plan or program and provides a brief description. If there were deficiencies, the deficiencies were identified in the gaps and deficiencies subsection.

## II Profiling Hazards and Assessing Vulnerability

### Natural Hazards

This section provides information on the nature of natural hazards which are a risk in Jackson County. These natural hazards include those caused by climatological, geological, hydrological or other events of the physical rather than manmade world. FEMA defines a natural hazard as a “natural event that threatens lives, property, and other assets. Natural hazards are both predictable and unpredictable in nature.

Natural hazards tend to be predictable in nature as they occur repeatedly in the same geographical locations due to weather patterns and physical characteristics of an area. Natural hazards tend to be unpredictable in nature in regards to exact times and locations when they occur. Natural hazards can change rapidly and can be unpredictable at times. We need to study and understand the risks associated with various natural hazards, so mitigation efforts can help limit damages to property and loss of life.

### A1 Agricultural Disease (animal or crop)

Agriculture is a major economic driver in Jackson County and Southwest Minnesota. Animal and crop related diseases have the potential to inflict both large economic losses and logistical hazards on the community. Agricultural disease was assigned a hazard rank of moderate by the planning team.

#### *Locations Affected by the Hazard*

Agricultural disease is often difficult to contain. The majority of incidents related to agricultural disease are likely to occur countywide rather than in localized areas, given the small size and the difficulty to contain a disease. The planning team identified the spatial extent of agricultural disease as countywide.

One of the most current threats is emerald ash borer, which is an exotic beetle from Asia that is devastating ash trees in a number of states. Emerald ash bore is a small green beetle that kills ash trees. It has been difficult to contain this threat, and there are a number of other similar examples of how it is difficult to contain an agricultural disease. The decision to relate agricultural disease to a countywide area instead of a localized area is also based on the planning teams experience within the county, the prevalence of crop agriculture, and the relative ease with which plant diseases spread. It is likely that any outbreak will likely affect all trees, crops, and animal agriculture within the county.

#### *Extent of the Hazard*

The majority of the land in Jackson County is used for agriculture. An agricultural disease causing crop failure could cause millions of dollars in lost production. The potential severity of agricultural disease is major according to the planning team. Jackson County is ranked 17<sup>th</sup> among counties in Minnesota in total agricultural production with \$282,902,000.<sup>17</sup> Animal transmitted diseases pose the greatest threat

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<sup>17</sup> Agricultural Census 2007. Accessed 5-17-13. Available:  
<http://www.mda.state.mn.us/Global/MDADocs/food/business/econrpt-Jacksoncnty.aspx>

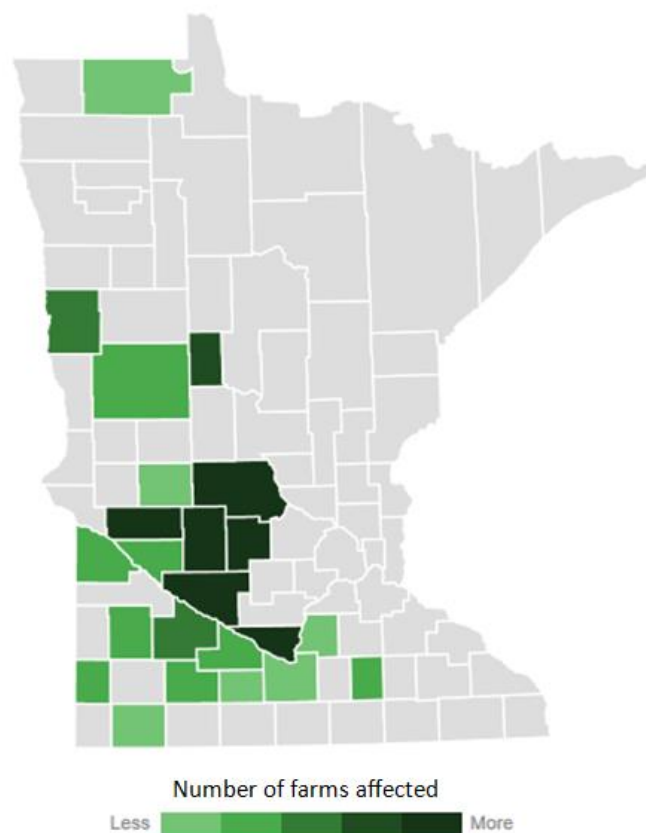
to animal confinement buildings, feeding lots, and pastures. Insects and pests pose the largest risk to both agriculture crops and tree-cover.

### *Animal Transmitted Diseases*

Avian Flu (HPAI) is a disease caused by infection with avian influenza and Type A viruses. These viruses occur naturally among wild aquatic birds worldwide and can infect domestic poultry and other bird and animal species. Avian flu viruses do not normally infect humans. However, sporadic human infections with avian flu viruses have occurred.<sup>18</sup>

“Influenza in poultry falls into two groups: low pathogenic avian influenza (LPAI), or highly pathogenic avian influenza (HPAI). Similar to influenza symptoms in people, birds infected with LPAI usually experience only mild signs if any, including respiratory signs such as conjunctivitis and nasal discharge, ruffled feathers or a drop in egg production. Unlike LPAI, the first indication of HPAI in poultry is sudden death, often without signs of illness. In the last 40 years, there have been introductions of LPAI in Minnesota poultry all of which have been successfully eliminated.”<sup>19</sup>

**RA Figure #2                      Avian Flu Outbreak Map – Minnesota June 2015**



<sup>18</sup> CDC. Information on Avian Influenza. Access: 7/23/15. Available: <http://www.cdc.gov/flu/avianflu/>

<sup>19</sup> Minnesota Board of Animal Health. Avian Influenza. Accessed: 7/23/15. Available: <https://www.bah.state.mn.us/avian-influenza>

The threat of bovine tuberculosis (TB) has impacted agriculture in Minnesota recently. In April, 2008, USDA downgraded Minnesota's status, requiring Minnesota cattle producers to do additional testing when shipping animals out of state. According to the Board of Animal Health website, bovine TB can be difficult to diagnose, infected animals can be infected for a long period of time before showing any outward signs of TB.<sup>20</sup>

The United States has been free of Hoof and Mouth Disease Bovine Spongiform Encephalopathy (BSE-Mad Cow Disease) since 1929.<sup>21</sup> This was possible through effective collaborative prevention programs between private producers, veterinarians, researchers, and government organizations. Education and early symptom identification were critical in the success. When an infection of foot and mouth disease or BSE is confirmed, the only effective way to control the disease is isolation and culling of an entire herd.

Early detection can be difficult since symptoms can be the same for multiple diseases. Later detection can result in a large percentage of a herd having the disease. Having to dispose of a large percentage of a herd would result in substantial financial loss to the producer.

Animals are also susceptible to the flu and common colds. "Respiratory diseases are common and costly to livestock producers."<sup>22</sup> The common cold along with other animal diseases like avian Influenza (bird flu), Chronic Wasting Disease, and Lyme Disease, just to name a few, pose risks to producers and cost thousands of dollars to producers to treat annually.

### *Plant Pests and Diseases*

Plant diseases can cause a loss of yield or damage to the infected plants. Certain tree diseases may weaken their structure and create a hazardous situation where property damage or serious bodily injury may result from falling limbs or the entire tree toppling. Root decay and the loss of trees may also lead to erosion.

In many cases, fungi are involved in tree diseases that result in a tree becoming a hazard. A tree with slowed growth, branch dieback, smaller than normal leaves or needles, excessive cone or seed set, premature autumn leaf coloration, or severe winter twig kill may be exhibiting early symptoms of a disease. Nothing can be done for a tree once it is infected nor is it likely that fungus can be completely eliminated from the soil or general area around the tree once the tree is removed.

A tree with fungal fruiting structures on several limbs, trunk, butt, or roots should be removed promptly if it is in a location where property damage might occur or where falling limbs or tree could strike people

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<sup>20</sup> Minnesota Board of Animal Health. Accessed 5-17-13. Available: <http://mn.gov/bah/diseases/bovine-tb/tb-testing.html>

<sup>21</sup> University of California Cooperative Extension. Accessed: 9/10/13. Available: [http://cesanbernardino.ucanr.edu/Dairy511/FACT\\_SHEET\\_No-1\\_Foot\\_and\\_Mouth\\_Disease/](http://cesanbernardino.ucanr.edu/Dairy511/FACT_SHEET_No-1_Foot_and_Mouth_Disease/)

<sup>22</sup> The Cattle Site. Accessed: 9/11/13. Available: <http://www.thecattlesite.com/diseaseinfo/#sthash.KWvGHoRq.dpuf>

or animals. If most of the tree appears healthy, any single branch with fungal fruiting structures should be removed promptly, regardless of the identity of the fungus present.

Some of the more notable pests infest corn fields. Corn rootworm and European corn borer are two major pests that pose serious potential loss of income to farmers. Goss's Bacterial Wilt and Leaf Blight are two other damaging diseases that have caused problems over the past few growing seasons Minnesota. In 2010, Wilt and Leaf Blight developed in many fields across southern Minnesota. Wilt and Leaf Blight can be a significant disease problem, with yield losses reported as high as 70 to 80 bushels per acre in Minnesota.<sup>23</sup>

In the past few decades technological progress has been made, and seed companies have been able to genetically enhance corn varieties to provide a higher level of protection against pests and diseases. Advances in Soybean seed modifications have also been able to overcome a number of plant pests and diseases that include soybean cyst nematode and soybean aphids. These hybrids have resistance to certain types of cyst nematode, but not all. Soybean aphids can be addressed with commercial spray, but Mother Nature is often one step ahead. Other plant diseases include: Asian Soybean Rust, European Corn Borer, and a number of insects.

#### *Relationship to Other Hazards—Cascading Effects*

- **Public Health.** Agricultural disease can have a major impact on public health. A shortage of food can cause poor development among youth that will have lifelong consequences.
- **Civil Disturbance.** A shortage of food could also result in civil disturbance. When the supply of a necessity becomes drastic low distress can take over and cause civil unrest.

#### *Previous Occurrences of the Hazard*

There have not been any recent large-scale occurrences of agricultural disease in the Jackson County. This may impart be due to farmers trying to stay ahead of new diseases and taking precautionary actions. Large operations have specialized staff to monitor livestock and enforce sterilization of equipment and employees before entering facilities. Ag businesses have an economic incentive to stay ahead of and combat agricultural disease. This is one of the major reasons why large occurrences have not occurred.

Minnesota Department of Agriculture (MDA) and University of Minnesota Extension Service provide information on a variety of insects and pests that help prevent occurrences of agricultural disease. Seed producers and other agricultural businesses use this information to modify crops to be resistant to more pests and diseases. The agricultural sector studies past seed modifications and make adjustments to combat the next year's hazards. It is important to study past plant pests and diseases, so we can prepare for future hazards. Understanding the past is an important variable in mitigating future hazard events.

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<sup>23</sup> University of Minnesota Extension. Accessed 5-17-13. Available:  
<http://blog.lib.umn.edu/efans/cropnews/2011/08/watch-for-gosss-leaf-blight-an.html>

During the spring and summer of 2015, Highly Pathogenic Avian Flu hit turkey and chicken farmers in Minnesota and neighboring states. As of June 5<sup>th</sup>, 2015, 9 million birds were affected and humanely put down in Minnesota.<sup>24</sup> Jackson County did not have any reported farms that were affected. Cottonwood County to the North and Nobles County to the west both reported farms that had been affected by the Avian Flu.

Losses in poultry production and related businesses due to avian influenza are estimated at \$309.9 million in Greater Minnesota, according to University of Minnesota Extension. "Using economic modeling, analysts determined that for every million dollars in direct losses, the estimated ripple effect leads to \$1.8 million in overall economic losses, including \$450,000 in wages. Ripple effect losses stem from factors including reduced wage-earner and business-to-business spending."<sup>25</sup>

### *Probability of Future Events of this Hazard*

Large scale animal outbreaks are rare. The Minnesota Board of Animal Health works with producers to educate, monitor, report, and respond to outbreaks. This coordinated effort has worked to reduce the frequency and scale of occurrences.

Some occurrence of crop pests and diseases happens each year. The potential frequency of agricultural disease is likely according to the planning team. Researchers try to stay ahead of the hazards by giving livestock vaccinations and supplements and by genetically modifying crops.

Emerald Ash Borer (EAB) is one pest that has the potential for a large amount of damage in Jackson County. There are statewide efforts being made to slow the spread, but the outcome is unknown at this time. According to a story in *Planning Magazine* ("Diversifying the Urban Forest, February 2010), Minnesota could lose all of its ash trees within 10 years.

Ash trees became a preferred quick-growing street tree and shade tree across the USA after elm trees succumbed to Dutch Elm Disease. According to the MDA, the EAB is an insect that attacks and kills ash trees. The adults are small, iridescent green beetles that live outside of trees during the summer months. The larvae are grub or worm-like and live underneath the bark of ash trees. Trees are killed by the tunneling of the larvae under the tree's bark.

"On May 14, 2009, emerald ash borer was confirmed as present in the South Saint Anthony Park neighborhood in St. Paul. EAB is a serious invasive tree pest. Quarantine has been placed on Ramsey, Hennepin, Houston, and Winona counties to help slow the spread of Emerald Ash Borer to other areas."<sup>26</sup>

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<sup>24</sup> CDC. Information on Avian Influenza. Access: 7/23/15. Available: <http://www.cdc.gov/flu/avianflu/>

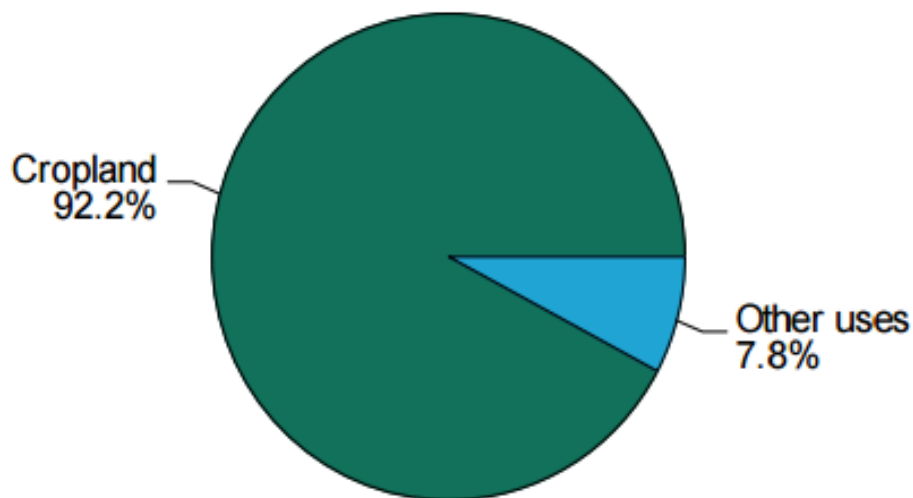
<sup>25</sup> University of Minnesota. Extension analysis: Economic impact of avian flu at nearly \$310 million as of May 11. Accessed: 7/23/15. Available: <http://discover.umn.edu/news/food-agriculture/extension-analysis-economic-impact-avian-flu-nearly-310-million-may-11>

<sup>26</sup> Minnesota Department of Agriculture. Accessed 5-17-13. Available: <http://www.mda.state.mn.us/plants/pestmanagement/eab.aspx>

**RA Table #2****Farm Summary – Jackson County**

	1987	1992	1997	2002	2007	2012	Change 2007-2012
Land in Production	394,000	401,039	383,631	398,068	400,531	357,834	-10.7%
Number of Farms	1074	1027	963	989	969	826	-14.8%
Average Size (acres)	367	390	398	402	413	433	4.8%
Harvested Crops	295,706	350,072	342,472	349,930	353,872	319,901	-9.6%
Corn	126,178	181,593	164,853	175,336	195,970	167,870	-14.3%
Soybean	160,063	163,039	170,892	NA	NA	NA	NA

Source: Census of Agriculture 1987, 1992, 1997, 2002, 2007, 2012 ([http://www.agcensus.usda.gov/Publications/Historical\\_Publications/](http://www.agcensus.usda.gov/Publications/Historical_Publications/))

**RA Figure #3****Farm Summary – Jackson County 2012**

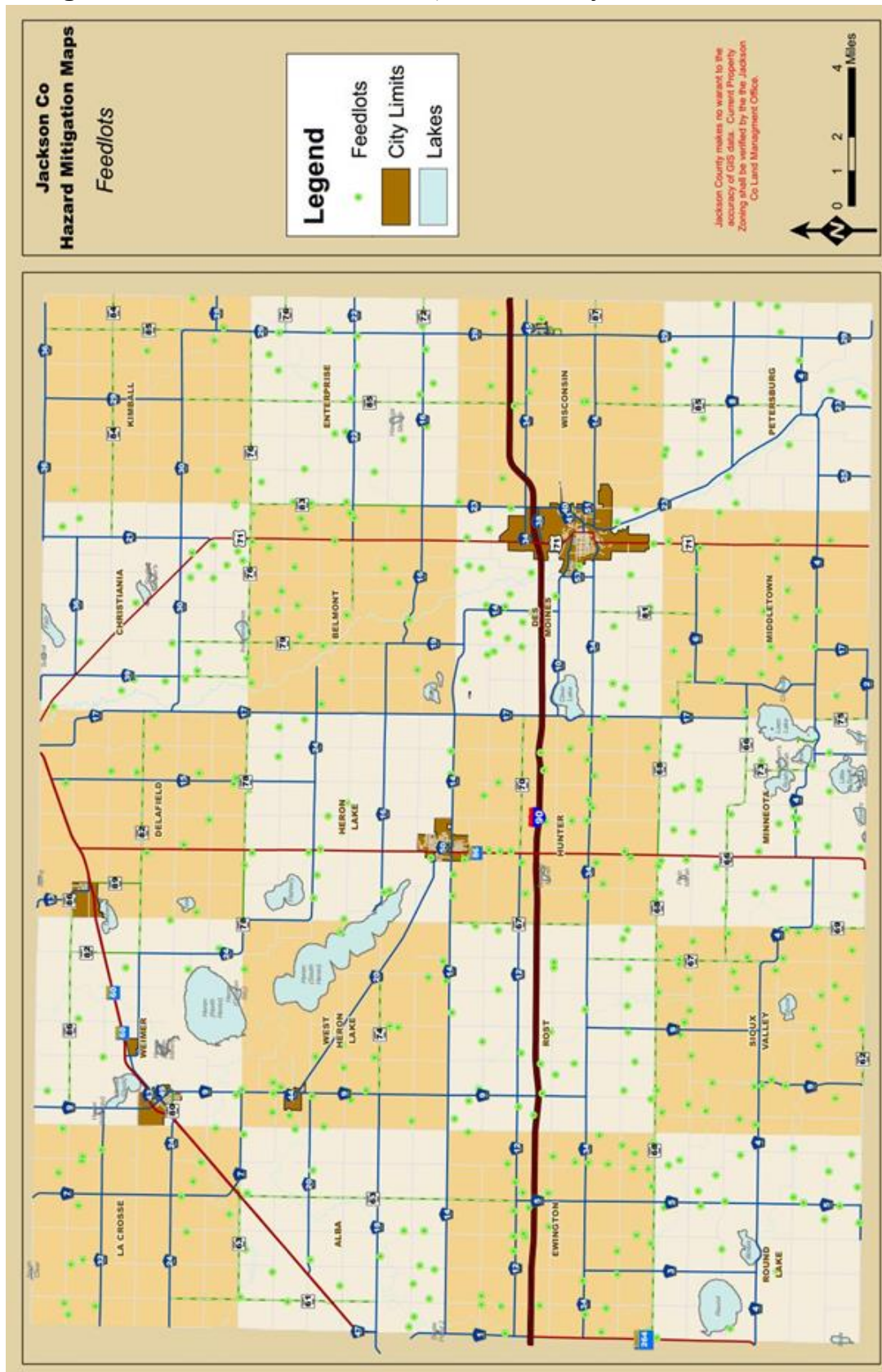
The Minnesota Pollution Control Agency (MPCA) regulates collection, transportation, storage, processing and disposal of animal manure. The 2002 Census of Agriculture counted 203 farms with cattle, 144 with swine and 44 with sheep. As of September 2015, there were 346 registered feedlots within Jackson County.<sup>27</sup> Management of feedlots was identified as part of a priority concern in Jackson County's Local Water Management Plan.

<sup>27</sup> Jackson County Planning and Zoning Department Information request. Received: 1/9/15.



RA Figure #4

Feedlots - Jackson County





### *Vulnerability*

Agricultural disease is difficult to contain and can spread quickly. The risk level assigned to agricultural disease by the planning team is average. Emerald Ash Bore is an example of how a plant disease can spread and how it is difficult to contain. The City of Minneapolis has removed 879 unhealthy ash trees in 2012.<sup>28</sup> It is recommended by the Minneapolis Tree Advisory Commission to remove and replace another 5,000 ash trees in 2013 to help prevent the widespread infestation of the bug.

### *Plans and Programs*

- Combined mitigation approach - Department of Agriculture, Minnesota Board of Animal Health, Minnesota Department of Health, University of Minnesota Extension Service, and Homeland Security and Emergency Management (HSEM) are working with local agencies and farmers to effectively mitigate any and all effects of hazards on animal agriculture and plant agriculture.
- Emergency Operations Plan - The Jackson County Emergency Operations Plan outlines procedures for county and local governments for contacting appropriate state and federal agencies and provides guidelines and strategies for dealing with animal and plant diseases and command structures with the Jackson County Emergency Manager.
- Tree cost share programs - Cost share programs have been available from state and federal sources to replace dead trees due to a disease outbreak.
- Local Arborists - Jackson County currently utilizes local arborists concerning diseased trees and the possible effects of insect infestation of these trees.
- The Minnesota Board of Animal Health continues to work together with agricultural industries and other state and federal agencies to prepare for and respond to introductions of animal disease outbreaks. The state's voluntary cooperative control plan includes education, monitoring, reporting, and response. For the Avian Flu outbreak, testing for influenza in poultry is conducted at the Minnesota Poultry Testing Laboratory in Willmar. Commercial and non-commercial poultry flocks are routinely monitored for influenza. Livestock and other agricultural operations are also monitored for animal disease outbreaks.
- Catastrophic animal loss - In the event of a catastrophic animal loss the Minnesota State Duty Officer, the BAH, the Department of Agriculture, and your local feedlot officer should be contacted.<sup>29</sup> The primary responsibility for regulating carcass disposal in Minnesota lies with the Board of Animal Health (BAH). The 7020 feedlot rule addresses site selection for composing animal carcasses.<sup>30</sup>

### *Gaps and Deficiencies*

- Livestock / Poultry Disposal - Disposal of dead livestock and poultry was an issue identified by the planning team. This is in regards to catastrophic animal loss. The catastrophic animal loss issue

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<sup>28</sup> City of Minneapolis. Accessed: 9/17/13. Available:

<http://www.minneapolismn.gov/sustainability/indicators/WCMS1P-081056>

<sup>29</sup> Minnesota Pollution Control. Accessed: 7/19/13. Available: <http://www.pca.state.mn.us/index.php/view-document.html?gid=3579>

<sup>30</sup> Minnesota Pollution Control. Accessed: 7/19/13. Available: <http://www.pca.state.mn.us/index.php/view-document.html?gid=3579>

pertains to on the farm animal loss and while the livestock and poultry are being transported. Refer to the section of Transportation accidents for more information related to catastrophic animal loss while livestock is being transported. There are mitigation efforts in place, but the planning team was unsure of how effective the plans would be in regards to a catastrophic animal loss. Jackson County Planning and Zoning is working on identifying potential burial sites. Owners are responsible for disposal, so this may result in inadequate disposal of livestock and poultry. Part of this planning was tested in 2015 with the Avian Flu outbreak. There were not expensive poultry losses in Jackson County, but there were catastrophic poultry losses in Minnesota, and neighboring Iowa.

- Community Response - The relationship between Emergency Management, Des Moines Valley Health and Human Services (DVHHS), and local veterinarians needs to be strengthened in order to respond to potential of actual animal disease that would pose a public health threat. Local biotechnology development of animal vaccines is occurring in Jackson County and more information is also needed to determine potential for biological vaccine release into the environment.
- Lag in Response – The response for Foreign Disease Outbreak is controlled at the State level. There may be a lag in response, since organizations have to be informed about the outbreak before a response is coordinated. Time is critical in responding to an outbreak, so additional local assets may be needed. Additional training between local assets and State level staff could also help to decrease response times.

#### *Existing Mitigation Measures*

- The planning team commented that the private sector has done a good job of policing itself in regards to animal outbreaks and the spread of plant diseases. Private agricultural businesses have an economic interest in maintaining a healthy field and healthy animal stock. Research and development plays a big role in trying to stay ahead of the animal and plant diseases and pests.
- Private / public partnerships - Jackson County has promoted private and public partnership to help foster the development disease resistant hybrids and to help educate the agricultural community regarding potential insects/ pests and diseases. These partnerships utilize research provided by public entities like the University of Minnesota Extension, and by private entities like Cargill. Creating private and public partnerships is important in mitigating the effects of agricultural disease. A number of issues impact geographically areas, so combining resources and taking advantage of economies of scale can help to make the mitigation efforts more effective.

## **A2 Blizzards, Winter Storms, and Extreme Cold Events**

Minnesota experiences winter weather from mid-Autumn through the winter season into spring. Heavy snowfall and extreme cold can immobilize large regions at the same time. All types of winter storms can be accompanied by extreme cold—both absolute temperatures and wind chill. Blizzards, winter storms, and extreme cold events were assigned a hazard rank of high by the planning team.

#### *Locations Affected by the Hazard*

All locations in Jackson County are equally likely to be exposed to this hazard. Rural areas are more likely to be severely impacted by the hazard. Rural homes and farms face the threat of isolation and utility failure during winter storms. Roads throughout the county are at risk from ice or blowing and

drifting snow. Roads closed due to hazardous winter weather also make it difficult for emergency responders to access individuals located in remote rural areas.

Given the rural nature of Jackson County, residents of smaller communities may face similar isolation issues as rural residents. City residents are also at risk. Attempting to travel between communities would expose city dwellers to higher levels of risk corresponding with their rural counterparts. The planning team identified the spatial extent of blizzards, winter storms, and extreme cold events as countywide.

### *Extent of the Hazard*

There are several types of winter storm events that are typical for this area including: heavy snow events, ice storms, blizzards, and extreme cold events. The potential severity of blizzards, winter storms, and extreme cold events is major according to the planning team.

Heavy snow events in Minnesota are considered to be 6 or more inches of snow in a 12-hour period, or 8 or more inches in a 24-hour period. Snow is considered heavy when visibilities drop below one-quarter mile regardless of wind speed. Heavy snows can lead to building collapse as well as creating a hazard to residents and travelers.

Ice storms include freezing rain, freezing drizzle and sleet (see Section A.6 Severe Summer Storms below for information on hail storms, which more typically occur in the spring and summer seasons). Freezing rain, probably the most serious of the ice storms, occurs during a precipitation event when warm air aloft exceeds 32 degrees Fahrenheit while the surface remains below the freezing point. When precipitation originating as rain or drizzle contacts physical structures on the surface, ice forms on all surfaces creating problems for traffic, utility lines, and tree limbs.

Sleet forms when precipitation originating as rain falls through a rather large layer of the atmosphere with below freezing temperatures allowing the raindrops to freeze before reaching the ground. Sleet is also referred to as ice pellets. Freezing rain freezes when it hits the ground, creating a coating of ice on roads, trees and power lines. Sleet storms are usually of shorter duration than freezing rain and generally create fewer problems.

Ice storms combined with high winds often threaten the electrical power grid. Typical power outages are due to localized storm events and utility crews can respond and restore power within hours. A complete power outage, however, has the potential to be a catastrophic event, due to the extensive systems that rely on remote power generation. Water and sewer service rely on electrical pumping stations. Individual home furnaces may be able to run on natural gas or propane, but usually need electricity to circulate warm air or hot water throughout a building.

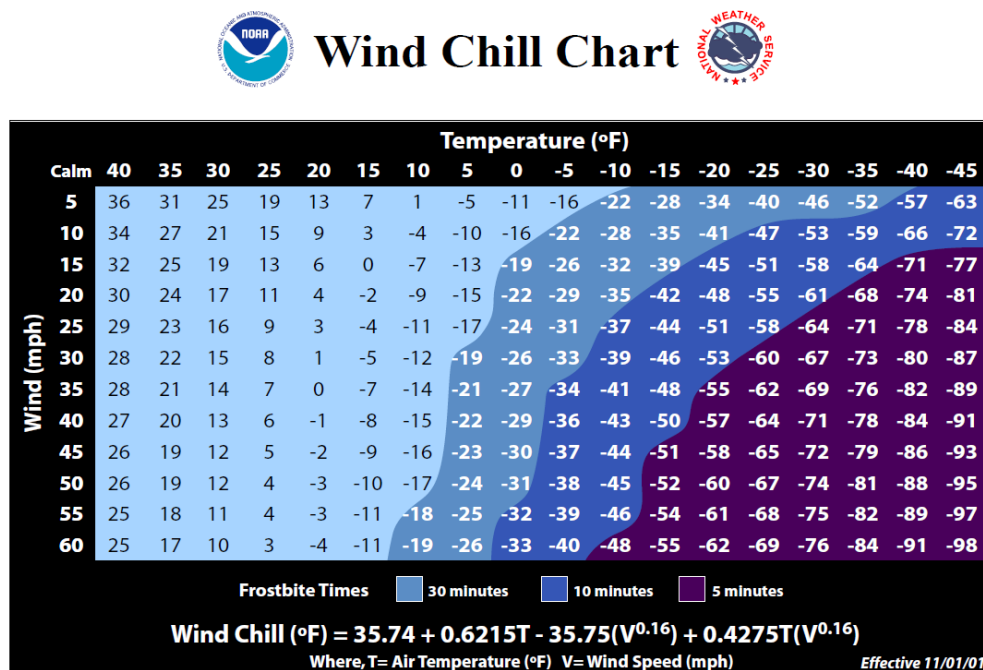
Blizzards are the most violent type of winter storm. A blizzard occurs with sustained or frequent gusts to 35 miles per hour or greater and considerable amounts of falling and/or blowing snow (reducing visibility to less than a quarter mile) for three hours or longer. While blizzards in Jackson County can occur from October through April, they are most likely from November through the end of March.

Temperature is not taken into consideration when the National Weather Service issues a Blizzard Warning; however, the nature of these storms typically leads to extreme cold.

Extreme cold events are when temperatures lead to direct dangers to people and animals. Infants and the elderly are most susceptible to prolonged exposure to the cold. Wind and cold weather can combine to cause wind chill temperatures as low as 70 degrees below zero.<sup>31</sup> Prolonged exposure can cause frostbite or hypothermia and can be life-threatening.

Below freezing temperatures can also damage vegetation and cause pipes to freeze and burst inside homes. More deaths are attributed to winter storms than to extreme cold weather events, but some populations are at more risk than others. The best advice is to stay inside. Over half of winter-weather deaths occurred in a vehicle, and 30 percent occurred outdoors.

**Table RA#3**



#### Relationship to Other Hazards—Cascading Effects

- **Flooding.** Heavy snows and rapid snow melt are primary contributors to seasonal spring flooding. Areas along rivers and stream in Jackson County can be impacted by spring flooding.
- **Transportation Crashes.** Winter storms often lead to hazardous conditions for transportation infrastructure. Icy roads can make travel difficult and poorly designed roads can result in large

<sup>31</sup> National Oceanic and Atmospheric Administration. Accessed 5-17-13. Available: <http://www.nws.noaa.gov/om/brochures/wnttrstm.htm>

drifts that make travel impossible. Poor driving conditions and poorly designed transportation infrastructure can contribute to motor vehicle crashes.

- **Utility Failure.** Winter storms can impact the power grid. Utility interruption can be severe in Jackson County due to the rural nature of the County. A winter storm can isolate rural residents and can leave them without power for extended periods of time. These residents are at risk of hypothermia or even death.

#### *Previous Occurrences of the Hazard*

From January 2000 through July 2014, there have been 18 documented winter storms in Jackson County. These winter storms are often not confined to Jackson County but affect all of southwest Minnesota. In the table below are winter storms occurrences that occurred from December 2009 through July 2014.

**RA Table #4 Winter Storms – Jackson County**

Date	Event Narrative	Number of Counties Affected
12/23/2009	Prolonged snowfall produced heavy accumulations of 1 to 2 feet in southwest Minnesota. The snowfall took place from two days before to the day after Christmas. The snowfall was accompanied by increasing north to northwest winds ranging from 25 to 30 mph with gusts around 35 mph, which caused areas of very low visibilities in blowing snow from Christmas Day through the night of December 27th. The heavy snow and drifting in the winter storm, along the areas of very low visibilities, made travel impossible for much of the time.	Rock, Pipestone, Murray, Nobles, Jackson, Lincoln, Lyon, Cottonwood
1/6/2010	New snowfall varying from four to 10 inches, previous snow cover, and northwest winds gusting to around 40 mph combined to produce widespread blowing and drifting snow over all of southwest Minnesota. Blizzard conditions were observed, ranging from spotty to widespread visibilities a quarter mile or less. Travel was brought to a standstill during the worst conditions. Even where visibilities were higher, travel was extremely difficult and dangerous because of the snowfall, drifting snow, and dangerous wind chills that accompanied the storm. The storm forced the closing of schools and businesses, and postponement of athletic events and other activities. The snow and blowing snow took place on January 6th and 7th, while dangerous wind chills continued well into January 8th.	Nobles, Jackson, Cottonwood, Rock, Murray, Pipestone, Lyon, Lincoln
11/13/2010	Snowfall of 4 to 7 inches, with a 7 inch report from the City of Jackson. Wind gusts over 30 mph accompanying the snow caused drifting snow and areas of reduced visibility in blowing snow.	Jackson, Murray, Nobles, Cottonwood
2/20/2011	Widespread moderate to heavy precipitation fell as heavy snow over the northern part of the area, with a mixture of freezing rain, sleet, and snow near the southern border of the state. Up to 12 inches of snow fell in the heavy snow area. Winds averaging 20 to 30 mph caused drifting and some areas of blowing snow.	Lyon, Lincoln, Nobles, Murray, Jackson, Rock, Pipestone

4/9/2013	Heavy precipitation with rapid cooling produced a combination of freezing rain, sleet, and snow over all of southwest Minnesota. There were heavy ice accumulations up to a half inch and sleet and snow accumulations reaching 5 to 10 inches. Many branches, limbs, whole trees, and power lines were downed by the weight of ice and accompanying wind. Both urban areas and rural electric cooperatives suffered major power line damage, with the rural cooperatives alone reporting 6 million dollars in damages. Trees and tree debris blocked many roads, and damaged several vehicles and homes. Major power outages were reported, affecting thousands of people. The winter precipitation made travel impossible in many areas, resulting in schools and businesses being forced to close. Moderate to heavy ice accumulations were reported along and for some distance north of Interstate 90.	Pipestone, Murray, Rock Lyon, Lincoln, Cottonwood, Nobles, Jackson
4/18/2013	Snowfall of 5 to 8 inches was accompanied by areas of blowing snow. The blowing snow, which took place in winds gusting up to 40 mph, was noticed mainly while the snow was falling.	Lyon, Lincoln, Rock, Pipestone, Nobles, Cottonwood, Murray, Jackson

National Climatic Data Center (NCDC) Storm Events database (<http://www.ncdc.noaa.gov/stormevents/>)

From January 2000 through July 2014, there have been ten documented Blizzards in Jackson County. In the table below are blizzard occurrences that occurred from December 20010 through July 2014.

**RA Table #5 Blizzards – Jackson County**

Date	Event Narrative	Number of Counties Affected
12/11/2010	Snowfall ranging from 5 to 10 inches was accompanied by sustained northwest winds which reached 40 mph at times, with gusts as high as 55 mph. The snowfall, strong winds, and existing snow cover resulted in widespread blizzard conditions. Travel was made impossible in much of the area. There were several accidents and vehicles going into ditches, attributed to slick roads and low visibilities. Several motorists were stranded. Businesses were forced to close, and several school and other weekend activities were canceled or postponed.	Cottonwood, Murray, Pipestone, Rock, Lincoln, Jackson, Nobles, Lyon
12/16/2000	Winds gusting above 50 mph combined with existing snow cover and 1 to 4 inches of new snow to produce prolonged blizzard conditions. Visibilities near zero and drifting snow made travel impossible. Even snow plows were pulled off the roads until conditions improved. Interstate highway 90 was closed for several hours. Many businesses, colleges, and technical schools closed during the storm. Wind chills dropped to colder than 60 below zero at times. While no significant damage was reported, the economic impact of the storm was still large in lost travel, business, and snow removal costs.	Rock, Pipestone, Nobles, Lincoln, Lyon, Cottonwood, Jackson, Murray

2/10/2013	Variable snowfall of 2 to 5 inches, northwest winds gusting to 45 mph, and snow cover existing before the storm in part of the area, produced blizzard conditions with visibilities below a quarter mile in blowing snow in many areas. The low visibilities and drifting snow forced some businesses to close, and also forced several school closings on Monday February 11th. The blizzard closed many roads.	Pipestone, Lyon, Rock, Nobles, Lincoln, Murray, Jackson, Cottonwood
1/16/2014	A period of northwest winds gusting to over 50 mph at times combined with existing snow cover and new snowfall of up to 2 inches to cause blizzard conditions. The blizzard caused widespread visibilities of less than one quarter mile in open areas. Travel was brought to a temporary halt and schools and some businesses were closed.	Lyon, Lincoln, Rock, Murray, Cottonwood, Nobles, Jackson

National Climatic Data Center (NCDC) Storm Events database

From January 2000 through July 2014, there have been eight documented extreme cold events in Jackson County. In the table below are extreme cold events that occurred from December 2009 through July 2014.

**RA Table #6** **Extreme Cold Events – Jackson County**

Date	Event Narrative	Location
1/23/2014	Temperatures reaching double digits below zero and northwest winds of 10 to 15 mph combined to produce wind chill readings of 35 to 40 below zero in southwest Minnesota.	Jackson, Nobles, Rock, Lincoln, Murray, Pipestone, Lyon, Cottonwood
2/27/2014	Temperatures dropping to double digits below zero, combined with winds of 10 to 20 mph, produced wind chill readings around 35 below zero for several hours ending a little after sunrise on February 27th.	Jackson, Nobles, Lincoln, Murray, Lyon, Cottonwood
3/2/2014	Temperatures dropping to around 15 below zero, combined with northwest winds of 5 to 15 mph, produced wind chill readings around 35 below zero for several hours ending a little after sunrise on March 2nd.	Jackson, Nobles, Rock, Lincoln, Murray, Pipestone, Lyon, Cottonwood

National Climatic Data Center (NCDC) Storm Events database

### ***Probability of Future Events of this Hazard***

Winter storms are highly likely in the area; they occur annually. The potential frequency of a blizzard, winter storm, and extreme cold event is highly likely according to the planning team.

### ***Vulnerability***

Winter storms have major impacts on local communities. The risk level assigned to blizzards, winter storms, and extreme cold events by the planning team is high. The effects of a winter storm can include: closures, need to clear snow and ice from public streets, recover from utility failure, possibly provide



emergency shelters for travelers and dislocated residents, and potential injuries and death. Winter storms can also cause lost productivity and disruptions in the local workforce, with public and private employees unable to work regular hours.

A number of facilities in Jackson County do have emergency generators that help keep emergency services available during a winter storm.

**RA Table #7                      Locations with Emergency Generators – Jackson County**

City	Location / Description
Alpha	None
Heron Lake	Permanent generator at the sanitary sewer lift station
Heron Lake	One portable generator
Jackson	Permanent generator at Lift Station No. 1
Jackson	Permanent generator at Lift Station No. 2
Jackson	Permanent generator at Lift Station No. 4
Jackson	Three portable generators (all relatively old)
Jackson	Small permanent generator at Water Plant for City Hall
Jackson	Permanent generator at Court House and Law Enforcement Center
Jackson	Permanent generator at the Jackson Armory
Lakefield	Power Plant – the diesel power plant can power the City of Lakefield. The power plant has generators which are only utilized during peak load periods or for emergencies.
Okabena	One portable generator
Wilder	None
Jackson County	County shop has a generator that can power the majority of the shop.

Information request to city and county representatives

The accumulated effects of winter storms and blizzard conditions also pose a risk to structures from snow load on roofs. Vulnerable structures can easily collapse under the weight of heavy snow and/or high winds. The Minnesota building code has requirements for snow loads.

Analysis of specific infrastructure and structure dollar-cost vulnerability is not possible since winter storms can (and do) impact large portions of the study area. Based on current available data, modeling future losses would only be possible for total losses with excessive margins of error. Future storm events could be tracked specifically as they occur and could be used to model local vulnerability to winter storms in future updates.

#### *Plans and Programs*

- Real-time weather monitoring - The City of Jackson has a real-time weather monitoring station at the Jackson Airport that provides current temperatures, dew point, wind speed, wind direction, and



barometric pressure. In addition, one of these monitoring stations is also located along Interstate 90 near the community of Rushmore (Nobles County).

- Travel Assistance – “511 is a public service of the Minnesota Department of Transportation (MnDOT) to help travelers access information about road conditions, traffic incidents, commercial vehicle restrictions, and weather information via the phone or the Web, 24 hours a day, seven days a week.”<sup>32</sup>
- Regional Forecasts - Jackson County is in the Sioux Falls broadcasting region. Weather forecasts in Sioux Falls region tend to be a good predictor of weather in Jackson County. Jackson County uses this information in regards to school closures and other weather related announcements.
- School closings - Jackson County’s school districts have a policy of closing schools when wind chills exceed certain thresholds, low visibilities create unsafe driving conditions, or when heavy snow has fallen making travel difficult. Local radio stations partner with the school districts to make sure the announcements are out by 6:00 am or earlier if possible. Jackson County Central Schools and Heron Lake – Okabena School District have a mass notification and emergency messaging system for sending out alerts for emergencies and school closings.
- Wind chill warnings - The local radio and television media partner with the National Weather Service to issue a wind chill warning when temperatures are 30o F or lower. Severe wind chill warnings are provided when conditions warrant and when safety is a factor. Wind chills of 40 degree Fahrenheit or lower frequently prompt the closing of schools to protect children, particularly in rural areas.
- Snow Fences - Jackson County has in the past promoted natural and manmade snow fences to protect highways against drifting snow.
- Road closures - Jackson County Public Works and local cities are working closely with MnDOT to improve transportation safety in all weather conditions. Road closures are enacted when conditions become too hazardous. MnDOT uses the 511MN.org, or 511 for mobile phones. This system does not send out alerts, but posts weather related road information online for public access.
- Emergency generators - Emergency generators help keep emergency services available during winter storms. Refer to RA Table #7 for public entities with emergency generators in Jackson County.
- Rental Ordinance - The City of Jackson has a rental ordinance to help identify and correct deficient rental housing units within the city.

### *Gaps and Deficiencies*

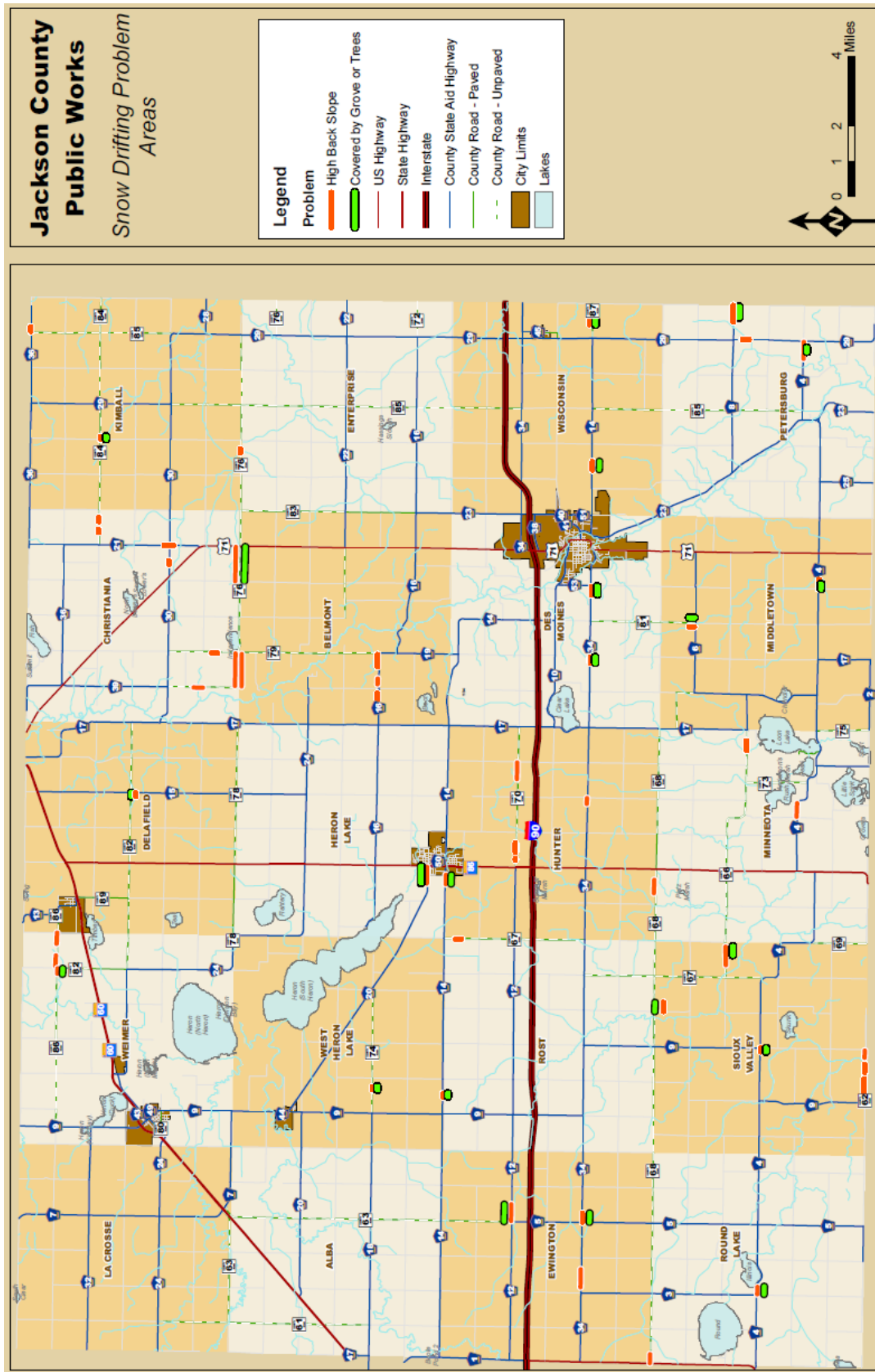
- Automated weather stations - Automated weather stations at schools throughout Jackson County would provide more current information and quicker response to dangerous and changing weather conditions.
- 511MN.org - The 511 system does not incorporate local knowledge as well as it could. County staff has little involvement. Including snowplow drivers and other county staff could help to improve the accuracy of the system. County staff has local knowledge regarding the road network and can provide accurate information into the system.

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<sup>32</sup> MnDOT. 511. Accessed: 12-2-14. Available: <http://hb.511mn.org/About.html>

RA Figure #5

# Snow Removal Problem Areas - Jackson County



- City ordinances - Snow removal around commercial and industrial buildings has caused problems in the past. Snow should be removed from sidewalks within 24 hours of a snow event, but this policy is not enforced. City ordinances could be created to prohibit snow piles from interfering with traffic and visibility, especially around schools.
- Warning Systems - The effective range of warning systems is limited. Travelers may be unaware of an upcoming storm. Local radio stations issue severe weather warnings, but satellite radio is becoming more widely used. Severe weather warnings issued on the radio may not be as effective as in the past. Weather radios should be promoted and more widely used, so residents and travelers can plan accordingly.
- Snow loads - Some residents are resistant to building codes that could help assure higher standards for new construction. The accumulated effects of winter storms and blizzard conditions also pose a risk to structures from snow load on roofs. Vulnerable structures can easily collapse under the weight of heavy snow and/or high winds. The City of Jackson has adopted the Minnesota State Building Codes, which includes snow load requirements. The Cities of Alpha, Heron Lake, Lakefield, Okabena, and Wilder do not have any building code requirements in regards to snow loads.
- Building Codes – Certified inspectors increase the cost of building. This increase in costs could result in less development. Cities in Jackson County have thought it is the responsibility of the property owner to ensure the building meets standards outlined in the Minnesota Building Code.
- Commuting time - In Jackson County a number of residents commute long distances to work, which increases their exposure to winter weather hazards.
- Backup generators - It is expensive to install back-up generators. Due to limited funding sources, redundant electrical supply back-up may not be available in all essential locations in Jackson County. The table below identifies essential locations that should have back-up generators.
  - The City of Jackson has three portable generators, but all three generators are old. It would be beneficial to replace at least one of these old generators with a new generator.
  - The City of Alpha has no backup generators.
  - The City of Wilder has no backup generators.

**RA Table #8 Facilities that Need Emergency Generators – Jackson County**

City	Location	Address
Alpha	A portable generator that can be used at the lift station, Fire hall, Community Hall, and water plant as needed	
Heron Lake	City Hall /Community Center – a large backup generator that could power the city offices and community center. This generator would also power the main siren in town, which by the Community Center.	312 10th Street
Jackson	Jackson Fire Department	305 Sheridan Street

Jackson	Portable generator – all three of the portable generators are old. A reliable new portable generator is needed.	
Jackson	Resource Center – the Emergency Management Office and the Incident Command Center is in the Resource Center.	402 White Street

Information request to city and county representatives

- Rental Ordinance - The City of Jackson has a rental ordinance to help identify and correct deficient rental housing units within the city. Other cities in Jackson County do not have a similar ordinance.

#### *Existing Mitigation Measures*

- Backup generators - Some critical public facilities have emergency electrical generation on-site. Refer to Risk Assessment Table #7 for locations with emergency generators. A number of private residents also have backup generators.
- Hardening of the electrical grid - Much work has already been completed to harden electric utilities against winter storms. Redundancies in utility systems can further reduce outages resulting from storms.
- Hardening of the electrical grid - Federated Rural Electric Association suffers from storm damage and interruptions mainly from ice, wind, and severe weather on its overhead lines. In order to lower the effects from extreme weather on overhead lines, Federated has implemented various building techniques that include: using T-2 overhead wire, which is resistant to ice buildup; shortening the span lengths from 300 feet to 250-265 feet; using larger class of pole; the relocation of overhead lines to underground; and tree maintenance, which helps to increase the reliability of the utility grid. As of December 1<sup>st</sup>, 2014, Federated Rural Electric Association has 28 projects to harden the electrical grid through overhead line replacement or overhead line replacement with underground. The placement of the line will be decided at a later date. The timeline for these projects could be advanced if Federated Rural Electric Association funding could be supplemented with mitigation funding from FEMA or another source. Below are a few non-site specific projects that could be pursued if mitigation funding from FEMA was available:
  - Looping substation feeds so if one substation fails, the load can be picked up by other substations.
  - Putting ties between substations underground.
  - Tying legacy system to acquired system (Former Alliant Service Territory) to increase reliability by redundancy to the cities of Heron Lake and Okabena.
  - Identifying sites within towns that might require higher levels of reliability (water/sewage pumping stations, police departments, fire departments, safe rooms, storm shelters, emergency command centers, etc.). Building redundant circuits to feed those sites identified.
  - Potentially establish electrical ties with bordering utilities to be used in emergency situations (City of Round Lake/Nobles Cooperative Electric, City of Jackson/Jackson Municipal Utilities, City of Lakefield/City of Lakefield Municipal Utilities, etc.)

- Potentially purchasing a mobile substation or a large scale (5-10 MVA) backup generator at proper voltage levels.
- Hardening of the electrical grid - Federated Rural Electric Association is in the process of acquiring the cities of Heron Lake and Okabena. After the acquisition, Federated Rural Electric Association plans to complete a plan to mitigate problem areas and harden the utility grid by increasing redundancy.
- Tree Maintenance - Cities help to increase the reliability of the utility grid by cutting down and maintaining trees that are close to power lines and in the public right-of-way. The Cities of Alpha, Heron Lake, Okabena, and Wilder do tree maintenance out of their general budget. The Cities of Jackson and Lakefield have a separate tree maintenance budget.
- Road design - Transportation engineers use road design to substantially reduce hazards from blowing and drifting snow. Living snow fences have been used to mitigate the effects of blowing and drifting snow, which affect road conditions. Living snow fences are designed plantings of trees and/or shrubs and native grasses located along roads or around buildings, which create a vegetative trap to control blowing and drifting snow.

### **A3 Drought**

Drought is defined as a prolonged period of dry weather with very little or no precipitation. There are four types of drought: meteorological drought (departure from average), hydrological drought (shortfall of stream flows or groundwater), agricultural drought (soil moisture deficiencies), and socioeconomic or water management drought. Droughts can have lasting effects and can cause a serious depletion of surface and ground waters. Drought was assigned a hazard rank of moderate by the planning team.

#### ***Locations Affected by the Hazard***

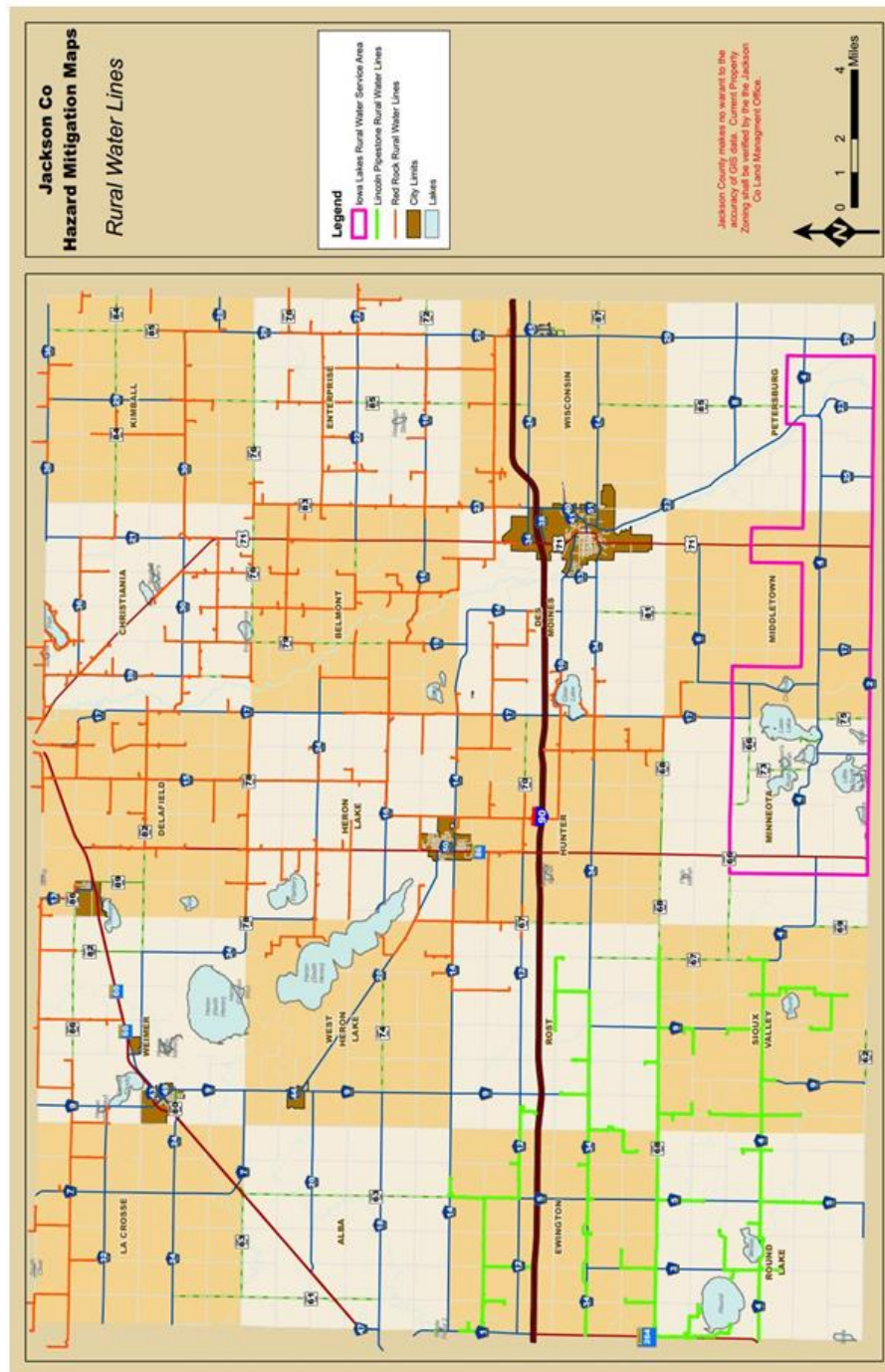
The entire county is equally at risk for drought; however, areas within the county may react differently to drought conditions. Areas with well-drained soils may be more likely to experience adverse impacts to crops. Areas that rely on individual wells for drinking water supplies are more likely to experience shortages than areas with access to municipal and rural water suppliers.

Different areas in Jackson County may be impacted differently by a drought, but the small size of the county and interdependence of the residents will result in any drought event having a significant impact on the entire county. The planning team identified the spatial extent of a drought as countywide.

The Cities of Alpha, Heron Lake, Lakefield and Okabena have their own water system that consists of multiple wells. The City of Jackson is served by city wells and is also hooked up to rural water as a backup. The City of Wilder is hooked up to rural water, but the City also has a well for backup.

Figure RA#6

# Rural Water Map - Jackson County





### *Extent of the Hazard*

Jackson County's economy is based heavily on agriculture. A severe drought could cause economic hardship within the county. The potential severity of a drought is major according to the planning team.

Corn and soybeans yields can be dramatically decreased by drought conditions. Livestock operations are affected by loss of feedstock, pasture and general forage, as well as drinking water. Reduced yields due to a drought event will not only have an economic impact on individual farmers, but on secondary suppliers who buy and sell crops and livestock, agricultural retailers, and local governments that rely on sales taxes. Drought insurance for crops does help compensate for losses, but there can still be economic hardship as the result of a drought.

A drought will not only produce a hardship for the farmers growing the crops, but overall supply can decrease causing food prices to rise. The U.S. Department of Agriculture estimates that the drought during the summer of 2012 will push retail food prices up by between 3% and 4% in 2013.<sup>33</sup>

### *Relationship to Other Hazards—Cascading Effects*

Drought can increase the risk of a number of natural and manmade hazards.

- **Wildfires.** Drought stressing woods, brush land, and non-cultivated fields significantly increases the risk of wildfires and lightning strikes onto dry fields having the potential to cause wildfires as well. In addition, moving equipment within Jackson County like trains or combines during fall harvest have the potential to cause wildfires.
- **Insect Infestation.** An increase in the amount of insects and other pests are often caused or impacted by severe drought conditions.
- **Tree Loss.** Due to the lack of moisture, tree loss or decline can be experienced resulting in several problems including: loss of shade for homes requires increased power consumption, and loss of windbreaks provided by trees allows for an increase in soil erosion.
- **Wells/Aquifers.** The absence of rain for a long period of time is insufficient to recharge aquifers and eventually, the loss of water in underground wells results.
- **Business interruption.** A drought can result in watering bans. Businesses that are heavier water users will be impacted. Golf courses, processing facilities, car washes, and a number other businesses will be impacted.
- **Utility/Infrastructure.** Jackson County's limited groundwater resources, provided by surficial aquifers, can be easily negatively impacted by drought.

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<sup>33</sup> Time. The Cost and Consequences of the U.S. Drought. Oct. 26 2012. Access: 6/20/14. Available: <http://business.time.com/2012/10/26/the-cost-and-consequences-of-the-u-s-drought/#ixzz2Tqswe7kB>

- Dust Storms. As surface soils dry out and the winds blow, an increased amount of soil erosion occurs.
- Civil Disturbance. A long pasting drought can cripple the economic opportunity in greater Minnesota and other areas that have an agricultural based economic. This loss in economic opportunity can cause social unrest.

#### *Previous Occurrences of the Hazard*

From January 2000 through July 2014, there were 13 documented droughts in Jackson County. In the table below are documented droughts that occurred from January 2000 through July 2014.

**RA Table #9**

#### **Droughts – Jackson County**

Date	Event Narrative	Number of Counties Affected
1/1/2013	Drought conditions continued over all of southwest Minnesota in January. Precipitation was below to well below normal, although with the low midwinter normals, even greater precipitation would have been unlikely to change the dry soil conditions. There was little noted in the way of new effects of the drought, with the dry conditions giving a poor outlook for the Spring and Summer, including poor germination of the winter wheat crop during the dry fall. Water restrictions continued to be few during the winter because of the low water usage, but the area was becoming more vulnerable to even marginally weather if it developed in the spring and summer. Drought was generally listed as continued severe to extreme for the area.	Lyon, Lincoln, Jackson, Cottonwood, Pipestone, Nobles, Murray, Rock
2/1/2013	Drought conditions continued over all of southwest Minnesota in February, despite precipitation which was a little above normal. The excess of a few tenths of an inch in the driest month of the year did little to relieve the long term dry soil conditions. There was little noted in the way of new effects of the drought, with the dry conditions giving a poor outlook for the Spring and Summer, including the poor germination of the winter wheat crop during the dry fall. Water restrictions continued to be few during the winter because of the low water usage, but the area was deemed vulnerable to even marginally dry weather if it developed in the spring and summer. Drought was generally listed as continued severe to exceptional for the area, with the northern edge of the area, from Ivanhoe to Marshall, making a slight improvement to severe because of greater snowfall and snow cover during the month.	Lyon, Lincoln, Jackson, Cottonwood, Pipestone, Nobles, Murray, Rock

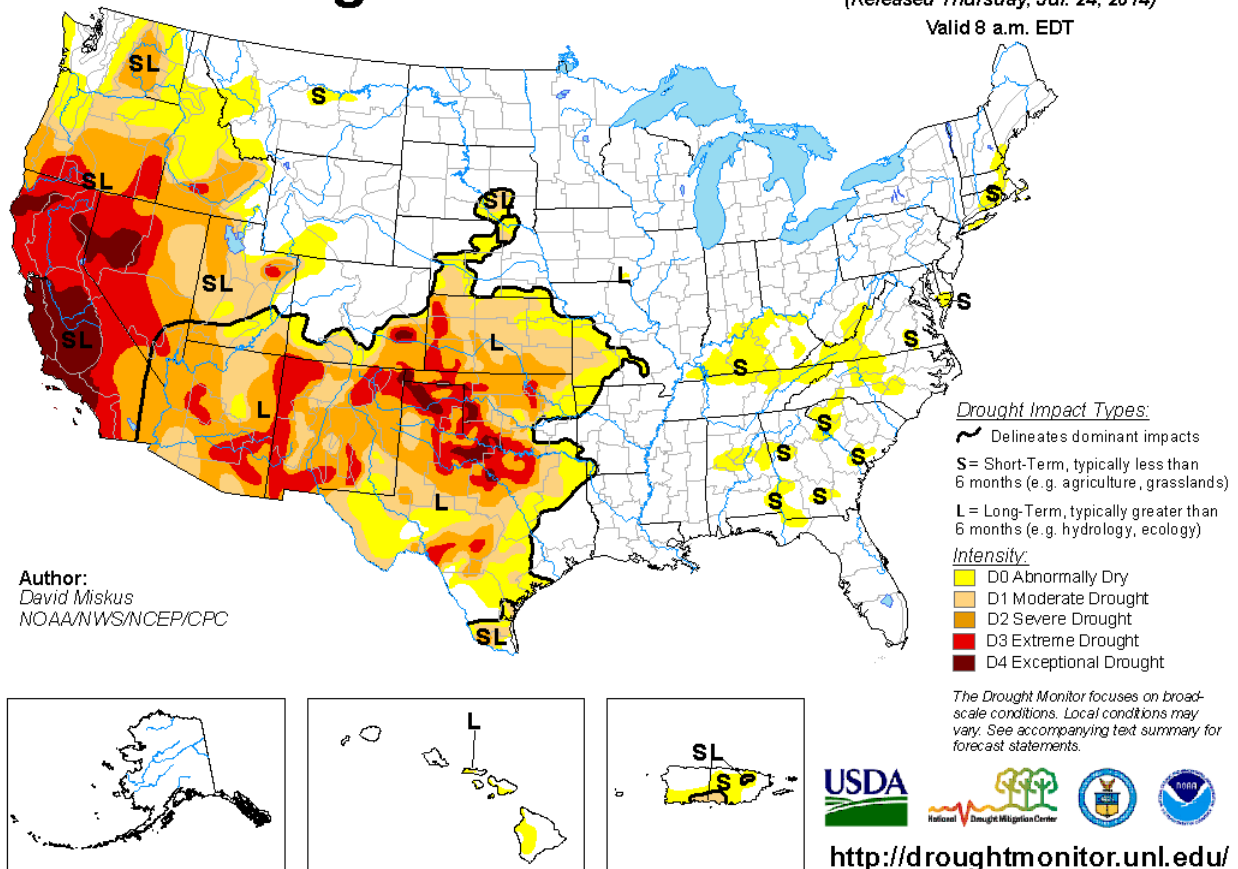


3/1/2013	Drought conditions continued over all of southwest Minnesota in March. Precipitation was normal to half of normal, with drought rated severe to extreme over all of the area. There continued to be a lack of soil moisture as winter approached its end, since even normal winter precipitation is low compared to the warmer seasons. Also, the frozen ground forced runoff of what precipitation and snowmelt there was. There was little noted in the way of new effects of the drought, with the dry conditions giving a poor outlook for the Spring and Summer, including the winter wheat crop, which was also affected by poor germination conditions in the dry fall. Water restrictions continued to be few because of the low water usage, but the area was deemed vulnerable to even marginally dry weather if it developed in the spring and summer. Some effect was noted on livestock, although the majority of the livestock was in good condition despite persistent feed shortages.	Lyon, Lincoln, Jackson, Cottonwood, Pipestone, Nobles, Murray, Rock
4/1/2013	Extreme to exceptional drought abated slowly to the moderate to severe category over southwest Minnesota during April. Near to a little above normal precipitation was not enough to end the long standing drought entirely, given the long term dry soil conditions that carried over into the month. Accordingly, the area was still deemed very sensitive to the potential of below normal rainfall during the planting and growing seasons. However, the severity of the drought generally decreased. No new effects of the drought were noted during the month.	Lyon, Lincoln, Jackson, Cottonwood, Pipestone, Nobles, Murray, Rock

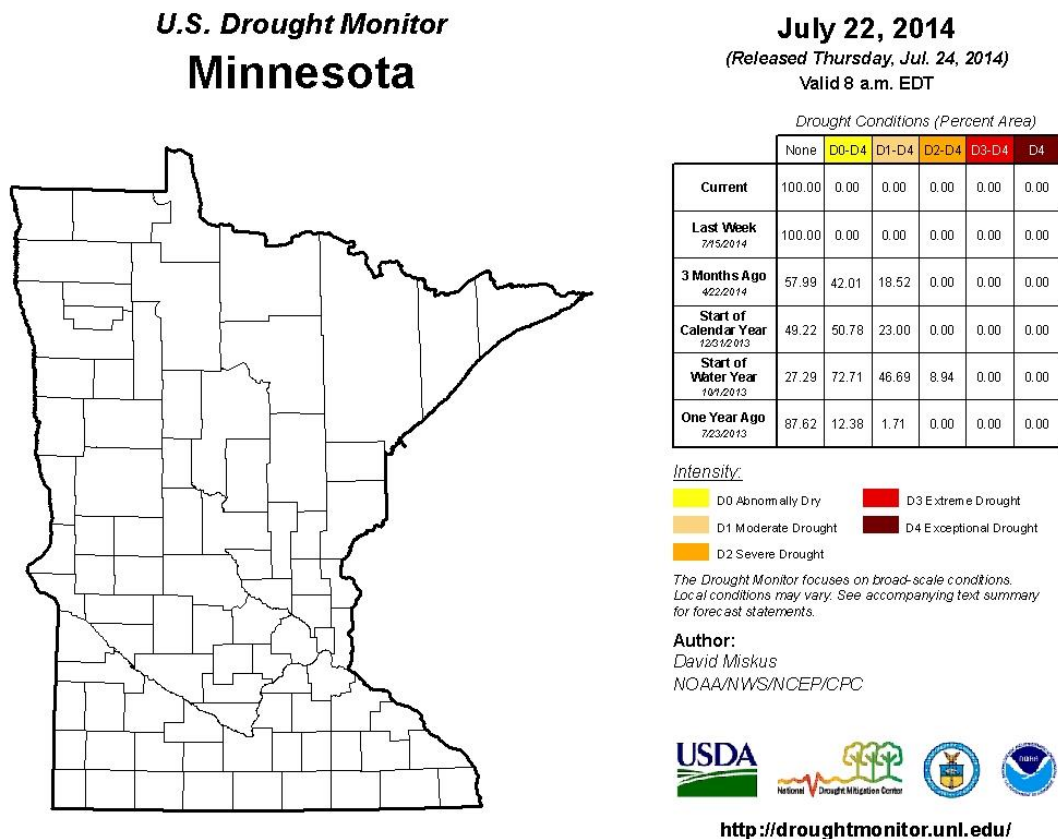
National Climatic Data Center (NCDC) Storm Events database

# U.S. Drought Monitor

**July 22, 2014**  
(Released Thursday, Jul. 24, 2014)  
Valid 8 a.m. EDT



RA Figure #8



### ***Probability of Future Events of this Hazard***

Droughts occur in the area. The potential frequency of a drought in Jackson County is occasional according to the planning team.

### ***Vulnerability***

The risk level assigned to drought by the planning team is average.

### ***Plans and Programs***

- **Watering Ban Ordinance** - Jackson County and the Cities of Jackson and Heron Lake have developed ordinances on water usage within their communities and can place restrictions on this usage in times of drought. The watering bans decrease the demand for water. This is done to curve demand for nonessential watering. Residents are alerted through the media when a watering ban is enacted. Cities in Jackson County have not issued a watering ban in recent memory.
- **Burning ban** - Jackson County can issue a burning ban during a drought event.
- **Jackson County Water Management Plan** - The Jackson County Water Management Plan is intended to identify existing and potential water issues in the context of watershed units and groundwater systems, informing specific implementation actions to achieve goals for sound hydrological management of water and related resources. The Plan identifies and maps the major and minor aquifers serving the county.

- Recharge rates - The Jackson County Water Management Plan estimates the recharge rates for various aquifers within the county and documents the number of gallons of water used per year by municipalities within the county. Recharge rates are tracked regional by Minnesota Board of Soil and Water Conservation.
- Shoreline zoning - Jackson County has adopted the Department of Natural Resources (DNR) statutory shoreline zoning classifications and minimum standards. Zoning along the river is also regulated by the river conservancy district, which is overseen by the Minnesota Board of Soil and Water Conservation.

#### *Gaps and Deficiencies*

- Water conservation - Water conservation programs need to be established to educate residents on the need and ways to conserve water usage.
- Watering ban ordinance - Jackson County and the Cities of Jackson and Heron Lake have developed ordinances on water usage within their communities and can place restrictions on this usage in time of drought. The Cities of Alpha, Heron Lake, Lakefield, Okabena, and Wilder do not have a watering ban ordinance in place.
- Fire Breaks - The County needs a program that places fire breaks in between the continuous CRP tracts of land or other state wildfire areas during times of severe drought.
- Water consumption rates - Semiannual or annual water consumption by various major consumers is not documented or known (urban residential, industrial/commercial, or agricultural).

#### *Existing Mitigation Measures*

- Aquifer inventories - Recharge rates and capacities of the county's aquifers are recorded and inventoried by United States Geological Survey (USGS). These studies help to determine the capacities and recharge rates of the county's aquifers in order to better assess use restrictions and provisions during times of drought.
- Usage rates - The Department of Natural Resources (DNR) regulates withdrawal and usage rates. There has to be a draw down study before irrigation permits can be issued.
- Public outreach - Educational campaigns regarding water conservation by Jackson County Soil and Water Conservation District and rural water systems are needed. This helps to ensure Jackson County's ground water supplies are sufficient to meet demands.

## **A4 Earthquakes**

"An earthquake is a sudden motion or trembling caused by an abrupt release of accumulated strain in the tectonic plates that comprise the earth's crust."<sup>34</sup> Earthquakes were assigned a hazard rank of low by the planning team.

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<sup>34</sup> MN All Hazard Mitigation Plan. Accessed: 5/29/13. Available: [https://dps.mn.gov/divisions/hsem/hazard-mitigation/Documents/2011\\_MinnesotaAllHazardMitigationPlanDraft.pdf](https://dps.mn.gov/divisions/hsem/hazard-mitigation/Documents/2011_MinnesotaAllHazardMitigationPlanDraft.pdf)

### *Locations Affected by the Hazard*

All of Jackson County is at equal risk of an earthquake according to the United States Geological Survey (USGS) seismic map of Minnesota. The planning team identified the spatial extent of an earthquake as countywide. It is important to acknowledge that earthquakes are a possibility in Jackson County and plan accordingly.

### *Extent of the Hazard*

The average magnitude for an earthquake in Minnesota is 3.2. The effects of an earthquake with a magnitude of 3.0 – 3.9 range from a few persons feeling the vibration, especially on upper floors of a building to many people noticing the vibration. Standing motor cars may rock slightly. The potential severity of an earthquake is minor according to the planning team.

**RA Table #10**

**Richter Scale**

Less than 2.0	Micro	Micro earthquakes, not felt
2.0–2.9	Minor	Generally not felt, but recorded
3.0–3.9		Often felt, but rarely causes damage
4.0–4.9	Light	Noticeable shaking of indoor items, rattling noises Significant damage unlikely
5.0–5.9	Moderate	Can cause major damage to poorly constructed buildings over small regions. At most slight damage to well-designed buildings
6.0–6.9	Strong	Can be destructive in areas up to about 160 kilometres (99 mi) across in populated areas
7.0–7.9	Major	Can cause serious damage over larger areas
8.0–8.9	Great	Can cause serious damage in areas several hundred kilometres across
9.0–9.9		Devastating in areas several thousand kilometres across
10.0+	Massive	Never recorded, widespread devastation across very large areas.

### *Relationship to Other Hazards—Cascading Effects*

An earthquake can be the catalyst to a number of other natural and manmade hazards.

- **Flooding.** An earthquake could result in dam failure and flooding downstream.
- **Transportation Infrastructure.** An earthquake could damage transportation infrastructure and make emergency response difficult.
- **Civil Disturbance.** An earthquake could cause countrywide distress. Emergency responders may not be able to handle everything, so as people grow desperate distress can take over and cause civil unrest.

### *Previous Occurrences of the Hazard*

Jackson County has not had any significant earthquake events. “Minnesota has one of the lowest occurrence levels of earthquakes in the United States, but a total of 19 small to moderate earthquakes have been documented since 1860.”<sup>35</sup>

**RA Table #11 Earthquakes – Minnesota**

Epicenter (nearest Town)	Date	Magnitude
Rosholt	10/20/1995	3.7
Granite Falls	2/9/1994	3.1
Dumont	6/4/1993	4.1
Walker	9/27/1982	2.0
Cottage Grove	4/24/1981	3.6
Nisswa	7/26/1979	1.0
Rush City	5/14/1979	0.1
Evergreen	4/16/1979	3.1
Milaca	3/5/1979	1.0
Pipestone	9/28/1964	3.4
Alexandria	2/15/1950	3.6
Detroit Lakes	1/28/1939	3.9
Bowstring	12/23/1928	3.8
Staples	9/3/1917	4.3
Red Lake	2/6/1917	3.8
New Ulm	02/12/1881	3.0-4.0
St Vincent	12/28/1880	3.6
New Prague	12/16/1860	4.7
Long Prairie	Date unknown (1860-61)	5.0

National Climatic Data Center (NCDC) Storm Events database

### *Probability of Future Events of this Hazard*

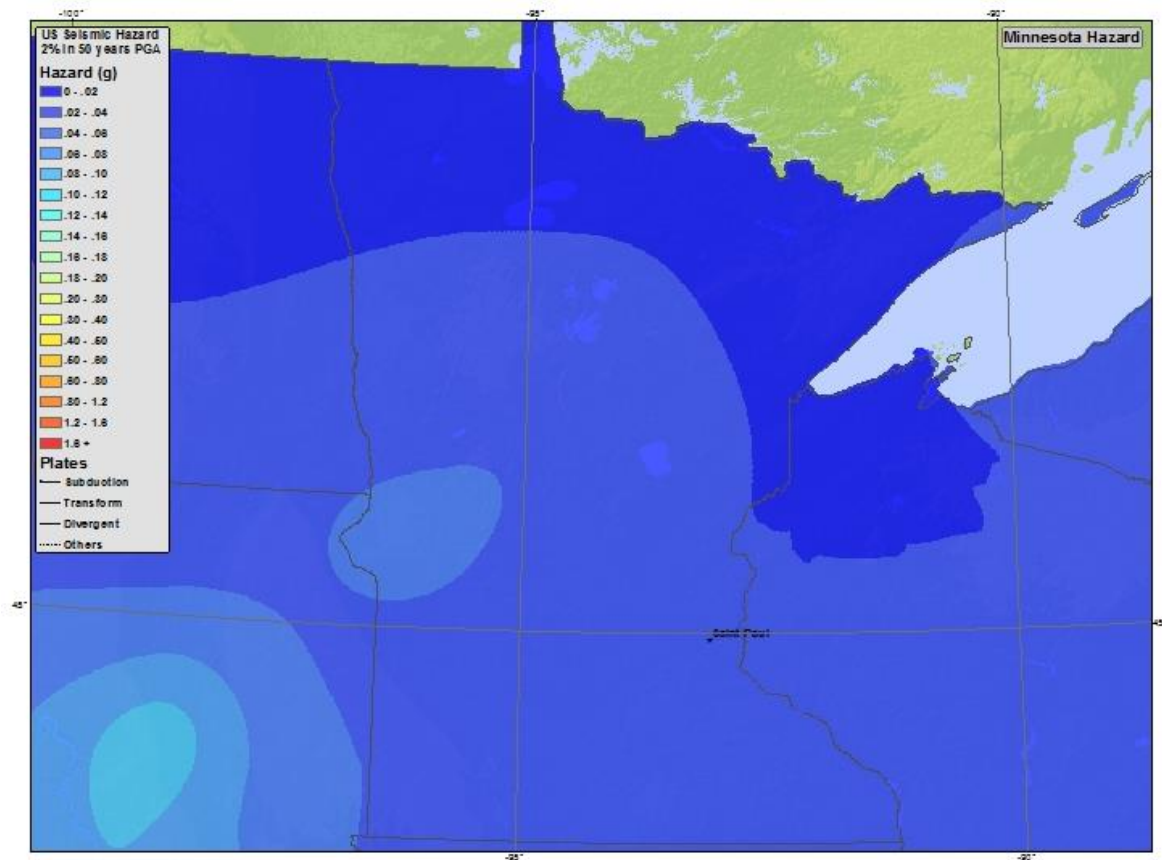
The USGS Seismic Map shows the seismic activity in the United States, the potential for an earthquake of any significant magnitude happening in Jackson County is very minimal. The potential frequency of an earthquake in Jackson County is unlikely according to the planning team.

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<sup>35</sup> MN All Hazard Mitigation Plan. Accessed: 5/29/13. Available: [https://dps.mn.gov/divisions/hsem/hazard-mitigation/Documents/2011\\_MinnesotaAllHazardMitigationPlanDraft.pdf](https://dps.mn.gov/divisions/hsem/hazard-mitigation/Documents/2011_MinnesotaAllHazardMitigationPlanDraft.pdf)

RA Figure #9

## Seismic Hazard Map – Minnesota



Source: USGS Minnesota Seismic Hazard Map

### *Vulnerability*

Since it is unlikely for an earthquake to occur in Jackson County, little or no preparation has occurred. There have been multiple earthquakes in Minnesota with a magnitude of 4.0 – 5.0. An earthquake registering a 5.0 on the Richter Scale could occur and cause major damage to poorly constructed buildings. The risk level assigned to earthquakes by the planning team is limited.

### *Plans and Programs*

- Jackson County does recognize that there is some risk associated with earthquakes, but there are not extensive plans and programs to address the risk.
- Well defined response – Emergency responders have a well-defined response protocol outlined in the Emergency Operations Plan. The response protocol is in regards to all hazards. An earthquake would result in a large hazard event with a number of smaller events that include the risk of fire, transportation infrastructure damage, utility damage, civil disturbance, and water supply contamination. The response protocols would generally be applied to an earthquake and the resulting hazard events.

### *Gaps and Deficiencies*

- The risk associated with an Earthquake in Jackson County is perceived as very minimal, so extensive planning does not take place. This lack of preparation could result in an earthquake causing large damages and disorganization in the aftermath of the hazard.



### *Existing Mitigation Measures*

- Past mitigation measures consist of recognizing that an earthquake is possible in Jackson County.

## **A5 Fire (Wildfires and Structure Fires)**

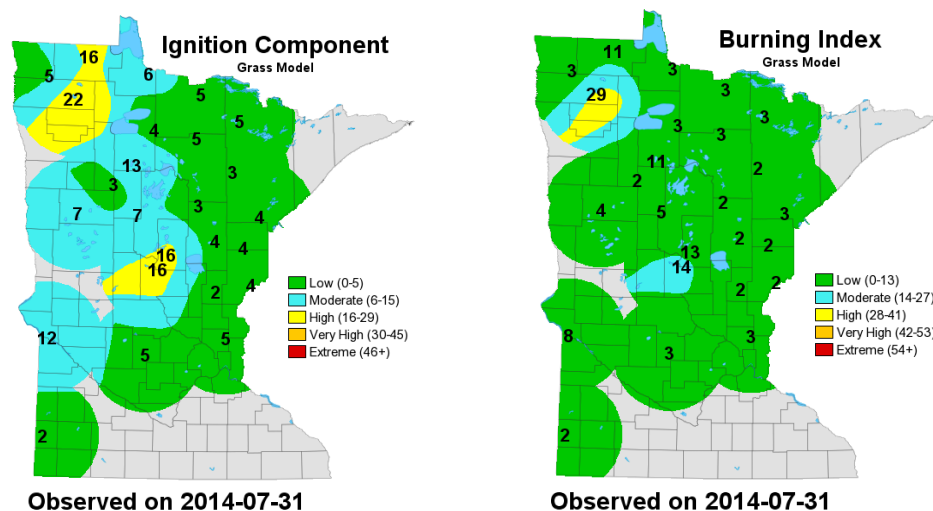
According to FEMA, each year in the United States more than 2,500 people die and 12,600 are injured in home fires, many of which could have been prevented.<sup>36</sup> A home fire is reported every 85 seconds in the United States.<sup>37</sup> Fires can occur in any community and pose a year-round threat. Structure fires were assigned a hazard rank of moderate by the planning team. Wildfires were assigned a hazard rank of moderate by the planning team.

### *Locations Affected by the Hazard*

All locations in Jackson County are at risk to be exposed to this hazard. Incidents of wildfire tend to be localized in southwest Minnesota due to the low burning index in this area. The planning team identified the spatial extent of a wildfire as countywide. "Burning Index relates the potential amount of effort needed to contain a single fire in a particular fuel type."<sup>38</sup> Wildfires can start in grasslands or in crops if the conditions are dry.

Incidents of structure fires tend to be contained to one or two buildings, rather than spreading widely. Isolated rural structures can be at risk due to long response times and limited water supplies. The planning team identified the spatial extent of a structure fire as countywide. However, there are many risks in town, such as one structure fire spreading to adjacent properties.

**RA Figure #10 Ignition Component & Burning Index Map – Minnesota**



<sup>36</sup> FEMA. Accessed: 6/2/14. Available: <http://www.ready.gov/fires>

<sup>37</sup> Karter Michael Jr. Fire Loss in the United States During 2011. Accessed: 6/20/14. Available: <http://www.nfpa.org/assets/files/pdf/os.fireloss.pdf>

<sup>38</sup> MN Department of Natural Resources. Accessed: 5/20/13. Available: [http://www.dnr.state.mn.us/forestry/fire/maps/fdi\\_grass.html](http://www.dnr.state.mn.us/forestry/fire/maps/fdi_grass.html)



### *Extent of the Hazard*

Structure fires are classified into three categories:

- Residential Structures
- Public and Mercantile Structures
- Industrial Structures

In Minnesota, there were over 152 million dollars in losses due to structure fires in 2010. Almost half of structure fires are caused by cooking accidents (mostly from unattended cooking equipment), with an open flame accounting for 10 percent, heating sources accounting for nine percent, and incendiary accounting for eight percent. Careless smoking was the leading cause of fatalities related structure fires in 2010.<sup>39</sup> The mostly deadly time for a fire is during the night when people are sleeping.

The State Fire Marshall reports that there was \$154,400 in fire-related losses reported in Jackson County in 2013. From 2010 through 2013, there was an average of \$128,350 in fire-related losses reported in Jackson County per year. The potential severity of a structure fire is minor according to the planning team.

Wildfire occurs when an uncontrolled fire spreads through vegetation, posing danger and destruction of property. Wildfires often begin unnoticed, spread quickly, and can be highly unpredictable. Prairie fires are less common than forest fires in the rugged Northern or Western forested area, but prairie fires can pose a serious threat. The State hazard plan categorizes wildfires into three types:

- Wild land fires in grasslands, brush and forests;
- Interface fires where natural landscapes meet urbanized areas
- Prescribed burns, intentionally set or natural fires that are allowed to burn for beneficial purposes

Factors such as topography, fuel and weather affect wildfire behavior. Fire intensity tends to increase during daytime heating. Large parcels of land left fallow in conservation and natural areas may be susceptible to grass fire even when properly managed. Gusty winds and low relative humidity create conditions for wildfire to spread rapidly in dry grasses and crops. Farm fields with row crops, ditches, and rights-of-way along railroad tracks are also vulnerable, in particular to the errant spark or carelessly discarded cigarette. Prolonged periods of high temperatures and/or high winds increase the risk of wildfires. The potential severity of a wildfire is minor according to the planning team.

### *Relationship to Other Hazards—Cascading Effects*

- Flooding and erosion. Major wildfires can completely destroy ground cover, which causes heavy erosion and vegetation loss. If heavy rains follow a major fire, flash floods, landslides, and mudflows might occur since vegetation is essential in deterring flooding during heavy rainfalls or spring runoff.

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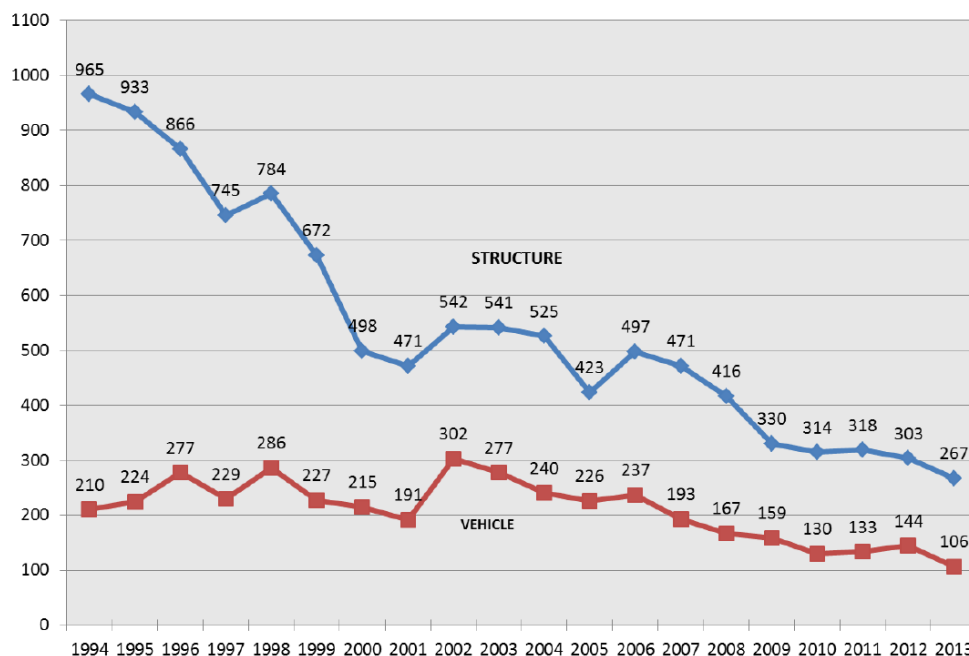
<sup>39</sup> Minnesota Fire Marshall. June 2011. Accessed 5/20/13. Available: [https://dps.mn.gov/divisions/sfm/public-education/Documents/Monthly%20Newsletter/PubEd%20Newsletter%20\\_June%202011.pdf](https://dps.mn.gov/divisions/sfm/public-education/Documents/Monthly%20Newsletter/PubEd%20Newsletter%20_June%202011.pdf)

- **Hazardous Material.** The potential for hazardous materials to catch on fire is an added risk to wildfires. Any leaking or explosion of hazardous materials adds to the potential destruction caused by a wildfire.
- **Service disruptions.** Major fires can completely destroy structures, utility infrastructure, and essential public facilities that provide basic services to the community.
- **Health risks.** Destruction or damage to essential infrastructure like water or wastewater facilities might cause public health risk.
- **Hazardous materials.** If certain buildings or storage areas are ruptured or caused to explode because of fire, dangerous hazardous materials could be unleashed into surrounding areas. For example, many farms have anhydrous ammonia and other agricultural chemicals, which can cause serious difficulties for emergency response.

### *Previous Occurrences of the Hazard*

Structure Fires occur periodically throughout Jackson County. From 1983 through 2011, there were eight civilian deaths related to structure fires in the County.<sup>40</sup> From 2004 through 2013, there were 153 structure fires in the County.<sup>41</sup>

**RA Table #12                      Structure & Vehicle Incendiary Fires – Minnesota**



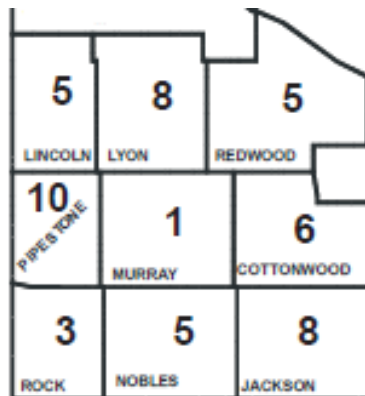
<sup>40</sup> Fire in Minnesota Annual Report 2011. Accessed: 11/7/14. Available:

[https://dps.mn.gov/divisions/sfm/mfirs/Documents/Fire%20in%20Minnesota/Fire\\_In\\_Minnesota\\_2011.pdf](https://dps.mn.gov/divisions/sfm/mfirs/Documents/Fire%20in%20Minnesota/Fire_In_Minnesota_2011.pdf)

<sup>41</sup> MN Department of Safety. Data Request. Received 11/24/14.

**RA Figure #11**

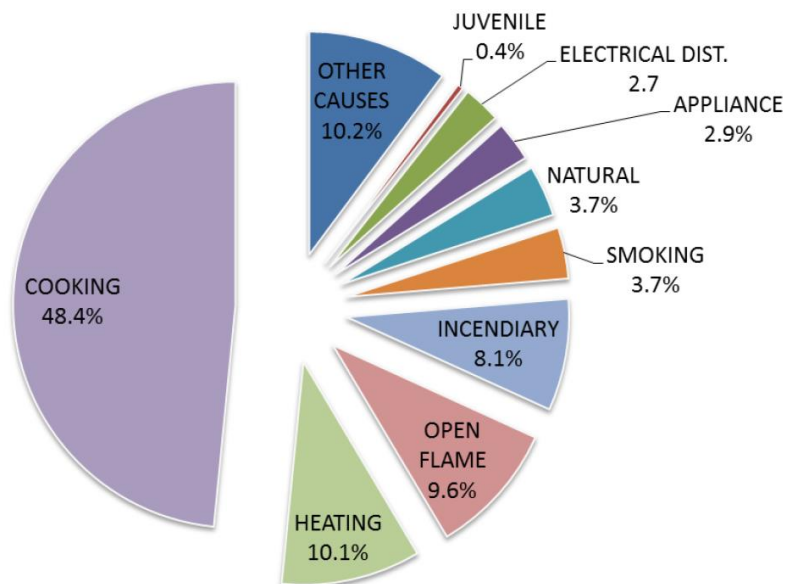
**Civilian Deaths Related to Structure Fires  
1983 - 2011**



Minnesota Department of Public Safety

**RA Figure #12**

**STRUCTURE FIRE CAUSES (2008-2012)**



Minnesota Department of Public Safety<sup>42</sup>

<sup>42</sup> Minnesota Department of Public Safety Fire Marshall Division. Fire in Minnesota. Accessed: 10/28/15. Available: <https://dps.mn.gov/divisions/sfm/mfirs/Documents/Fire-in-Minnesota-2013-accessible.pdf>

RA Figure #13

## Reported Fire Department Responses – Minnesota 2013

2013 REPORTED FIRE DEPARTMENT RESPONSES					
	SEVEN-COUNTY METRO		GREATER MINNESOTA		STATEWIDE
TYPE OF INCIDENT	NO. OF INCIDENTS	% OF STATE TOTAL	NO. OF INCIDENTS	% OF STATE TOTAL	
<b>FIRES</b>					
Structure fires	3,446	54%	2,884	46%	6,330
Vehicle fires	1,183	48%	1,302	52%	2,485
Other fires	1,701	38%	2,755	62%	4,456
<b>TOTAL FIRES</b>	6,330	48%	6,941	52%	13,271
<b>CALLS</b>					
Rescue/EMS calls	105,249	68%	49,522	32%	154,771
False calls	18,633	71%	7,660	29%	26,293
Mutual aid given	2,618	43%	3,497	57%	6,115
Other incidents	33,960	66%	17,199	34%	51,159
<b>TOTAL CALLS</b>	166,790	66%	84,819	34%	251,609
<b>ESTIMATED DOLLAR LOSS FROM FIRE</b>	<b>\$81,032,045</b>	<b>35%</b>	<b>\$148,039,444</b>	<b>65%</b>	<b>\$229,071,489</b>

Minnesota Department of Public Safety

There were zero wildfires in Jackson County from January 2000 through July 2014.<sup>43</sup> The National Weather Service issues Grassland Fire Danger statements from April 1<sup>st</sup> to November 15<sup>th</sup> each year. The DNR is the lead state agency for wildfire response and prevention across the state, and offers training and other resources for local fire departments. DNR conducts controlled burns annually to help manage grasslands.

#### *Probability of Future Events of this Hazard*

There are structure fires every year, so the planning team felt the potential frequency of a structure fire is likely. Wildfires in Jackson County are rare, but they can occur under the right conditions. The potential frequency of a wildfire is occasional according to the planning team.

#### *Vulnerability*

Fire is a serious risk that is not always understood. Fires can spread very quickly. It only takes 30 seconds for a small flame to get completely out of control.<sup>44</sup> There is often only enough time to get out

<sup>43</sup> NOAA. Storm Events Database. Accessed 11/7/14. Available: <http://www.ncdc.noaa.gov/stormevents/>

<sup>44</sup> FEMA. Learn About Fire: The Nature of Fire. Accessed: 9/6/13. Available: [http://www.usfa.fema.gov/citizens/about\\_fire.shtm](http://www.usfa.fema.gov/citizens/about_fire.shtm)

of the house safety, before the entire house is engulfed with smoke and flames. The risk level assigned to structure fires and wildfires by the planning team is moderate.

### *Plans and Programs*

- Local fire departments - Local fire departments within the districts extinguish structure fires. Each department is responsible for fires within their boundaries. However, they often work together on larger fires through mutual aid agreements.
- State training - Local firefighters participate in mandatory firefighting training classes offered by the state. Firefighters are also offered the opportunity to participate in wildfire training classes offered by the Minnesota Department of Natural Resources-Forestry Department.
- Zoning - The Jackson County Development Code controls development of new construction, including the enforcement of safety restrictions like setbacks, coverage, depth, and structure height requirements. The county Environmental Office issues permits for all new construction in the county outside incorporated municipalities.
- Burning Bans - Currently, in times of extreme heat and drought, the county will enact burning bans. Residents are alerted through the media when a burning ban is enacted.
- Burn Permits - Jackson County Sheriff's Office issues burn permits free of charge. Burning permits are good for two years and law enforcement will be checking and calling if they see smoke. Emergency responders respond to reported fires, so you should alert the authorities when you are going to burn.
- Burn barrels - "In Minnesota, open burning of household garbage is banned, with the exception of farms where regularly scheduled pick up of waste is not 'reasonably available to the resident' (Minn. Stat. §§ 17.135 and 88.171). However, 28 of Minnesota's 87 counties have passed no-burn/bury resolutions to close this exemption."<sup>45</sup> It is illegal to burn garbage in Jackson County. The Cities of Heron Lake, Jackson, and Lakefield do not allow burn barrels.
- Property management - Many properties that are owned by Jackson County are used for recreation or conservation. Management plans providing maintenance of these properties (including cutting tall grass, thinning trees, prescribed burning, and removal of low-hanging branches around structures) are in place.
- Wind tower fires - Plans are in place for fires involving wind towers. Firefighters are instructed to contain the fire from a distance and let the turbine burn.
- Ethanol plant fire protection - Specific fire training is done in regards to ethanol plant fires. The Heron Lake Fire Department works with the ethanol plant to understand the layout of the plant and what materials are on the grounds. An annual tour of the facility is done by the Heron Lake Fire Department and other neighboring departments are invited to participate in the training. The Heron Lake Fire Department also attended two specific ethanol fire specific classes led by Minnesota West Community and Technical College. These classes were open to any fire department that wanted to attend.

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<sup>45</sup> Minnesota Pollution Control Agency. Accessed: 3/27/15. Available: <http://www.pca.state.mn.us/index.php/view-document.html?gid=11355>

- Water availability – The City of Heron Lake supplies water to the ethanol plant and biodiesel plant. Currently, Heron Lake has a large surplus of available water. This surplus could be used for regionally.
- Red Rock Rural Water is expanding to southeast section of Jackson County. This expansion will provide a more reliable water supply in this area.
- Electrical fires - The state electrical inspectors inspect commercial structures for potential fire hazards.
- Prescribed burns - The DNR conducts prescribed (or controlled) burns annually in Jackson County. Controlled burns help to reduce fuel load, while also benefiting native prairie restoration. Controlled burns have to be conducted in the right locations and in the right weather conditions. Coordination between the DNR and local fire departments is done to ensure the controlled burns are contained.
- Burning permits - Local residents are required to acquire burning permits to conduct burns.
- Ditch maintenance - Road ditches are maintained to help decrease the chance of a wildfire spreading. MN Stat. 160.232 states: “To provide enhanced roadside habitat for nesting birds and other small wildlife, road authorities may not mow or till the right-of-way of a highway... Exception is from July 31 to August 31, where the entire right of way may be mowed. Statute also states “When feasible, road authorities are encouraged to utilize low maintenance, native vegetation that reduces the need to mow, provides wildlife habitat, and maintains public safety.”
- Water source capacity - Water storage is also analyzed by fire departments in Jackson County to understand water source capacity to fight fires.
- Road closures - Fire departments in Jackson County keep up to date on road closures so efficient routes can be used to reduce response times.
- Development Policy - New developments in Jackson County are required to have streets and alleys wide enough to sufficiently handle the size of a modern fire truck.
- Mutual Aid Agreements - Mutual Aid Agreements are in place between police forces, fire districts and ambulance districts to ensure adequate emergency services in Jackson County. Mutual Aid Agreements create agreement among emergency responders to lend assistance across jurisdictional boundaries.
- Rural fire hydrants - There are fire hydrants located by water storage towers in rural Jackson County.
- Evacuation plans - All cities in Jackson County should have evacuation plans detailing the routes residents should take in the event of a large fire.

### *Gaps and Deficiencies*

- Fire Breaks - Jackson County needs a program that places fire breaks in between the continuous CRP (Conservation Reserve Program) tracts of land or other state wildfire areas during times of severe drought.
- Wildfire risk assessment - Jackson County does not undertake a systematic assessment of wildfire risk and associated prevention measures.

- **Zoning** - Currently, Jackson County zoning lacks regulations regarding vegetation on property. One of the problems with past fires is the undergrowth and overhanging trees near residential structures. Although aesthetically appealing, vegetation around homes can add fuel to the fire.
- **Specialized trainings** - Homes with chimneys pose a larger threat for fires. Specialized training classes, like chimney cleaning, safe cooking in the kitchen, and holiday hazards could be offered to residents.
- **Street capacity** - Currently, some local streets and alleys are not adequate to handle fire trucks. Those roads should be identified and widened in the future to provide adequate protection.
- **Property maintenance** - An increasing number of properties are used for recreation or conservation. These properties may not be monitored frequently, which can result in overgrowth and an increased fire risk. Managing properties effectively can reduce the risk of structure and wildfires. Effective property maintenance can include cutting tall grass, thinning trees, prescribed burning, and removal of low-hanging branches around structures as needed.
- **Staffing levels** - Keeping local fire departments staffed is becoming an issue. Local fire departments are getting older, and there are less young residents volunteering for the departments. Availability is also a concern for the local fire departments. A number of Jackson County residents work outside the county, so availability is an issue.
- **Burn barrel compliance** - Compliance with burn barrel regulation is an issue. An educational campaign may be necessary to increase compliance.
- **Water availability** - Jackson County is a rural county, so water availability during a rural fire can be an issue. Barn fires require between 5 and 15 tankers of water, each 2,000 gallons. This requires firefighters to pull water from multiple locations depending on the location of the fire. Pulling water from multiple sources affects response times and the ability to contain the fire.
- **Rural water map** – A permit is required for rural water projects. Most big projects have a plan, but the old maps are not on GIS. There is only a rough idea where the water lines are, so placing hydrants in rural areas may be difficult and more costly, since you have to identify where the water lines are.
- **Dry hydrant** - There are no dry hydrants in Jackson County. Clear Lake and Loon Lake may be potential locations for a dry hydrant.
- **Dry hydrant maintenance** - Maintenance is an issue regarding dry hydrants. The dry hydrant has to be blown out once a year. The City of Jackson removed a dry hydrant on First Street due to maintenance issues.

### *Existing Mitigation Measures*

- **Right-of-way maintenance** - Road Authorities maintain the right-of-way of roadways in Jackson County. This helps to limit tree growth and farm fields from approaching onto public right-of-way of roadways.
- **Fire education** - Jackson County participates in the nationally coordinated “Firewise Program” to increase resident education.
- **Ordinance** - Snow removal ordinances are in place to keep fire hydrants accessible.
- **Building codes** - Public buildings are constructed to include fire/smoke alarms and sprinkler systems.

- Rural fire hydrants - Rural water systems in Jackson County are desired and researching hydrates in where there is adequate flow. This will help to improve firefighting capabilities in rural areas in Jackson County.

## A6 Flooding

Flooding is one of the most common hazards across the United States. Flooding can occur anytime, anywhere. Seemingly benign streams can overflow their banks from a sudden rainstorm, quick snowmelt, or blockage of a channel. Lakes or reservoirs can retain water and quietly creep up the shorelines. City sewers can back up and pour into private basements and onto public streets. Dams can break causing flooding down river. Flooding was assigned a hazard rank of moderate by the planning team.

The National Flood Insurance Program (NFIP) was created by Congress to help property owners to protect themselves financially. NFIP offers flood insurance in communities that agree to adopt and enforce ordinances to reduce the risk of flooding. In Minnesota, the DNR administers floodplain management programs.<sup>46</sup>

There are 30 flood insurance policies in Jackson County. Nineteen of those policies are in the City of Jackson. Each policy covers a single building, but all single family home policies include detached garages.<sup>47</sup>

The Federal Emergency Management Agency (FEMA) has mapped the probability of flood waters inundating floodplains. FEMA works with local communities to map the Special Flood Hazard Area (SFHA), commonly known as the 100-year floodplain (one percent floodplain), where they calculate a one percent chance of a flood event any given year. Within the SFHA lie the floodway, in which water can be expected at any time, and the flood fringe which is vulnerable to flood events.

FEMA has developed Flood Insurance Rate Maps (FIRMs) for many communities across the United States. FEMA now posts these online, along with “FIRMettes” —a “a full-scale portion of a FEMA Flood Insurance Rate Map (FIRM) that you create yourself online by selecting the desired area from an image of a Flood Insurance Rate Map.”

FIRMs may not be up to date since they were initially produced in the 1970s, and a number of these maps have not been updated since the originals were created. Communities in Jackson County have made improvements to their infrastructure to mitigate the impact of flooding, but these improvements are not reflected in their FIRMs. Maps and models are critical components in mitigating the impact of flooding. These technologies help planners mitigate the effects of flooding. Decision support systems (DSS) based on models are increasingly being used by engineers and scientists in flood management. DSSs are used for planning and designing infrastructure to prepare for flooding.

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<sup>46</sup> Flood Smart. Accessed 5/21/13. Available:

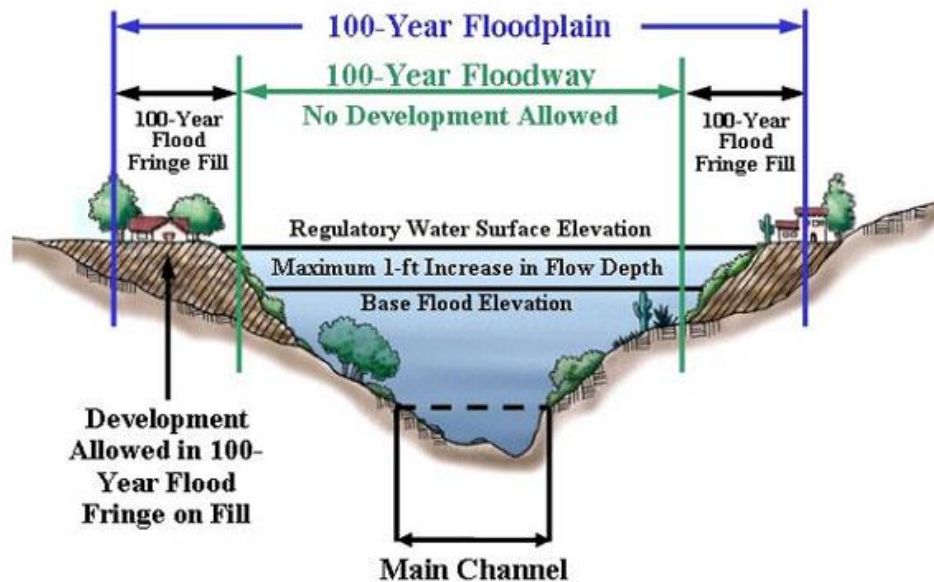
[http://www.floodsmart.gov/floodsmart/pages/about/nfip\\_overview.jsp](http://www.floodsmart.gov/floodsmart/pages/about/nfip_overview.jsp)

<sup>47</sup> FEMA Region V. Information request. Received: 8/11/15.



RA Figure #14

# 100-Year Floodplain (1 percent Floodplain)



## *Locations Affected by the Hazard*

Flooding can occur anytime, anywhere. The planning team identified the spatial extent of flooding as countywide. The majority of Jackson County is classified as Zone C, which is defined as an area of minimal flooding. The areas of minimal flooding include most of the intermittent streams throughout the county. These streams contain surface water runoff at various times throughout the year and high water levels may extend beyond the established drainage channel and onto adjacent lands.

Flash flooding events tend to be localized, not countywide, but the risk is countywide. Flash flooding can occur rapidly and cause substantial damage. Flash flooding can cause a rapid rise in the water level of a stream or creek above a predetermined flood level.

One percent floodplain areas do exist in Jackson County. These flood plain areas are along the Des Moines River which affects the City of Jackson, Okabena Creek which affects the City of Okabena, and other permanently flowing streams and creeks which impact rural areas in Jackson County. Jackson County's lakes and lakeshore are typically stable, so FEMA has not identified any significant 100-year floodplain areas around any of the county's major lakes.

Within the unincorporated areas of Jackson County, subject to the zoning controls of the County, and according to official FEMA flood hazard maps utilized by the County, there are approximately 27,874 acres in the County prone to flooding. There are approximately 40 residential dwelling units in rural Jackson County.<sup>48</sup> The County has provided some technical assistance to homeowners in obtaining FEMA Letters of Map Amendment (LOMA), which requires a certified engineer who is licensed in

<sup>48</sup> Jackson County Soil and Water Conservation District. Data Request Received 11/6/14

floodplain delineation to determine Base Flood Elevations (BFE) in these requests. Additionally, the flood of 1993 were considered to be the equivalent of a one percent flood event, and resulting flood related damages to homes and farmstead properties were relatively minimal.

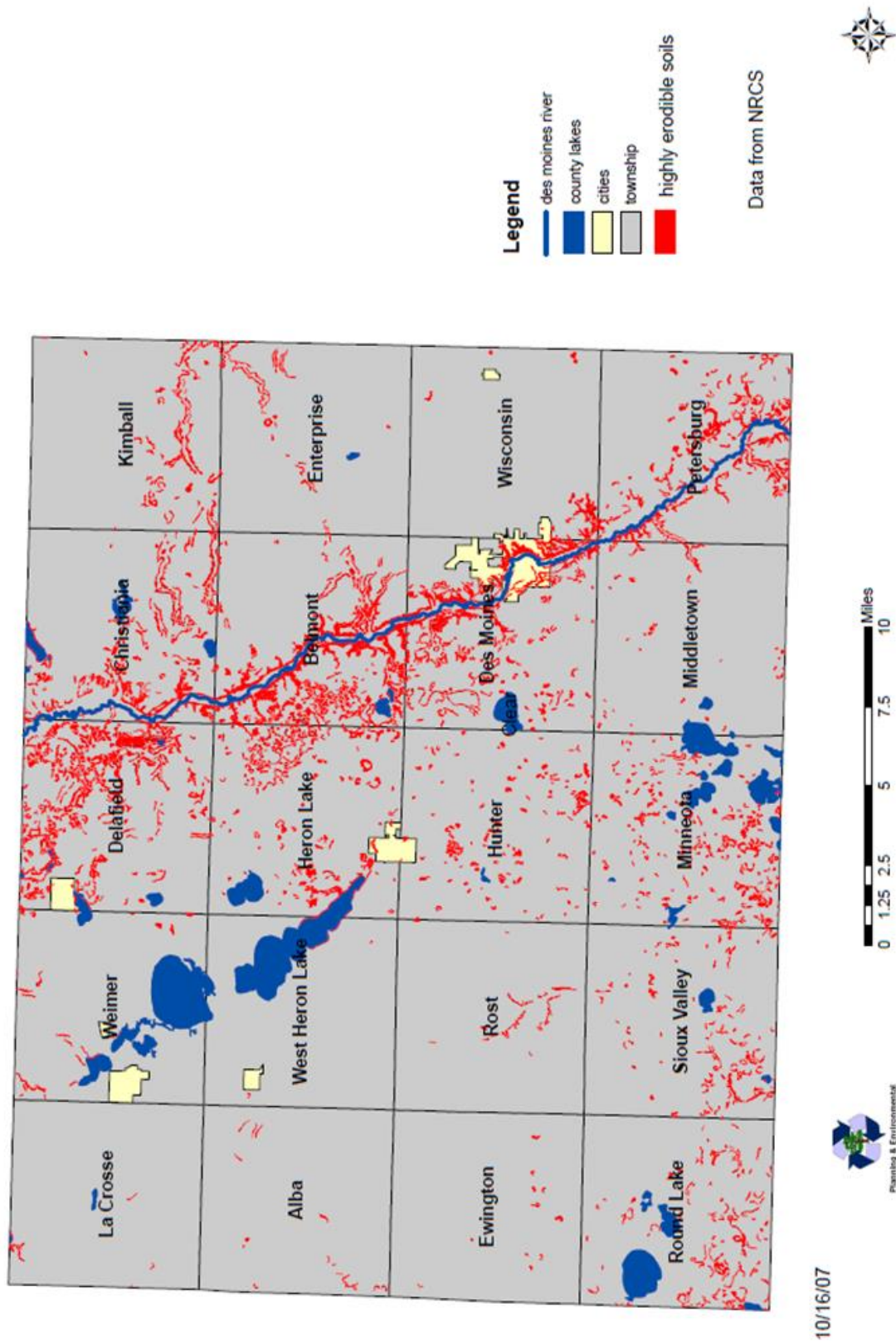
There are two communities within Jackson County that have areas identified within the one percent floodplain: Jackson and Okabena. These two communities have a higher risk to actually see some flooding damage. A structure located within one percent floodplain has a 26 percent chance of suffering flood damage during a 30 year mortgage term. There was no public and semi-public infrastructure developed within the floodplain within these two communities.

The municipality facing the largest risk is the City of Jackson. In 2004, new FIRM maps were developed and approved for the City of Jackson. It is estimated that 21 residential structures and 36 non-residential structures are present in the 500-year floodplain, which include FEMA flood Zone AE and Zone X. These areas are mainly low lying poorly drained areas within the city's corporate limits.

There are no structures in the 100-year floodplain within the City of Okabena.

RA Figure #15

# Highly Erodible Soils - Jackson County



"A highly erodible soil, or soil map unit, has a maximum potential for erosion that equals, or exceeds, eight times the tolerable erosion rate. The maximum erosion potential is calculated without consideration to crop management or conservation practices, which can markedly lower the actual erosion rate on a given field. The maximum potential erosion rate is determined using the formula:  $RKLS/R$  (where R = the rainfall factor, K = erodibility value of the soil, and LS = the slope factor). If  $RKLS/T > 8$  then the soil meets the criteria for a highly erodible soil."<sup>49</sup>

### *Extent of the Hazard*

"Floods are among the most frequent and costly natural disasters."<sup>50</sup> The potential severity of flooding in Jackson County is minor according to the planning team.

### *Critical Facilities*

There are no critical facilities in Jackson County that are within the one percent floodplain.

### *Effect on Housing*

The majority of Jackson County's population lives safe from flooding, although some housing units have been identified within the one percent floodplain and flooding can occur anywhere. County staff has identified residential and commercial structures within the floodplain using GIS, FIRM Maps, and the State of Minnesota DOQ flyovers.

Development has occurred along and near waterways in Jackson County due to the aesthetics they create. The median housing unit value in Jackson County was \$100,300 in 2010.<sup>51</sup> If we assign this median value for all the residential structures within the floodplain in Jackson County, there is a total value of \$6,118,300. This is just the value of the residential structures. Since flooding could occur in any of the communities within Jackson County and in the rural areas, the potential damage of a flood could be relatively high.

### *Commercial Structures*

There are some commercial structures currently located within the one percent floodplain in Jackson County, but past damages that have occurred were minimal. Future construction of commercial buildings in the floodplain has been prohibited under Jackson County's zoning regulations.

### *Public Infrastructure*

Within Jackson County there are some roads that are prone to flooding or washing out during a hazard event. Those most noted are roads in low-lying areas. Along with flooding or washing out of roads, the County has had a problem with debris being left on roads as a result of water running over the roadway. Debris removal is often limited, but cleanup is a cost that is incurred.

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<sup>49</sup> National Resources Conservation Service. Accessed: 11/24/14. Available: [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/ri/soils/?cid=nrcs144p2\\_016637](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/ri/soils/?cid=nrcs144p2_016637)

<sup>50</sup> American Red Cross. Accessed: 10/30/13. Available: <http://www.redcross.org/prepare/disaster/flood>

<sup>51</sup> Census 2010. Accessed: 2/26/15. Available: <http://factfinder2.census.gov>

The Des Moines River crossings are the most vulnerable to intermittent flooding from spring thaws or large rain falls. Jackson County has approximately 153 bridges located within the floodplain.<sup>52</sup> Most are made of steel or steel reinforced concrete, which can withstand annual spring flooding. To date, none of the bridges within Jackson County have been destroyed as a result of flooding.

The majority of damages from flooding occur on township and county roads. Many other locations can experience damage from flooding depending on the location, amount, and duration of the rainfall event. A one percent flood event would result in a number of roadways sustaining damage and wider spread road closures.

Roads, bridges, and culverts are susceptible to damage from flooding. The figure below identifies areas where drainage is an issue. This may be the result of an undersized culvert, poor drainage, inadequate holding basin, or other issues. For more information regarding specific locations identified in the figure below, please contact the Jackson County Public Works Office.

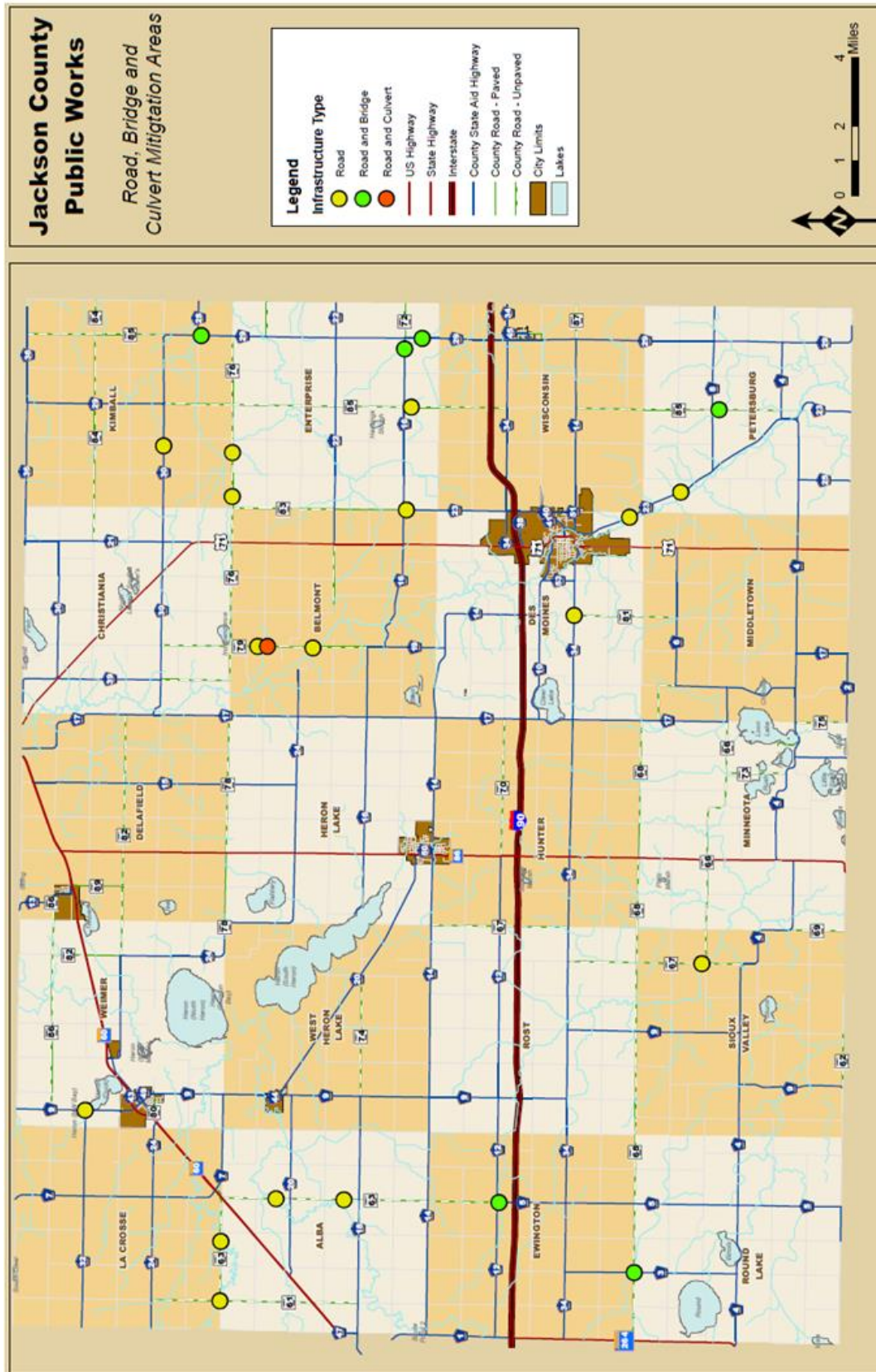
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<sup>52</sup> Jackson County Public Works. Data Request Received 1/9/15



RA Figure #16

Public Infrastructure Susceptible to Flooding - Jackson County



There are no communities in Jackson County that have wastewater treatment plants close to the one percent floodplain. To date, extensive damage to wastewater treatment ponds within the county due to flooding has not occurred.

#### Relationship to Other Hazards—Cascading Effects

- Numerous. Flooding can have a number of secondary effects that can create additional hazards related to fire, public health, utility failure, insect and pest infestation, and infrastructure damage. Flooding can interfere with emergency response to fires, as seen in Grand Forks, North Dakota, during the Red River Flood of 1997. The after effects of a flood can be a contaminated water supply and mold which affect public health. It can take up to a week or two to get the power back on after a flood. Not having reliable power makes day to day life more difficult. Insect and pest infestation can take place after the flood has receded. Damage to infrastructure can take weeks to repair. This can cause increase emergency response times and put residents at risk.

#### Previous Occurrences of the Hazard

From January 2000 through July 2014, there have been 10 documented floods and 15 documented flash floods in Jackson County. NOAA defines a flood as “an overflow of water onto normally dry land. The inundation of a normally dry area caused by rising water in an existing waterway, such as a river, stream, or drainage ditch. Ponding of water at or near the point where the rain fell. Flooding is a longer term event than flash flooding: it may last days or weeks.”<sup>53</sup>

NOAA defines a flash flood as “a flood caused by heavy or excessive rainfall in a short period of time, generally less than 6 hours. Flash floods are usually characterized by raging torrents after heavy rains that rip through river beds, urban streets, or mountain canyons sweeping everything before them. They can occur within minutes or a few hours of excessive rainfall. They can also occur even if no rain has fallen, for instance after a levee or dam has failed, or after a sudden release of water by a debris or ice jam.”<sup>54</sup>

**RA Table #13**

**Floods – Jackson County**

Date	Location	Event Narrative
10/1/2010	Jackson County	Minor to moderate flooding of the Des Moines River steadily abated and ended during the first two weeks of the month. Some roads and riverside lowlands including agricultural land were still flooded early in the month.
3/16/2011	Jackson County	Melting of a heavy winter snow cover caused flooding of the Des Moines River, as well as flooding of lowlands, lakes, and streams. The Des Moines River crested at 3.59 feet above flood stage at Jackson on March 26th. There was considerable flooding of farmland. Numerous roads in the county were flooded. Some of the roads were closed, and some were washed out in spots. The flooding onset was rapid for a snow melt flood due to high water and

<sup>53</sup> NOAA. Accessed: 7/21/14. Available: <http://www.srh.noaa.gov/mrx/hydro/flooddef.php>

<sup>54</sup> NOAA. Accessed: 7/21/14. Available: <http://www.srh.noaa.gov/mrx/hydro/flooddef.php>

		groundwater levels from record precipitation in the year 2010.
4/1/2011	Jackson County	Flooding of lakes, streams and lowlands, including some farmland, continued in the county through April. The Des Moines River was at its highest level of 2.6 feet above flood stage at Jackson on April 1st. Lake and lowland flooding continued with very slow improvement. Several roads remained flooded. High water and groundwater levels resulting from record precipitation in the previous year was the main reason that the flooding either grew worse or improved so slowly.
6/21/2011	Jackson County	Heavy rain caused minor flooding of the Des Moines River, with some farmland and other lowlands affected. The river crested at a foot above flood stage at Jackson on June 23rd.

National Climatic Data Center (NCDC) Storm Events database

#### RA Table #14

#### Flash Floods – Jackson County

Date	Event Narrative	Number of Counties Affected
9/22/2010	Okabena	Heavy rain caused flooding of streets and a few basements, and there was a sewer backup into some homes
5/4/2012	Lakefield	Heavy rain caused flooding of Minnesota Highway 86.
6/22/2013	Jackson County	There was also flash flooding in Jackson County, which continued after midnight into the early morning hours of June 22nd.
6/22/2013	Lakefield	Heavy rain from thunderstorms caused flash flooding of streets in Lakefield. Basements and lower levels of some homes were flooded.

National Climatic Data Center (NCDC) Storm Events database

#### *Probability of Future Events of this Hazard*

Flooding is highly likely to occur each year and forecasting technology and models can help predict yearly spring flooding. The potential frequency of a flood is likely according to the planning team. Even with weather forecasting technology floods can occur rapidly and poses a risk throughout the county.

#### *Vulnerability*

Flooding can occur anytime anywhere, so the potential damage of a flood could be higher than the total value of residential structures within the floodplain. The value of residential structures does not take into consideration of outbuildings, machine sheds, and agricultural production. The potential damage of a flood could be relatively high. Flash flooding could result in sewer systems being over loaded and flooding to occur in basements. Basement flood could be isolated to low lying areas, or could be citywide in an event of an extreme rain event.

Improvements have been made along the flood plain. Pumps have been purchased by cities to assist with bypassing the sewer system during an extreme rain event. The risk level assigned to flooding by the planning team is average.

#### *Plans and Programs*

- Zoning - The floodplain section of the Jackson County Development Code addresses the placement of structures within the floodplain. Jackson County's zoning regulations prohibits any further



development within the floodplains. Existing structures may continue to exist as “grandfathered” structures, but the county anticipates the number of these structures will be reduced over time.

- County flood area maps - Jackson County has FIRM maps identifying the 100-year. The county zoning ordinance controls permitted land uses in these areas, what can be built, and how.
- City flood area maps - Cities in Jackson County have official FIRM maps identifying the 100-year flooding plain. All cities addressed flood risks in their planning and zoning documents.
- Water Plan - The Jackson County Local Water Management Plan addresses flood mitigation.
- Jackson County Emergency Operations Plan - A response plan to a flood emergency has been developed and local resources and personnel have been committed to it:
- *Response Plan - A response plan to a flood emergency has been developed and local resources and personnel have been committed to it.*
- National Flood Insurance Program (NFIP) - The City of Jackson and Jackson County participate in the NFIP.<sup>55</sup> The NFIP has three basic aspects that include: floodplain identification and mapping, floodplain management, and flood insurance. The City of Okabena has not participated in the NFIP because there are no structures to insure in the identified Special Flood Hazard Area.
- Zoning restrictions - The City of Jackson and Jackson County have zoning restrictions that limit new structures and land uses within the Floodway, Flood Fringe, and General Flood Plain District.
- Water level monitoring - Water levels in the Des Moines River are monitored, so the water levels downstream are predictable. The closest gages are in the Cities of Windom and Jackson.
- Local Water Management Plan - The water plan identifies priorities regarding drainage, which includes flooding.
- Emergency response planning - Road closures are taken into account in planning and training. Local fire departments, emergency medical services, and other emergency responders plan for having to use alternative routes in case of flooding.
- Ditch system / drainage - Jackson County continues to make improvements to the ditch system. With increases tiling, it is important to reevaluate the ditch system and drainage.
- Sediment ponds - The Jackson County Highway Departments works with the DNR and other organizations to increase the number of sedimentation ponds along roadways in Jackson County. Sedimentation ponds hold back water, which helps to control flooding. Jackson County Zoning references erosion control and drainage in our subdivision ordinance, but the county does not distinctly call out requirements for sedimentation ponds or their required size. Jackson County follows state recommendations on storm water management for bare land development and other applicable projects.
- BWSR and SWCD offer flood recovery money to fix conservation practices damaged by floods. BWSR and SWCD also cost-share on installing new practices where damages occurred due to flooding.

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<sup>55</sup> FEMA. National Flood Insurance Program. Accessed: 11/7/14. Available: <http://www.fema.gov/cis/MN.pdf>

### *Gaps and Deficiencies*

- Wastewater treatment - Wastewater treatment plants are vulnerable to flooding. Pumps may not be capable to keep up with flood events. This would result in sewer water being combined with clean water and entering the various watersheds.
- Zoning - At-risk uses and structures remain in identified 100-year floodplains, because they are “grandfathered” in.
- Severe flooding - Local resources are not adequate for a severe and prolonged flood. State and federal resources are required when responding to severe flooding. There may be a time delay to receive assistance.
- Development in the floodplain - Some residents are resistant to leaving their property, even if it is located in a designated floodplain. The area may be seen as scenic, so the resident may want to continue living in the floodplain.
- Local assistance - Local match for mitigation projects (such as acquisition of property) is often difficult to acquire, due to limited local budgets.
- Local resources - Local resources are not adequate for a severe or prolonged flood. Addition assistance would be needed.
- Outdated flood plain maps - It is difficult to estimate the number of structures within the flood plain, since the maps are outdated. The City of Okabena FIRM map was developed in 1974. The Jackson County FIRM Map was developed in 1981. The City of Jackson FIRM map was updated in 2004. A number of improvements have been made to mitigate the effects of flooding in Jackson County, but these changes are not reflected in the FEMA flood plain maps. These maps have not been updated due to the costiveness of the project.
- Limitations of models - Models are increasingly being used by engineers and scientists in flood management. Models are only as accurate as the data that is used in the analysis. Outdated maps and not including all the impacting variables can cause forecasting errors to occur. Ground saturation is one variable that is not included in the models for estimating yearly flood levels. Ground saturation affects the amount of moisture that can be soaked in during a precipitation event. Forecasters are working on ways to include ground saturation into their flood models.
- Access to the dam on Heron Lake - To access the dam on Heron Lake you have to cross private property. Accessing the dam requires providing a notice, except in the case of an emergency.

### *Existing Mitigation Measures*

- Road mitigation projects - Road retention projects were pursued to reduce the impact of flooding along roadways. These projects included: analyzing runoff and the capacity of county ditches, the installation of smaller culverts, and adding water retention ponds. Downsizing culverts is a reversal in the trend of replacing culverts with larger sized culverts, which only transfer additional water downstream.

## **A7 Severe Summer Storms, Lightning, Hail, and Extreme Heat Events**

During the spring, summer and autumn, severe thunderstorms, lightning, hail, and excessive heat can occur. Severe summer storms, lightning, hail, and extreme heat events were assigned a hazard rank of

high by the planning team. Excessive heat temperatures and temperature change is one of the variables that impact summer storms. (Windstorms and Tornado events are addressed in the next section.)

### *Locations Affected by the Hazard*

All locations in Jackson County are at risk to be affected by this hazard. Severe summer storms and extreme heat events will be more widespread. These weather events can generate lightning and hail that tend to be more isolated. The planning team identified the spatial extent of severe summer storm, lightning, hail, and extreme heat events as countywide.

### *Extent of the Hazard*

The potential severity of severe summer storms, lightning, hail, and extreme heat events is major according to the planning team.

Thunderstorms, which occur most frequently from mid-May through mid-July, are the most common type of severe summer storm. Thunderstorms are usually localized, produced by cumulonimbus clouds, accompanied by lightning, and have strong wind gusts, heavy rains, and sometimes hail or tornados. Thunderstorms are produced by air masses that become unstable and that overturn violently. Unstable air masses are usually the result of warm humid air at lower elevations and colder air at higher elevations.

Extreme heat helps to contribute to the magnitude of a thunderstorm and often accompany severe summer storms. The combination of high temperatures and exceptionally humid conditions can lead to overheating, heat stress, and a severe strain on the system. Heat stress can lead to heat cramps, heat exhaustion and heatstroke, and even death. According to the Centers for Disease Control and Prevention (CDC), more than 300 Americans die annually from excessive heat exposure from 1979-2003. More people in the United States died from extreme heat than from hurricanes, lightning, tornadoes, flood and earthquakes combined.<sup>56</sup>

Lighting is often associated with thunderstorms and can be deadly. Lightning occurs to balance the difference between positive and negative discharges within a cloud, between two clouds, and between the cloud and ground. For example, a negative charge at the base of the cloud is attracted to a positive charge on the ground. A lightning bolt happens when the difference between the charges is great enough. The charge is usually strongest on tall buildings, trees, and other objects protruding from the surface. Consequently, these objects are more likely to be struck than lower objects.

While cloud-to-ground lightning poses the greatest threat to people and objects on the ground, it accounts for only 20 percent of all lightning strikes. The remaining lightning occurs within the cloud, from cloud to cloud, or from the ground to the cloud. The most common type of lightning is lightning occurring within a cloud.

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<sup>56</sup> CDC. Emergency Preparedness and Response. Accessed: 9/6/13. Available: [http://www.bt.cdc.gov/disasters/extremeheat/heat\\_guide.asp](http://www.bt.cdc.gov/disasters/extremeheat/heat_guide.asp)

Hail is an ice product produced in severe thunderstorms. It is formed when strong updrafts within the cumulonimbus cloud carry water droplets above the freezing level or when ice pellets in the cloud collide with water droplets. The water droplets freeze or attach themselves to the ice pellets and begin to freeze as strong updraft winds toss the pellets and droplets back up into colder regions of the cloud. Both gravity and downdrafts in the cloud pull the pellets down, where they encounter more droplets that attach and freeze and are tossed once again to higher levels in the cloud. This process continues until the hail becomes too heavy to be supported by the updrafts and falls to the ground.

**RA Table #15**

**Estimating Hail Size**

Description	Diameter (inches)
Pea	0.25
Marble or Mothball	0.5
Penny or Dime	0.75
Nickel	0.88
Quarter	1
Half Dollar	1.25
Walnut or Ping Pong Ball	1.5
Golf ball	1.75
Hen's Egg	2
Tennis Ball	2.5
Baseball	2.75
Tea Cup	3
Grapefruit	4
Softball	4.5

National Weather Service (NWS)

In Minnesota, most hail ranges in size from pea-size (1/4 inch) to golf-ball size (1-¾ inch). Larger hailstones have been reported, but occur less frequently. Strong updrafts are necessary within the cloud to form hail, and are usually associated with severe thunderstorms. Coverage areas for individual hailstorms are highly variable and spotty due to the changing nature of the cumulonimbus cloud.

Given the rural agricultural nature of the county, the likelihood is greatest that crops would experience the most damage from a hail event; however, hail can also do a great amount of damage to vehicles and roofs of individual structures. The chance of significant building damage is likely to be higher within the cities as there are simply more buildings clustered in a small area to be potentially damaged.

#### Relationship to Other Hazards—Cascading Effects

- **Utility Failure.** Extreme heat can lead to the power grid being overloaded and can in turn cause blackouts.
- **Transportation Infrastructure.** Heavy rain can cause flash flood events, and may threaten transportation infrastructure.
- **Fire.** Lightning can cause both structure fires and wildfires.

- **Agricultural Disease.** Extreme Heat can have a major effect on the county's crops and livestock. During prolonged heat events, crops grow weak and are more susceptible to plant pests and diseases. In times of extreme heat, it is important that confinement buildings are properly ventilated and outside livestock are provided with places to get into the shade. Heat stroke can pose a serious threat to livestock.

### *Previous Occurrences of the Hazard*

Thunderstorms are not documented by the NOAA as a separate event. Extreme heat events are documented as a separate event by NOAA. There were four documented extreme heat events in Jackson County from January 2000 through July 2014. Excessive heat occurs from a combination of high temperatures and high humidity index. From 1979 to 2003, more people in the U.S. died from extreme heat than from hurricanes, lightning, tornadoes, floods, and earthquakes combined.<sup>57</sup>

#### **NOAA Definitions**

##### **Excessive Heat Outlook**

A combination of temperature and humidity over a certain number of days, is designed to provide an indication of areas of the country where people and animals may need to take precautions against the heat during May to November.

##### **Excessive Heat Warning**

Issued within 12 hours of the onset of the following criteria: heat index of at least 105°F for more than 3 hours per day for 2 consecutive days, or heat index more than 115°F for any period of time.

##### **Excessive Heat Watch**

Issued by the National Weather Service when heat indices in excess of 105°F (41°C) during the day combined with nighttime low temperatures of 80°F (27°C) or higher are forecast to occur for two consecutive days.

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<sup>57</sup> Minnesota Department of Health. Assessed: 8/1/14. Available:  
[http://www.health.state.mn.us/divs/climatechange/docs/toolkit\\_chapter1.pdf](http://www.health.state.mn.us/divs/climatechange/docs/toolkit_chapter1.pdf)

**RA Table #16****Excessive Heat – Jackson County**

Date	Location	Event Narrative
7/15/2011	Jackson County	Several consecutive days were experienced with an extremely stressful combination of high heat and humidity. Heat indices frequently rose above 115 degrees during the day, with temperatures reaching the 90s and dew points remaining in the 70s to lower 80s. The high heat and humidity were evident at night, with minimum temperatures usually in the middle to upper 70s, and in some cases 80 degrees or a little higher. There were several reports of livestock deaths.
6/27/2012	Jackson County	A combination of high heat and humidity, with temperatures reaching the 90s and dew points in the 70s, pushed the heat index to a little above 100 degrees during the afternoon and early evening hours of June 27th over southwest Minnesota.
7/2/2012	Jackson County	A combination of high heat and humidity persisted for several days. Daytime temperatures reached the 90s to just above 100, and dew points were in the 70s. The heat index went as high as 110 degrees. Low temperatures were in the 70s, leading to some uncooled indoor locations remaining excessively warm through the night. The dangerous nature of the heat was added to by its continuing over a period of several days.
7/16/2012	Jackson County	A combination of high heat and humidity consisted of daytime temperatures reaching the 90s, and dew points in the 70s. The heat index went as high as 105 degrees.

National Climatic Data Center (NCDC) Storm Events database

There was one documented lightning event in Jackson County from January 2000 through July 2014.<sup>58</sup> There were most likely a number of other lighting events, but they went unreported. “Tall objects such as trees and skyscrapers are commonly struck by lightning... Lightning can strike the ground in an open field even if the tree line is close by.”<sup>59</sup>

**RA Table #17****Lightning Events – Jackson County**

Date	Location	Event Narrative
7/15/2011	Lakefield	Lightning struck a cable television tower, destroying antennas, and damaging electronic equipment in the building. Property damage was estimated at .02 million.

National Climatic Data Center (NCDC) Storm Events database

The lightning activity level is a common parameter that is part of fire weather forecasts nationwide. LAL is a measure of the amount of lightning activity using values 1 to 6 where:

<sup>58</sup> NOAA. Accessed: 5/21/13. Available: <http://www.ncdc.noaa.gov/stormevents/>

<sup>59</sup> NOAA. Accessed: 5/21/14. Available: <http://www.nssl.noaa.gov/education/svrwx101/lightning/>

**RA Table #18****Lightning Activity Level**

<b>LAL</b>	<b>Cloud &amp; Storm Development</b>	<b>Lightning Strikes/15 min</b>
1	No thunderstorms.	-
2	Cumulus clouds are common but only a few reach the towering cumulus stage. A single thunderstorm must be confirmed in the observation area. The clouds produce mainly virga, but light rain will occasionally reach the ground. Lightning is very infrequent.	1-8
3	Towering cumulus covers less than two-tenths of the sky. Thunderstorms are few, but two to three must occur within the observation area. Light to moderate rain will reach the ground, and lightning is infrequent.	9-15
4	Towering cumulus covers two to three-tenths of the sky. Thunderstorms are scattered and more than three must occur within the observation area. Moderate rain is common and lightning is frequent.	16-25
5	Towering cumulus and thunderstorms are numerous. They cover more than three-tenths and occasionally obscure the sky. Rain is moderate to heavy and lightning is frequent and intense.	>25
6	Similar to LAL 3 except thunderstorms are dry.	

Hail events are separate events recorded by NOAA. Hail is often part of a thunderstorm and is not always reported due to the varying size and the rural nature of Jackson County. From January 2000 through July 2014, there have been 71 documented hail events in Jackson County. Some of these hail events are only minutes apart, but a hail event is a separate event if the storm stops hailing and starts hailing a few minutes later.

**RA Table #19****Hail Events –Jackson County**

<b>Date</b>	<b>Location</b>	<b>Time</b>	<b>Event Narrative</b>
7/17/2010	Okabena	12:25	Thunderstorms produced damaging thunderstorm winds, along with a brief tornado, in Murray, Nobles, and Jackson Counties of southwest Minnesota on the evening of July 17th. Three quarters inch size hail was reported.
5/21/2011	Jackson	17:24	Thunderstorms produced large hail and damaging winds at several locations across southwest Minnesota during the evening of May 21st. One inch size hail was reported.
5/4/2012	Alpha	14:57	Thunderstorms produced a variety of large hail, damaging winds, and brief tornadoes in southwest Minnesota on the afternoon of May 4th. One inch size hail was reported.
5/23/2012	Lakefield	18:57	Thunderstorms produced large hail in three counties of southwest Minnesota during the late afternoon and early evening of May 23rd. One inch size hail was reported.
5/27/2012	Okabena	20:05	Thunderstorms produced damaging winds, large hail, and flash flooding in Nobles and Jackson Counties in southwest Minnesota on the evening of May 27th. One and a quarter inch hail was reported.

5/17/2013	Miloma	17:30	Thunderstorms produced large hail at numerous locations in Cottonwood and Jackson Counties in southwest Minnesota on the late afternoon of May 17th. One inch size hail was reported.
10/2/2013	Okabena	16:53	Thunderstorms produced large hail in Nobles and Jackson Counties in southwest Minnesota on the afternoon and early evening of October 2nd. One inch size hail was reported.
10/2/2013	Heron Lake	16:53	Same Description as above.

National Climatic Data Center (NCDC) Storm Events database

### *Probability of Future Events of this Hazard*

Severe summer storms are highly likely to take place every year, including excessive heat, lightning, and hail. The potential frequency of a severe summer storm is likely according to the planning team.

### *Vulnerability*

People do not always recognize their limitations. Summer heat can pose a serious risk to all populations, especially the young and elderly population. Informing the public about extreme heat events and other summer storms is important in preventing accidents. The risk level assigned to severe summer storms by the planning team is high.

### *Plans and Programs*

- Heat advisories - The local radio and television media are in contact with the National Weather Service to issue a heat advisory when the combination of temperature and humidity create risks for people and animals. A heat index of 105 to 114 warrants a heat advisory. This occurs when air temperature reaches 95 degrees and the relative humidity is 50 percent. An excessive heat warning is issued when the heat index reaches 115. This occurs with an air temperature of 95 degrees and relative humidity of 60 percent. A heat index of 115 or higher puts both humans and animals at risk.
- Emergency alert system - Jackson County is in the process of implementing an emergency alerts system, via text message and email. This system can be used to inform the public about the risk of extreme heat and other summer storms.
- Lightning detectors - Lightning detectors detect lightning produced by thunderstorms. Lightning detectors would improve safety at outdoor sporting events. The Jackson County Central track and field coach and the Lakefield swimming pool have lightning detectors.

### *Gaps and Deficiencies*

- Public education - The public may not be aware of the real risks associated with heat exhaustion, extreme heat events, and other severe summer storms.
- Lightning detectors - Lightning detectors detect lightning produced by thunderstorms. Lightning detectors would improve safety at outdoor sporting events. Not all outdoor sporting events have a lightning detector. A lightning detector could improve safety at these events. Current, the National Federation of State High School Associations (NFHS) "30-30 Rule is used. The 30-30 Rule states that when you see lightning, count the time until you hear thunder. If this time is 30 seconds or less, go immediately to a safer place. Some smart phones are able to download a lightning detector app.



### *Existing Mitigation Measures*

- Severe weather Awareness - Each spring, Jackson County Emergency Management personnel will educate local schools, nursing homes, hospital, etc. on the importance of doing a “Severe Weather Awareness Week” workshop for their staff. This workshop identifies evacuation routes and emergency shelters, along with other important information.

## **A8 Tornado & Straight-line Wind Events**

Tornados are the most violent of all storm types experienced in Minnesota.<sup>60</sup> A tornado is a rapidly rotating column of air that is spawned from a cumulonimbus cloud. When it drops to the ground, it can create significant property damage and loss of life.

Straight-line winds are also damaging but not to the extent of more powerful tornados. Straight-line winds can and do produce substantial damage over wider areas at one time. NOAA documents straight-line wind events as thunderstorm wind events and defines them as winds equal to or greater than 40 mph (35 knots). Tornados and straight-line wind events were assigned a hazard rank of high by the planning team.

### *Locations Affected by the Hazard*

All of Jackson County is at risk of a tornado. FEMA places Southern Minnesota in Wind Zone IV, subject to winds of up to 250 mph.<sup>61</sup> The planning team identified the spatial extent as countywide for tornadoes and straight-line wind events.

### *Extent of the Hazard*

Minnesota lies along the north edge of the region of maximum tornado occurrence in the United States, known as tornado alley. Tornado Alley encompasses part of the central United States that extends across parts of Texas, Oklahoma, Kansas, Missouri, East Nebraska, and West Iowa. Tornados have been reported in Minnesota in every month from March through November.<sup>62</sup> The potential severity of tornadoes and straight-line wind events is major according to the planning team.

The severity of tornado damage is measured by the Fujita Tornado Scale, with a sliding scale from F0 to F5 depending on wind speed. A tornado’s path typically ranges from 250 feet to a quarter of a mile in width. The speed a tornado travels varies but commonly is between 20 mph and 30 mph. Most tornados stay on the ground for less than five minutes. Tornados frequently move from the southwest to the northeast but this also varies and cannot be counted on in all instances.<sup>63</sup>

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<sup>60</sup> MN All Hazard Mitigation Plan. Accessed: 5/29/13. Available: [https://dps.mn.gov/divisions/hsem/hazard-mitigation/Documents/2011\\_MinnesotaAllHazardMitigationPlanDraft.pdf](https://dps.mn.gov/divisions/hsem/hazard-mitigation/Documents/2011_MinnesotaAllHazardMitigationPlanDraft.pdf)

<sup>61</sup> FEMA. Accessed: 5/29/13. Available: <http://www.fema.gov/safe-rooms/wind-zones-united-states>

<sup>62</sup> MN All Hazard Mitigation Plan. Accessed: 5/29/13. Available: [https://dps.mn.gov/divisions/hsem/hazard-mitigation/Documents/2011\\_MinnesotaAllHazardMitigationPlanDraft.pdf](https://dps.mn.gov/divisions/hsem/hazard-mitigation/Documents/2011_MinnesotaAllHazardMitigationPlanDraft.pdf)

<sup>63</sup> MN All Hazard Mitigation Plan. Accessed: 5/29/13. Available: [https://dps.mn.gov/divisions/hsem/hazard-mitigation/Documents/2011\\_MinnesotaAllHazardMitigationPlanDraft.pdf](https://dps.mn.gov/divisions/hsem/hazard-mitigation/Documents/2011_MinnesotaAllHazardMitigationPlanDraft.pdf)

Tornado damage can vary from limited damage to trees and building to complete destruction of a community. Along with monetary damages, loss of life is a real concern. However, due to the rural nature of Jackson County, many funnel clouds have only caused damages to crops and unpopulated area.

**RA Table #20** **Enhanced F-Scale for Tornado Damage**

Scale	Wind Estimate	Typical Damage
F0	65-85 mph	Light damage. Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.
F1	86-110 mph	Moderate damage. Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.
F2	111-135 mph	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
F3	136-165 mph	Severe damage. Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.
F4	166-200 mph	Devastating damage. Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown and large missiles generated.
F5	>200 mph	Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yds); trees debarked; incredible phenomena will occur.

National Climatic Data Center (NCDC) Storm Events database

**RA Table #21** **Straight-line Wind Damage Estimates**

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

The National Weather Service

The most severe windstorms usually occur (and do the most damage) during severe thunderstorms in the spring and summer months. These include tornados, downbursts, or straight line winds. Straight-line winds have similar effects to tornadoes without the rotational damage pattern.

Downburts are created by a column of sinking air, capable of producing straight-line winds in excess of 150 mph. Winds of greater than 60 mph are also associated with intense spring and fall low-pressure systems. These winds can inflict damage to buildings and overturn high profile vehicles.

The Minnesota AHMP calculated an annual probability of 0.84 of a windstorm event causing \$54,167 worth of damages per event.<sup>64</sup> This average damages per event are based on wind damages from 1950 through 2007. During that timeframe there were 48 reported incidences of damages from windstorms.

#### Relationship to Other Hazards—Cascading Effects

- Numerous. A tornado or straight-line wind storm, can lead to total destruction of buildings and wide-scale casualties. There can be fires, disruptions to transportation infrastructure and other infrastructure, and potential public health emergencies. Catastrophic events such as these may also create the potential for civil unrest.
- Emergency Response. Emergency response times can also be affected by infrastructure being damaged. Cell phone towers and telephone lines can be downed delaying calls for help.

#### Previous Occurrences of the Hazard

There were 11 documented tornados in Jackson County from January 2000 through July 2014. There were 46 thunderstorm wind events documented during this same time period. Straight-line winds are classified by NOAA as thunderstorm wind events.

**RA Table #22**

**Tornados – Jackson County**

Date	Location	Event Narrative
9/5/2004	Lakefield	A tornado damaged corn crops, trees, and an outbuilding on a farm.
5/4/2012	Lakefield	Thunderstorms produced a variety of large hail, damaging winds, and brief tornadoes in southwest Minnesota on the afternoon of May 4th. There was also a report of flash flooding. No damage was reported.
5/17/2013	Miloma	Thunderstorms produced large hail at numerous locations in Cottonwood and Jackson Counties in southwest Minnesota on the late afternoon of May 17th. There were also two tornadoes reported, though no damage was reported with either. No damage was reported.

National Climatic Data Center (NCDC) Storm Events database

**RA Table #23**

**Thunderstorm Wind Event – Jackson County**

Date	Location	Event Narrative
5/4/12	Jackson Co	Thunderstorms produced a variety of large hail, damaging winds, and brief tornadoes in southwest Minnesota on the afternoon of May 4th. Thunderstorm winds tore the roof off an open faced hog barn. There was also a report of flash flooding.
5/7/13	Jackson Co	A thunderstorm produced damaging winds in northern Jackson County during the predawn hours of July 5th. A thunderstorm produced damaging winds in northern Jackson County during the predawn hours of July 5th.
6/21/13	Jackson Co	Thunderstorms produced damaging winds and large hail at numerous locations in southwest Minnesota during the late afternoon and evening

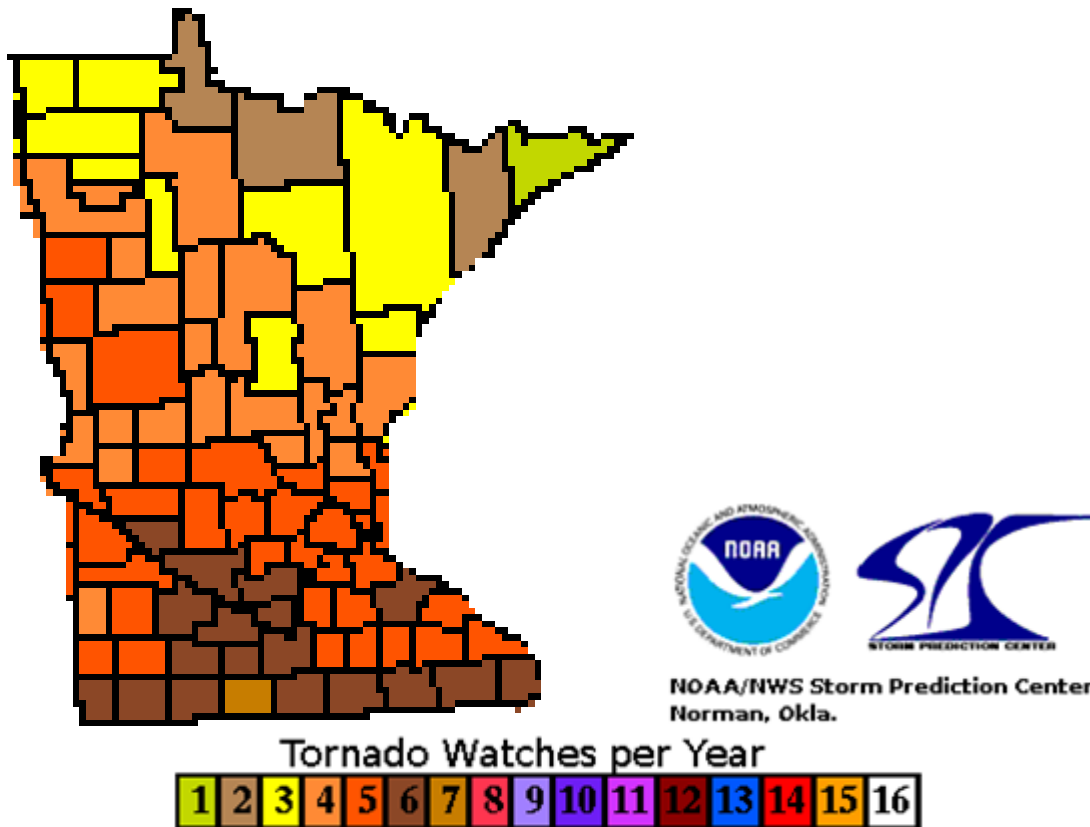
<sup>64</sup> MN All Hazard Mitigation Plan. Accessed 9/11/13. Available: [http://www.rrbdin.org/wp-content/uploads/2011/08/MN\\_state\\_mitigation\\_plan.pdf](http://www.rrbdin.org/wp-content/uploads/2011/08/MN_state_mitigation_plan.pdf)

of June 21st, with one brief tornado also reported. There was also flash flooding in Jackson County, which continued after midnight into the early morning hours of June 22nd.

National Climatic Data Center (NCDC) Storm Events database

**RA Figure #17**

**Tornado Watches per Year  
1999 – 2008 Average**



There was on average six tornado watches per year in Jackson County from 1999 to 2008. Often the right conditions exist to produce a tornado, but a tornado will not be produced. Also, an unknown number of tornados are not reported because they do not touch down or cause any damages.

RA Table #24

**Potential Structure Vulnerability to F4/F5 Tornadoes**  
**Estimated Market Value 2013 – Jackson County**

	No. Improved Parcels	Value of Parcels	At-Risk Parcels	Value
<b>City of Alpha</b>				
Agricultural	2	\$ 170,448	2	\$ 153,403
Commercial	11	\$ 389,364	10	\$ 350,428
Exempt/Non-Profit	12	\$ 701,241	11	\$ 631,117
Industrial	0	\$ -	0	\$ -
Residential	71	\$ 1,712,055	64	\$ 1,540,850
<b>Vulnerable Structures</b>			<b>87</b>	<b>\$ 2,675,797</b>
<b>City of Heron Lake</b>				
Agricultural	5	\$ 453,190	5	\$ 407,871
Commercial	37	\$ 16,068,025	33	\$ 14,461,223
Exempt/Non-Profit	25	\$ 7,999,889	23	\$ 7,199,900
Industrial	0	\$ -	0	\$ -
Residential	300	\$ 16,884,163	270	\$ 15,195,747
<b>Vulnerable Structures</b>			<b>331</b>	<b>\$ 37,264,740</b>
<b>City of Jackson</b>				
Agricultural	7	\$ 1,363,310	6	\$ 1,226,979
Commercial	164	\$ 46,145,013	148	\$ 41,530,512
Exempt/Non-Profit	73	\$ 102,309,376	66	\$ 92,078,438
Industrial	6	\$ 13,273,410	5	\$ 11,946,069
Residential	1290	\$ 123,034,680	1161	\$ 110,731,212
<b>Vulnerable Structures</b>			<b>1386</b>	<b>\$ 257,513,210</b>
<b>City of Lakefield</b>				
Agricultural	3	\$ 634,815	3	\$ 571,334
Commercial	97	\$ 7,554,747	87	\$ 6,799,272
Exempt/Non-Profit	40	\$ 22,537,992	36	\$ 20,284,193
Industrial	0	\$ -	0	\$ -
Residential	765	\$ 61,357,557	689	\$ 55,221,801
<b>Vulnerable Structures</b>			<b>815</b>	<b>\$ 82,876,600</b>
<b>City of Okabena</b>				
Agricultural	6	\$ 651,816	5	\$ 586,634
Commercial	17	\$ 467,311	15	\$ 420,580
Exempt/Non-Profit	17	\$ 4,819,264	15	\$ 4,337,338
Industrial	0	\$ -	0	\$ -
Residential	95	\$ 5,157,985	86	\$ 4,642,187
<b>Vulnerable Structures</b>			<b>121</b>	<b>\$ 9,986,738</b>

<b>City of Wilder</b>					
Agricultural	6	\$	527,571	5	\$ 474,814
Commercial	1	\$	494,000	1	\$ 444,600
Exempt/Non-Profit	1	\$	34,780	1	\$ 31,302
Industrial	0	\$	-	0	\$ -
Residential	30	\$	974,855	27	\$ 877,370
<b>Vulnerable Structures</b>				<b>34</b>	<b>\$ 1,828,085</b>
<b>Vulnerable Structures</b>				<b>2773</b>	<b>\$ 392,145,171</b>

Assuming a 90% destruction rate per National Weather Service  
Source: JACKSON County Tax System Data Base; July 2014

Straight-line winds can also cause property damage, but there is less risk of loss of life associated with straight-line winds. Tornadoes and straight-line winds can be most devastating to those living in mobile homes, boats, or RV's. The 2010 Census identified 73 mobile home units in Jackson County.<sup>65</sup>

### *Probability of Future Events of this Hazard*

Tornado and Straight-line Wind events are likely to take place in any year. Tornadoes are less common than straight-line wind events, but communities need to be prepared since loss of life is a risk associated with these two hazards. The potential frequency of tornadoes and straight-line wind events in Jackson County is likely according to the planning team.

### *Vulnerability*

Severe wind events can cause minor damage to structural failure and full-scale devastation. The risk level assigned to tornadoes and straight-line wind events by the planning team is high. Residents and travelers must be warned of impending danger immediately before and during a Tornado or severe Straight-line Wind event. With I-90 traversing through the County there are a number of travels who may be caught out on the road with little protection. Blue Mound State Park is also an area that poses a serious risk since there are no safe rooms in the park.

### *Plans and Programs*

- Severe Weather Spotter Network - The severe storm spotter network, sponsored by the National Weather Services (NWS), enlists the help of trained volunteers to spot severe storm conditions and report this information to the NWS. No tornado warnings are given unless the storm has been spotted by someone or is confirmed by NWS radar reports. The County has a number of trained severe weather spotters who report directly to the NWS when severe weather is observed.
- Severe Weather Shelters - The Minnesota State zoning ordinance regarding severe weather shelters has been adopted by Jackson County. This ordinance requires on-site shelter for mobile home park residents or provides information on evacuation routes to safe shelters elsewhere. There is one mobile home park in Jackson County, which is located in the City of Lakefield.

<sup>65</sup> FactFinder. Accessed 5/29/13. Available: <http://factfinder2.census.gov>

- NOAA Weather Radio - NWR broadcasts official warnings, watches, forecasts, and other hazard information 24 hours a day, seven days a week. The nationwide network of radio stations broadcast continuous weather information from the nearest National Weather Service office. The NWR is your primary source of comprehensive weather and emergency information regarding all hazards.
- Outdoor warning sirens - Outdoor warning sirens offer last minute warnings to take shelter. The primary purpose of the outdoor warning siren is to alert people who are outside to severe weather, chemical hazard, or other emergency. If you hear an outdoor warning siren you should seek shelter immediately. Most of the cities in Jackson County have good coverage by emergency sirens that can be activated to warn residents in the event of a severe weather event or other emergency. All of the sirens in Jackson County have been converted to narrow band frequency.
- County Emergency Management Plan - The county Emergency Management Plan designates where to go in case of an emergency, who the main contacts are, and who is in charge of response and clean up.
- Minnesota State Parks and Trails Severe Weather Policy - Kilen Woods State Park uses the severe weather policy to guide park campers and visitors during severe weather. The purpose of the policy is to direct state park and state recreation area managers to provide information and communication methods to state park, state recreation area and forest recreation area visitors for managing their safety during adverse weather situations. State parks, state recreation areas and state forest recreation areas will have posted general procedures on how visitors should respond to severe weather events. Division of Parks and Trails staff will make reasonable efforts to advise visitors of impending severe weather information when staff is present. The state park and state recreation area manager is responsible for the implementation of this policy. State park, state recreation area and forest recreation area visitors are ultimately responsible for their own safety during severe weather.
- Text Alert - Jackson County Central Public Schools have a text alert system for emergencies and school closings.
- Tornado drills – Jackson County Central Public Schools and Heron Lake – Okabena Public Schools participate in severe weather awareness week. The schools have a plan in place for tornadoes and other severe weather events.

**RA Table #25 Outdoor Warning Sirens – Cities**

Cities	Sirens Adequate	Feedback	Have backup battery
Alpha	Yes		Yes
Heron Lake	Alright	Siren coverage is very good in the majority of town (southeast of Hwy 60) The houses on CR 9 to the NW of the hwy may have trouble hearing if the wind is from the NW	No
Jackson	No	Two sirens are needed. One siren is needed by the industrial park and by Fort Belmont.	All of the sirens are equipped except one
Lakefield	No	Siren coverage is adequate, but an expected development on the Eastern side would require an additional siren at that time. There is also one siren that is unreliable.	No

		Lakefield has been working with Raycom for repair. It works with a manual start, but does not always work with the remote start.	
Okabena	Yes		Yes
Wilder	Yes		No

### *Gaps and Deficiencies*

- Shelters in nursing homes - A number of nursing homes in Jackson County do not have basements shelters or other suitable shelters for the residents. A survey conducted by the Southwest Area Agency on Aging analyzed how many nursing homes within the county do have basements shelters or other suitable shelters for the residents. Over 90 percent of the respondents indicated that their facility does NOT have a basement that can be used for a shelter. While some of the facilities do have basements, in the event of a violent storm residents are moved into an interior hallway away from windows. This policy is in place because the majority of the residents are elderly and don't move well, so it would be difficult to move all the residents to the basement.
- Shelters in mobile home parks - Mobile homes typically do not provide adequate emergency shelters for residents. Mobile home parks are required to have an Emergency Management Plan, park managers are not notified by emergency management personnel when there is a severe storm warning system. Residents are told where they can go for provided shelter, but they are not given directions of what to do during an emergency.
- Warning sirens - The effective range of warning sirens is limited. Rural areas are outside the range of the severe weather warning system areas.
- Local radio and television - Local radio and television stations do provide warnings, but they are effective only if tuned to the local channel. Satellite and internet based mediums are widely used, so local emergency broadcasts are limited. Language barriers can also be an issue regarding severe weather warnings.
- Tornado preparedness training - Training should be given to educate residents as to where to go in their own homes during a tornado.
- Countywide basement study - A small number of homes in the county lack basements that would provide shelter in the event of a tornado or damaging winds from a severe thunderstorm. The county needs to better assess how many actual homes do not have basements, and then develop a plan to provide shelter to those residents.
- Severe weather spotters network - While the county participates in the severe weather spotters network, sponsored by the NWS, the county has trouble getting enough volunteers to make this an effective program.
- Safe rooms / tornado shelters - Not all parks in Jackson County have a safe rooms / tornado shelters. Funding is an obstacle for the construction of safe rooms.
- Warning sirens - Not all parks and campgrounds in Jackson County have a warning siren. There is only one siren currently at Loon Lake. Two additional sirens are needed to provide adequate coverage around the lake. There is also no siren at the Sandy Point Campground on Heron Lake.

There are no sirens by Clear Lake. There is a new development and camp ground on Clear Lake. A siren is needed to provide adequate coverage around the lake.



- Backup batteries - Not all sirens are equipped with a backup battery. If the power goes off as a result of the storm, the siren is useless if it does not have a backup generator. Refer to table RA Table #25 for warning sirens in Jackson County that do and do not have backup batteries (backup power generation).

#### *Existing Mitigation Measures*

- Emergency Shelters - Local units of government within Jackson County provide emergency shelters for travelers and dislocated residents.
- Warning siren - Jackson County installed a new warning siren at Fish Lake. This warning siren is equipped with a backup battery. The City of Alpha replaced one of their warning sirens. The City of Heron Lake replaced their main siren in the city. The City of Jackson replaced two sirens and have two more sirens planned.

### **Manmade Hazards**

Manmade hazards are hazards caused by humans rather than nature. These hazards are primarily caused directly by people or in the case of disease spread person to person, rather than by natural events. The nature of this hazard covers acts both intentional and accidental. Manmade hazards considered in this plan include terrorism, hazardous materials and meth labs, public health emergencies, and risks to transportation infrastructure.

## **B1 Civil Disturbance and Terrorism**

Several large-scale manmade disasters have highlighted the need to address terrorism along with civil disturbance. Timothy McVey was in Minnesota conducting surveillance on the Whipple Federal Building before he decided to attack the Murrah Federal Building in Oklahoma City. The 2001 World Trade Center and Pentagon attacks demonstrate the need to protect our citizens, in large cities and small. Civil disturbance and terrorism was assigned a hazard rank of low by the planning team.

FEMA's *Integrating Manmade Hazards into Mitigation Planning* guide explains:

*The term “terrorism” refers to intentional, criminal, malicious acts. There is no single, universally accepted definition of terrorism, and it can be interpreted in many ways. Officially, terrorism is defined in the Code of Federal Regulations as “...the unlawful use of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives.” (28 CFR, Section 0.85). The Federal Bureau of Investigation (FBI) further characterizes terrorism as either domestic or international, depending on the origin, base, and objectives of the terrorist organization; however, the origin of the terrorist or person causing the hazard is far less relevant to mitigation planning than the hazard itself and its consequences.*

For the purposes of this plan, civil disturbance and terrorism refers to the use of:

- Weapons of Mass Destruction (WMD), including biological, chemical, nuclear, and radiological
- Arson, incendiary explosive, and armed attacks
- Industrial sabotage and intentional hazardous materials releases

- Cyber Terrorism
- Staging grounds for acts to take place in other areas

Within these general categories, however, there are many variations. Particularly in the area of biological and chemical weapons, there are a wide variety of agents and ways for them to be disseminated.

### *Locations Affected by the Hazard*

Terrorism can take the form of both the act of taking out a target to the planning that goes into an attack. All locations in Jackson County are at risk from this hazard. Cities, public and private buildings, churches, and schools may all be targets for attacks. Due to the rural nature of Jackson County, rural farmsteads may be inviting staging grounds for terroristic groups or individuals. Training and planning could take place in these rural settings due to the seclusion. The planning team identified the spatial extent of civil disturbance and terrorism as local.

### *Extent of the Hazard*

Protests and demonstrations in the United States tend to be scheduled peaceful gatherings. Civil disturbances can erupt if liberties are threatened by the government or if excessive force is used. Public protests and demonstrations can lead to windows being smashed, dumpster fires being lit, cars being overturned, and demonstrators and officials being injured. The potential severity of a civil disturbance or terrorist event is minor according to the planning team.

### *Domestic Concerns*

The Minnesota All Hazard Mitigation Plan (MAHMP) defines domestic terrorism as involving groups or individual whose unlawful activities are directed at elements of our government or population without foreign direction. Domestic Preparedness focuses on mitigating these activities without foreign direction.

The US Department of Homeland Security (DHS) and the FBI classify domestic threats in four broad categories—special interest, rightwing, leftwing, and lone wolf. While current monitoring is typically classified at the Law Enforcement Sensitive (LES) level, the MAHMP notes that there are specific areas of concern within Minnesota. Two examples specifically cited in the state plan (p.172):

- *Both lone gunmen and small organized cells have planned and carried out attacks in public places, such as the school shootings at Red Lake (2005).*
- *Minnesota's growing migrant worker populations, including East African, South East Asian, and other ethnic groups, have numerous documented affiliations with criminal/gang-related activity. As well, the American Nazi Party has been active within the state.*

### *International Concerns*

Threats from abroad are typically addressed at the federal level. The state Mitigation Plan defines international terrorism as involving groups or individuals whose terrorist activities are foreign-based and/or directed by countries or groups outside of the United States or whose activities transcend national boundaries. The state plan notes (p 172):

*The local FBI Joint Terrorism Task Force (JTTF) is among the most active in the nation, addressing the issue of overseas financial transfers and groups such as Al Qaeda, Hizballah, Hamas, Al-Ittihad al-Islami and Islamic Jihad. These cases provide examples that the threat of terrorism warrants attention and consideration.*

#### **Relationship to Other Hazards—Cascading Effects**

- Numerous/Uncertain. The nature of domestic or international terrorism is inherently unpredictable. Cascading effects depend on the specifics of the event. Release of anthrax or other biological agents could lead to animal and crop disaster. Small pox has also been threatened as a biological agent.

Destruction of a bridge would lead to a crisis with transportation infrastructure. Destruction of an industrial or farm chemical site could lead to a hazardous material being carried by water and wind to other areas, having far reaching effects. A bomb or other explosive device could lead to fires.

#### **Previous Occurrences of the Hazard**

Jackson County has been fortunate to not have experienced any major incidents that could be classified as domestic unrest or terrorism.

#### **Probability of Future Events of this Hazard**

The potential frequency of a civil disturbance or terrorist event is unlikely according to the planning team. Due to the rural nature of Jackson County, it is more likely for the county to be used as a staging ground for a terrorist event.

#### **Vulnerability**

The unpredictable nature of terrorism creates a crisis between liberty and safety. A balance has to be struck between letting people live their lives and trying to keep people safe. Terrorism is a serious risk, so mitigation needs to be strategic and focused. The risk level assigned to civil disturbance and terrorism by the planning team is average.

#### **Plans and Programs**

- Emergency Operations Plan - The Jackson County Emergency Operations Plan outlines procedures for county and local governments to deal with the occurrence of civil disturbances.
- Media outreach - Jackson County has established a position of public service operator. The position is identified in the Jackson County Emergency Operations Plan and is named by department in the event of an emergency.
- Law enforcement - Local, State, and Federal Law Enforcement monitor and analyze possible terrorist threats. Local law enforcement has plans in place to call upon regional and state assets to help with terrorism and civil disturbances. This consists of a Community Emergency Response Team (CERT) from the Twin Cities, Chemical Assessment Team (CAT) from Marshall, bomb squad from the Twin Cities, and the National Guard.
- School Plans - Local schools have plans in place and have drills to practice the response actions in the plans.

### *Gaps and Deficiencies*

- Emergency Operations Plan - The Jackson County Emergency Operations Plan does not reflect possible worst case scenarios in regards terrorist events.
- Scenario Planning - Annual scenario training should occur regarding lethal attacks and other terrorist events. Planning should occur with schools in Jackson County and at other government buildings. It is difficult to bring all of the different organizations together to plan (schools, law enforcement, emergency management, etc.).
- Evacuation Plans - spaces that have higher population densities should have evacuation plans. A non-exhaustive list of locations includes schools, AGCO, the race track, etc.
- Specialized Equipment - Emergency responders are in need of specialized equipment to deal with hazardous materials. This equipment is often expensive, single use items.
- Riots - Highest potential cases and locations for potential riot need to be identified.
- High value targets - High value locations for potential threats include: elevators and fertilizer storage facilities. A rural agricultural area can provide the space and material need plan a large scale terrorist act.
- Cyber Terrorism - The Jackson County Planning Team identified internet viruses as a major threat to the county. The Planning Team believes there is a likely chance that the county will have to deal with at least one internet virus annually. The Planning Team also identified the county computer server as a critical site to protect from cyber terrorism.
- Antivirus software - Better plans and programs need to be implemented to ensure that all computers remain current with their current anti-virus updates.
- A countywide warning system - A countywide warning system for a disaster is not currently in place. Many residents would be left without warning in the event of a major catastrophe. A warning system that can send out messages to residents via phone, email, and social media.
- Response time - The HAZMAT and bomb squad are out of the Cities of Marshall, Mankato, and the Twin Cities which make their response times long. Jackson County is working to be able to have the HAZMAT team and bomb squad out of Sioux Falls cover Jackson County, but state lines are causing problems for establishing this system.
- Design and operation - The design and operation of facilities in the county were not developed with terrorism prevention in mind. Jackson County government buildings, including the county courthouse and city hall, have unrestricted pedestrian access. Jackson County various public buildings do not have up-to-date water supply and fire suppression system and are not blast resistant.
- Continuing education - Continuing education occurs for emergency responders, but additional in-depth training may be needed.

### *Existing Mitigation Measures*

- Statewide domestic preparedness strategy - Local, regional, state, and national efforts are working together to combat hazards associated with terrorism and civil disturbances. These efforts include but are not limited to training, sharing of resources, planning, and participating in the statewide domestic preparedness strategy.

- Terrorism Risk Assessment - Jackson County Emergency Management Staff conducted a countywide terrorism assessment.
- Schools in Jackson County have increased safety at their entrances by limited access.

## **B2 Dam Failure**

Dams maintain lake levels and help control flooding and the destructive power of water. Dams and impoundments are a critical part in minimizing erosion. “There are more than 1,250 dams in Minnesota; 800 are public dams, and the state owns over 430 of the public dams. Most of the public dams are more than 50 years old and require ongoing emergency repairs and reconstruction to maintain their structural integrity.”<sup>66</sup>

Dam failure is defined as a collapse or failure of an impoundment resulting in downstream flooding. Dam failure was assigned a hazard rank of low by the planning team. The Department of Natural Resources (DNR) has a dam safety program that inspects the structural integrity of dams and impoundments. The DNR classifies dam structures in three categories:

- Class 1; High Hazard: any loss of life or serious hazard to public;
- Class 2; Significant Hazard: possible health hazard or probable loss of high-value property;
- Class 3; Low Hazard: property loss restricted to rural outbuildings and local roads.

### ***Locations Affected by the Hazard***

There are seven dams in Jackson County that include: Christina 5 Dam, Fish Lake Dam, Gruhlke Dam, Heron Lake Outlet Dam, Jackson Dam, Loon Lake Dam, and Tobola Detention Dam. The Christina 5 Dam is located by the Christiana Bridge on 900th Street and is privately owned. The Fish Lake Dam is located on Fish Lake is owned by the Minnesota DNR. The Gruhlke Dam is a detention dam located north of the City of Jackson on a slough southeast of the intersection of 805th Street and 520th Avenue. The Gruhlke Dam is privately owned. The Heron Lake Outlut Dam is located on Heron Lake and is owned by the Minnesota DNR. The Jackson Dam located along the Des Moines River in the City of Jackson and is owned by the City of Jackson. The loon Lake Dam is located on Loon Lake and is owned by the Minnesota DNR. The Tobola Detention Dam is located north of the City of Jackson on a slough southeast of the intersection of 830th Street and 525th Avenue. The Tobola Dam is privately owned. The Gruhlke Dam and Christina Dam are classified as Class 2 dams, which pose a significant hazard: possible health hazard or probable loss of high-value property. All of the other dams in Jackson County are classified as Class 3 dams, which pose a low hazard: property loss restricted to rural outbuildings and local roads.

Select areas along other streams and water ways in Jackson County where impoundments were constructed to hold back water are also susceptible to flooding from impoundments washing out or dam failure upriver. The planning team identified the spatial extent of dam failure as local. The City of

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<sup>66</sup> Minnesota Department of Natural Resources. Accessed: 11/14/13. Available: [http://www.dnr.state.mn.us/waters/surfacewater\\_section/damsafety/index.html](http://www.dnr.state.mn.us/waters/surfacewater_section/damsafety/index.html)

Jackson removed and replaced the dam on the Des Moines River located in downtown Jackson with impoundments, due to the age of the structure. The City worked with the Minnesota Department of Natural Resources (DNR) to install natural rock rapids, which the DNR said will improve stream flow and fish passage, while reducing the risk of dam failure.

In 2006, the Des Moines began to undercut an abutment of the Windom Dam, just upriver from Jackson County. The issues at the Windom Dam were studied and in the 2011 the dam was removed. Natural rock rapids were installed to help control river levels and erosion.

### *Extent of the Hazard*

Dam failure, although the risk is minimal, has the potential to be devastating to the areas within the floodplain and around the streams directly below impoundments and dams. Dam failure may result in flash flooding, extensive property damage, erosion, destruction of infrastructure including road and culvert, and loss of life. The potential severity of dam failure is minor according to the planning team.

### *Relationship to Other Hazards—Cascading Effects*

- Flash Flooding. Dam failure has the potential to cause damage to the areas directly below the dam. Dam failure would cause immediate flash flooding, destruction of property, erosion of crops, infrastructure damage, and the possible of lives being lost. Damage to public infrastructure could also occur in areas of heavy water movement.

### *Previous Occurrences of the Hazard*

Jackson County has not experienced a major dam failure.

### *Probability of Future Events of this Hazard*

Free flowing water has tremendous power. It can move boulders, carve out rock, and erode an impoundment or dam. It is important to slow the runoff of water, so groundwater supplies can be replenished and the volume of free flowing water in streams and rivers is reduced. Reducing the free flowing water in streams and rivers will help to preserve impoundments and dams, but over time impoundments and dams will require maintenance and replacement. The potential frequency of dam failure affecting Jackson County is unlikely according to the planning team.

### *Vulnerability*

All dams in Jackson County are classified as a Class 2 or Class 3 dam. Class 1 dams are the highest classification level. A dam classified Class 1 pose the highest risk of damage if failure would occur and are inspected annually. A dam classified Class 2 pose a significant risk of damage if failure would occur and is inspected every three to four years. A dam classified Class 3 pose a low risk of damage if failure would occur and are inspected ever eight years. Ground water quality is the biggest vulnerability if a dam was to fail in Jackson County. Erosion would result in topsoil being stripped from land and taken downstream. The risk level assigned to dam failure by the planning team is limited.

### *Plans and Programs*

- Minnesota Dam Safety Program - The Minnesota Department of Natural Resources (DNR) regulates nearly 900 dams in the State of Minnesota. The DNR and U.S. Army Corps of Engineers

regularly inspect dam and reservoir capabilities for flooding and dam failure. The Minnesota DNR dam safety program inspects the structural integrity of dams and impoundments in Jackson County. The classification of the dam depends on how often the dam is inspected. A dam classified as High Hazard is inspected annually. A dam classified as Significant Hazard is inspected every three to four years. A dam classified as Low Hazard is inspected every eight years.

- Dam Emergency Action Plan - The Minnesota DNR drafts an Emergency Action Plan (EAP) for all High Hazard dams and strongly recommends that Significant Hazard dams be included as well. An EAP is a formal document that identifies potential emergency conditions at a dam and specifies preplanned actions to be followed in order to minimize property damage and loss of life in the event of a dam failure.
- Annex A - Notification and warning section of the Jackson County Emergency Operations (EOP) explains the procedures for countywide notification in the event of an emergency.
- Annex F - Evacuation, Traffic Control and Security section of the Jackson County EOP explains the procedures of evacuation during an emergency.

#### *Gaps and Deficiencies*

- Dam evacuation plan - Jackson County does not have an identified dam evacuation plan. In the event of a dam failure, residents below the dam would need to know evacuation routes. There is no communication system or program to warn downstream communities and residents.
- Registry of dams - Not all dams and impoundments are identified by the DNR. If the dam is not on the registry, the dam does not get inspected by the DNR. Non-identified dams could be at risk of failing, since they are not inspected.
- Infrequency of inspection - Dams in Jackson County that are all classified by the Minnesota DNR as Low Hazard dams and therefore only get inspected every eight years. The infrequency of inspection may result in maintenance being deferred for a number of years or structural deficiencies not being identified. Inadequate maintenance could result in dam failure.
- Dam property - Property around the dams in Jackson County is in private and public ownership. Local authorities enforce trespassing laws on both private and public-owned property directly surrounding the dams, but these properties are easily assessable. Structural damage to a dam could result in flooding downstream.

#### *Existing Mitigation Measures*

- Impoundment dam in the City of Jackson. The Impoundment dam replaced the old dam.

### **B3 Hazardous Materials**

Hazardous materials are found everywhere, from farm to home. A hazardous material is any item which has the potential to cause harm to humans, animals, or the environment, by itself or through interaction with other factors. Spilled material can be costly to clean up and may render the area of the spill unusable for an extended period of time. Water supplies may become contaminated by the introduction of point and non-point source pollutants into public ground water and/or surface water supplies. Hazardous materials were assigned a hazard rank of moderate by the planning team.

### *Locations Affected by the Hazard*

All locations in Jackson County are affected by this hazard. The planning team identified the spatial extent of hazardous materials as countywide. In Jackson County there are a number of manufacturers who use and or produce a number of hazardous chemicals. I-90 runs through the county and this major transportation corridor has a high volume of semi-truck traffic. The loads coming to the county and through the county varies, but some of these loads could pose as a serious chemical hazard if a crash would take place. Oil tankers are one example.

Many chemicals are also used daily in agriculture, putting farms and rural communities at risk. Anhydrous ammonia is one dangerous chemical used in agriculture that if not handled properly can be very dangerous. Methamphetamine (commonly referred to as “meth”) manufacturers have targeted isolated rural homes and abandoned farm sites for illegal drug labs. However, these individuals also have been known to set up labs in their car or basement in town, so populations in town are equally at risk of a meth lab explosion and other hazards.

### *Extent of the Hazard*

Federal law defines certain hazardous chemicals, and requirements for emergency planning for facilities at which hazardous substances are present. According to the Minnesota AHMP, approximately 6,000 facilities across the state report their storage of hazardous chemicals to the Minnesota Department of Public Safety’s Emergency Planning and Community Right-To-Know Act (EPCRA) Program, US Environmental Protection Agency (EPA), and their local fire department. Within Jackson County there are 26 facilities that report hazardous material storage to state and local authorities. These 26 facilities are known as 302 facilities after EPCRA Section 302(c) that require state and local authorities to develop chemical emergency preparedness and response capabilities through better coordination and planning with local businesses. The potential severity of hazardous materials is minor according to the planning team.

### *Chemicals*

Land use activities and farming practices can have significant impacts on vulnerable aquifers. Aquifers in the region are often shallow and have a high potential of contamination from nitrate leaching. Deeper aquifers may not be suitable for water supplies due to naturally occurring contaminants, such as sulfur, or because of slow well recharge. Nitrates have been identified as a specific problem in the region.

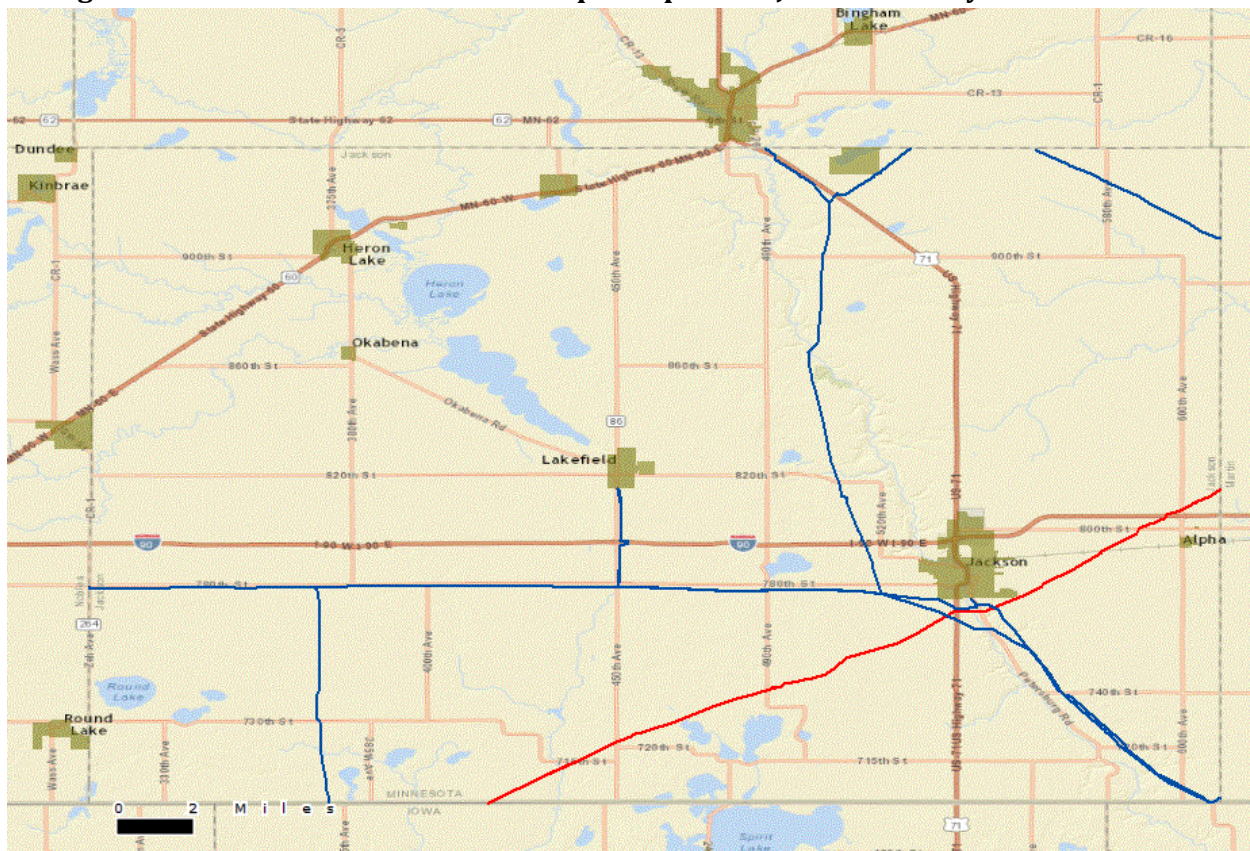
### *Pipelines*

The State Fire Marshall’s Pipeline Safety Team (SFMPST) oversees pipeline operations in Minnesota. The National Pipeline Mapping System identifies one Hazardous Liquid Pipeline traversing Jackson County. The pipeline is red in the map below and is south of the City of Jackson and is north of the City of Alpha. There are also several Gas Transmission Pipelines in Jackson County. These pipelines are blue in the map below. Pipelines are pressurized and monitored, so pipelines can be quickly shut off in case of an accident. Pipelines are a safer way to transport hazard liquids than by trucks or rail. “The evidence is clear: transporting oil and natural gas by pipeline is safe. Furthermore, pipeline transportation is safer



than transportation by road, rail, or barge, as measured by incidents, injuries, and fatalities—even though more road and rail incidents go unreported.”<sup>67</sup>

**RA Figure #18 Hazardous Liquid Pipeline – Jackson County**



Source: National Pipeline Mapping System

## Meth

Meth is a powerful stimulant drug that is similar to a family of drugs called amphetamines. During the production process there are a number of dangerous chemicals that are mixed that can cause dangerous fires and explosions. According to the Rand Drug Policy Research Center, amphetamines are the most widely used illicit drug worldwide, after marijuana.<sup>68</sup> Information in regional data systems and feedback from law-enforcement agencies and county hospital (Sanford Jackson Medical Center) indicate that meth is still a problem facing the populations they serve.

## Decommissioning of Wind Towers

There are a number of wind towers in Jackson County and more are being built. There is a concern of wind towers being abandoned and property owners left with removal and cleanup. There are removal and cleanup guarantees in the majority of the contracts with the wind farms, but if the wind farm files

<sup>67</sup> Manhattan Institute for Policy Research. Issue Brief – Pipelines are Safer for Transportation of Oil and Gas. Accessed: 7/23/15. Available: [http://www.manhattan-institute.org/html/ib\\_23.htm#.VbFOi6\\_bK70](http://www.manhattan-institute.org/html/ib_23.htm#.VbFOi6_bK70)

<sup>68</sup> Rand. Accessed: 5/29/13. Available: [http://www.rand.org/pubs/research\\_briefs/RB9438/index1.html](http://www.rand.org/pubs/research_briefs/RB9438/index1.html)

bankruptcy or closes all together, there may not be funding for removal and cleanup. There would be a substantial cost associated with decommissioning wind towers.

#### **Relationship to Other Hazards—Cascading Effects**

- **Fire.** Hazardous materials incidents may cause or occur in conjunction with a fire. This could result in the fire spreading at a fast rate and can make containing and fighting the fire more difficult. Specialized equipment may be required to combat the fire caused or in conjunction with a hazard material.
- **Water Supply Contamination.** An incident involving hazardous materials on the roads, rail, or in the air can lead to a water contamination issue. Wellhead Protection Plans discuss the infiltration of chemicals leaking into ground water aquifers. The issue of infiltration could be multiplied by a load of hazardous materials on I-90 being in a crash and causing contamination to the ground water.
- **Terrorist activity.** Most hazardous materials in transit are marked, but there is an unknown volume of government materials being shipped that are not marked due to security reasons. Since I-90 traverses through Jackson County, there is an increased risk of a semi-truck crash being stolen and used in a terrorist activity.
- **Public Health Emergency.** Hazardous materials being proceeded in or shipped through Jackson County could be involved in a crash. The exposure of radiological substances by unprotected humans might result in the negative effects caused by such an exposure. It can be life threatening depending upon how much exposure and the length of the exposure time.

#### ***Previous Occurrences of the Hazard***

Hazardous material incidents can occur in different locations:

- Fixed site facilities
- Highway and rail transportation
- Air transportation
- Pipeline transportation

There have not been any major hazardous materials incidents in Jackson County. Hazardous material incidents also include the discovery of underground storage tanks and other minor incidents. Removal of underground storage tanks is required procedure by EPA, but in the past barrels and other materials were buried and discarded. It is unknown how many hazard materials are buried in Jackson County.

#### **Meth**

Meth labs are a concern in the region and an incident at a lab could result in a major hazard material incident. A number of hazardous chemicals are used in the production process. An explosion and fire could result in a number of chemicals being emitted into the air and the ground water. There is also chemical byproduct from cooking meth that is often discarded. This chemical byproduct could infiltrate the ground water and cause ground water contamination.

### *Probability of Future Events of this Hazard*

The potential frequency of hazard events involving hazardous materials is occasional according to the planning team. With I-90 traversing through the county and two Class I railroads (the Canadian pacific and the Union Pacific), there is a high probability that there will be a crash involving hazardous materials. Refer to RA Figure #21 for the Minnesota Railroad Map in the Transportation Infrastructure subsection.

As traditional drugs, like cocaine, become more scarce and expensive due to the War on Drugs, it is likely demand for synthetic drugs, like meth, to increase. This increase in demand will entice more people to supply the drug. Meth can be produced locally and is relatively inexpensive to manufacture, so as the number of meth labs increase due to the increase in demand, the probability of a hazardous event involving a meth lab increases.

### *Vulnerability*

With I-90 and a Class I railroad crossing the Jackson County, hazardous materials may be traveling through the area at any time. This volume of hazard materials traversing Jackson County poses a serious risk of a hazardous material incident occurring. The risk level assigned to hazardous materials by the planning team is average. Precautionary measures are in place to prevent an incident from occurring, but a crash on I-90 involving a tanker of hazardous materials could result in a major hazardous material incident. A major incident could have large cascading effects since almost all water for public consumption in Southwest Minnesota is sourced from underground aquifers, rather than surface waters.

### *Plans and Programs*

- State agency cooperation - Jackson County works directly with the appropriate state agencies to address needs for responding to and mitigating the impacts of a hazardous materials event.
- Emergency Operations Plan - Annex L discusses Radiological/Hazardous Materials and outlines procedures for dealing with hazardous material accidents, spills, and releases. Annex L identifies the 302/312 facilities within Jackson County that maintain a supply of hazardous chemicals.
- Environmental health regulations - Jackson County has worked to develop environmental health regulations and a County Safety Procedures and Policy Guide. These documents are cross-departmental plans that deal with hazardous material, infectious disease, and food-borne illnesses. They serve to provide guidelines to protect the citizens of the county.
- Training of emergency personnel - All emergency personnel are trained to at least the minimum Hazardous Materials Awareness level and all first responder groups conduct the required Occupational Health and Safety Administration training on a yearly basis.
- Incident command center - Jackson County has acquired a recreational vehicle and converted it to an incident command center, should one be needed on location at a disaster.
- Ordinance - Jackson County has a meth lab ordinance describing the policies and procedures for cleaning up such a site. The cost of the cleanup is billed to the property owner.
- Jackson County Solid Waste Plan - In 2014, Jackson County updated its 10 year Solid Waste Plan. The plan identifies the policies and programs regarding Hazardous Waste Management for the county. The plan also identifies the large waste generators within the county.

- Hazardous chemicals collection – The Jackson County Sheriff’s Office and Land Management Office works with the Department of Public Safety to assist in the statewide collection of hazardous chemicals existing at facilities throughout Jackson County so that local emergency officials can prepare for incidents.
- Household Hazardous Waste Facility - In 2002, Jackson County opened it’s greater than 90 day Household Hazardous Waste Facility. The facility takes any hazardous waste that comes from a household such as paint, cleaners, fluorescent lights.
- Mobile Household Hazardous Waste Unit - In 1992, Jackson County purchased a Household Hazardous Waste Mobile Unit to provide a service to the smaller communities within Jackson County. The unit provides an opportunity for residents to dispose of their HHW correctly and safely.
- Regional hazardous waste facility. Jackson County works with the regional office in Marshall, MN, in providing a way for Very Small Quantity Generators (VSQG) to dispose of their hazardous waste.
- Hazardous Materials Response Team - Jackson County does not have a HAZMAT Team. Jackson County coordinates with the HAZMAT Team out of Mankato and Marshall. Sioux Falls could potentially be added as HAZMAT Team, but state lines can make coordination more difficult.
- Monitoring program - A number of store owners currently report to the sheriff’s office when products are sold that are used in making meth.
- Sanford Jackson Medical Center has a stationary decontamination shower and a portable decontamination shower. There is enough personal protective equipment to decontaminate patients for approximately one hour. The facility has access to other decontamination assets and resources through the System and Regional partners which can be deployed with a phone call.
- MnDOT - MnDOT has several departments to address hazardous materials, freight, emergency management and disaster preparedness. The District State Aid Engineer is a good contact for access to those resources.
- County assistance - Although the potential risk of a radiological emergency to the county is small, Jackson County is responsible to house displaced residents from eastern Minnesota around the Prairie Island Nuclear Power Plant.
- Water Plan - Jackson County’s water plan recognizes that the county’s ground water is impacted by both agricultural and residential fertilizer and pesticide applications.

#### *Gaps and Deficiencies*

- Water Plan - The Jackson County Water Plan only addresses ground water contamination based on fertilizer or pesticide use from residential and agricultural uses. Additional detail for other hazardous substances impacting the county’s ground water would provide more detailed findings regarding the overall quality and potential risks if a hazardous materials event happens.
- Proper hazardous waste disposal - Although the Jackson County Household Hazardous Waste Facility is open, there is still a need to educate the public and businesses on how to dispose of their waste properly.
- Specialized equipment - Jackson County fire departments are in need of specialized equipment to deal with hazardous materials. This equipment is often a single use item and is a high cost item. A rural county like Jackson County typically has to share this type of equipment with neighboring counties.



- Public education - Public outreach to business owners needs to occur more frequently regarding substances used in making meth and other controlled substances.
- Meth lab cleanup -The sheriff's office and local fire departments are trained to handle a number of hazardous materials, but for meth labs and other hazard materials a HAZMAT certified cleanup team is required. The Jackson County Sheriff's Office does not have a HAZMAT Team. Meth lab clean up can be very costly. If a fire fighter goes into a fire and sees that it is a meth lab, the equipment the fire fighter is wearing is no longer good. The chemicals in the fire contaminate the suit, so there are other costs that can be associated with a meth lab fire and clean up.
- First responders – First responders are trained to recognize hazardous materials and establish a perimeter. Hazardous material training only happens every three years for emergency responders. A refresher course would be helpful for emergency responders.
- 302 Facilities – it may be time consuming to look up what hazardous materials a 302 facility is storing. A more usable database could assist with emergency response and increasing the safety of emergency responders.

#### *Existing Mitigation Measures*

- Regional and State assistance - Plans are in place specifying hazardous material cleanup and protocol for who should be contacted for regional and state assistance.

## **B4 Public Health Emergencies**

As technology developed people started to demand sewer systems, running water, and waste disposal. This helped to prevent the spread of disease and helped to maintain a healthier public. As building technology also developed people started to demand safe and well-built buildings. This made it safer for people to live and work. Local government saw these demands and has tried to create uniformity through regulation. Through this government regulation the public health service evolved.

Public health services today face new challenges to counter ever-evolving disease. The Minnesota Department of Health (MDH) works with Department of Public Safety (DPS) and other agencies to prepare for large-scale emergencies of many types. Infectious diseases can present wide threats to many people, or very narrow threats to highly susceptible populations. Public health emergencies were assigned a hazard rank of moderate by the planning team.

- An “epidemic” is a disease that occurs suddenly in numbers clearly in excess of normally expected rates.
- A “pandemic” is an epidemic that spreads across a large region.

#### *Locations Affected by the Hazard*

People throughout Jackson County are equally affected by this hazard. The planning team identified the spatial extent of public health emergencies as countywide.

### *Extent of the Hazard*

“Infectious diseases have the potential to affect any form of life.”<sup>69</sup> Some infectious diseases that were thought to have been eradicated have re-emerged and new strains present threats to the populations and require monitoring. Different strains of the influenza virus emerge seasonally and require modifications to antibiotics and vaccinations. The potential severity of public health emergencies is major according to the planning team.

Infection diseases in livestock also pose a significant risk. Food supplies could be affected and the livelihood of the owners of livestock will be impacted. Certain infectious diseases are considered more likely to present a public health emergency hazard in rural Minnesota.

Many infectious diseases are preventable and controllable. Measles, Rubella, Polio, and Pertussis are all vaccine preventable diseases. These diseases are no longer common, but a single case can cause a public health emergency. Doctors are often not looking for these diseases, so they may be overlooked which can cause the disease to spread. Also, more parents are electing not to vaccinate which puts the entire population at greater risk.

Arboviral Encephalitis commonly known as West Nile Virus is a mosquito transmitted disease that can cause encephalitis in people and horses. This virus was usually found in mosquitos and birds in Africa and Europe. However, West Nile encephalitis was reported in New York City in 1999.<sup>70</sup> In 2012, there was one death in Minnesota associated with West Nile Virus. In Jackson County there was one donor who was reported as being a carrier of West Nile Virus.<sup>71</sup>

In 2009, the Centers for Disease Control and Prevention (CDC) started taking larger steps to combat H1N1 (sometimes called “swine flu”). H1N1 was first detected in people in the United States in April 2009. This virus has the potential to spread fast and can cause severe illness in people. The virus can spread person to person, much in the same way the seasonal influenza is spread.<sup>72</sup>

Smallpox has not been an issue in the United States for more than 50 years. Due to the threat of terrorism, this disease has been thrust to the forefront of public concern and fear. Smallpox is a serious, contagious, and sometimes fatal infectious disease. There is no specific treatment for smallpox. The only prevention for small pox is vaccination.

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<sup>69</sup> MN All Hazard Mitigation Plan. Accessed: 5/29/13. Available: [https://dps.mn.gov/divisions/hsem/hazard-mitigation/Documents/2011\\_MinnesotaAllHazardMitigationPlanDraft.pdf](https://dps.mn.gov/divisions/hsem/hazard-mitigation/Documents/2011_MinnesotaAllHazardMitigationPlanDraft.pdf)

<sup>70</sup> Minnesota Department of health. Accessed: 8/19/13. Available: <http://www.health.state.mn.us/divs/idepc/diseases/westnile/>

<sup>71</sup> Minnesota Department of health. Accessed: 8/19/13. Available: <http://www.health.state.mn.us/divs/idepc/diseases/westnile/wnvmap12.pdf>

<sup>72</sup> Center for Disease Control and Prevention. Accessed: 5/29/13. Available: <http://www.cdc.gov/h1n1flu/qa.htm>

“Ebola is a rare and deadly disease caused by infection with a strain of Ebola virus. The 2014 Ebola epidemic is the largest in history, affecting multiple countries in West Africa. The risk of an Ebola outbreak affecting multiple people in the U.S. is very low.”<sup>73</sup>

#### **Relationship to Other Hazards—Cascading Effects**

- **Emergency Response.** A public health emergency will affect the ability to respond and recover from any other natural or manmade hazard. If an epidemic event were to occur, deaths could be in the many hundreds of thousands across the nation.
- **Civil Disturbance.** If the health of the general public is perceived to be threatened on a large scale, riots or states of lawlessness are a possibility.

#### ***Previous Occurrences of the Hazard***

Many infectious diseases are preventable and controllable. Standard procedures involve collection of accurate assessment data, outbreak detection and investigation, and development of appropriate control strategies based on specific epidemiological data. These activities require close collaboration between health care providers, clinical laboratories, state and local health departments, and federal agencies.

There has been one major public health emergencies in Jackson County in recent years. There was an outbreak of Legionnaires’ disease in Jackson County during the 1990s. Legionnaires' disease is a severe form of pneumonia that is caused by a bacterium known as legionella. Legionnaires’ disease causes lung inflammation, and if left untreated can be fatal. Legionella bacterium can also cause Pontiac fever, a milder illness resembling the flu. Following this event, legionella testing has remained a standing order when considering forms of pneumonia within Jackson County residents due to this particular outbreak.

Influenza is a common seasonal occurrence in Jackson County, but no major outbreak has occurred. Seasonal influenza is planned for every year. The annual seasonal influenza usually peaks February.

There are strands of influenza that can be more devastating. Influenza Type A virus has caused three pandemics in the past century worldwide with significant loss of life. Pandemics are caused by the unstable nature of influenza type A, and new subtypes that appear through genetic drifts or shifting.

#### ***Probability of Future Events of this Hazard***

People contract seasonal influenza every year. Other diseases occur regularly. The potential frequency of a public health emergency is occasional according to the planning team.

#### ***Vulnerability***

If an outbreak occurs that is contagious it is critical to quarantine the population affect by the disease. This is often difficult since the outbreak may go unnoticed for a period of time. Curtain mutations of a

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<sup>73</sup> Center for Disease Control and Prevention. Accessed 11/5/14. Available: <http://www.cdc.gov/vhf/ebola/outbreaks/2014-west-africa/index.html>

disease are also becoming more resistant to antibiotics. This is particularly true regarding influenza type A. Younger and older population cohorts are at a higher risk for acquiring a disease. The risk level assigned to a public health emergency by the planning team is average.

### *Plans and Programs*

- Emergency Operations Plan - County Emergency Management is working closely with Public Health and local healthcare facilities to mitigate and effectively respond to potential Public Health Emergencies. The Jackson County Emergency Operations Plan outlines procedures for county and local governments for contacting appropriate state and federal agencies and provides guidelines and strategies for dealing with infectious diseases. A command structure between local public health and the Emergency Manager is also outlined in the Emergency Operations Plan (public health annex).
- Des Moines Valley Health and Human Services (DVHHS) - DVHHS works with the Minnesota Department of Health (MDH) to address infectious diseases that are listed in MN Rule #4605.7040 (such as Encephalitis, Hepatitis, Influenza, Lyme Disease, Tuberculosis, and Syphilis). If any of these or other listed diseases should appear in Jackson County, DVHHS works with MDH and local medical providers to limit the spread of the disease. DVHHS routinely receives information from MDH via Health Alert Network for outbreaks occurring in Minnesota or outbreaks that could impact the state and issues appropriate information based on the most current alerts. The Health Alert Network also disperses routine disease information.
- Mass dispensing of medicines and supplies - Des Moines Valley Health and Human Services (DVHHS) and the Minnesota Department of Health maintain a Strategic National Stockpile (SNS) of needed medicines and supplies for a Public Health Emergencies. DVHHS will continue to coordinate with regional partners for mass distribution of needed medical supplies for a public health emergency. DVHHS is working with Community Options and Resources (COR) as a possible site or company for a closed Point of Dispensing.
- Media outreach - County Emergency Management works with DVHHS and other local media throughout the county in the event of an infectious disease outbreak.
- Vaccination program - DVHHS conducts outreach programs to educate residents on the benefits of routine vaccinations. Part of this outreach is to assure that children and adults have access to recommended vaccines. Targeted groups such as children with high deductibles or no insurance can receive immunizations through the agency. Flu immunizations are targeted to some adults within the county. Immunizations are designed to assist families of need in protecting their children and themselves from infectious diseases. DVHHS also participates in the South Central /Southwest Minnesota Immunization Information Connection (MIIC), which is a confidential, computerized network of shared immunizations records. It provides clinics, schools, and parents/adults with accurate, complete, and up-to-date immunization records. This system can assist in alerting participating families if there is any disease outbreak that may put them at risk in their area.
- Environmental health regulations and policies - DVHHS in cooperation with MDH has worked to develop environmental health regulations, a policy guide, and procedures to address infectious disease and food borne illness. Jackson County relies on the State for inspections.
- Outbreaks - Sanford Jackson Medical Center has written plans for Investigation of Suspected Outbreaks, Significant Epidemiologic Occurrence or Sentinel Events, Pandemic Influenza, Flu Center, and



Reporting of Communicable Diseases. Plans also include an All Hazard, Surge Capacity Planning Procedure, Mass Fatality Plan, and a Point of Distribution Plan.

- Southwest Emergency Preparedness Team (SWEPT) – SWEPT is a joint coalition of Public Health, hospitals, and clinics utilizing Incident Command to oversee any regional infections, pandemics, flu activities, or Ebola outbreak.
- MDH FluSafe Program - Sanford Jackson Medical Center has performed staff vaccination and tracked percentage vaccinated each year participating in the MDH FluSafe Program with vaccination efforts of greater than 90% for several years. In 2013, the System implemented mandatory employee vaccination with the Sanford Jackson Medical Center.

### *Gaps and Deficiencies*

- Staying up to date - The Jackson County Emergency Operations Plan will continue to need updating to reflect the changes. Part of staying up to date is coordinating more effectively with local media providers and adjoining counties and states regarding response activities.
- Mass dispensing of medicines and supplies - Des Moines Valley Health and Human Services (DVHHS) and the Minnesota Department of Health maintain a Strategic National Stockpile (SNS) of needed medicines and supplies for a Public Health Emergencies. This stockpile is vulnerable to power outages. A power outage could result in medicines and supplies not being kept cold and spoiling.
- Isolation/Quarantine (I/Q) Plan - Jackson County has not developed an isolation/quarantine plan to prevent the spread of diseases. The Isolation/Quarantine Plan will be event specific. The plan will address measures to protect the public and prevent spread of disease. Isolation measures are directed towards people already ill usually within a health care facility or off site care. Quarantine is a tool used to hold & limit contact between persons who have been exposed to a disease in their own home. Both measures are effective tools in preventing spread of disease.
- Response capabilities (facilities) - DVHHS needs to work with Emergency Management, various units of government, and health care facilities to clarify and determine the use of buildings needed to respond to a public health emergency or response to a hazard.
- Aging population - An aging population puts the county at greater risk of Public Health Emergencies. The population cohort 85 plus has increased by 22.4 percent from 2000 to 2010.<sup>74</sup> As more of the population is dependent on the younger population cohorts to help them, it puts a greater need on the rest of the population to stay health. The older population is dependent and requires services the rest of the population provides. If healthcare staff becomes sick that will put a strain on the care capacity of assistant living facilities, other elderly care facilities, and general care facilities.

### *Existing Mitigation Measures*

- Public education - Des Moines Valley Health and Human Services has various campaigns to educate the public on the importance of active living and healthy eating, vaccinations, tobacco, and other public health issues.

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<sup>74</sup> U.S. Census 2000, 2010. Accessed: 6/3/13. Available: <http://factfinder2.census.gov>

- Senior Linkage Line - The Senior LinkAge Line® is the Minnesota Board on Aging's free statewide information and assistance service. This service helps to connect Minnesotans to local services.

## **B5 Transportation Infrastructure & Transportation Crashes**

Infrastructure is a critical need for the operation and competitiveness of a city, county, or region. Infrastructure is the skeleton and nervous system of a community. Infrastructure includes roads and bridges, rail, air and transit.

Minnesotans move goods and people on a variety of transportation networks. In the wake of the Interstate 35W bridge collapse, the 2008 update of the Minnesota AHMP focused attention on the status of bridges across Minnesota. Transportation infrastructure and transportation crashes were assigned a hazard rank of low by the planning team.

### *Locations Affected by the Hazard*

Roads, bridges, rails, landing strips, and other transportation infrastructure wear out. This requires our public infrastructure to be continually upgraded and inspected. Numerous locations in Jackson County have the potential to be affected by Transportation Infrastructure hazards.

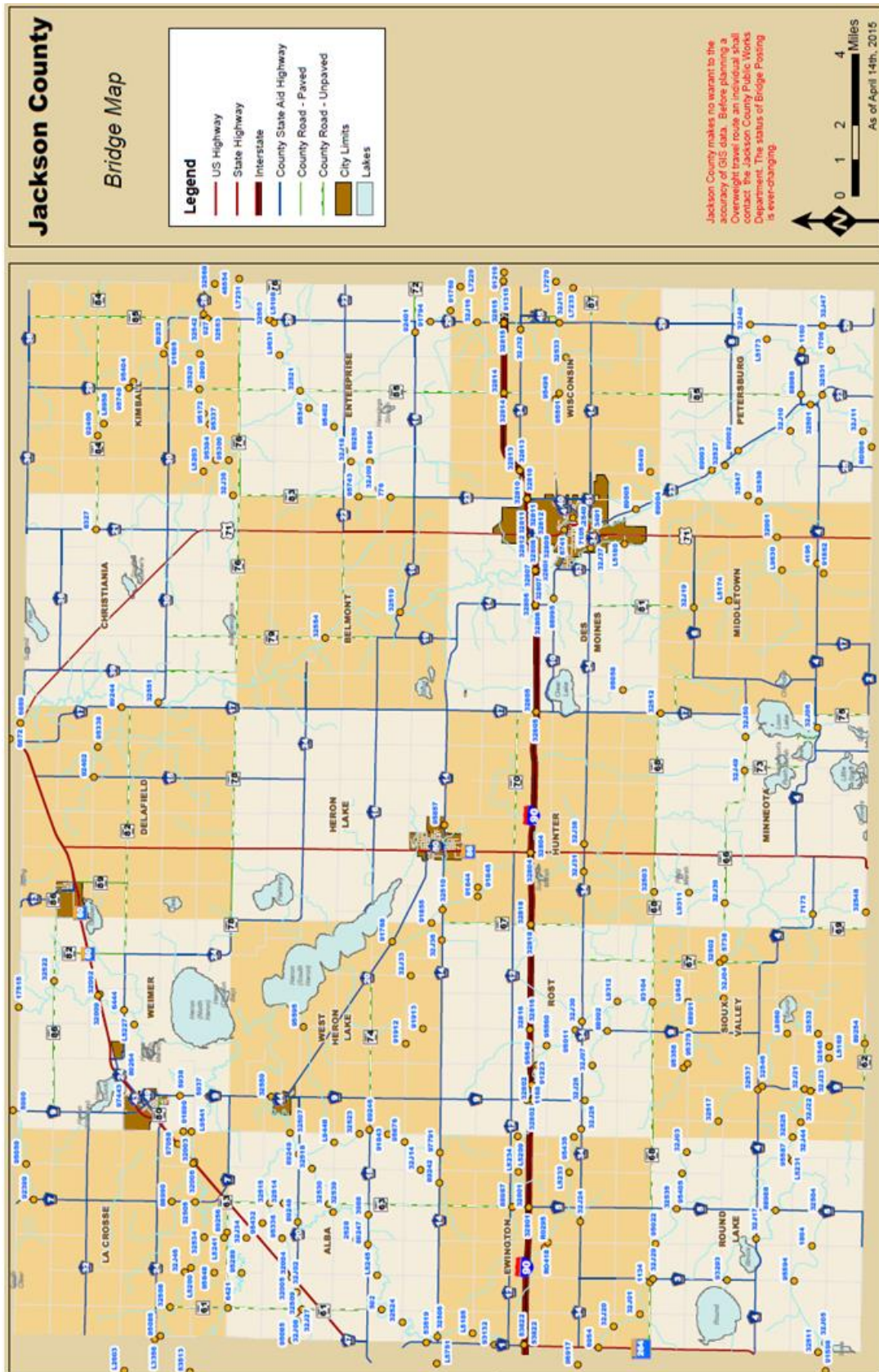
There are hundreds of miles of roadway to be monitored and maintained in Jackson County. There are gravel roads, highways, and an interstate traversing Jackson County that all require different monitoring and upkeep. It is critical keep the system in a good state of repair, so people and goods can travel safely. The planning team identified the spatial extent of transportation infrastructure and transportation crashes as local.

### *Roads*

Major roadways in Jackson County include Interstate 90, Minnesota State Highway 60, U.S. 71, and Minnesota Highway 86. There are also numerous county roads in Jackson County. These roadways connect the major population areas in the county and serve as vital farm to market routes.

RA Figure #19

# Road & Bridge Map - Jackson County



## Railroads

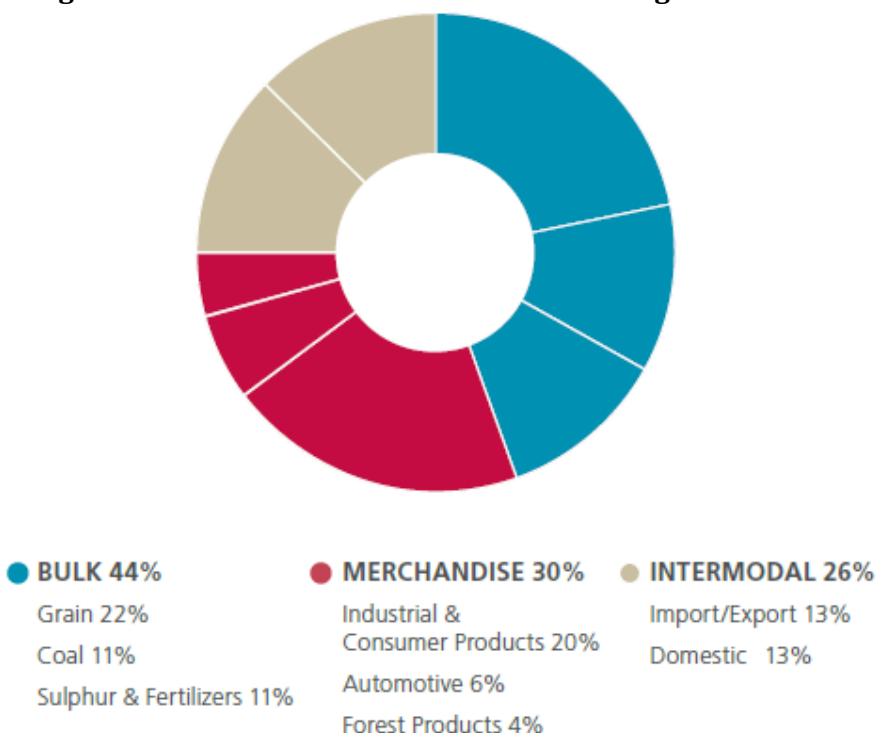
There are two railroads within Jackson County, The Canadian Pacific and the Union Pacific. Both of these railroads are Class I Railroads that move a significant volume of freight. These railroads are an important element in the county's transportation system.

"Canadian Pacific Railroad Limited operates a 14,700-mile rail network linking the principal cities of Canada from Montreal to Vancouver, and the U.S. Midwest and Northeast."<sup>75</sup> Forty-four percent Canadian Pacific Railroad Limited shipments include grain, coal, sulfur, and fertilizer. Canadian Pacific Railroad Limited is a critical part of the transportation infrastructure in Jackson County.

Union Pacific Railroad serves 23 states with 32,000 miles of track linking every major West Coast and Gulf port.<sup>76</sup> Principal commodities handled by the Union Pacific Railroad in Minnesota includes: coal, taconite, agricultural products, automobiles, and sand. Union Pacific Railroad is also a key component of transportation infrastructure in Jackson County.

**RA Figure #20**

**Canadian Pacific Freight Overview**



<sup>75</sup> Canadian Pacific Railroad Limited. Accessed: 9/14/15. Available: <http://www.cpr.ca/en>

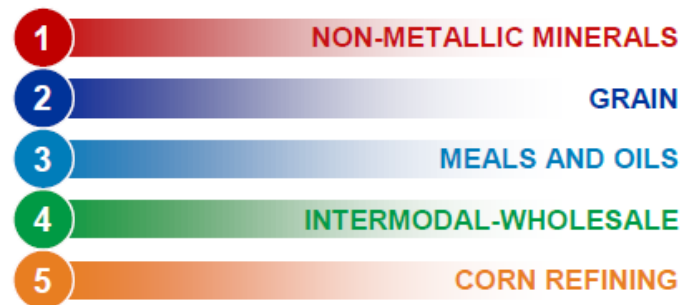
<sup>76</sup> Union Pacific Railroad. Accessed: 9/14/15. Available: <http://www.up.com/>

RA Figure #21

Union Pacific Railroad overview – Minnesota

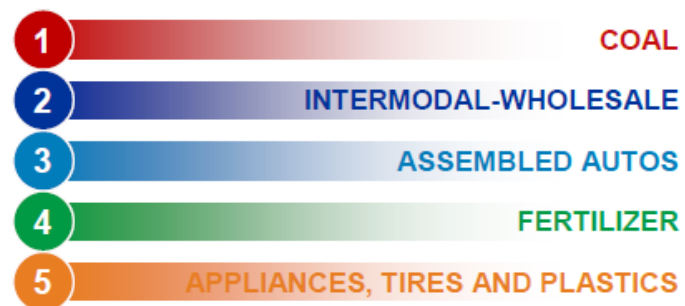
**TOP FIVE COMMODITIES SHIPPED**

2014 BY VOLUME



**TOP FIVE COMMODITIES RECEIVED**

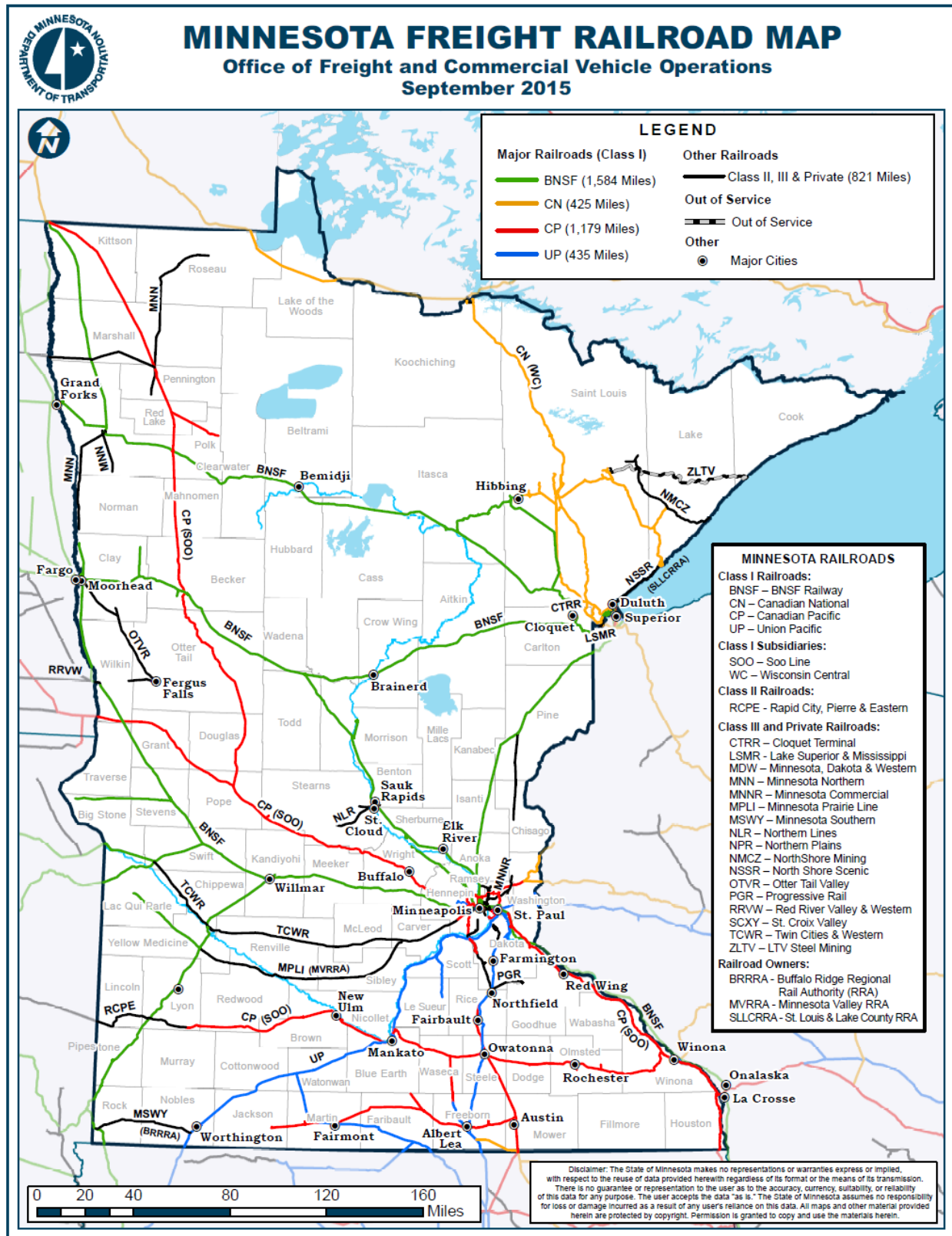
2014 BY VOLUME





RA Figure #22

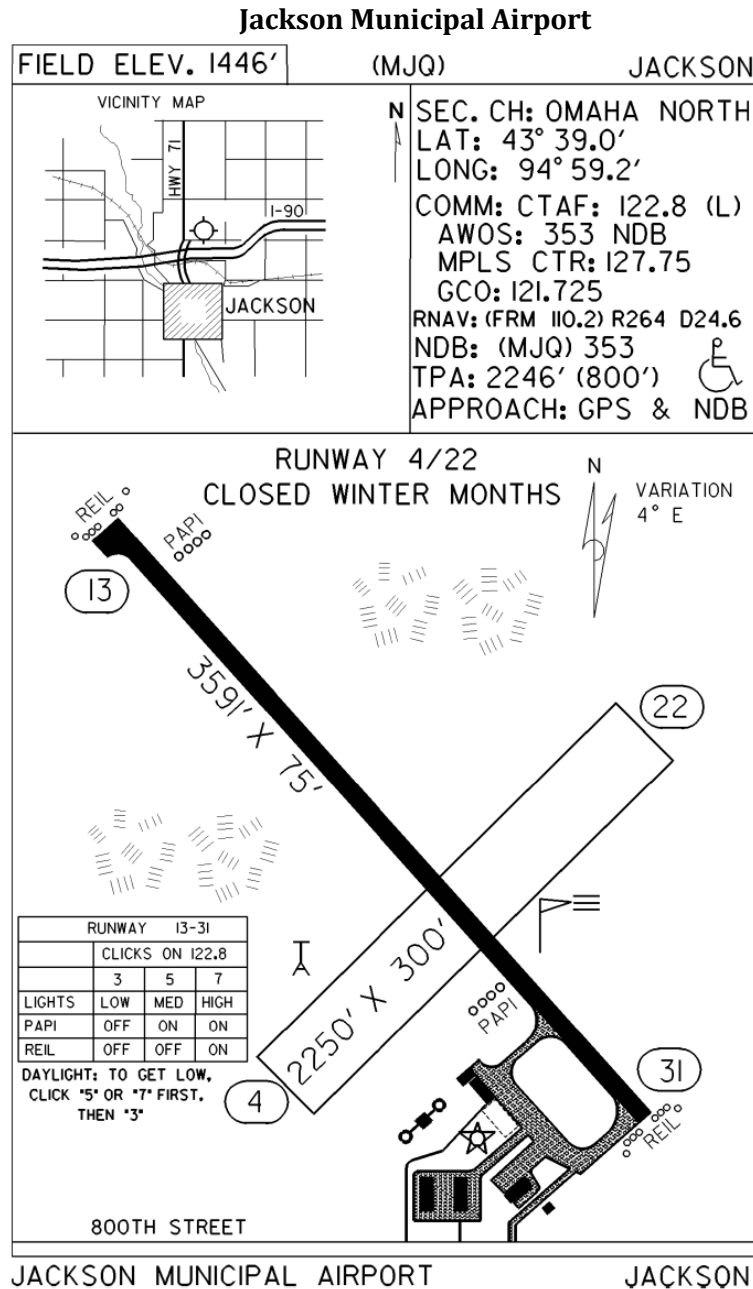
## Railroads - Minnesota



### Air Transportation

There is one municipal airport in Jackson County. The Jackson Municipal Airport is a general aviation airport. The airport is located one mile north of the City of Jackson on U.S. Highway 71. The Airport has two runways. The first runway designated 13/31 has a 3,591 x 75 feet asphalt surface. The second runway designated 4/22 is 2,250 by 300 feet grass surface.<sup>77</sup>

RA Figure #23



<sup>77</sup> Federal Aviation Administration. Accessed 11/5/14. Available:  
<http://www.gcr1.com/5010web/airport.cfm?Site=MJQ&AptSecNum=0>

### *Extent of the Hazard*

Rails, landing strips, and other transportation infrastructure are monitored, inspected, and maintained to ensure people and goods are transported safely. The potential severity of transportation infrastructure is minor according to the planning team. There are a number of variables that impact safety that vary from current weather condition and design to age and upkeep. Driving and planning for the conditions are important to ensure safety.

One issue that affects road conditions is winter weather. Ice and snow can build up on the road and can cause hazardous driving conditions. Due to the prevailing wind patterns in the area, east-west roads are more susceptible to ice and snow affecting the road surface. Road crews are responsible for maintaining the roadway, clearing snow, and salting for ice. It is also the responsibility of the driver to take the road conditions into consideration and drive appropriately. Winter weather is just one variable that impacts road conditions. There are a number of other variables that impact road conditions.

Traffic crashes are the primary hazard to people and property related to transportation infrastructure. The potential severity of transportation crashes is minor according to the planning team. The Minnesota Department of Transportation (MnDOT) and Minnesota Department of Public Safety (DPS) developed a *Comprehensive Highway Safety Plan* in 2004. The plan was intended to examine the underlying causes of traffic deaths and serious injuries, determine strategies to mitigate those causes, and implement the most promising strategies in the “Toward Zero Deaths” program. The Toward Zero Death program continues today.

Minnesota Comprehensive Strategic Highway Safety Plan (CHSP) study for Area Transportation Partnership (ATP) 7 found the most frequent crash types and contributing factors included:<sup>78</sup>

- Impaired Driving
- Safety Belt Usage
- Young Drivers
- Aggressive Drivers
- Lane Departures
- Intersections
- Driver Safety Awareness
- Data Information Systems

These variables along with transportation infrastructure conditions and design can impact the severity of crash or incident. The condition can be a variable that is assumed to be safe, as in the 35W bridge collapse. Bridges are classified as “structurally deficient” if they have a general (poor) condition rating for the deck, superstructure, substructure, or culvert or if the road approaches regularly overtop due to flooding. The fact that a bridge is structurally deficient does not imply that it is unsafe. If a bridge has been identified as unsafe during a physical inspection, the structure will be closed.

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<sup>78</sup> MNDOT. Accessed: 5/29/13. Available: <http://www.dot.state.mn.us/trafficeng/safety/shsp/>



There are approximately 216 bridges on county, municipal, and township roadways within Jackson County. These bridges are inspected and a grade of the bridge is given. This helps to ensure the safety of crossing using a bridge. There are 18 bridges in Jackson County that have been identified as structurally deficient January 1, 2015.<sup>79</sup> In Minnesota, 9.1 percent of bridges are structurally deficient in 2012.<sup>80</sup>

Railroad crossing pose a serious risk for motor vehicles passing over the tracks. Railroad crossings are market and a number have crossing arms, but according to MnDOT, the chance of death or serious injury from a vehicle and train crash is 11 times greater than other traffic collisions.<sup>81</sup> Since there is an increased risk of crossings, additional measures should be taken to ensure the safety of the crossing.

#### **Relationship to Other Hazards—Cascading Effects**

- **Hazardous Materials.** Dangerous roadways can lead to an accident and hazardous materials being spilt. This spill can result is ground water contamination, dangerous chemicals going into the air, and dangerous fire scenarios. If fuel tanker is involved in the crash, the fire would be extremely hot and the fire would burn until the right equipment can be brought in to control the fire.
- **Emergency Response.** Dangerous roadways can make emergency response difficult.

#### ***Previous Occurrences of the Hazard***

Fatal crashes per million vehicles miles traveled have been on a steady decline since the 1966 in Minnesota. According to Minnesota Department of Transportation (MnDOT), there were 23 traffic deaths in Jackson County from 2003 through July 2014. “For all crashes, the driver behaviors police cite most often as contributing factors are, in order of frequency, driver inattention or distraction, failure to yield right of way, and illegal or unsafe speed.”<sup>82</sup> “Most crashes occur in good driving conditions. Over half of fatal crashes, and two-thirds of nonfatal crashes occurred during daylight hours”<sup>83</sup>

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<sup>79</sup> Jackson County Highway Department Information request. Received: 1/9/15.

<sup>80</sup> Governing. Local Bridges in Bad Shape. Accessed: 3/28/15. Available: <http://www.governing.com/topics/transportation-infrastructure/gov-local-state-government-owned-bridge-condition-disparity.html>

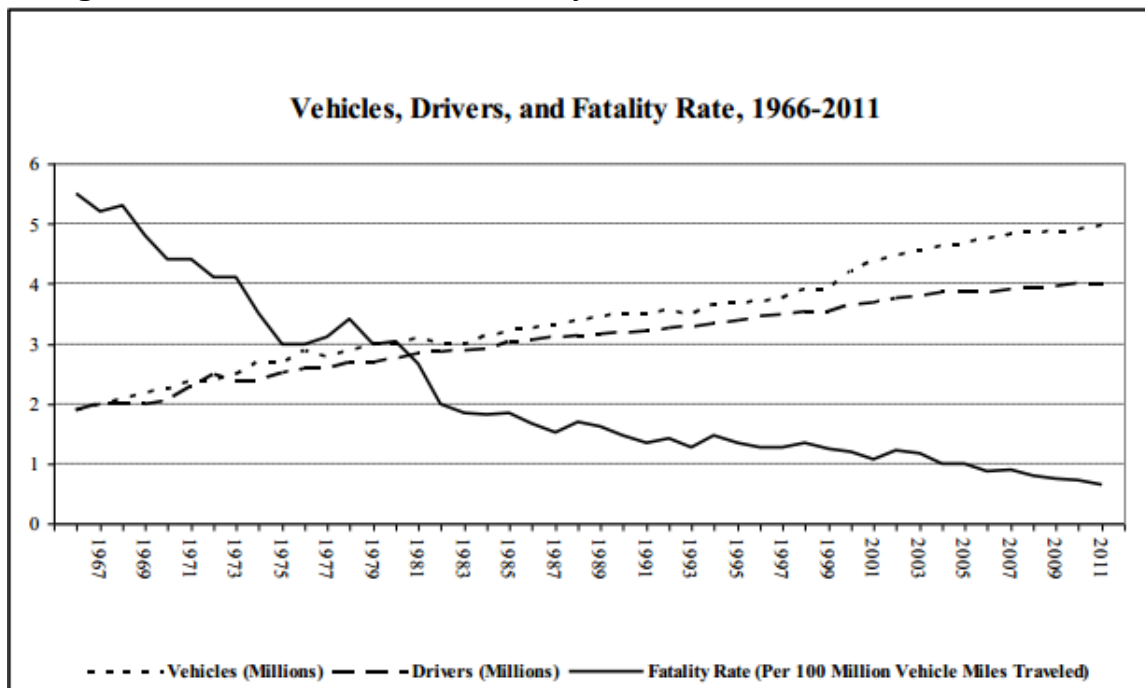
<sup>81</sup> MnDOT. Accessed: 5/29/13. Available: <http://www.dot.state.mn.us/ofrw/safety.html>

<sup>82</sup> Minnesota Department of Public Safety. 2011. Accessed: 6/4/13. Available: <https://dps.mn.gov/divisions/ots/educational-materials/Documents/CRASH-FACTS-2011.pdf>

<sup>83</sup> Minnesota Department of Public Safety. 2011. Accessed: 6/4/13. Available: <https://dps.mn.gov/divisions/ots/educational-materials/Documents/CRASH-FACTS-2011.pdf>

**RA Figure #24**

**Driver Fatality Rate - Minnesota**



Source: Minnesota Department of Public Safety

**RA Table #26**

**Motor Vehicle Crashes & Fatalities, Jackson County**

Year	Number of Crashes	Number of Fatal Crashes
April, 2013	33	0
2012	110	4
2011	156	3
2010	173	4
2009	139	1
2008	172	3
2007	151	4
2006	175	1
2005	151	1
2004	199	2
2003	188	0

Source: MnDOT

There are a number of vehicle fires in Jackson County since Interstate 90 runs through the County. From 2005 through 2011, there were 74 passenger vehicle fires in Jackson County.<sup>84</sup>

There have been no recent bridge related incidents, nor fatal rail or air-related incidences in Jackson County.

<sup>84</sup> MN Department of Safety. Data Request. Received 5/21/13.

### *Probability of Future Events of this Hazard*

Fatal crashes are more likely to occur in rural areas, which are defined as having a population of less than 5,000 people. In 2011, 67 percent of all fatal crashes in Minnesota occurred in rural areas.<sup>85</sup> The potential frequency of a transportation crash is highly likely according to the planning team.

There are a number of variables that impact the likelihood of a crash from driver distraction to infrastructure failure. Distracted drivers are a definite threat to safety regarding other drivers, pedestrians, and bicyclists. Infrastructure failure, like a bridge collapsing, can also cause transportation crashes, but are less common. The potential frequency of a hazard involving transportation infrastructure is unlikely according to the planning team.

### *Vulnerability*

Transportation infrastructure is a basic component of government. Funding for transportation infrastructure should be maintained in every budget cycle, but funding previously allocated for transportation infrastructure has been used for other programs, like subsidizing ethanol and other program in the general fund. This has resulted in less funding to maintain our transportation infrastructure. This decrease in funding makes maintaining and improving our transportation infrastructure more difficult. The risk level assigned to transportation crashes and transportation infrastructure by the planning team is average.

### *Plans and Programs*

- Emergency Operations Plan - Annex F in the Jackson County Emergency Operations Plan explains the procedures of evacuation during an emergency evacuation.
- Road authorities - The Jackson County High Department works closely with MnDOT to improve local transportation infrastructure. MnDOT encourages discussions to identify and improve locations where higher risk areas of conflict may exist and is interested in suggestions to improve safety. Public Roadways and other transportation infrastructure are inspected, monitored, and maintained to ensure safety.
- Safe Routes to School (SRTS) – Transportation projects around schools may be eligible for SRTS funding. These projects can be related to education, encouragement, enforcement, evaluation, and engineering. Southwest Regional Development Commission Staff and MnDOT can discuss potential SRTS projects on request.
- Towards Zero Deaths (TZD) - Strategies for promoting safe driving are important facets to MnDOT's TZD program. Many counties are forming local TZD coalitions involving schools, law enforcement, and other agencies. Representatives from Jackson County are encouraged to attend TZD meetings with MnDOT. Jackson County Representatives can attend either in Mankato, or via video conference in Windom. Besides Education, the TZD program includes Engineering, Enforcement, and Emergency Services as the "4 – E's" the program focuses on.

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<sup>85</sup> Minnesota Department of Public Safety. 2011. Accessed: 6/4/13. Available: <https://dps.mn.gov/divisions/ots/educational-materials/Documents/CRASH-FACTS-2011.pdf>

- Safe and Sober: a Minnesota campaign under the umbrella of the Minnesota Department of Public Safety and the Office of Traffic Safety. The program is dedicated to reducing traffic related deaths and injuries.<sup>86</sup>
- Traffic safety resources - Several publications, such as the National Cooperative Highway Research Program (NCHRP), are available to MnDOT to suggest options for improved safety for all users. Other technical guides exist to improve pedestrian safety and include: MnDOT Road Design Manual, ADA Tool Kit, MnDOT Bikeways Facility Design Manual, Minnesota Manual on Uniform Traffic Control Devices, and multiple Safe Routes to School Resources.
- Snow management - According to MnDOT, "Drift-free roads are achievable through two mitigation strategies, proper road design and/or the use of snow fences. A suitably designed roadway will promote snow deposition in ditches rather than on the roadway and blowing snow that does reach the road will move across without drifting. Snow fences can also help maintain clear roadways by capturing blowing snow upwind of a problem area and storing that snow over the winter season."<sup>87</sup>
- Snow management - Jackson County in partnership with the Extension Service and the Board of Soil and Water Conservation continues to explore the use of and reimbursement of natural snow fences to protect highways against drifting snow
- National Bridge Inventory system - Bridges or culverts that carry vehicular traffic and are longer than 20 feet are part of the Nation Bridge Inventory system. In Minnesota, bridges 10 feet or longer are inspected and inventoried. The general condition rating ranges from 0 (failed condition) to 9 (excellent) based on the physical condition of the deck (riding surface), the superstructure (load carrying members such as beams or trusses that support the driving surface), and substructures (abutments and piers).
- Jackson County Transportation Safety Plan - the Jackson County Highway Department develops a transportation safety plan to identify higher risk intersections and other transportation related safety concerns. Higher risk intersections are identified by the number of crashes and local knowledge by the Jackson County Highway Department and local law enforcement.
- Safe Routes to School Plans - The Cities of Heron Lake, Jackson, Lakefield, and Okabena have Safe Routes to School (SRTS). Safe Routes to School (SRTS) plans are community plans to promote an active lifestyle for all residents. The focus of SRTS plans are on teaching children pedestrian and bicycle safety, making the environment safer for children to walk and bicycle to school and around the community, and promote a healthy lifestyle. The SRTS plan encourages children and the community as a whole to walk, bike, and be more physically active. By promoting a more active lifestyle, there are a number of positive externalities that include: reduced traffic congestion near schools and in the community, better air quality around schools and in the community, and an overall healthier community.
- Active Living Plans - The City of Jackson has an Active Living Plan. Active Living Plans are community plans to promote an active lifestyle for all residents. The focus of this Active Living Plan was on identifying destinations, gaps in pedestrian infrastructure (sidewalks and trails), areas of concern, and

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<sup>86</sup> DMV. Accessed 10/15/13. Available:

<sup>87</sup> MNDOT. Accessed: 5/29/13. Available: <http://www.dot.state.mn.us/environment/livingsnowfence/design.html>

prioritizing projects to make the community more pedestrian friendly. Through the implementation of this plan, the City of Jackson will become more walkable and bikeable, and this will encourage the community to be more physically active. By promoting a more active lifestyle, there are a number of positive externalities that include: economic benefits, reduced traffic congestion, better air quality, and an overall healthier community.

- Land Use Plan - The City of Lakefield has a Land Use Plan with an Active Living Component. A land use plan is the foundation document for the community to assess what is currently in place, review of history (economic and social conditions), and provide guidance for the future development and redevelopment. Land use planning is used to direct the development of land for the betterment of the entire community. The Lakefield Land Use Plan not only contains sections on land use but how land use affects active living. Active living is promoting a healthier lifestyle by integrating transportation planning, neighborhood and city design, land use policy, and health policy into one plan.
- Comprehensive Plan - the City of Jackson has a Comprehensive Plan and an updated Land use Plan. Both of these plans contain a chapter or section on transportation. Transportation goals are outlined in these plans to mitigate transportation related issues in the City of Jackson.

#### *Gaps and Deficiencies*

- Funding - As funding has declined the condition of the transportation infrastructure has also declined
- Commuting - Many people in Jackson County commute to work, which increases exposure to transportation hazards.
- Disposal of dead livestock and poultry - There have been crashes on I-90 involving semi-trucks hauling livestock. A major crash in Jackson County has not occurred, but a large crash could result in a situation that poses multiple challenges.
- Road width limitations - A narrow road can cause difficulties when trying to improve safety and mitigate snow drifting. If a road is too narrow there is not room to add rumble strips. Rumble strips alert drivers that they are leaving the travel lane.

#### *Existing Mitigation Measures*

- Regional livestock trailers - Six livestock trailers have been purchased regional. The trailers are located in the Cities of Sleepy Eye (Brown County Dispatch), Worthington (Nobles County Dispatch), Fairmont (Martin County Dispatch), Pipestone (Pipestone County Dispatch), Granite Falls (Yellow Medicine County Dispatch), and Buffalo Lake (Renville County Dispatch). These livestock trailers will be available for law enforcement in southwest Minnesota to use in the event there is an accident involving a semi-truck hauling livestock.

## **B6 Utility Failure**

Utility failure consists of power outages, water treatment system failure, and waste water treatment system failure. Citizens have come to expect these services on a 24/7 basis. When these service failure there can be a social, economic, and public health impact. Utility failure was assigned a hazard rank of moderate by the planning team.

### *Locations Affected by the Hazard*

The majority of Jackson County residents are connected to and rely on one or more of these systems: power grid, water treatment system, and waste water treatment system. A small percentage of residents have personal backup generator, personal wells, and septic tanks. In the event of a major utility failure, the majority of Jackson County Residents will be affected by the event. The planning team identified the spatial extent of utility failure as countywide.

### *Extent of the Hazard*

Utility failure can cause hardship and economic loss. The loss of power can have a cascading effect. A loss of power can result in water supply pumps not being able to replenish the water supply for a city or rural water system and water treatment facilities not being able to process waste water. Power interruption can also result in food spoiling, adequate drinking water supplies being diminished, and extreme cold and warm temperatures causing hardship and can be potential life threatening for both people and livestock. The majority all feedlots operating within the county rely on electricity for their livestock's water. In terms of animal production, a loss of power could result in large livestock losses. Routine daily activities can also become difficult and overwhelming at times. The potential severity of utility failure is major according to the planning team.

### *Relationship to Other Hazards—Cascading Effects*

- Civil Disturbance. Food and water are basic necessities and if power is out for multiple days, supplies could be diminished to critical levels. When the supply of a necessity becomes drastic low distress can take over and cause civil unrest. Scarce resources could cause the public to loot and cause civil disorder.
- Public Health Emergency. The failure of septic treatment facilities and systems can have immediate adverse impacts on human health due to communicable diseases and epidemics. A water treatment failure could also result in contamination of the water supply.
- Fire. Utility failures caused by downed power lines can cause wild and structure fires. Fighting a fire would be more challenging since electric pumps are not able to replenish the water supply and refueling may have to take place a number of miles from the fire. These variables will affect the response time, and will make it more difficult to stay ahead of the fire.

### *Previous Occurrences of the Hazard*

Jackson County has seldom experienced a countywide power loss. Typically, when the power is down it is confined to certain localities and crews can respond immediately and have power restored within hours. However, a severe daylong blizzard can keep crews from getting to the problem. The initial storm and piled up snow left behind can cause the power outage to last for multiple days.

Ice storm can also cause power outages that last for multiple days. In the spring of 2013, an ice storm hit Jackson County that caused hundreds of electric poles to snap in half. The ice storm caused miles of downed power lines that took weeks to fully repair. For close to a week some Jackson County residents were without power.

**RA Figure #25**

### **Downed Powerlines**



Associated Press

#### ***Probability of Future Events of this Hazard***

Natural hazards will continue to cause power outages. Hardening of the utility grid will help to prevent large outages, but the costs of redundancy and hardening of the utility grid will limit the extent of the project. The potential frequency of a large scale utility failure is occasional according to the planning team.

#### ***Vulnerability***

There are miles of power lines in Jackson County that are above ground on poles. This makes them vulnerable to winter storms, ice buildup, tornados and straight line winds, and other natural disasters. The risk level assigned to utility failure by the planning team is average.

#### ***Plans and Programs***

- Tree maintenance - Electric utility providers identify and clean up areas of Jackson County that are most likely to experience damage to power lines from falling tree limbs. Jackson County works with each of its communities to ensure that these activities are conducted regularly.
- Limiting electrical power - In times of extreme heat, the county will enact rolling power blackouts. Rolling blackouts decrease the demand for electricity and conserves energy during peak demand. A rolling blackout is having certain portions of the community scheduled to lose power. This is done to keep the system from overloading. Residents are alerted through the media when their portion of town will be without power.
- Utility grid upgrades - The utility grid is constantly being upgraded with new poles and technology to make the system more reliable.
- Water storage - There are planning recommendations to help mitigate the impact of utility failure. To help ensure adequate water storage capacity, cities consider two basic recommendations when analyzing water storage needs. First, Minimum storage should be at least 40 gallons/capita.



Second, municipal water supply should have a minimum water storage capacity equal to the average daily water usage. During a power outage the water stored in water holding facilities can act as a reserve water supply until power can be regained.

- Emergency primary care facility - The Jackson County Central High School is designated as an emergency primary care facility.
- Underground gas lines - Most gas mains within the county have been placed underground. This makes the lines less susceptible to damages to the system.
- Water availability – The City of Heron Lake supplies water to the ethanol plant and biodiesel plant. Currently, Heron Lake has a large surplus of available water. This surplus could be used for regionally.
- Red Rock Rural Water is expanding to southeast section of Jackson County. This expansion will provide a more reliable water supply in this area.
- Mutual Aid Agreement - Federated Rural Electric Association has mutual aid agreements with neighboring electric utilities to provide support encase of a large scale outage.
- Federated Rural Electric – is working on a four year plan regarding redundancy. Part of this place is also to bring their new territories into a plan for the future.
- City of Jackson – the City of Jackson has a four year plan to bury lines on the west side of the Jackson.

#### *Gaps and Deficiencies*

- Power lines - Many power lines in the county are above ground and subject to damage from ice storms, wind, and falling tree limbs.
- Backup generators - Not all communities have backup electrical generators to guarantee the operation of essential services in the event of county wide utility failure. Water supplies could be diminished quickly, medical supplies that need to be cold may spoil, large amount of food may spoil, and waste water could become an issue.
- Essential operating systems - Facilities that have backup generators learned, in the Spring ice storm of 2013, that all essential operating systems were not hooked up to the generator. There are also key facilities that do not have backup generators. Refer to RA Table #8 for a list of facilities that need new or additional backup generators.
- Public education - Public awareness should be increased alerting of potential damage to gas mains and lines as these could be disrupted at many locations within the county.
- Natural Gas Lines – There is a risk associated with snagging natural gas lines along township roads when work is being done. County Roads require getting a permit. A permit should also be required along township roads.
- Lakefield Water Treatment Plant – The water treatment plant in the City of Lakefield has passed its useful life cycle. It is getting more costly to maintain, so other systems are being researched. Water treatments ponds are being considered, but the costs of building a new facility are extremely high. This project is still being discussed and developed due to the potential cost. The timeline for the project could be advanced if mitigation funding from FEMA could be supplemented with local funding and other sources.

- Hardening of the electrical grid – It is important to increase redundancy between the different electrical utilities in Jackson County. There is redundancy within individual systems, but there should also be redundancy between systems / suppliers. This would increase the reliability of the grid within Jackson County.

#### *Existing Mitigation Measures*

- Utility grid hardening - Some power lines are being buried to make the utility grid less vulnerable to natural hazards.

## **B7 Water Supply Contamination**

Water supply contamination is the introduction of point and non-point source pollutants into public ground water and/or surface water supplies.<sup>88</sup> Water supply contamination can be the result of mismanaged landfills and dumps, negative externalities of industrial activity, and agricultural run-off. Water supply contamination was assigned a hazard rank of low by the planning team.

#### *Locations Affected by the Hazard*

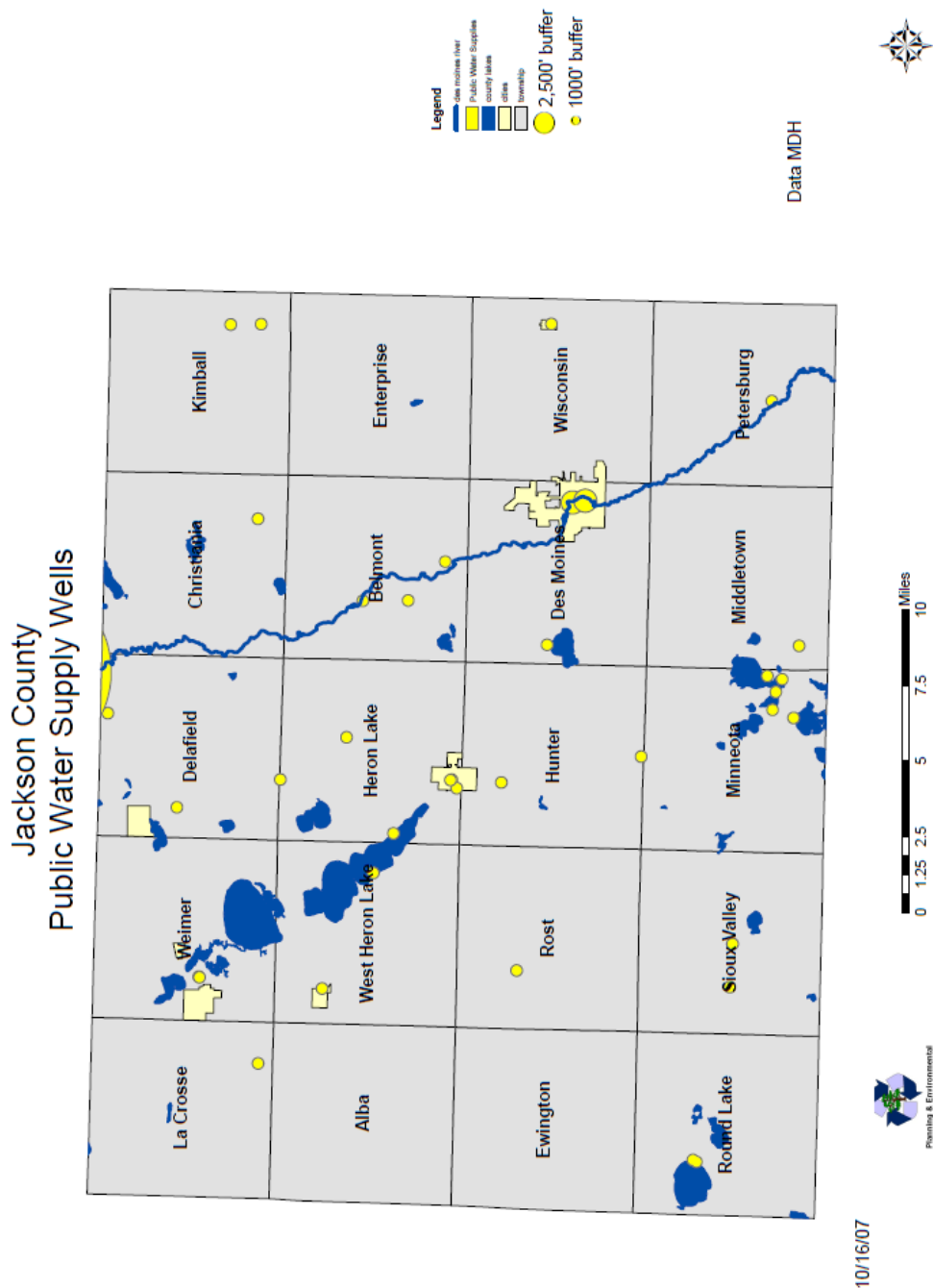
All of Jackson County is equally at risk of water supply contamination. The planning team identified the spatial extent of water supply contamination as countywide. Jackson County does not have an overabundance of high quality groundwater. Groundwater is generally drawn from three aquifers in Jackson County that include: the unconsolidated glacial-drift deposits, the Sioux Quartzite, and the Cretaceous bedrock aquifer. The highest quality water comes from these shallow aquifers. The deeper the aquifers the more iron and manganese there is in the water. The shallower aquifers are preferred since they have better quality water, but the shallower aquifers are more susceptible to contamination.

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<sup>88</sup> EPA. Accessed 6/3/13. Available: <http://www.epa.gov/agriculture/tsur.html>

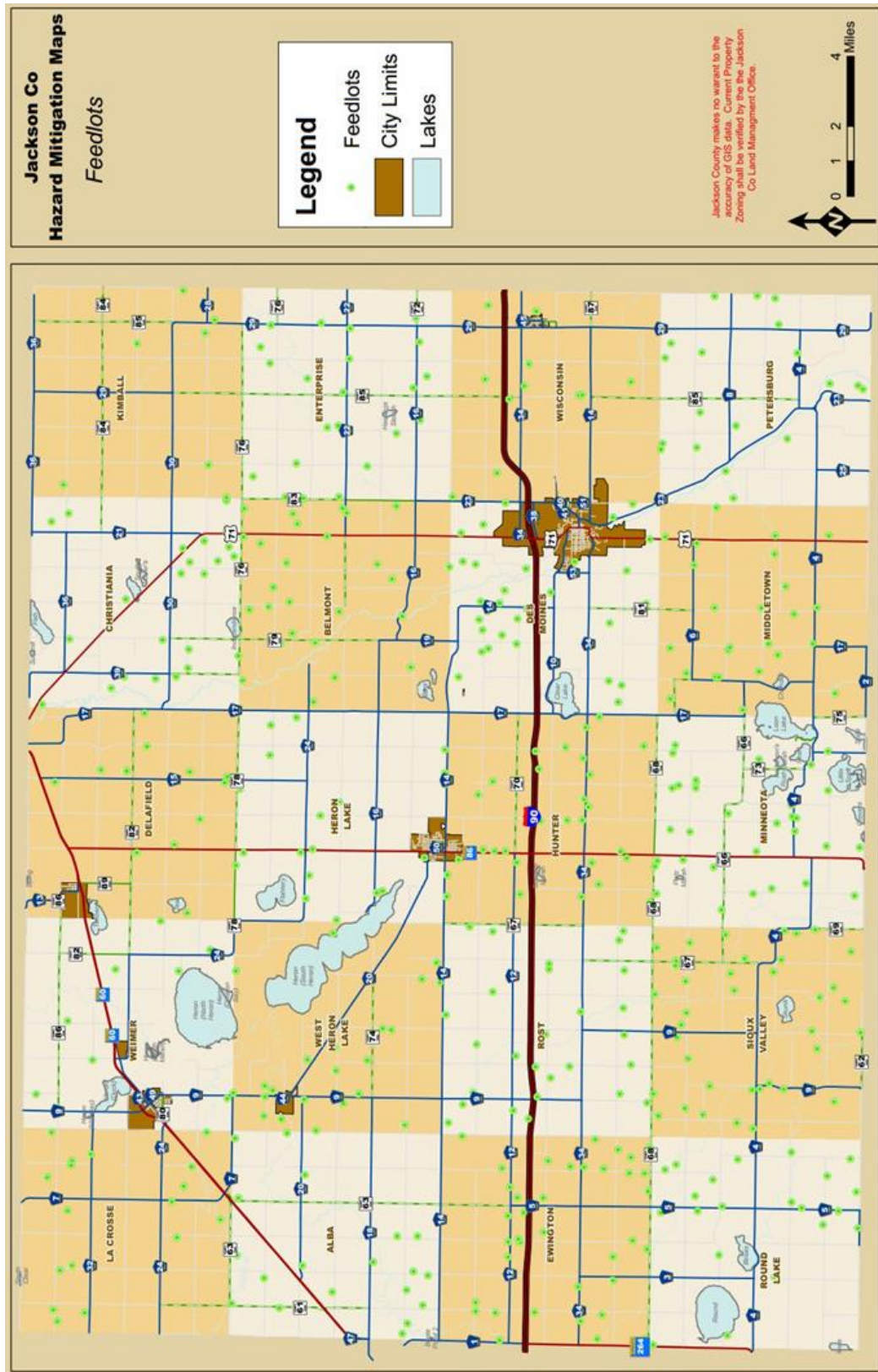
Microbiological and chemical contaminants can enter the ground water through leaking underground storage tanks, feedlots, and waste disposal sites. Human wastes and pesticides can also be carried to lakes and streams during heavy rains or snow melt. Areas in Jackson County have different risk factors in regards to certain contaminates, but there is equal risk throughout the county for water contamination.

**RA Figure #26      Public Water Supply Well Map – Jackson County**

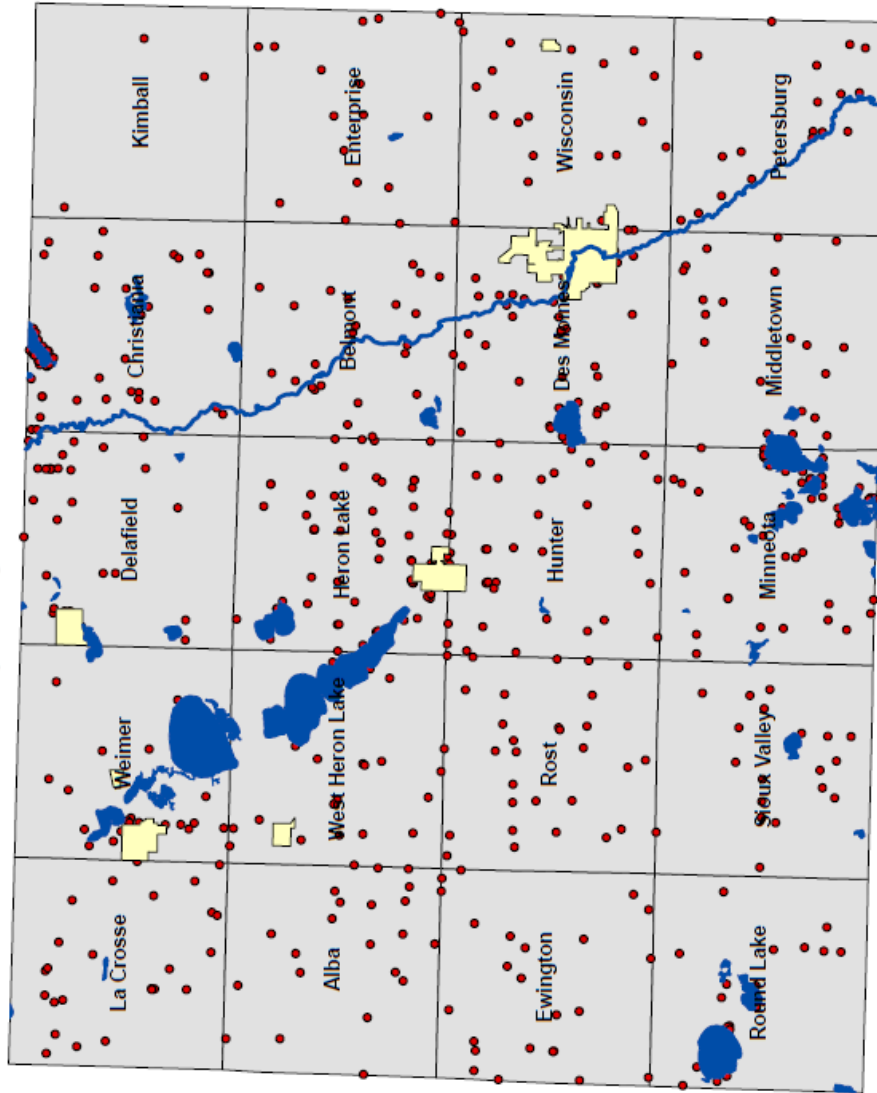


RA Figure #3

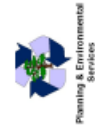
# Feedlots - Jackson County



Jackson County  
New Septic Systems 1993-2006



10/16/07



0 1.25 2.5 5 7.5 10  
Miles



**Legend**  
 Mississippi River  
 county lakes  
 cities  
 septic  
 township  
 1993 - 26  
 1994 - 31  
 1995 - 38  
 1996 - 27  
 1997 - 35  
 1998 - 36  
 1999 - 49  
 2000 - 33  
 2001 - 57  
 2002 - 44  
 2003 - 46  
 2004 - 54  
 2005 - 44  
 2006 - 37

### *Extent of the Hazard*

A major contamination could cause massive disruption to Jackson County's economy and surrounding communities. Removing contaminants from a water supply or relocating a well is an expensive process. Treating water for both human and animal consumption may result in people and farming operations relocating to new locations. This would leave areas of Jackson County unused until contaminants are removed from the water supply. The potential severity of water supply contamination is major according to the planning team.

### *Relationship to Other Hazards—Cascading Effects*

- **Public Health Emergency.** Since Jackson County has a shallow well system, the county is more susceptible to water supply contamination. Polluted water sources can cause illness and epidemics in both humans and animals.
- **Civil Disturbance.** A water supply shortage could also lead to public unrest and civil disturbances. When the supply of a necessity becomes drastically low distress can take over and cause civil unrest. Scarce resources could cause the public to loot and cause civil disorder.

### *Previous Occurrences of the Hazard*

Jackson County has not had a major groundwater contamination problem.

### *Probability of Future Events of this Hazard*

Jackson County is at a greater risk of water supply contamination since the county is tapped into shallow aquifers, but no major groundwater contamination has occurred. The potential frequency of a water supply contamination is unlikely according to the planning team. A number of regulations and monitoring procedures are in place to help maintain a quality water supply. Refer to the Plans and Programs section under Vulnerability for more measures to keep ground water supplies safe.

### *Vulnerability*

Jackson County relies on shallow aquifers since the water quality is better than deeper aquifers. Water recharge in shallow wells can occur in a matter of hours, so wells that are drilled into the shallow aquifers are more vulnerable to pollutants infiltrating the water supply. There are also an unknown number of wells that continue to provide pathways for potential pollutants to reach the county's aquifers. The risk level assigned to water supply contamination by the planning team is average.

### *Plans and Programs*

- **Jackson County Local Water Management Plan** – The Jackson County Local Water Management Plan address management of water, effective environmental protection, and efficient resource management. The water management plan is intended to identify existing and potential water issues in the context of watershed units and groundwater systems. The Plan identifies and maps the major and minor aquifers serving the county. The Plan outlines Jackson County's enforce of the state code for septic systems and floodplain ordinances. The county also does testing of some private wells through the guidelines set in the county's water plan.
- **Wellhead Protection Program** - Several municipalities in Jackson County have set up a wellhead protection program, as promoted by the Minnesota Department of Health. All incorporated

communities in Jackson County will eventually be developing wellhead protection plans. Since 1974, all water wells constructed in Minnesota must meet the location and construction requirements of the Minnesota Well Code. These requirements pertain to private wells, also. Refer to Appendix A for a handout regarding wellhead protection.

- Abandoned Well Sealing Program - Jackson County has a cost share program for sealing abandoned wells. This program is part of the Local Water Management Plan. SWCD also offers cost-sharing to seal a well.
- Feedlot pollution prevention – Jackson County actively works to protect water sources from feedlot runoff. County ordinances require that all feedlots within the county participate in the state’s feedlot program. Also, county and county extension services promote best management practices to minimize runoff from feedlots into rivers. County zoning ordinances also limit feedlot locations.
- Feedlot pollution prevention – The SWCD can cost-share to fix feedlots, as well as prepare nutrient management plans for manure application.
- Subsurface Sewage Treatment Systems (SSTS) - SSTS are commonly known as septic systems and are regulated by Minnesota Statutes 115.55 and 115.56. Minnesota Pollution Control Agency (MPCA) enforces the statutes and Jackson County continually works with MPCA towards updating failing septic systems.
- Septic System Code – Jackson County enforces the state code for septic systems and floodplain ordinances.
- Household Hazardous Waste Program (HHW) - Through Jackson County’s HHW program, helps residents with the disposal of toxic household products and provides an exchange program for usable leftover products.<sup>89</sup>
- Wastewater water monitoring - The MPCA requires routine inspection of all public wastewater systems. State staff, in the Water-Quality Point-Source Program, issue permits and monitors compliance through data review and inspections, and enforces permit conditions. Employees at the Jackson County wastewater facilities are certified operators under state requirements. These operators are required to take state training to maintain their certified operator status.
- Public water system monitoring - The MDH requires routine inspection of all public water systems. State staff issue permits and monitors compliance through data review and inspections, and enforces permit conditions. Employees at the Jackson County water facilities are certified operators under state requirements. These operators are required to take state training to maintain their certified operator status.
- Drinking water standards - The U.S. Environmental Protection (EPA), as required by the Safe Drinking Water Act of 1974, sets uniform nationwide minimum standards for drinking water. State public health and environmental agencies have the primary responsibility for ensuring that each public water supplier meets the federal drinking water standards or more stringent ones established by the

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<sup>89</sup> Jackson County Local Household Hazardous Waste Facility. Accessed: 11/21/14. Available: [http://www.co.jackson.mn.us/index.asp?SEC=56F425CF-9D81-411C-880E-DAEA5A5DF9C1&DE=893BD2B8-B631-43BC-9B31-07757B4B44F8&Type=B\\_BASIC](http://www.co.jackson.mn.us/index.asp?SEC=56F425CF-9D81-411C-880E-DAEA5A5DF9C1&DE=893BD2B8-B631-43BC-9B31-07757B4B44F8&Type=B_BASIC)



state. The EPA requires an ongoing water quality monitoring program to ensure public water systems are working properly. Local officials work together with the MDH and EPA to ensure that all public water supplies are safe. Also, the EPA requires all local suppliers to promptly inform the public should the supply become contaminated.

- Shoreline zoning - Jackson County has adopted the state's statutory shoreline riparian zoning classifications and minimum standards via ordinance.
- Floodplain Management Program – The floodplain Management Program outlines the how Jackson County tests general water quality following a heavy rain or flood event. The water quality test is looking for high levels of nitrates, phosphorus. The MDH assist Jackson County with the program.
- Clean Water, Land and Legacy Amendment – The Clean Water, Land and Legacy Amendment of 2008 increased the sales and use tax rate by three-eighths of one percent on taxable sales, starting July 1, 2009, continuing through 2034. Approximately 33 percent of this revenue is dedicated to the Clean Water Fund to protect, enhance, and restore water quality in lakes, rivers, streams, and groundwater.
- I & I - Cities in Jackson County work to reduce Infiltration and Inflow in their sanitary sewer systems.
- Sediment ponds – The Jackson County Highway Departments works with the DNR and other organizations to increase the number of sedimentation ponds along roadways in Jackson County. Sedimentation ponds hold back water, which allows for a more natural filtration process to occur and helps to increase water quality and aquifer recharge rates.

#### *Gaps and Deficiencies*

- Backup drinking water sources – The Jackson County Emergency Management Plan should identify alternate sources of drinking water, including locations for acquiring adequate amounts of bottled water, in the event of well contamination.
- Public outreach – Efforts to educate private well owners on the importance of wellhead protection plans are not well planned and coordinated with state and federal efforts.
- Septic system inspection - Jackson County does not have an ordinance requiring periodic inspections of individual septic systems. The initial installation has to meet MPCA requirements, and it has to be installed by a licensed contractor.
- Security around public water sources - Wells, water towers, groundwater storage tanks and water treatment plants should have additional security. This may include fencing around sites, alarm systems for break-ins and the addition of surveillance cameras.
- Backup electrical generators - Not all communities have backup electrical generators to guarantee the operation of their water supply and/or wastewater treatment facilities.
- Annual recharge rates - Other than those wells found within designated wellhead protection areas, Jackson County has no estimates of annual recharge rates or the capacities of the various aquifers.
- Heron Lake Sanitary Sewer System – The City of Heron Lake is seeing increased waste water going to their treatment ponds. Water conservation measures could help to decrease this increase demand to the sanitary sewer system.

- Public education – The general public may be unaware that sump pumps could not drain into the city wastewater system.
- Wellhead protection plans – All cities do not have Wellhead Protection Plans. The Cities of Jackson and Lakefield have wellhead protection plan. The Cities of Alpha, Heron Lake, Okabena and Wilder do not have wellhead protection plans. Alpha will be starting the Wellhead Protection Plan process in 2015 and the plan must be finished by August 17<sup>th</sup>, 2017. Heron Lake and Okabena are scheduled to be phased into the process in 2017.
- Jackson County currently does not have a wellhead protection program. Existing rural wells can provide a pathway for potential pollutants to reach the county's aquifers.
- Wellhead protection plan funding - The Minnesota Department of Health lacks resources to work with every community to complete wellhead protection plans quickly.
- Wastewater Treatment Ponds – Seepage and bank failure is a concern regarding wastewater treatment ponds. Public and private water supply contamination is a concern regarding wastewater treatment pond failure. Minnesota Pollution Control Agency does regulate and monitors sewer treatment ponds, but allowable seepage from wastewater treatment ponds may be an issue.

#### *Existing Mitigation Measures*

- County zoning - Several steps are being taken to protect ground water sources from feedlot runoff. County ordinances require that all feedlots within Jackson County participate in the State's feedlot programs. Also, county extension services promote best management practices to minimize runoff from feedlots into streams and rivers. County zoning ordinances also limit feedlot locations.
- Heron Lake I & I project - The City of Heron Lake is completing a two year project to reduce Infiltration and Inflow in their sanitary sewer system.
- Jackson I & I project – The City of Jackson is upgrading their sewer system on the east side of town. A pump was added, so the system could handle increased flows.
- Highway 60 Sedimentation pond – Two sedimentation ponds were built as part of the Highway 60 reconstruction project by Heron Lake. These ponds helped to eliminate basement flooding on the east side of town.

### **III Hazard Identification Worksheet**

#### **Methodology**

The Hazard Identification Worksheet is a tool to help profile the identified hazards. In Section II above the results of Planning Team's Hazard Identification Worksheet were included in the profile of the identified natural and manmade hazards. The profile and the hazard identification worksheet helped the planning team assign priority to hazard mitigation strategies.

The Hazard Identification Worksheet was developed by the former Minnesota Planning Agency and expanding by the Southwest Regional Development Commission.

The sorting criteria for categories in the Hazard Identification Worksheet are as follows:

Potential Frequency: Unlikely if <1% chance in the next 100 years, Occasional = 1% and 10% in next year, Likely =between 10% and 100% in next year, Highly Likely =greater than 10% in next year.

Spatial Extent: Countywide or Local

Potential Severity: Limited =<10% area affected destroyed, Minor =10% to 25% area affected, Major =25% to 50% area affected, Substantial =>50% area affected.

Warning Time: Minimal, 6 – 12 hours, 12- 24 hours, 24+ hours

Risk Level: Subjective ranking by Planning Team based on previous categories

Hazard Rank: Subjective ranking by Planning Team based on previous categories

**RA Table #27**

**Hazard Identification Worksheet – Planning Team**

Hazard	Potential Frequency	Spatial Extent	Potential Severity	Warning Time	Risk Level	Hazard Rank
Ag Disease (animal or crop)	Occasional	Countywide	Minor	12 - 24 hours	Average	Low
Blizzards, Winter Storms, and Extreme Cold Events	Likely	Countywide	Major	12 - 24 hours	High	High
Drought	Occasional	Countywide	Major	24+ hours	Average	Moderate
Fire—Wildfires	Unlikely	Local	Limited	6 - 12 hours	Limited	Low
Fire—Structure Fires	Likely	Local	Minor	Minimal	Average	Moderate
Flooding	Occasional	Countywide	Minor	6 - 12 hours	High	Moderate
Severe Summer Storm, Lightning, Hail, and Extreme Heat Events	Likely	Countywide	Major	6 - 12 hours	High	Moderate
Tornadoes and Straight-line Wind Events	Occasional	Countywide	Major	6 - 12 hours	High	High
Earthquakes	Unlikely	Countywide	Minor	Minimal	Limited	Low
Dam Failure	Unlikely	Local	Limited	Minimal	Limited	Low
Civil Disturbance and Terrorism	Unlikely	Local	Minor	Minimal	Limited	Low
Hazardous Materials	Occasional	Countywide	Minor	Minimal	Average	Moderate
Public Health Emergencies	Occasional	Countywide	Minor	6 -12 hours	Limited	Low
Transportation Infrastructure	Occasional	Local	Minor	Minimal	Average	Moderate
Transportation Crashes	Likely	Local	Minor	Minimal	Average	Low
Water Supply Contamination	Occasional	Countywide	Major	Minimal	Average	Low
Utility Failure	Occasional	Local	Major	Minimal	Average	Low
Hazard	Potential Frequency	Spatial Extent	Potential Severity	Warning Time	Risk Level	Hazard Rank
	<i>Highly Likely</i>		<i>Substantial</i>	<i>Minimal</i>	<i>Very High</i>	
	<i>Likely</i>	<i>Countywide</i>	<i>Major</i>	<i>6 - 12 hours</i>	<i>High</i>	<i>High</i>
	<i>Occasional</i>			<i>12 - 24 hours</i>		
		<i>Local</i>	<i>Minor</i>		<i>Average</i>	<i>Moderate</i>
	<i>Unlikely</i>		<i>Limited</i>	<i>24+ hours</i>	<i>Limited</i>	<i>Low</i>

For Potential Frequency, *Unlikely* if <1% chance in the next 100 years, *Occasional*= 1% and 10% in next year, *Likely*=between 10% and 100% in next year, *Highly Likely*=greater than 10% in next year.

For Potential Severity, *Limited*=<10% area affected destroyed, *Minor*=10% to 25% area affected, *Major*=25% to 50% area affected, *Substantial*=>50% area affected.

Risk Level is subjective ranking by Task Force members based on previous categories. *Adapted from Minnesota Planning*

RA Table #28

Hazard Identification Worksheet –Cities

Hazard	Potential Frequency	Spatial Extent	Potential Severity	Warning Time	Risk Level	Hazard Rank
Ag Disease (animal or crop)	Occasional	Countywide	Minor	12 - 24 hours	Average	Low
Blizzards, Winter Storms, and Extreme Cold Events	Likely	Countywide	Major	12 - 24 hours	High	High
Drought	Occasional	Countywide	Major	24+ hours	Average	Moderate
Fire—Wildfires	Unlikely	Local	Limited	6 - 12 hours	Limited	Low
Fire—Structure Fires	Likely	Local	Minor	Minimal	Average	Moderate
Flooding	Occasional	Countywide	Minor	6 - 12 hours	High	Moderate
Severe Summer Storm, Lightning, Hail, and Extreme Heat Events	Likely	Countywide	Major	6 - 12 hours	High	Moderate
Tornadoes and Straight-line Wind Events	Occasional	Countywide	Major	6 - 12 hours	High	High
Earthquakes	Unlikely	Countywide	Minor	Minimal	Limited	Low
Dam Failure	Unlikely	Local	Limited	Minimal	Limited	Low
Civil Disturbance and Terrorism	Unlikely	Local	Minor	Minimal	Limited	Low
Hazardous Materials	Occasional	Countywide	Minor	Minimal	Average	Moderate
Public Health Emergencies	Occasional	Countywide	Minor	6 - 12 hours	Limited	Low
Transportation Infrastructure	Occasional	Local	Minor	Minimal	Average	Moderate
Transportation Crashes	Likely	Local	Minor	Minimal	Average	Low
Water Supply Contamination	Occasional	Countywide	Major	Minimal	Average	Low
Utility Failure	Occasional	Local	Major	Minimal	Average	Low
Hazard	Potential Frequency	Spatial Extent	Potential Severity	Warning Time	Risk Level	Hazard Rank

*Highly Likely**Likely**Occasional**Unlikely**Countywide**Local**Substantial**Major**Minor**Limited**Minimal**6 - 12 hours**12 - 24 hours**24+ hours**Very High**High**Average**Limited**High**Moderate**Low*

For Potential Frequency, *Unlikely* if <1% chance in the next 100 years, *Occasional*= 1% and 10% in next year,

*Likely*=between 10% and 100% in next year, *Highly Likely*=greater than 10% in next year.

For Potential Severity, *Limited*=<10% area affected destroyed, *Minor*=10% to 25% area affected,

*Major*=25% to 50% area affected, *Substantial*=>50% area affected.

Risk Level is subjective ranking by Task Force members based on previous categories.

*Adapted from Minnesota Planning*

#### IV Repetitive Flood Claim Properties and Severe Repetitive Loss Properties

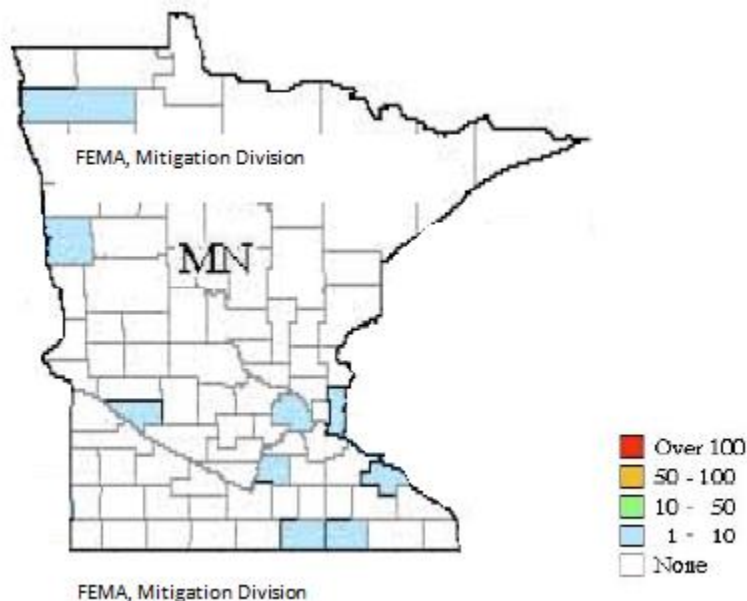
Repetitive loss properties are defined by FEMA as having two or more losses of at least \$1,000 each paid under the National Flood Insurance Program (NFIP) within any 10-year period since 1978. A Severe Repetitive Loss (SRL) property is defined by FEMA as a residential property covered under NFIP that has at least four NFIP claim payments over \$5,000 each and the cumulative amount of such claims exceeds \$20,000. An SRL property may also be one for which at least two separate NFIP payments have been made with the cumulative amount of the building portion of these claims exceeding the market value of the building.

### Repetitive Loss Properties

FEMA has a nonpublic database of all of the repetitive loss structures within the State. These structures are those which have sustained damages on two separate occasions within a ten-year time span for which the cost of repairs at the time of the flood meets or exceeds 25 percent of the market value of the structure before the damage occurred.

Based on this database, Jackson County does not have any repetitive loss structures identified. From January 1, 1978, through June 30<sup>th</sup>, 2015, only 14 Flood insurance claims have been paid in Jackson County, 10 of those in the City of Jackson and 4 in unincorporated Jackson County. The total paid out in the City of Jackson was \$14,094. The total paid out in Jackson County was 11,898.<sup>90</sup> Currently there are 30 flood insurance policies in the Jackson County.<sup>91</sup> Nineteen of those policies are in the City of Jackson. Each policy covers a single building, but all single family home policies include detached garages.

**RA Figure #26**      **Counties with Repetitive Loss Properties**



### Severe Repetitive Loss Properties

As of June 2013, there were no Severe Repetitive Loss properties in Jackson County.<sup>92</sup>

## V Analyzing Development Trends

### Land Use and Development Trends

Jackson County is a rural county with 357,834 acres of farm land in production.<sup>93</sup> From 2007 through 20012 the number of acres in farm production decreased by 12%. Not having all of the tillable ground

<sup>90</sup> FEMA. Loss Statistics. Accessed: 8/11/15. Available: <http://bsa.nfipstat.fema.gov/reports/1040.htm>

<sup>91</sup> FEMA, Date Request. Received 8/11/15.

<sup>92</sup> FEMA, Date Request. Received 6/4/13.

in production helps to maintain ground water quality, wetlands, and plants and wildlife.

Prohibiting development in floodplains also helps to mitigate the negative effects of flooding and runoff. Grasslands, shrubs, and other vegetation help to negate the negative effects that flooding and runoff can have. It is important to incorporate land conservation practices into local and county land use policies and development plans.

There are two communities within Jackson County that have areas identified within the one percent floodplain: Jackson and Okabena. Jackson County's zoning regulations does prohibit future development within the floodplain. The City of Jackson has similar restrictions to development within the flood plain.

Population projections from the MN Department of Administration show that the population in Jackson County is projected to decrease by 9.8 percent from 2015 to 2030. The projections show an increase in the age cohorts 15-29 and 65-84 from 2015 to 2030. This demographic shift will impact development.

An older population will require more assistant living services and healthcare services than a younger population. Development trends may shift towards more group living facilities and townhomes. Higher density housing may develop and increase emergency response demand in a specific area.

In southwest Minnesota there have also been a growing number of wind farms, ethanol plants, and other biofuel plants. This development trend poses some unique challenges. In regards to infrastructure, there is an increase of oversized loads, which can wear out the roads faster and pose safety concerns to other motorists.

Firefighting also may be challenging. Specialized equipment is required to reach the top of the turbines, so firefighters have been instructed to sit back and let the wind turbine burn. Firefighths will monitor the fire to make sure the fire does not spread.

Ethanol plants and other biofuel plants have the potential to generate large and very hot fires. Plans are in place to address these new developments, but there is not extensive experience in mitigating hazards related to these development trends. Refer to A5 Fires for more information related to wind turbines ethanol plants, and biofuel fires.

A combination of conservation and planning has helped Jackson County maintain safe and efficient development. Jackson County is a rural county, so emergency response is impacted by distance and time and the availability of equipment and resources. Regional efforts help to mitigate the effects of natural and manmade hazards in Jackson County.

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<sup>93</sup> USDA Census 2012. Accessed: 8/11/15. Available:  
[http://www.agcensus.usda.gov/Publications/2012/Full\\_Report/Volume\\_1,\\_Chapter\\_2\\_County\\_Level/Minnesota/st27\\_2\\_001\\_001.pdf](http://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_2_County_Level/Minnesota/st27_2_001_001.pdf)

# CHAPTER 6: EMERGENCY RESPONSE PROFILE

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## I Introduction

A county's ability to respond to an emergency situation is based on service areas, facilities, equipment, and staff. An understanding of response times and abilities is critical for providing protection to Jackson County residents. The existing facilities, equipment, and staff in Jackson County are here to respond to local hazard events and provide regional support. These investments are critical in mitigating the effects of natural and manmade hazards and protecting lives, property, and other assets. Jackson County is considered a mutual aid county because they provide and receive support from neighboring counties. The following summary and description serves as an inventory of the response facilities for Jackson County. This Chapter profiles the emergency response capabilities of Jackson County. Facilities included in the profile include:

- Law Enforcement
- Ambulance Service
- Fire Department
- Medical Facilities
- Red Cross Shelter
- Sirens and other Emergency Notification Devices

### Jackson County Emergency Management

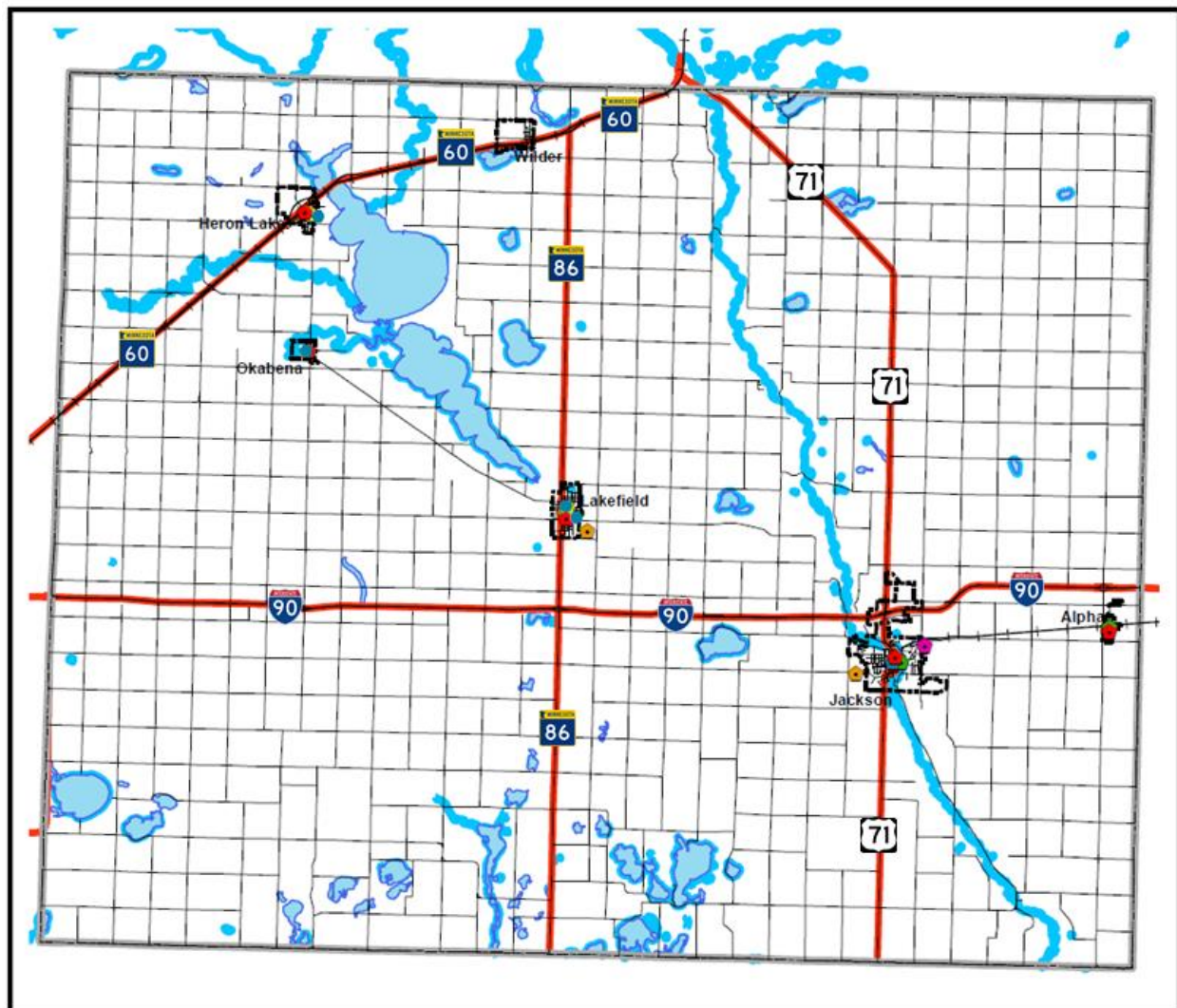
The Jackson County Emergency Management Director administers the county-wide emergency management program in Jackson County. The Director coordinates the emergency management functions of county and city governmental units assigned to various emergency management responsibilities. The Director's duties also include the following:

- Coordinates response to actual disasters/emergencies, the logistics of federal field and survey teams, mitigation request and disaster assistance centers
- Coordinates meetings of the Jackson County Emergency Management Planning Advisory Committee (EMPAC)
- Works with the EMPAC to develop and maintain the Jackson County Emergency Operation Plan (EOP) and test this plan through exercises
- Maintains an inventory and utilization record of county equipment secured through emergency management sources
- Maintains liaison with county and state regional offices
- Prepares informational materials for dissemination to the public and meets with interested groups to explain emergency management programs
- Meets with interested groups to explain the emergency management program and to enlist their support and cooperation



RA Figure #29a

Public Facilities Map - Jackson County



### Legend

- Roads
- +— Railroad
- Trunk Highway
- Rivers
- Lakes
- Cities
- Jackson County

### Public Facility

- Airport
- City Hall
- City Hall/Community/Police Station
- County Highway Shop
- Courthouse
- Emergency Management Office
- Fairground
- Firehalls
- Law Enforcement
- Library

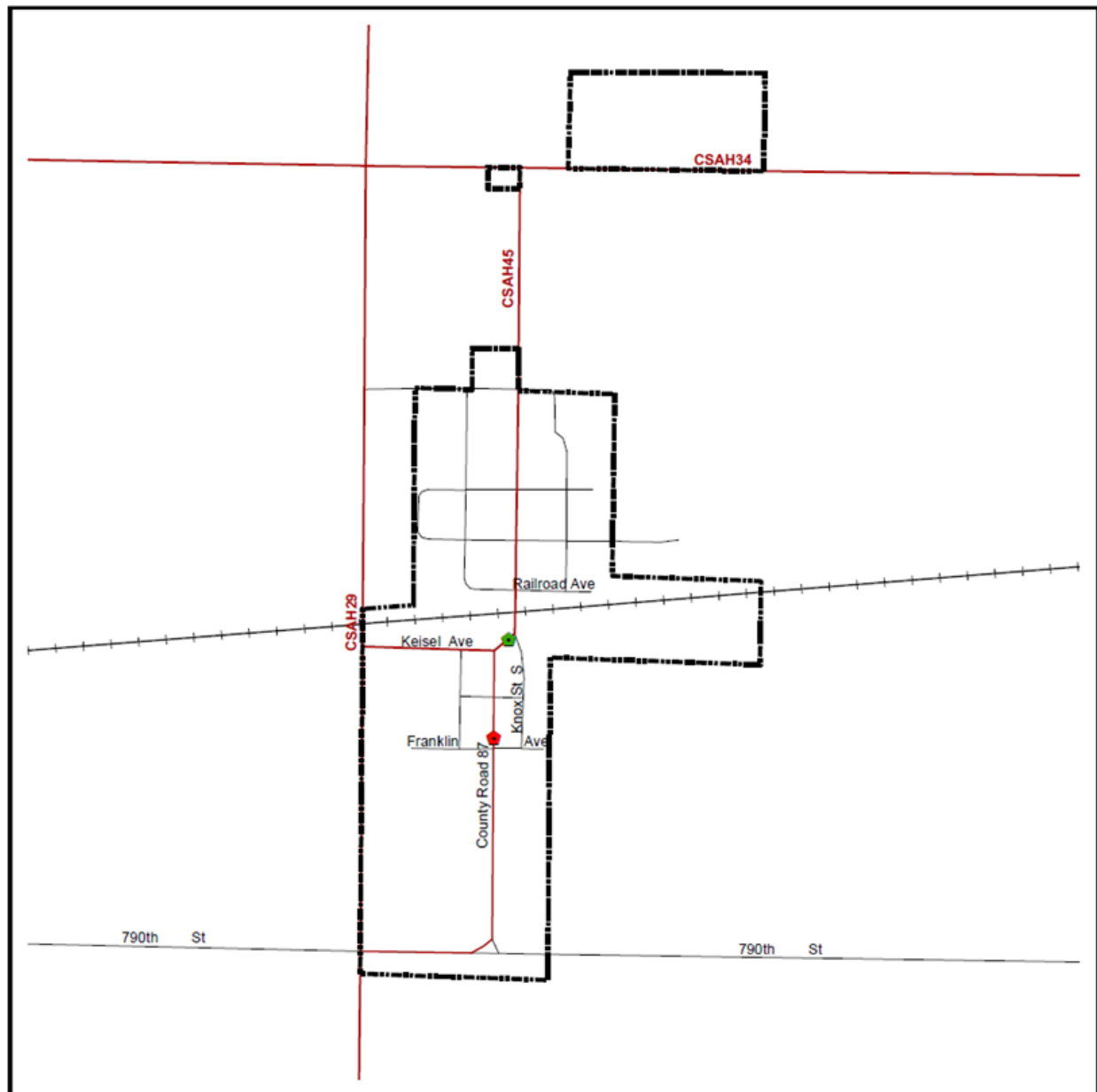


Dec 29, 2015

0 3 6 Miles

RA Figure #29b

Public Facilities Map - Alpha



**Legend**

- Alpha Roads
- County Road
- CSAH
- +— Railroad
- City of Alpha

- ◆ Fire Hall - 215 Main Steet
- ◆ City Hall - 145 Main Street North



0 0.1 0.2 Miles

RA Figure #29c

Public Facilities Map – Heron Lake



### Legend

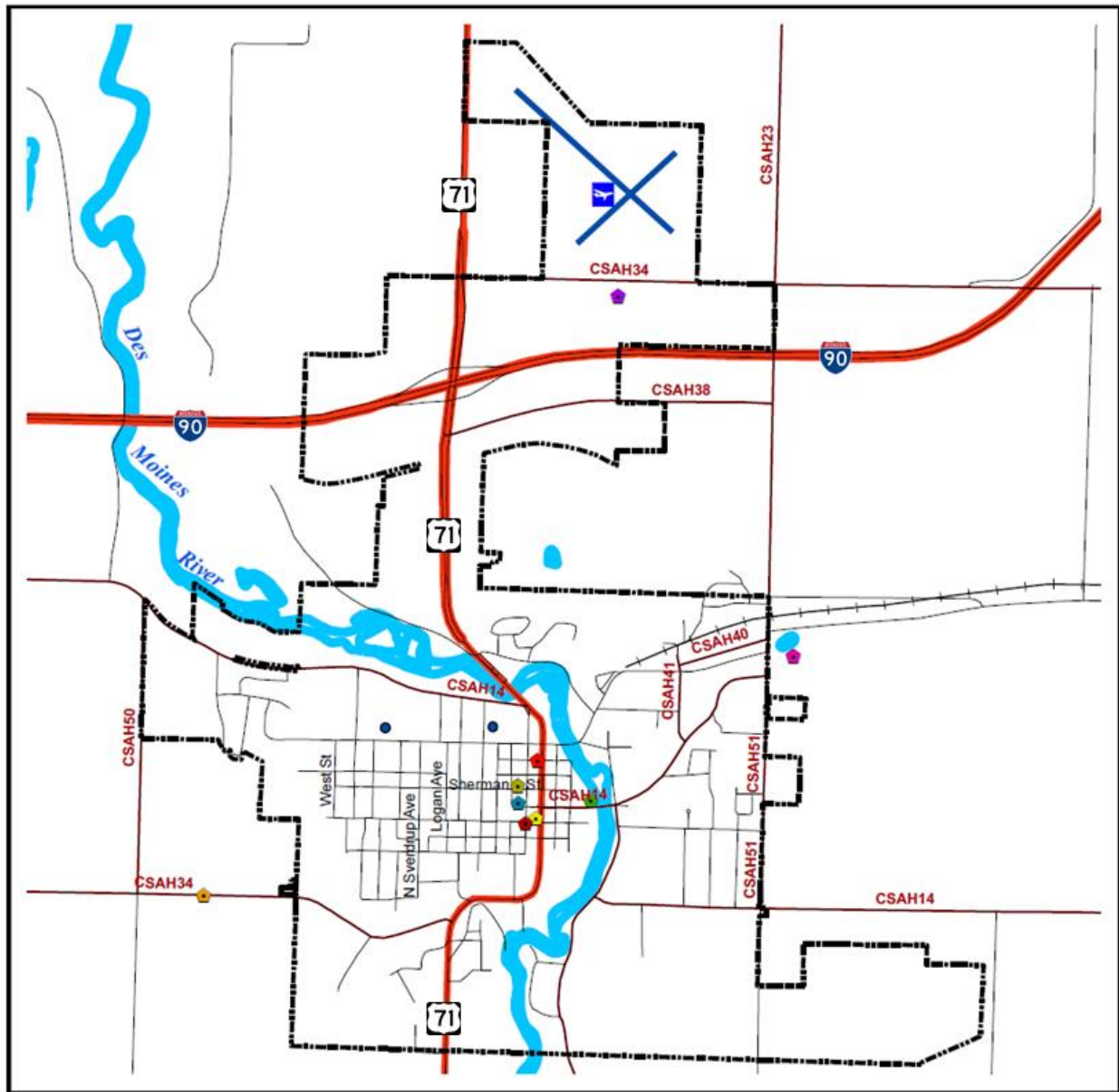
- |                    |  |
|--------------------|--|
| Heron Lake Roads   | Heron Lake - Okabena School - 321 Stearns Avenue         |
| County Road        | Fire Hall - 1111 2nd Ave                                 |
| CSAH               | Heron Lake Public Library – 401 9th Street               |
| Trunk Highway      | City Hall / Community / Police Station – 312 10th Street |
| Railroad           |  |
| Lakes              |  |
| City of Heron Lake |  |



0 0.1 0.2 Miles

RA Figure #29d

Public Facilities Map - Jackson



### Legend

- Jackson Roads
- ++ Railroad
- CSAH
- Trunk Highway
- River and Lakes
- City of Jackson

- Jackson County Central High School - 1128 N Hwy
- Riverside Elementary School - 829 Park St
- MnDOT Shop - 149 County Rd. 34 E
- City Hall - 80 W Ashley Street
- Fairground - 76748 550th Ave
- Jackson County Library - 311 3rd Street
- Jackson County Sheriff's Office - 400 Sherman Street
- County Highway Shop - 53053 780th St
- Jackson Fire Hall - 305 Sheridan St
- Jackson County Emergency Management - 402 White Street Suite L01
- Jackson County Court House - 405 4th Street

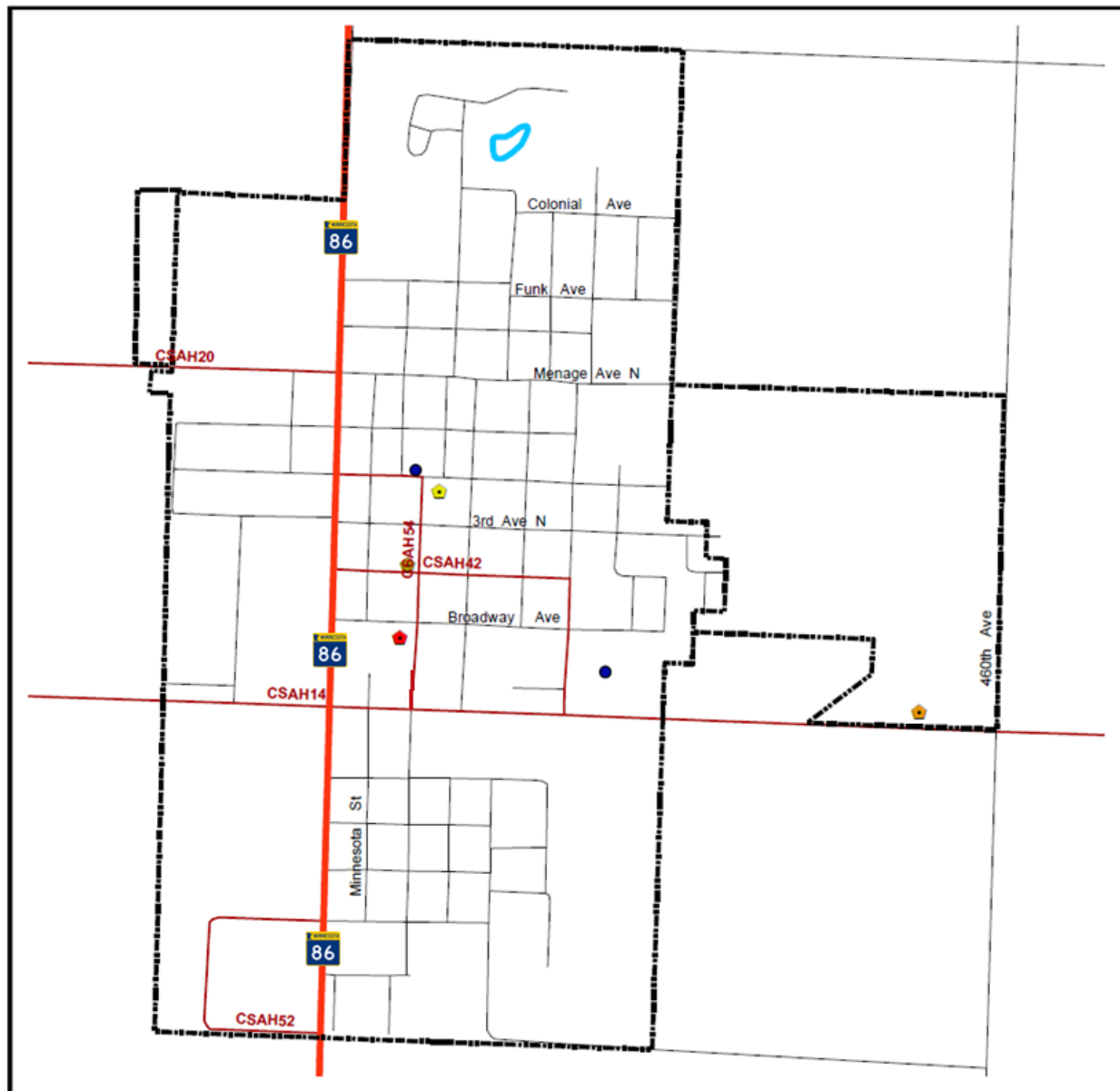
■ Jackson Municipal Airport



0 0.3 0.6 Miles

RA Figure #29e

# Public Facilities Map – Lakefield



## Legend

- Lakefield Roads
- Trunk Highway
- CSAH
- River and Lakes
- City of Lakefield

- Pleasantview Elementary School - 110 Milwaukee St
- ★ Jackson Co Central Middle School - 205 4th Ave N
- ★ Lakefield Fire Hall – 111 Main Street
- ★ Police Department – 301 Main Street
- ★ City Hall - 301 Main Street
- ★ Lakefield Public Library – 410 Main Street
- ★ County Highway Shop - 45917 820th St

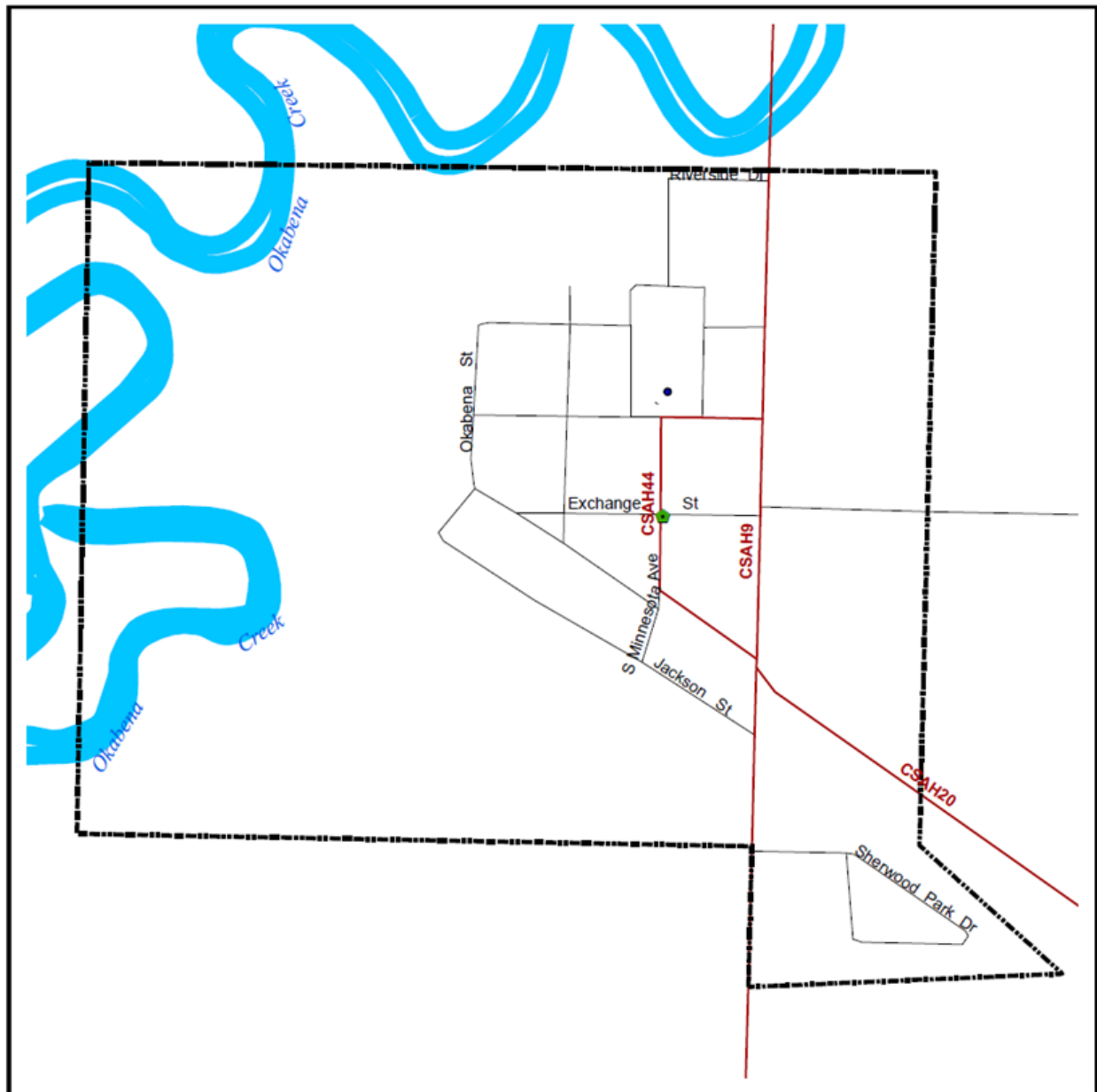


0 0.2 0.4 Miles



RA Figure #29f

Public Facilities Map - Okabena



Legend

- Okabena Roads
- CSAH
- River
- City of Okabena

- Heron Lake-Okabena School - 124 N Minnesota Avenue
- City Hall - 101 North Minnesota Ave
- Fire Hall - 101 North Minnesota Ave



0 0.1 0.2 Miles

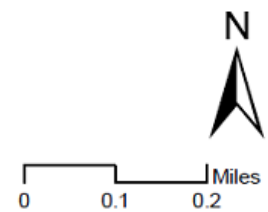
RA Figure #29g

Public Facilities Map - Wilder



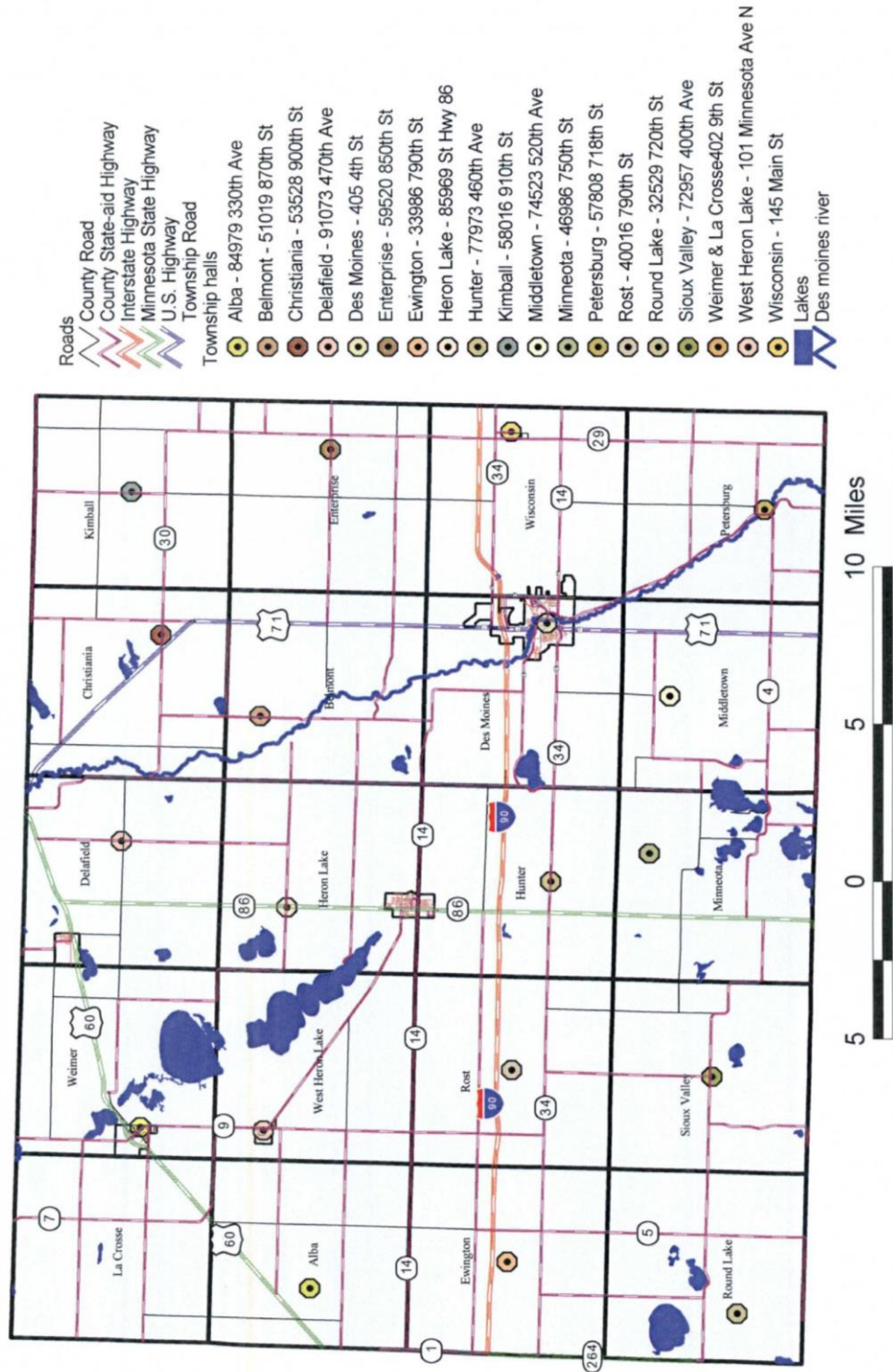
Legend

- |                |                 |                 |
|----------------|-----------------|-----------------|
| — Wilder Roads | — Trunk Highway | —+— Railroad    |
| — County Road  | — CSAH          | — City of Alpha |





# Jackson County Township Halls



## **II Profiling Emergency Response Capabilities**

### **Emergency Operations Center**

The Resource Center currently serves as Jackson County's Emergency Operations Center (EOC) for all events in Jackson County. The head of the EOC is named at the time of the disaster based on disaster type and staff availability.

### **A1 Law Enforcement**

In Jackson County, the Cities of Heron Lake and Lakefield have an independent police department. The rest of the county is served by the Jackson County Sheriff's Office. The mission of the Jackson County Sheriff's Office is "Jackson County is committed to service, growth, and tradition in a diverse, rural environment."

The Jackson County Sheriff's Office provides law enforcement services and dispatch for the Cities of Alpha, Jackson, Okabena, and Wilder. The Sheriff's Department also provides support and dispatch for the Cities of Heron Lake and Lakefield and dispatch for fire and ambulance service in Jackson County. The Jackson County Sheriff's Office consists of one station with 13 Full Time Deputies, which include two Patrol Sergeants and one Investigator. There are also three Part Time Deputies.

Jackson County Sheriff's Office operates a county jail system. The Jackson County Sheriff's Office Dispatch/Jail operates 24/7 with 9 jailers/dispatchers, 3 Part time jailers/dispatchers, and 1 administrator. The mission of the Jackson County Jail is, "The Jackson County Sheriff's Office will protect and serve the public by providing a safe and secure environment for inmates, staff, and visitors of the Jackson County Jail."

The City of Lakefield's Police Department is comprised of three and half FTEs. The City of Lakefield has discussed contracting with Jackson County for law enforcement services. At this time the Lakefield City Council has decided to maintain a police department.

The Heron Lake Police Department is comprised of one FTE. The Heron Lake Police Department is assisted by the Jackson County Sheriff's Office. The Jackson County Sheriff's Office, the Heron Lake Police Department, and the Lakefield Police Department belong to a Regional Emergency Rescue Team (ERU) with other agencies from Minnesota and Iowa. This allows Jackson County and the City of Lakefield to draw on other force, departments, and agencies to assist with investigation and other law enforcement activities. Equipment is also shared regionally to help law enforcement effectively respond to emergencies.

Six livestock trailers have been purchased regional for law enforcement in southwest Minnesota to use in the event there is an accident involving a semi-truck hauling livestock. One trailer will be located in Nobles County and the other trailer will be located in Yellow Medicine County. Other regional assets include: The Jackson County Sheriff's Office has access to one of two radio communication trucks for the region; The Jackson County Sheriff's Office has access to a Portable ARMER Tower for the region; and the Jackson County Sheriff's Office can contact the MN Bureau of Criminal Apprehension (BCA) for Felony crimes that have occurred in the county or for Internal investigations.

## A2 Public Health

Jackson County is part of the Des Moines Valley Health and Human Service (DVHHS) public health group. DVHHS is comprised of Cottonwood County Family Services, Jackson County Human Services, and Cottonwood Jackson Community Health.

DVHHS is a two county agency committed to strengthening individuals, families, and communities by providing quality services in respectful, caring, and cost-effective manner. DVHHS provides human services in regards to chemical health services, child support services, financial assistance, licensing of child care and foster care, adult and elderly care, children and family care, and vulnerable adult investigation and protection. DVHHS provides public health services in regards to emergency preparedness, family health, home care services, and preventative health.

### *Medical Facilities*

Medical facilities inventoried in Jackson County consist of a hospital, two nursing homes, five assistant living facilities, two medical clinics, a rehab facility, and three chiropractic clinics. The hospital in Jackson County is the Sanford Jackson Medical Center and is located in the City of Jackson. Sanford Jackson Medical Center is a combined 20-bed hospital/ clinic, which high quality, affordable, and compassionate healthcare services for families throughout Jackson County, MN and the surrounding area. Sanford Jackson also provides air/ground ambulance services.

Patients that need advance treatments are transferred to other hospitals in the region. The Windom Area Hospital, just outside Jackson County in the city of Windom is a Level IV Trauma Center. There is a Level III Trauma Center located in the City of Mankato and a Level II Trauma Centers in the City of Sioux Falls.

There are two nursing homes in Jackson County. The nursing homes in Jackson County include the Colonial Manor Nursing Home in Lakefield and Good Samaritan Home in Jackson. The Colonial Manor is a 37 bed dual Medicare/Medicaid skilled nursing home facility. Colonial Manor's Mission is to provide dignity, comfort, and quality care to our residents in an environment that promotes a person's independence. The Good Samaritan Home is a 63 bed dual Medicare/Medicaid skilled nursing home facility.

There are five assisted living facilities in Jackson County. The assisted living facilities in Jackson County include: Valley View Assistant living and Doman-Rose Place and Rosewood Villa in Lakefield, The Pines in Jackson, and Lakeview Assisted Living in Heron Lake.

There are three health clinics within Jackson County. The health clinics in Jackson County include: Sanford Clinic Jackson, Sanford Clinic Lakefield, and Sacred Heart Mercy Medical Care Center in Jackson. The Sanford Clinics are both classified as Medicare Certified Rural Health Clinics.

There is one rehab facility in Jackson County. Prairie Rehabilitation Services is located in Jackson and is a Medicare Certified Out-Patient Occupational Physical or Speech Therapy facility.

There are three chiropractic clinics in Jackson County. The chiropractic clinics in Jackson County include: Lewis Chiropractic in Jackson, Jackson Chiropractic PA in Jackson, and Swoboda Chiropractic in Lakefield.

### **A3 Ambulance Service**

There are seven primary Ambulance Districts in Jackson County. The primary Ambulance Districts include: Heron Lake Ambulance District, Jackson Ambulance District, Lakefield Ambulance District, Mountain Lake Ambulance District, Trimont Ambulance District, Windom Ambulance District, and Worthington Ambulance District. Additional ambulances can be called from neighboring counties. Secondary Ambulance Districts include: Lake Park Ambulance District, and Spirit Lake Ambulance District.

The Jackson Ambulance Service went on 550 calls in 2012 and 566 calls in 2013. The majority of the calls were to transfer patients to Sanford Jackson Medical Center. The ambulance service also transfers a number of patients from Sanford Jackson Medical Center to Sanford Medical Center in Sioux Falls along with Avera McKennan and VA hospital. For assistance the Jackson County Ambulance Service most frequently call upon neighboring ambulance service that includes: Sherburn Ambulance, Windom Ambulance, Lakefield Ambulance, and Worthington Ambulance. The Jackson Ambulance Service does have mutual aid agreements with these neighboring ambulance services. The Jackson Ambulance Service has three operational ambulances.

The Lakefield Ambulance Service went on 238 calls in 2012 and 208 calls in 2013. The majority of the calls were to transfer patients to Sanford Jackson Medical Center. For assistance the Jackson County Ambulance Service most frequently call upon neighboring ambulance service that includes: Heron Lake Ambulance, Jackson Ambulance, Windom Ambulance, and Worthington Ambulance. The Lakefield Ambulance Service does have mutual aid agreements with these neighboring ambulance services. The Lakefield Ambulance Service has two operational ambulances.

The Heron Lake Ambulance Service went on 95 calls involving billed transport in 2012 and 78 calls involving billed transport in 2013. The majority of the calls were to transfer patients to neighboring hospitals in Windom and Worthington. For assistance the Jackson County Ambulance Service most frequently call upon neighboring ambulance service that includes: Windom Ambulance, Lakefield Ambulance, and Worthington Ambulance. The Heron Lake Ambulance Service does have mutual aid agreements with these neighboring ambulance services. The Heron Lake Ambulance Service has one operational ambulance.

The Mountain Lake Ambulance Service went on 158 calls in 2013. The majority of the calls were to transfer patients to hospital in Windom. The ambulance service also transfers a few patients to the hospital in St. James. For assistance the Jackson County Ambulance Service most frequently call upon neighboring ambulance service that includes: Jackson Ambulance, Jeffers Ambulance, Springfield Ambulance, Westbrook Ambulance, Windom Ambulance, Storden Ambulance, Comfrey Ambulance, and Gold Cross Ambulance. The Mountain Lake Ambulance Service does have mutual aid agreements with these neighboring ambulance services. The Jackson Ambulance Service has two operational ambulances.

The Windom Ambulance Service went on 630 calls in 2012 and 640 calls in 2013. The majority of the calls were to transfer patients to Windom Area Hospital. The ambulance service also transfers a number

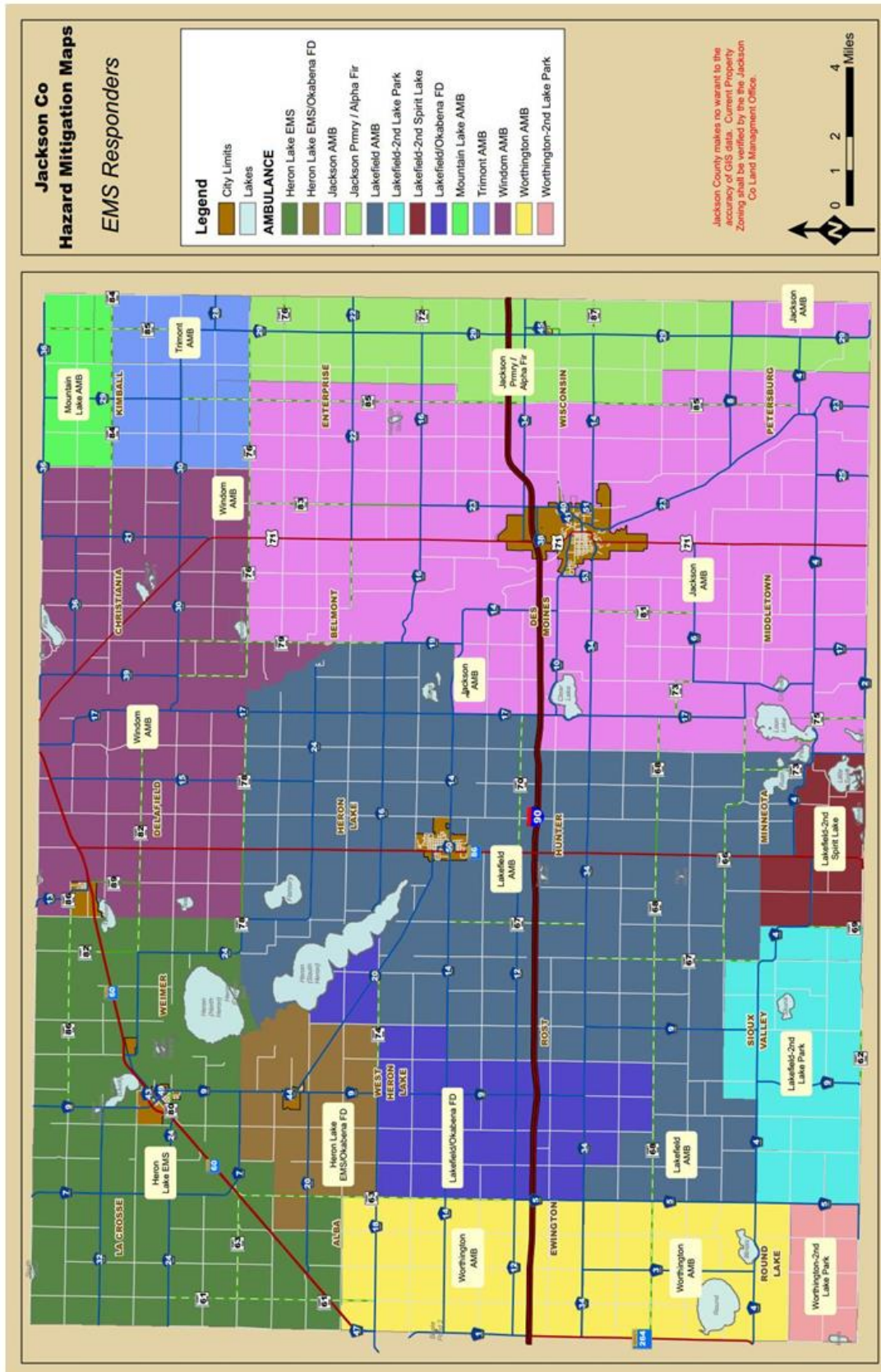
of patients from Sanford Jackson Medical Center to Sanford Medical Center in Sioux Falls along with Avera McKennan and VA hospital. For assistance the Jackson County Ambulance Service most frequently call upon neighboring ambulance service that includes: Mountain Lake Ambulance, Westbrook Ambulance, Jackson Ambulance, Heron Lake Ambulance, and Lakefield Ambulance. The Jackson Ambulance Service does have mutual aid agreements with these neighboring ambulance services. The Jackson Ambulance Service has three operational ambulances.

The Trimont Ambulance Service went on 53 calls in 2012 and 66 calls in 2013. The majority of the calls were to transfer patients to Mayo Clinic Health System in Fairmont. The ambulance service also transfers patients to the hospital St. James and Mankato. The Trimont Ambulance Service has one operational ambulance.



RA Figure #31

# Ambulance Districts - Jackson County



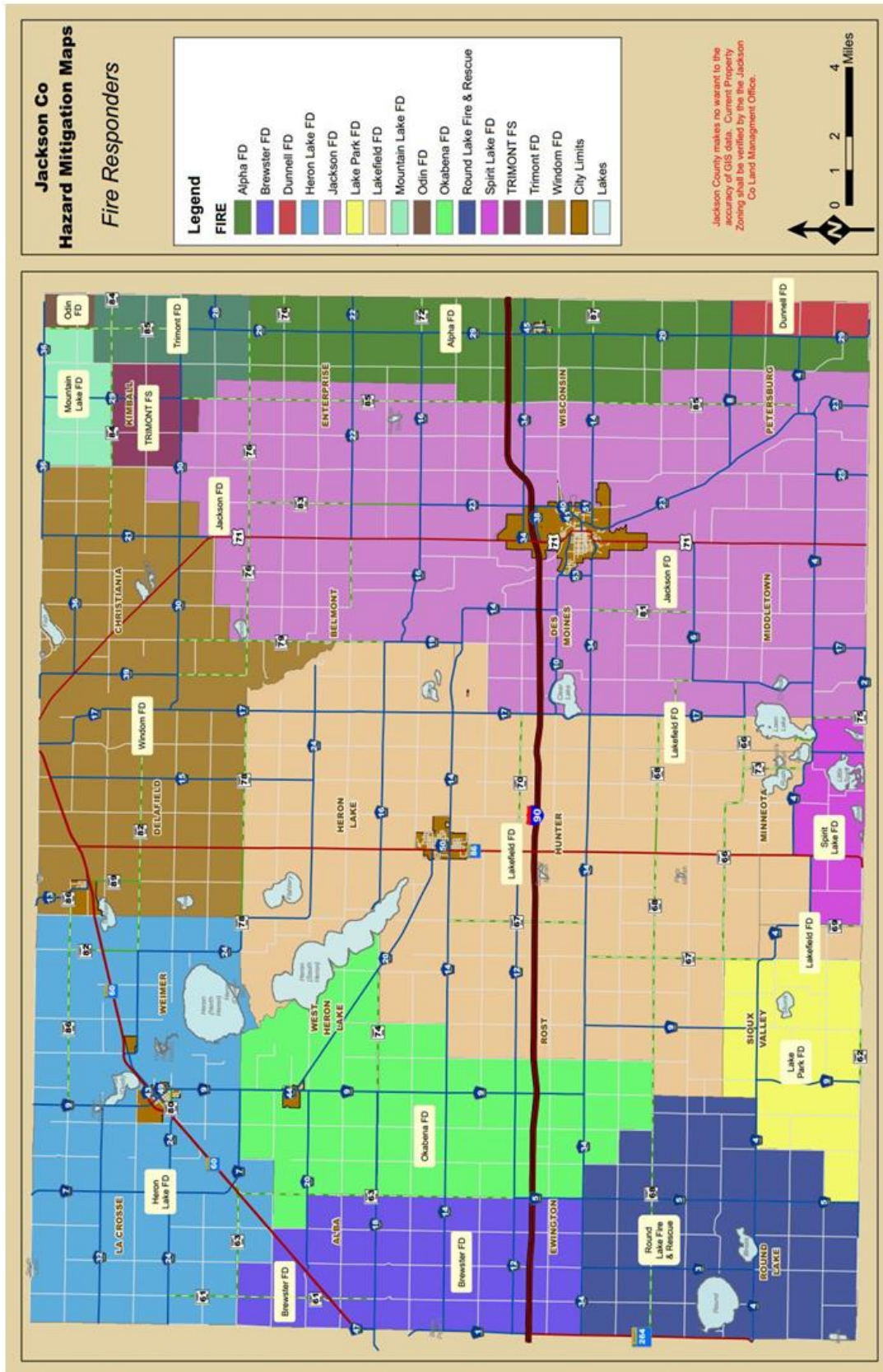
## **A1 Fire / Emergency Services**

There are no full time fire departments within Jackson County. All fire departments are volunteer based with responsibilities being divided into 13 districts. The 13 fire districts include: Heron Lake Fire District, Windom Fire District, Mountain Lake Fire District, Trimont Fire District, Alpha Fire District, Jackson Fire District, Lakefield Fire District, Okabena Fire District, Brewster Fire District, Round Lake Fire District, Lake Park Fire District, Spirit Lake Fire District, and Dunnell Fire District. A Jackson County Fire District Map can be found below. The ten districts allow for response times to be reduced, but since Jackson County is a rural county so some areas are better served than other.



RA Figure #32

Fire District Map - Jackson County



## A5 Red Cross Shelters

The American Red Cross Southwest Minnesota Chapter covers 19 counties in Southwest Minnesota. The 19 counties include: Blue Earth, Brown, Cottonwood, Fairbault, Jackson, Lincoln, Lyon, Martin, McLeod, Murray, Nicolet, Nobles, Renville, Sibley, Watonwan, Yellow Medicine, Redwood, Pipestone, and Rock. The Southwest Chapter has a series of small storage centers with disaster supplies dispersed throughout the counties. There are also shelter teams throughout the region with community partners and those partner sites have some disaster supplies. The American Red Cross Southwest Minnesota Chapter is an Emergency Support Function (ESF) #6 and #15. ESF #6 is responsible for Mass Care, Emergency Assistance, Housing, and Human Services. ESF #6 coordinates the delivery of Federal mass care, emergency assistance, housing, and human services when local, tribal, and State response and recovery needs exceed their capabilities.<sup>94</sup>

- *Mass Care* - Includes sheltering, feeding operations, emergency first aid, bulk distribution of emergency items, and collecting and providing information on victims to family members.
- *Emergency Assistance*: Assistance required by individuals, families, and their communities to ensure that immediate needs beyond the scope of the traditional “mass care” services provided at the local level are addressed. These services include: support to evacuations (including registration and tracking of evacuees); reunification of families; provision of aid and services to special needs populations; evacuation, sheltering, and other emergency services for household pets and services animals; support to specialized shelters; support to medical shelters; nonconventional shelter management; coordination of donated goods and services; and coordination of voluntary agency assistance.
- *Housing* - Includes housing options such as rental assistance, repair, loan assistance, replacement, factory-built housing, semi-permanent and permanent construction, referrals, identification and provision of accessible housing, and access to other sources of housing assistance. This assistance is guided by the National Disaster Housing Strategy.
- *Human Services* - Includes the implementation of disaster assistance programs to help disaster victims recover their nonhousing losses, including programs to replace destroyed personal property, and help to obtain disaster loans, food stamps, crisis counseling, disaster unemployment, disaster legal services, support and services for special needs populations, and other Federal and State benefits.

Emergency Support Function (ESF) #15 ensures that sufficient Federal assets are deployed to the field during incidents requiring a coordinated Federal response to provide accurate, coordinated, timely, and accessible information to affected audiences, including governments, media, the private sector, and the local populace, including the special needs population. ESF #15 provides the resource support and mechanisms to implement the National Response Framework (NRF) Incident Communications Emergency Policy and Procedures (ICEPP) described in the Public Affairs Support Annex.<sup>95</sup>

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<sup>94</sup> FEMA. Accessed: 4/16/14. Available: <http://www.fema.gov/pdf/emergency/nrf/nrf-esf-06.pdf>

<sup>95</sup> FEMA. Accessed: 4/16/14. Available: <https://www.hsdll.org/?view&did=483049>

## **A6 Sirens and other Emergency Notification Devices**

Outdoor warning sirens provide coverage in cities and other more densely populated areas within Jackson County. The emergency sirens can be activated by the Jackson County Dispatchers or city officials to warn residents in the event of severe weather. Jackson County is a rural county, so large portions of the county are outside the range of severe weather warning sirens.

Since Jackson County is a rural county, additional measures are in place to expand the notification system. Emergency warnings over the radio are still an effective medium to reach wide audiences. NOAA Weather Radio is used for broadcasting severe weather warnings. NOAA Weather Transmitter is the Rowena Tower.

In 2016, Jackson County anticipates selecting Civic Ready as their emergency response system. Jackson County compared two other systems, Nixle Alert System and the Code Red System, before selecting Civic Ready. Civic Ready integrates both Emergency Preparedness and emergency communication together, so the solution is effective before, during, and after an emergency situation. Civic Ready reaches the entire community through multiple mediums that include: phone, email, internet, and radio.

Mass Notification System – Jackson County Central Schools has a mass notification and emergency messaging system for sending out alerts for emergencies and school closings. Heron Lake – Okabena School District also has a mass notification and emergency messaging system. The system covers a wide variety of devices, including voice, text, and email. The alert system was designed specifically for Kindergarten through 12th Grade Schools.

### **Features You Can Count On With Instant Alert**

- Delivery and Reach
- Mass alerts via multiple devices, including phone, email and text
- Send thousands of messages with the click of a button
- Effective Messaging
- Record your messages or use an electronic, text-to-speech voice
- Target communication to unlimited groups to control who receives information
- Eliminate paper notifications with email alert attachments
- Multiple Activation Methods
- Launch alerts from an easy-to-use web interface
- Send alerts using our 24/7/365 staffed help desk, if Internet access is unavailable
- Fully hosted, cloud-based service with no hardware, software or phone lines to maintain

# CHAPTER 7: MITIGATION STRATEGIES

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This Chapter documents goals, objectives and mitigation strategies that the Jackson County All Hazard Mitigation Plan (AHMP) Planning Team developed through the hazard mitigation planning process. Section I describes mitigation goals, objectives, and strategies. Section II addresses NFIP compliance. Section III describes implementation of mitigation actions.

## **I Hazard Mitigation Goals**

Hazard mitigation is intended to protect our communities by reducing or eliminating long-term risk to people and property before a disaster strikes. Emergency management involves a cycle through which communities prepare, respond, and recover from emergencies and disasters. The planning team formulated goals, objectives, and strategies to mitigate the effects of natural and manmade hazards.

Goals are general guidelines that explain what Jackson County wants to achieve. Objectives narrow the general guidelines and define in more detail what Jackson County wants to achieve. Strategies are the actual steps to be taken to achieve the goals.

A qualitative approach was used by the planning team to judge and prioritize the mitigation strategies based on perceived costs and benefits. The process used to judge and prioritize the mitigation strategies was the STAPLEE Process. Through the STAPLEE Process the Goals Subcommittee evaluated every strategy based on social, technical, administrative, political, legal, economic, and environmental criteria. These seven criteria allowed for a more precise priority ranking. Before the priority rankings were finalized, the Goals Subcommittee shared their priority rankings with the entire planning team. The completed STAPLEE Process can be found in Appendix B of the plan.

It should be noted that not every hazard identified within the risk assessment has a goal outlined below. Goals were combined for certain hazards with similar mitigation measures. For example, severe summer storms and tornados both require similar awareness, prevention and structural measures. The main benefit of the actions listed is the improved health, safety and welfare of the community and residents. The highest ranking hazards are listed first, followed by moderate rank hazards and finally low rank hazards.

An acronym list of entities listed in the strategies below can be found on page 169.

### ***Priority Rank***

The priority rank is scored on a scale of one through five, one being the least important and five being most important. The STAPLEE Process assisted the planning team in assigning the priority ranking.

### ***Status***

The status designations for the mitigation action chart are below. The status designations are broken into new and existing.

### ***New Mitigation Action***

- New – new action added to the AHMP
- Existing - from previous Jackson County AHMP

#### *Existing*

- Ongoing – actions require continuing application
- In Progress – actions are currently being acted upon
- Complete – the action is complete
- Deferred – no progress has been made
- Not Relevant – no longer relevant

#### *Timeframe*

The timeframe for implementing a mitigation strategy is divided into two categories:

- Short Term – 1 to 5 years
- Long Term – 5 + years
- Continuous

## **II Implementation of Mitigation Strategies**

### **Strategy Implementation & Administration**

Prioritization does not mean that all strategies with a priority ranking of five have to be accomplished before strategies with a four and so on can be implemented. The purpose of the prioritization is to show that the planning team talked about possible options and with unlimited resources, this is what they chose to accomplish first. Due to scarce resources, it may be necessary to start with a goal that have less upfront costs and is relatively easier to implement. The goals, objectives, and strategies being outlined in the Jackson County AHMP are recommendations from the planning team, so during implementation modifications can take place.

Jackson County Emergency Management is the primary agency responsible for implementation and administration of this plan. The County will implement mitigation strategies within the next five years, and will seek appropriate funding to do so.

Local jurisdictions with comprehensive plans and land use controls will be strongly encouraged to incorporate applicable goals, objectives, and strategies into their local plans upon their next update. Transmittal of the final plan will include a letter from the County Emergency Manager requesting that each participating jurisdiction 1) adopt this Hazard Mitigation Plan as a primary policy document, and 2) review and incorporate all applicable policies of this document into the community's existing plans by inclusion or by reference.

## Mitigation Strategies Acronym List

### Cities

AL	City of Alpha
HL	City of Heron Lake
CJ	City of Jackson
LF	City of Lakefield
OK	City of Okabena
WD	City of Wilder

### Townships

AT	Alba Township
BT	Belmont Township
CT	Christiania Township
DT	Delafield Township
DMT	Des Moines Township
ET	Enterprise Township
EWT	Ewington Township
HLT	Heron Lake Township
HUNT	Hunter Township
KT	Kimball Township
LCT	Lacrosse Township
MT	Middletown Township
MNT	Minnesota Township
PT	Petersburg Township
RT	Rost Township
RLT	Round Lake Township
SV	Sioux Valley Township
WT	Weimer Township
WHT	West Heron Lake Township
WST	Wisconsin Township
Twp	All Townships

### Local Organizations

JCA	Jackson County Administration
JCPW	Jackson County Public Works
EM	Jackson County Emergency Management
LMO	Jackson County Land Management Office
HAZ	HAZMAT Team
DVHHS	Des Moines Valley Health and Human Services
SWCD	Soil and Water Conservation District

### Other Entities and Organizations

EMT	Ambulance volunteers
Fire	Firefighting volunteers
Hosp	Hospital
LAW	Law Enforcement
Sch	Local School districts
PU	Public Utilities
RWS	Rural Water Systems
BWSR	Minnesota Board of Water and Soil Resources
MDAg	Minnesota Dept. of Agriculture
MDH	Minnesota Dept. of Health
MnDOT	Minnesota Dept. of Transportation
BAH	Minnesota Board of Animal Health
EXT	University of Minnesota Extension
FEMA	U.S. Federal Emergency Management Administration
MPCA	Minnesota Pollution Control Agency
DNR	Department of Natural Resources
RC	American Red Cross
Rail	Local Railroads
Air	Jackson Airport
ALL	All Departments/Parties listed



**MS Table #1****General**

Hazard	Goal	Mitigation Objective	Mitigation Strategy	Priority	Status / Timeframe	Who	Comments on Implementation & Potential Funding
All Hazards	Improve the planning process for updating All Hazard Mitigation Plans (AHMP) in Minnesota.	Ensure that needs and projects outlined in county AHMPs are eligible for funding.	Educate state and federal decision makers that county AHMPs do not expire. Currently, a county AHMP can expire if a plan is not updated within the five year update cycle. Projects outlined in an expired county AHMP are not eligible for FEMA funding. Mitigation strategies should remain eligible for funding, if local issues have not changed, there is a need for the project, and the project is outlined in a county AHMP.	5	New  Short Term	EM, JCA, All Cities	Cost: In-kind  Rural counties that are not seeing dramatic population change may not need to update their AHMP every five years. An update to a county AHMP may be sufficient, which consists only of updating the Mitigation Strategies Chapter.

**MS Table #2****Agricultural Disease**

Hazard	Goal	Mitigation Objective	Mitigation Strategy	Priority	Status / Timeframe	Who	Comments on Implementation & Potential Funding
Agricultural Disease – including plant and animal hazards	To reduce the risk to pets and livestock from agricultural disease.	Make sure that Jackson County farmers are following guidelines set forth by governing bodies at the federal, state, and local levels.	Encourage agricultural officials to give presentations about the warning signs of various diseases that are likely to affect Jackson County.	2	Existing: Ongoing  Continuous	EXT, LMO, MDAg, BAH	Cost: In-kind



Hazard	Goal	Mitigation Objective	Mitigation Strategy	Priority	Status / Timeframe	Who	Comments on Implementation & Potential Funding
		Develop a plan for farmers if there is an outbreak of disease or a major disaster occurs (Avian Flu, etc.).	Encourage Jackson County government officials to work with farmers to develop ways of containing a disease and allow business continuity for livestock producers.	2	Existing: Ongoing  Continuous	EM, JCA, LMO, DVHHS, MDAG, BAH	Cost: In-kind
		Develop a plan for farmers if there is an outbreak of disease or a major disaster occurs (help to contain foreign animal diseases)	Create and expand a section in the Emergency Operations Plan that deals with response and care of animals in an outbreak of disease or a major disaster along with disposal.	2	Existing: Completed  Annual review	EM, LMO, DVHHS, EXT	Cost: In-kind
	Reduce the risk of plant loss from insects/pests and diseases.	Keep informed of current pests and insects that could threaten Jackson County.	Utilize information provided by the University of Minnesota Extension, private industry, and the Department of Agriculture on how to handle certain pests and insects.	2	Existing: Ongoing  Continuous	EXT, SWCD, LMO, MDAG, BAH	Cost: In-kind
		Educate citizens on the types of fungi, insects, and pests that could potentially cause a problem for plants and trees.	Use current information services that provides useful and factual information about infectious diseases and various insects and pests.	3	Existing: Ongoing  Continuous	EXT, LMO, MDAG	Cost: In-kind

Hazard	Goal	Mitigation Objective	Mitigation Strategy	Priority	Status / Timeframe	Who	Comments on Implementation & Potential Funding
		Contain invasive species in lakes and rivers (Asian Carp, zebra mussels, etc.)	Educate the public...	3	New	DNR, LMO, SWCD, LAW, BWSR	

**MS Table #3**

**Severe Storms & Extreme Temperatures**

Hazard	Goal	Mitigation Objective	Mitigation Strategy	Priority	Status / Timeframe	Who	Comments on Implementation & Potential Funding
Severe Storms/Extreme Temperatures – including blizzards winter storms, and extreme cold temperatures; severe summer storms, lightning, hail, and extreme heat events; tornado and straight-line wind events	Minimize negative impacts caused by severe weather and extreme temperatures.	Educate county residents on the importance and need of adequate supply of emergency shelters and safe rooms.	<p>Conduct a study to determine areas that are deficient in emergency shelters and safe rooms.</p> <p>Upon completion, a project to construct shelters and safe rooms should be pursued.</p>	5	<p>Existing: In Progress</p> <p>Short Term</p>	EM, Law, All Cities, JCPW, Sch	<p>EM will work with local jurisdictions that have campgrounds to provide information to campground operators.</p> <p><i>Cost:</i> In-kind</p>

Hazard	Goal	Mitigation Objective	Mitigation Strategy	Priority	Status / Timeframe	Who	Comments on Implementation & Potential Funding
		Educate county residents on where emergency shelters are located.	Distribute a map of identified emergency shelters as part of the welcome pack to cities and chambers give to new residents (include campgrounds).  This packet would also include other general emergency information.	4	New: in progress  Continuous	EM, All Cities, JCA, RC, JCPW	Cost: printing costs of \$250 per year.  Red Cross is in the process of doing an evaluation (Fall 2015)
		Have staff at the schools, hospitals, and nursing homes trained for severe weather emergency response.	Each spring, Jackson County Emergency Management personnel will educate local schools, nursing homes, hospitals, etc. on the importance of doing a "Severe Weather Awareness Week" workshop for their staff. This would identify evacuation routes, emergency shelters, and safe rooms, along with other important information.	5	Existing: Ongoing  Continuous	EM, Sch, Hosp, All Cities, LAW	Cost: In-kind
		Have county citizens become better notified of severe weather conditions and precautions they should take.	Encourage the distribution of NWS weather radios to all residents who want one, especially those in rural areas away from community sirens.	4	Existing: Ongoing  Continuous	EM, DVHHS, LAW, All Cities, Sch	Cost: \$10,000  Civic Ready, internet, and other services have made radio less important.

Hazard	Goal	Mitigation Objective	Mitigation Strategy	Priority	Status / Timeframe	Who	Comments on Implementation & Potential Funding
		To have designated tornado and winter storm shelters and safe rooms in town for people with no appropriate shelter.	Ensure that each manufactured home park has an updated emergency management plan and work with park managers to improve communication during severe storm events, ensure that residents are familiar with the emergency management plans and that residents recognize the evacuation routes within the plan and where they can go for shelter.	5	Existing: Ongoing  Short Term	EM, LMO, LAW, All Cities	Cost: In-kind  Limited number of manufactured home parks in Jackson County
		To have a backup generator for winter electric failure to insure proper heating of designated shelters, safe rooms, and homes.	Work with fire and ambulance volunteers to develop a safe shelter plan for Jackson County (including shelters, shelter capacity, safe rooms, safe room capacity, and transportation routes).	5	Existing: Ongoing  Short Term	EM, LAW, EMT, Fire, All Cities, JCPW, PU	Cost: In-kind

Hazard	Goal	Mitigation Objective	Mitigation Strategy	Priority	Status / Timeframe	Who	Comments on Implementation & Potential Funding
		Ensure all severe weather sirens have a back-up power source.	Identify sirens that currently do not have a back-up power source. Refer to Table RA Table #25 for sirens that do and do not have backup batteries (backup power generation).  Identify funding sources, when available, to purchase back-up power sources for severe weather sirens.	5	New Continuous	EM, All Cities, JCPW, LAW	Cost: \$14,000 - \$20,000 per back-up power source
		Ensure proper siren coverage within Jackson County.	Refer to the warning sirens gap on page 106 for parks and campgrounds in Jackson County that need warning sirens.	5	New Continuous	EM, All Cities, JCPW, LAW	Cost: \$15,000 - \$30,000 per siren

**MS Table #4**

**Drought**

Hazard	Goal	Mitigation Objective	Mitigation Strategy	Priority	Status / Timeframe	Who	Comments on Implementation & Potential Funding
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Hazard	Goal	Mitigation Objective	Mitigation Strategy	Priority	Status / Timeframe	Who	Comments on Implementation & Potential Funding
Drought	Minimize the negative impacts of drought conditions in Jackson County.	Ensure accurate inventories of the recharge rates and capacities of Jackson County's aquifers are recorded.	Perform necessary studies to determine the capacities and recharge rates of Jackson County's aquifers in order to better assess use restrictions and provisions during times of drought.	3	Existing: Ongoing  Continuous	LMO, SWCD, BWSR, ALL Cities, RWS	Cost: In-kind  DNR issues the pumping permits for wells. They also have the right to suspend the permit during drought.
		Any water supplier should have a wellhead protection plan.	Educate the public and private leaders of the importance of wellhead protection and water conservation in times of low rainfall.	3	Existing: Ongoing  Short Term	EM, AL, OK, WD, LMO	Cost: In-kind  The Cities of Alpha, Heron Lake, Okabena and Wilder do not have wellhead protection plans
		Ensure all cities within Jackson County have the capability to restrict water use.	Develop watering ban ordinances with the Cities of Alpha, Lakefield, Okabena, and Wilder.	3	New  Short Term	AL, LF, OK, WD	Cost: In-kind

**MS Table #5**

**Fire – Structure Fires & Wild Fires**

Hazard	Goal	Mitigation Objective	Mitigation Strategy	Priority	Status / Timeframe	Who	Comments on Implementation & Potential Funding
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Hazard	Goal	Mitigation Objective	Mitigation Strategy	Priority	Status / Timeframe	Who	Comments on Implementation & Potential Funding
Fire – Structure Fires & Wildfires	Eliminate or lessen the negative impacts from fire.	Partnership between landowners that limits the potential for wildfires to spread through the establishment of fire breaks.	Encourage township road authorities to cut back road ditches and bale where appropriate, which will limit potential for spreading of wildfires.	1	Existing: Ongoing  Continuous	EM, JCPW, Fire, Townships	Cost: In-kind
		Increase fire prevention and safety for residential units throughout Jackson County including school districts.	Participate in the nationally coordinated “Firewise” program to increase resident education.	4	Existing: Ongoing  Continuous	All Cities, Fire, LMO, Sch	Education regarding vegetation management and the use of fire resistant building materials.
		Safer commercial structures by having building codes include alarms and sprinkler systems.	Encourage building construction to include fire/smoke alarms, sprinkler systems, and snow load minimum design standards.	4	Existing: Ongoing  Continuous	All Cities, LMO, LAW, Fire	The City of Jackson is the only city that adopted the Minnesota Building Code.
		Ensure accessibility for fire fighting vehicles and other emergency vehicles.	Outline streets and alleys that are and are not sufficient size to handle modern fire fighting vehicles and other emergency vehicles.	2	Existing: Ongoing  Short Term	All Cities, Twp, JCPW, LMO, Fire	This may require limiting parking on the street and having setback requirements along alleys.



Hazard	Goal	Mitigation Objective	Mitigation Strategy	Priority	Status / Timeframe	Who	Comments on Implementation & Potential Funding
		Maintain existing mutual aid agreements.	Coordinate with regional fire departments outside of Jackson County who could directly assist in fighting fires within the county.	5	Existing: Ongoing  Continuous	EM, Fire, LAW, All Cities	This is done well already
		Ensure emergency response personnel are prepared for response to incidents at renewable energy facilities.	Facilitate education on best practices for response to incidents at renewable energy facilities (including the Heron Lake Ethanol Plant, Brewster Biodiesel Plant, wind farms, etc.).	5	Existing: Ongoing  Continuous	EM, LAW, EMT, Fire	Already occurs
		Ensure emergency response personnel are prepared for response to incidents at 302 Facilities	Annually check to ensure all 302 Facilities are inventoried and included in Jackson County's map of 302 Facilities.	4	New  Continuous	EM, Law, EMT, Fire, JCPW	
		Ensure information regarding 302 Facilities is easily accessible.	Develop an application to identify hazards at each 302 site, so emergency responders can more efficiently look up a facility they are responding to.	4	New  Continuous	EM, Law, EMT, Fire, All Cities, JCPW	Should be integrated into the 911 system

Hazard	Goal	Mitigation Objective	Mitigation Strategy	Priority	Status / Timeframe	Who	Comments on Implementation & Potential Funding
		Ensure water access in rural areas is faster and efficient.	Install dry hydrant at Clear Lake and Loon Lake	2	New Long Term	EM, Fire, DNR	Cost: \$1,000 to \$3,000  Issues: DNR regulations and maintenance costs

**MS Table #6**

**Flooding & Dam Failure**

Hazard	Goal	Mitigation Objective	Mitigation Strategy	Priority	Status / Timeframe	Who	Comments on Implementation & Potential Funding
Flooding & Dam Failure	Minimize negative impacts resulting from flood events by identifying problem areas and potential solutions to correct them.	Ensure that any future developments constructed within Jackson County and each city within the county are located outside of 100-year flood plains.	Continuation of flood plain mapping and zoning in the official land use maps and zoning ordinances.	1	Existing: Ongoing  Continuous	LMO, EM, CJ, FEMA	Cost: In-kind
		Ensure cities that utilize centralized sewer treatment systems have compliant systems that keep inflow and infiltration to a minimum.	Work with cities to implement best practices in regards to inflow and infiltration	3	Existing: Ongoing  Continuous	All Cities, MPCA, FEMA	Cities do this but it is costly
		Update the Flood Insurance Rate Maps covering Jackson County.	Jackson County communities with flood hazards are encouraged to work with DNR and FEMA to modernize the floodplain maps.	2	Existing: Ongoing  Continuous	DNR, OK, CJ, JCPW, LMA	The City of Jackson has a recent flood plain map. Continuous since funding for map is unknown.

Hazard	Goal	Mitigation Objective	Mitigation Strategy	Priority	Status / Timeframe	Who	Comments on Implementation & Potential Funding
		Update the Flood Insurance Rate Maps covering Jackson County.	Structures in floodplains should be identified for inclusion in acquisition, relocation, or elevation projects to reduce flooding risk.	2	Existing: Ongoing  Continuous	LMO, CJ, OK, DNR, EM, LMO	
		Ensure developments in the flood hazard areas follow best practices to minimize risk.	Work closely with DNR on all development applications in identified flood hazard areas.	2	Existing: Ongoing  Continuous	LMO, CJ, OK, DNR, EM	
		Decrease phosphorus, nitrogen, and sediment from entering rivers, streams, and ditches.	Promote a buffer system along creeks and streams that are prone to flooding (Grass Strips, CRP, RIM, etc.).	3	Existing: Ongoing  Short Term	LMO, SWCD, BWSR, MPCA	<p>In 2015, a buffer initiative was signed into law, designating an estimated 110,000 acres of land for water quality buffer strips statewide. The law establishes new perennial vegetation buffers of up to 50 feet along rivers, streams, and ditches.</p> <p>Cost: land owners – government devaluing agricultural land without compensating landowners.</p>

Hazard	Goal	Mitigation Objective	Mitigation Strategy	Priority	Status / Timeframe	Who	Comments on Implementation & Potential Funding
		Determine the risk of flooding along the Des Moines River in Jackson County.	Monitor the effects of the Jackson Dam replacement on potential for flooding.	1	Existing: Ongoing  Continuous	CJ, DNR, LMO	Impoundments are still considered a dam
		Have communities within the one percent floodplain participate in the NFIP.	Jurisdictions with identified flood hazard areas that do not currently participate in NFIP will consider participation during scheduled update of zoning ordinances.		Complete		Jurisdictions that participate in the NFIP include: City of Jackson and Jackson County. Okabena does have property within the one percent floodplain, but there are no structures in this area.
		Discourage development in the flood hazard areas	Discourage zoning variances in identified flood hazard areas.	2	Existing: Ongoing  Continuous	LMO, CJ, OK, DNR	

**MS Table #7**

**Civil Disturbance & Terrorism**

Hazard	Goal	Mitigation Objective	Mitigation Strategy	Priority	Status / Timeframe	Who	Comments on Implementation & Potential Funding
Civil Disturbance & Terrorism	Protect Jackson County critical infrastructure and county residents from civil disturbance and terrorism.	Ensure new facility construction is responsive to potential terrorist activity, where appropriate.	Consider zoning and building code changes and updates that reflect building measures to withstand civil disturbances and terrorist attacks, where appropriate.	4	Existing: Ongoing  Continuous	LMO, All Cities, EM, LAW	Cost: In-kind

Hazard	Goal	Mitigation Objective	Mitigation Strategy	Priority	Status / Timeframe	Who	Comments on Implementation & Potential Funding
		Encourage safe county and city public facilities.	Consider limiting public access in high profile county and city locations in times of increased potential for civil disturbances and terrorist activity. These times should follow the Federal Department of Homeland Security warning system.	4	Existing: Ongoing  Continuous	LAW, JCA, EM, Sch, All Cities, Hosp	Cost: In-kind
		Increase the level of security of public facilities through landscape design, vehicle barriers, and separation of public and private functions.	When remodeling or building a new building consider the design to increase security.  When landscaping around a public building consider the design to increase security.	3	Existing: Ongoing  Continuous	JCA, All Cities, LAW, EM, Sch, Hosp	Cost: In-kind
		Work with state and federal agencies engaged in the statewide domestic preparedness strategy to identify options for Jackson County.	Assess local capacity and risk of civil disturbances and terrorism, and security of critical facilities.	3	Existing: Ongoing  Continuous	EM, Law, Sch, All Cities, JCA	Cost: In-kind
		Increase response capabilities in Jackson County regarding civil disturbances and terrorism.	Update the local emergency plans to adequately address civil disturbances and terrorism.	4	Existing: Ongoing  Continuous	EM, Law, Sch, All Cities, JCA, Hosp	Cost: In-kind

Hazard	Goal	Mitigation Objective	Mitigation Strategy	Priority	Status / Timeframe	Who	Comments on Implementation & Potential Funding
		Increase coordination schools and other government agencies regarding scenario planning for lethal attacks and other terrorist events.	Conduct annual scenario trainings with schools in Jackson Counties and other government agencies.  School Shut down training could be one of the scenarios.	4	New  Short Term	Sch, EM LAW, Fire, EMT, JCA, All Cities, Hosp	
		Increase safety at higher density public places.	Identify higher density locations in Jackson County. A non-exhaustive list includes: schools, AGCO, the race track, etc.  Coordinate and develop evaluation plans at these locations.	4	New  Short Term	EM, Law, Sch, Fire, EMT, Hosp	
		Increase security at government facilities in Jackson County.	Install security devices (metal detector, etc.) at the entrance to the court house.  Evaluate other government facilities regarding the need for additional security.	3	New  Continuous	Sch, EM, Law, JCA, All Cities	

**MS Table #8**

**Hazardous Materials**

Hazard	Goal	Mitigation Objective	Mitigation Strategy	Priority	Status / Timeframe	Who	Comments on Implementation & Potential Funding
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Hazard	Goal	Mitigation Objective	Mitigation Strategy	Priority	Status / Timeframe	Who	Comments on Implementation & Potential Funding
Hazardous Materials	Improve the effectiveness and quality of the various agencies addressing hazardous materials that may impact Jackson County.	The ability to quickly map the affected disaster area as well as surrounding areas within Jackson County.	Increase training of emergency personnel so that all types of potential spills will be readily recognized upon arrival.	3	Existing: Ongoing  Continuous	Law, Fire, EMT, EM, JCPW, MnDOT	Cost: In-kind
		To have properly trained HAZMAT personnel/emergency management personnel.	Continue to expand the use of mutual aid agreements and memoranda of understanding to improve coordination between state, local, and federal agencies, and appropriate private sector representatives.	3	Existing: Ongoing  Continuous	JCPW, Law, FIRE, EMT, All Cities, EM	Cost: In-kind
		Make sure emergency personnel are able respond to and identify a variety of hazardous materials.	Work with state and federal agencies to identify and address hazardous materials that have the potential to impact Jackson County and region.	3	Existing: Ongoing  Continuous	EM, LAW, Fire, EMT	Cost: In-kind
		Support policies and programs that assist in creating factual and timely information about hazardous materials in Jackson County.	Develop a plan to implement Geographic Information Systems (GIS) to effectively plan for and respond to hazards.	4	Existing: Ongoing  Continuous	JCA, LMO, EM, JCPW	Cost: In-kind + equipment



Hazard	Goal	Mitigation Objective	Mitigation Strategy	Priority	Status / Timeframe	Who	Comments on Implementation & Potential Funding
Hazardous Materials	Reduce the negative impacts found with methamphetamine labs in Jackson County.	Identify who is responsible for meth lab clean up and identify the responsibilities of the property owners.	Enforce Jackson County's ordinance that deals with who is responsible for the cleanup of a meth lab.	3	Existing: Ongoing  Continuous	LAW, JCA, EM, Fire, LMO, MPCA	Cost: In-kind
		Educate the public about the warning signs of meth and potential dangers of the drug especially school officials, health officials along with mail carriers, cable repair men, plumbers, electricians, and delivery personnel (UPS, FEDEX).	Distribute fliers associated with commonly found materials involved with meth labs and risks of the drug.  Encourage the elimination of abandoned houses/buildings and make sure wooded areas are checked regularly.	3	Existing: Ongoing  Continuous	All Cities, All Townships, JCA, LAW, EM, LMO, JCPW, Sch	Cost: In-kind
		Educate landlords on the warning signs of a possible meth lab.	Educate landowners that they are responsible for the cost of Meth lab cleanups, so there is an increased economic incentive for monitoring properties (letter with tax Statement)	3	Existing: Ongoing  Continuous	LAW, HAZ, Fire, LMO, EM, JCA	Cost: In-kind

Hazard	Goal	Mitigation Objective	Mitigation Strategy	Priority	Status / Timeframe	Who	Comments on Implementation & Potential Funding
		Educate store owners on the ingredients used to make meth, and what they can do to prevent or limit the sale of the ingredients.	Conduct an annual education campaign to increase education of store owners, school officials, health care workers, and the general public about the warning signs of meth.	3	Existing: Ongoing  Continuous	EM, DVHHS, LAW, Sch	Cost: In-kind
		Ensure that law enforcement and hazardous materials professionals (HAZMAT) are properly trained in the cleanup and evaluation of a meth lab.	Work with local law enforcement and hazardous materials professionals (HAZMAT) to identify training and changes in policies and regulations.  Work with law enforcement and HAZMAT personnel to evaluate needs for equipment to deal with meth-lab clean up.	3	New  Continuous	EM, Law, Fire, LMO, MPCA	Cost: In-kind

**MS Table #9**

**Public Health Emergencies**

Hazard	Goal	Mitigation Objective	Mitigation Strategy	Priority	Status / Timeframe	Who	Comments on Implementation & Potential Funding
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Hazard	Goal	Mitigation Objective	Mitigation Strategy	Priority	Status / Timeframe	Who	Comments on Implementation & Potential Funding
Public Health Emergencies	Reduce the threat of infectious diseases through education and awareness.	Better coordination with local media in the case of medical emergencies.	Update the Jackson County Emergency Operations plan to reflect recent changes made to the State plan in regards to coordinating more effectively with the local media.	3	Existing: Ongoing  Continuous	EM, DVHHS, Hosp, Fire, EMT, LAW, JCA	Cost: In-kind
		Increased distribution of medications and medical supplies in the case of emergency.	Encourage DVHHS to continue work with Minnesota Department of Health for the mass distribution of needed medicines and supplies for public health emergencies.	3	Existing: Ongoing  Continuous	DVHHS, MDH, LAW, Fire, EMT, EM, Hosp	Cost: In-kind
		Develop an effective quarantine plan that limits the spread of highly contagious diseases.	Implement a quarantine plan in coordination with local doctors and other health professionals in Jackson County.	3	Existing: Ongoing  Continuous	MDH, DVHHS, Hosp, LAW, Fire, EMT, EM	Cost: In-kind
		Maintain Health Alert Network (HAN).	Notify local medical providers of potential infectious disease threats.	3	Existing: Ongoing  Continuous	DVHHS, MDH, Hosp,	Cost: In-kind
		Decrease the health risk associated with the West Nile Virus.	Develop/adopt a West Nile Virus protection plan and a cooperative partnership with cities to spray for mosquitoes.	3	Existing: Ongoing  Continuous	DVHHS, JCPW, LMO, All Cities	Cost: In-kind

**MS Table #10****Transportation Infrastructure & Transportation Crashes**

Hazard	Goal	Mitigation Objective	Mitigation Strategy	Priority	Status / Timeframe	Who	Comments on Implementation & Potential Funding
Transportation Infrastructure & Transportation Crashes	Ensure transportation systems in Jackson County are efficient, cost effective, and safe for all users.	Ensure train tracks and airport are free of debris and visibility is sufficient so that people will see them.	Make maintenance personnel keep the train tracks clear of debris when they are grading the roads.  Maintain adequate visibility and lighting at railroad crossings and airport.	3	New  Continuous	EM, LAW, MnDOT, JCPW, Rail, Air	
		Help to maintain culverts and ditches to ensure roads are not as vulnerable to erosion.	Identify culverts that are frequently in need of repair or are in poor condition.	5	New  Short Term	JCPW, EM, LAW, MnDOT, All Townships	
		Reduce road closures due to drifting snow.	Identify locations that cause road closures occur due to drifting snow.  Identify mitigation measures to mitigate road closures caused by drifting snow.	5	New  Short Term	JCPW, EM, LAW, All Townships, All Cities, LMO	

Hazard	Goal	Mitigation Objective	Mitigation Strategy	Priority	Status / Timeframe	Who	Comments on Implementation & Potential Funding
		Reduce the risk of crashes at intersections within Jackson County	<p>The top ten problem intersections have been identified by the Jackson County Highway Department as part of the Jackson County Transportation Safety Plan. Identify traffic safety improvements to mitigation the risk of crashes at these intersections.</p> <p>Identify funding sources to assist with reducing the risk of crashes at these intersections.</p>	5	New  Continuous	JCPW, EM, LAW, All Cities, MnDOT, Sch	Refer to the Jackson County Transportation Safety Plan for higher risk intersections. There may not be mitigation measures to improve safety at these intersections. These intersections may have more crashes due to reckless driving and other measures out of control of engineering and local law enforcement.
		Increase visibility of pedestrians at higher traffic volume crossings.	Support projects outlined in local Active Living Plans, Safe Routes to School Plans, Land Use Plans, and Comprehensive Plans that increase pedestrian safety.	5	New  Continuous	JCPW, EM, LAW, All Cities, MnDOT, Sch	

MS Table #11

## Utility Failure

Hazard	Goal	Mitigation Objective	Mitigation Strategy	Priority	Status / Timeframe	Who	Comments on Implementation & Potential Funding
Utility Failure	Increase coordination between Rural Electrical Cooperatives, emergency response, DVHHS, and emergency management.	Ensure critical facilities have redundant service in case of utility failure.	Evaluate the needs and costs for providing backup generation where none currently exists.  Refer to RA Table #8 for a list of facilities that need new or additional backup generators.	5	Existing: Ongoing  Short Term	EM, All Cities, PU, JCPW, DVHHS	Cost: In-kind for research. Costs vary for backup generators from \$5,000 to \$100,000.
		Ensure that critical facilities such as hospitals and rural water suppliers have access to back up power generators.	Evaluate the needs and costs for providing back up generation to critical facilities, including: hospitals, rural water suppliers, and locations of Strategic National Stockpile of medicines and supplies.	5	Existing: Ongoing  Short Term	EM, PU, RWS, Hosp, All Cities	Cost: In-kind
		Ensure that citizens living in their own home dependent on oxygen or respiration assistance have access to backup power or alternative life support.	Work with rural electric and Medicare to maintain a list of homes that are dependent on oxygen or respiration assistance and require backup power.	5	Existing: Ongoing  Continuous	DVHHS, PU, EM, All Cities	Cost: In-kind  This list is maintained by REA and Medicare. This list is not all inclusive.
	Eliminate or reduce the effect of utility failures that occur within Jackson County.	Increase hardening of the electrical grid in Jackson County.	Examine need for redundant utility service/sources at critical facilities.	5	Existing: Ongoing  Continuous	EM, PU, JCPW, All Cities	Cost: In-kind

Hazard	Goal	Mitigation Objective	Mitigation Strategy	Priority	Status / Timeframe	Who	Comments on Implementation & Potential Funding
		Increase hardening of the electrical grid in Jackson County.	Encourage utility providers to bury electric lines where feasible.	5	Existing: Ongoing  Continuous	LMO, PU, All Cities, EM	Cost: 3 phase lines cost \$79,000 a mile so it is extremely costly to bury lines.  Mitigation funding is required to make obtainable
		Reduce the risk of damaging natural gas lines.	Require a permit when working along township roads.	3	New  Short Term	All Townships, PU, LMO, JCPW	Cost: in-kind  There is a risk associated with snagging natural gas lines along township roads when work is being done. County Roads require getting a permit, while township roads do not.
		Increase safety around substations.	Reduce the risk of substation vulnerability to disruption.	3	New  Continuous	PU, JCPW, LAW, EM	Cost: unknown  In western states there have been issues of people shooting guns at substations. Cameras or other security devices may be needed if this becomes an issue in Minnesota.



MS Table #12

## Water Supply Contamination

Hazard	Goal	Mitigation Objective	Mitigation Strategy	Priority	Status / Timeframe	Who	Comments on Implementation & Potential Funding
Water Supply Contamination	Preserve and protect the quality of Jackson County's ground water resources.	Ensure that an emergency supply of clean drinking water is available even in the case of emergencies.	Provide updates to the Emergency Response Plan that identifies alternate sources of drinking water including the location of adequate amounts of bottled water.	3	Existing: Ongoing  Continuous	EM, DVHHS, MDH	Cost: In-kind
		Minimize contamination of groundwater from abandoned wells.	Promote an abandoned well sealing program within Jackson County.	4	Existing: Ongoing  Continuous	LMO, BWSR, JCPW, All Cities, SWCD	Cost: \$1000 per well
		Promote the interconnected water supply in the case of emergencies.	Maintain wells that are accessible if Rural Water (current source) would need to shut down.	4	Existing: Ongoing  Continuous	RWS, All Cities	Cost: unknown (could be substantial)  CJ can access Red Rock Rural Water
		Minimize inflow and infiltration in sewer systems in Jackson County.	Work with cities in Jackson County to identify funding sources to improve sewer systems that are outdated and do not meeting current standards regarding inflow and infiltration.	4	New  Continuous	All Cities, EM, LMO, MPCA	Cost: it is extremely costly to update a sewer system. Cities want to minimize inflow and infiltration but cost can be a barrier.
		Minimize runoff from feedlots in Jackson County.	Work with LMO and MPCA to ensure feedlots are compliant with existing regulations.	4	New  Continuous	LMO, MPCA, JCPW, EM	Cost: In-kind  Environmental costs associated with a spill.

## Sources of Funding

Funding sources for mitigation actions vary from FEMA to other federal, state, and local funding sources. Certain mitigation actions lend themselves to specific funding sources.

- Mitigation actions for Public Health Emergencies are typically led by Public Health Services, with funding through the Minnesota Department of Health and other sources.
- Mitigation actions for Transportation Infrastructure will likely be accomplished in conjunction with MnDOT/Federal Highway Administration, County State Aid, and other County/Township/City-funded projects. MnDOT may pay \$500-\$700 per acre, per year for living snow fence projects in priority locations, which is often supplemented by the Conservation Reserve Program (CRP) through USDA Farm Service Agency and SWCD.
- Mitigation action items for Drought/Water Supply may find funding from DNR, the Minnesota Board of Water and Soil Resources (BWSR), Minnesota Pollution Control Agency (MPCA), US Environmental Protection Agency (EPA) and US Department of Agriculture (USDA).
- Mitigation actions for flooding/dam failure beyond property acquisition, relocation and elevation may be fundable through DNR, BWSR, and local Soil & Water Conservation District sources.
- Mitigation actions for Fires (both structure/vehicle fires and wildfires) may be fundable by local fire departments through FEMA's Assistance to Firefighters Grants (AFG), Staffing for Adequate Fire and Emergency Response Grants (SAFER), Fire Prevention and Safety Grants (FP&S), and Assistance to Firefight Fire Station Construction Grants (SCG) programs. The DNR also works with local fire departments to conduct wildfire training programs.
- Mitigation actions for hazardous materials mitigation and response may be funded by Minnesota Pollution Control Agency (MPCA) and US Environmental Protection Agency (EPA). An example project may include: water and sewer projects, Brownfield cleanups, Voluntary Investigation and Cleanup (VIC) projects, and Tank Compliance and Assistance Program.
- Other actions would have to be funded from general tax levies, ongoing program budgets, and by private citizens.

## Action items for Participating Jurisdictions

Jackson County is a rural county with few full-time paid staff in the area of emergency management. Jurisdictions in Jackson County rely on Jackson County Emergency Management for services regarding emergency management and hazard mitigation. Jackson County Emergency Management maintains regular communication with all local units of government in the county to facilitate intergovernmental cooperation.

Combining strategies between jurisdictions is due to the rural nature of the county, and that a number of jurisdictions are similar in regards to the natural or manmade hazard the strategy is trying to mitigate. A number of strategies in the Jackson County AHMP have "All Cities" listed as who will be working to implement the strategy. Some strategies specifically outline a specific city or multiple specific cities to work together on implementing the strategy. The listed entities under each strategy have had the opportunity to provide input and recommendations in regards to the strategy and will work together to implement the strategy.

### III Identification and Analysis of Mitigation Strategies: National Flood Insurance program (NFIP)

#### Participation in the Nation Flood Insurance Program

FEMA's National Flood Insurance Program (NFIP) is intended to provide flood insurance, assist with floodplain management, and complete flood hazard mapping (Refer to Chapter 5, Section A6 for more information regarding flooding). A number of jurisdictions in Jackson County participate in the National Flood Insurance Program (NFIP). These jurisdictions include: City of Jackson, City of Okabena, and Jackson County.<sup>96</sup>

**MS Table #13 Participation in the National Flood Insurance Program**

CID Community	Jurisdiction	Init FHBM Identified	Init FIRM Identified	Curr EFF Map Date	Reg-Emer Date
270213	City of Jackson	10/26/1973	7/16/1980	4/2/2004	7/16/1980
270595	City of Okabena	12/27/1974	NA	12/27/1974	12/27/1975
270632	Jackson County	3/21/1975	1/2/1981	1/2/1981	1/2/1981

FEMA <http://www.fema.gov/cis/MN.pdf>

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<sup>96</sup> Fema. National Flood Insurance Program. Accessed: 11/8/13. Available: <http://www.fema.gov/cis/MN.pdf>

# CHAPTER 8: PLAN MAINTENANCE

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This Chapter documents procedures for long-term plan maintenance. Section I describes monitoring, evaluating and updating the plan. Section II addresses the need for continued public involvement.

## **I Monitoring, Evaluating, & Updating the Plan**

### **Plan Monitoring**

The Jackson County All Hazard Mitigation Plan (AHMP) is not a static document. It is the intent of the plan to serve as a guide for mitigating current and future hazards. Jackson County Emergency Management Department maintains regular contact with all jurisdictions in Jackson County. This will allow the Jackson County Emergency Management Director and Department to monitor and implement strategies outlined in the AHMP. The Jackson County Emergency Management Director will evaluate the goals that have been implemented by Jackson County and jurisdictions within the county. The Jackson County Emergency Management Director will also evaluate the Jackson County AHMP on the number of strategies that have been implemented and the number of goals that were reached.

Public participation is critical in implementing strategies outlined in the plan. Local residents and representatives have a thorough understanding of local issues. Local residents and representatives can assist in gathering support and technical information to help ensure the project is successful. Maintaining regular contact with the jurisdictions in Jackson County will help to ensure that the Jackson County Emergency Management Director and Department are able to effectively implement the strategies outlined in the plan.

### **Evaluating the Plan**

It is recommended that the County Emergency Management Director review and formally evaluate the plan within 3 years of adoption, as well as after every disaster event, to adequately prepare for the plan update. When implementing strategies from the existing plan it is important to consider improvements that can be made to the planning process, implementation, and evaluation of the plan. AHMP are evolving documents that need to stay up to date. Information gathering and evaluation should be taking place throughout the five year cycle of updating the plan. This will help to insure existing risk assessments are accurate and that mitigation efforts are effective.

### **Updating the Plan**

FEMA requires that plans be reviewed, updated and re-approved every five years or sooner. The planning process timeline for reviewing, updating, and approving an AHMP at Minnesota Homeland Security and Emergency Management (HSEM) and Federal Emergency Management Agency (FEMA) is around 15 months. Within three years of adoption, the Emergency Management Director will formulate a work plan and seek input from Jackson County AHMP Planning Team members, local units of government, and local residents to start the process to update the Jackson County AHMP. The Emergency Management Director will also extend an invitation to non-participating jurisdictions to join the planning process for the update.

The Jackson County Emergency Management Department will work the Development Planner at Southwest Regional Development Commission (SRDC) to collect information regarding hazard events during the five year update cycle. This includes but is not limited to: keeping newspaper articles describing hazard events, taking notes regarding feedback from residents of Jackson County in relations to hazard events and mitigation efforts, working with cities and townships to document hazard events, and plan for mitigation measures to mitigate the effects of hazard events and potential hazard events.

## **II Continued Public Involvement**

Jackson County maintains a website that includes a page for Emergency Management. The SRDC also maintains a website that includes a page for hazard mitigation. Both of these websites will be the main point of access for the public regarding information about the Jackson County AHMP. A PDF copy of the approved plan will be available on these pages along with other information related to the update and hazard mitigation. The public will have access to the plan and be able to provide input regarding progress on the mitigation strategies.

<http://www.co.jackson.mn.us/>

<http://www.swrdc.org/planning/hazard-mitigation/>

### **Other Opportunities for Involvement**

Hazard mitigation has been a regional effort in Southwest Minnesota with services overlapping between counties. All Hazard Mitigation Plan (AHMP) development starts with reviewing the counties existing mitigation plan and comparing the plan with the neighboring counties. There are many opportunities during the development of a plan for involvement provided from neighboring communities, agencies involved in hazard mitigation, businesses, academia, and other relevant private and non-profit interests. SRDC has helped to development mitigation plans for the following counties in southwest Minnesota:

- Cottonwood County
- Jackson County
- Lincoln County
- Lyon County
- Murray County
- Nobles County
- Pipestone County
- Redwood County
- Rock County

## Conclusion

Hazards can occur with little or no warning. The relatively unpredictable nature of some hazards makes mitigating the effects of an event more difficult, but history and probability says that natural and manmade hazards are going to occur. Since hazardous events are going to take place, hazard mitigation is here to minimize the damages to property and loss of life.

When planning mitigation projects and investing in the future, it is critical to consider all the costs, not just the construction costs. There are costs associated with the potential loss of life, public and private property damages, interruption to the economy, decreased connectivity, health outcomes, and loss of community. Decision makers need to consider health and include health related outcomes in the benefits and costs of a project.

Health benefits of a project could be related to increasing livability, connectivity, and creating an environment where people want to live. When people are there, people invest and create demand. Hazard mitigation can be the link between livability, economic vitality, and public safety.

**G Figure #9**                      **Disaster Management Cycle**





# APPENDIX

## Appendix A – Wellhead Protection Plan Handout



MN Department of Health staff work with Wellhead Protection Advisory Committees including local officials and landowners to create a Wellhead Protection Plan. The plan involves several steps, starting with **DELINEATION**.

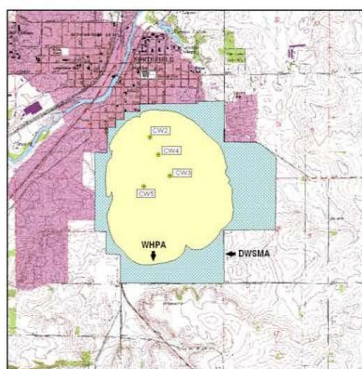
### Wellhead Protection Protects Our Drinking Water!

**Wellhead Protection** seeks to prevent contaminants from entering the wells and groundwater that provide our public water supply. The Minnesota Department of Health works with communities and other public water suppliers to carry out the Wellhead Protection Program.

**Why Wellhead Protection?** Wellhead Protection helps to prevent the health effects of drinking water contaminants such as nitrates, organic and inorganic compounds, and pathogens. Wellhead Protection also helps water suppliers avoid the high cost of replacing a well or installing expensive treatment equipment.

#### 1 **DELINEATION** Create a map of the wellhead protection area (WHPA) and drinking water supply management area (DWSMA).

The groundwater within the wellhead protection area (WHPA) will reach the well within 10 years. The drinking supply management area (DWSMA) includes the scientifically calculated WHPA, but is defined using identifiable landmarks such as railroads, streets, and highways.



#### 2 **VULNERABILITY ASSESSMENT** Assess the vulnerability of the well and the DWSMA

Hydrologists from the Minnesota Department of Health and private firms use technical data to determine whether the geology of the land around the well is likely to permit contaminants to get into the groundwater. For example, sandy soils from land surface to the aquifer can convey contaminants.

#### 3 **CONTAMINANT SOURCE INVENTORY** Make an inventory of potential sources of contamination within the WHPA

Examples: fuel tanks, feedlots, septic tanks, lawns, dumps, abandoned wells



Storage tanks can leak contaminants



Runoff from feedlots in the WHPA can contaminate groundwater.

#### 4 **MANAGEMENT PLAN** Develop a plan of action to manage inventoried sources

Examples: Seal unused wells, upgrade septic systems, manure management



A buffer zone of vegetation along a creek helps to prevent contaminants from entering the creek.



This mural in Cold Spring was created by high school students.

#### 6 **IMPLEMENTATION** Carry out the plan of action

The variety of sources of contamination requires that diverse community members participate in managing them. Education is an important part of IMPLEMENTATION.

#### 5 **CONTINGENCY PLAN** Develop a water supply contingency strategy

This is a plan for getting water from another source in the event the well becomes contaminated. Examples: Other wells, water transported by tanker, bottled water

*Everyone has a role to play in protecting ground water!*



For more information about Wellhead Protection, contact the Source Water Protection Unit at the Minnesota Department of Health, 651/215-0800 or 800/818-9318





## Appendix B – STAPLEE Process

### General

Goal: Improve the planning process for updating All Hazard Mitigation Plans (AMHP) in Minnesota.

<b>Objective</b>	Ensure that needs and projects outlined in county AHMPs are eligible for funding.		
<b>Strategy</b>	Educate state and federal decision makers that county AHMPs do not expire. Currently, a county AHMP can expire if a plan is not updated within the five year update cycle. Projects outlined in an expired county AHMP are not eligible for FEMA funding. Mitigation strategies should remain eligible for funding, if local issues have not changed, there is a need for the project, and the project is outlined in a county AHMP.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public safety - Decrease mitigation planning costs, so additional funding could be used for mitigation projects
<i>Technical</i>		+	More effective planning process – not burning out rural counties with planning requirements
<i>Administrative</i>		+	More efficient planning process (five year update - only Mitigation Strategies Chapter; 10 year update -complete update)
<i>Political</i>		+	FEMA and HSEM is being more efficient
<i>Legal</i>	NA	NA	
<i>Economic</i>		+	Decrease mitigation planning costs, so additional funding could be used for mitigation projects
<i>Environmental</i>		+	Larger number of mitigation projects could be funded
<i>Priority</i>			2

### Agricultural Disease

Goal: To reduce the risk to pets and livestock from agricultural disease.

<b>Objective</b>	Develop a plan for farmers if there is an outbreak of disease or a major disaster occurs.
<b>Strategy</b>	Encourage Jackson County government officials to work with farmers to develop ways of containing a disease.

<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Including the major players
<i>Technical</i>		+	Including all the different players listed under the objective of who is involved
<i>Administrative</i>	-		Getting the information to the farmers
<i>Political</i>	-	+	Support for AG but can be a slow process
<i>Legal</i>	NA	NA	
<i>Economic</i>	-		Could be big – affects the entire economy
<i>Environmental</i>	-		Containment and disposal
<i>Priority</i>			2

<b>Objective</b>	Develop a plan for farmers if there is an outbreak of disease or a major disaster occurs.		
<b>Strategy</b>	Create and expand a section in the Emergency Operations Plan that deals with response and care of animals in an outbreak of disease or a major disaster along with disposal.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>	-	+	Including all the farmers
<i>Technical</i>		+	Including all the different players listed under the objective of who is involved
<i>Administrative</i>	-		Getting the information to the farmers
<i>Political</i>	-	+	Support for AG but can be a slow process
<i>Legal</i>	NA	NA	
<i>Economic</i>	-		Could be big – affects the entire economy
<i>Environmental</i>	-		Containment and disposal
<i>Priority</i>			2

<b>Objective</b>	Help to contain foreign animal disease (Avian Flu, etc.).		
<b>Strategy</b>	Help to educate local producers on maintaining perimeters and other best practices for limiting exposure to their animals.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>			
<i>Technical</i>			
<i>Administrative</i>			
<i>Political</i>			
<i>Legal</i>			
<i>Economic</i>			
<i>Environmental</i>			
<i>Priority</i>			Completed – annual review

Goal: Reduce the risk of plant loss from insects/pests and diseases.

<b>Objective</b>	Keep informed of current pests and insects that could threaten Jackson County.		
<b>Strategy</b>	Utilize information provided by the University of Minnesota Extension, private industry, and the Department of Agriculture on how to handle certain pests and insects.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>	-	+	Including all the farmers
<i>Technical</i>		+	Including all the different players listed under the objective of who is involved
<i>Administrative</i>	-		Getting the information to the farmers
<i>Political</i>	-	+	Support for AG but can be a slow process
<i>Legal</i>	NA	NA	
<i>Economic</i>	-		Could be big – affects the entire economy

<i>Environmental</i>	-		Potential issues with pesticides
<i>Priority</i>			2

<b>Objective</b>	Educate citizens on the types of fungi, insects, and pests that could potentially cause a problem for plants and trees.		
<b>Strategy</b>	Use current information services that provides useful and factual information about infectious diseases and various insects and pests.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>	-		Educating all boaters
<i>Technical</i>	-		Man power to enforce it. Very difficult to comply
<i>Administrative</i>	-		Educating the public
<i>Political</i>		+	There is funding
<i>Legal</i>	-		Enforcement – court costs
<i>Economic</i>	-		Decrease of tourism
<i>Environmental</i>	-		Containing the spread of invasive species
<i>Priority</i>			3

### ***Severe Storms & Extreme Temperatures***

Goal: Minimize negative impacts caused by severe weather and extreme temperatures.

<b>Objective</b>	Educate county residents on the importance and need of adequate supply of emergency shelters and safe rooms.		
<b>Strategy</b>	Conduct a study to determine areas that are deficient in emergency shelters and safe rooms.  Upon completion, a project to construct shelters and safe rooms should be pursued.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public safety
<i>Technical</i>		+	Easy to identify locations

<i>Administrative</i>	-		Labor costs for study
<i>Political</i>		+	Has been funded in the past (FEMA)
<i>Legal</i>	NA	NA	
<i>Economic</i>	-		Cost of constructing the rooms
<i>Environmental</i>	NA	NA	
<i>Priority</i>			4

<b>Objective</b>	Educate county residents on where emergency shelters are located.		
<b>Strategy</b>	Distribute a map of identified emergency shelters as part of the welcome pack cities and chambers give to new residents.  This packet would also include other general emergency information.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public safety
<i>Technical</i>		+	Easy to identify locations
<i>Administrative</i>	-		Labor costs for study
<i>Political</i>		+	Public service
<i>Legal</i>	NA	NA	
<i>Economic</i>	-		Cost of printing / distribution
<i>Environmental</i>	NA	NA	
<i>Priority</i>			4

<b>Objective</b>	Have staff at Jackson County schools, hospitals, and nursing homes trained for severe weather emergency response.		
<b>Strategy</b>	Each spring, Jackson County Emergency Management personnel will educate local schools, nursing homes, hospitals, etc. on the importance of doing a “Severe Weather Awareness Week” workshop for their staff. This would identify evacuation routes, emergency shelters, and safe rooms, along with other important information.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>	-		Bring everyone together
<i>Technical</i>	-		Bring everyone together
<i>Administrative</i>	-		Labor expense
<i>Political</i>		+	Public safety / Public Service
<i>Legal</i>	NA	NA	
<i>Economic</i>		+	Saves lives
<i>Environmental</i>	NA	NA	
<i>Priority</i>			5

<b>Objective</b>	Have county citizens become better notified of severe weather conditions and precautions they should take.		
<b>Strategy</b>	Encourage the distribution of NWS weather radios to all residents who want one, especially those in rural areas away from community sirens.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>	-		Cost for the radios (public)
<i>Technical</i>		+	Civic Ready, internet, etc. – overlap
<i>Administrative</i>	-		Labor costs
<i>Political</i>		+	Public service
<i>Legal</i>	NA	NA	

<i>Economic</i>		+	Saves lives
<i>Environmental</i>	NA	NA	
<i>Priority</i>			4

<b>Objective</b>	To have designated tornado and winter storm shelters and safe rooms in town for people with no appropriate shelter.		
<b>Strategy</b>	Ensure that each manufactured home park has an updated emergency management plans and work with park managers to improve communication during severe storm events, ensure that residents are familiar with the emergency management plan and that residents recognize the evacuation routes within the plan and where they can go for shelter.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>	-		Cost for the safe rooms and emergency shelters
<i>Technical</i>	-		Construction for safe rooms
<i>Administrative</i>	-		Labor costs for building a safe room
<i>Political</i>		+	Public service
<i>Legal</i>	NA	NA	
<i>Economic</i>		+	Saves lives
<i>Environmental</i>	NA	NA	
<i>Priority</i>			5

<b>Objective</b>	To have a backup generator for winter electric failure to insure proper heating of designated shelters, safe rooms, and homes.		
<b>Strategy</b>	Work with fire and ambulance volunteers to develop a safe shelter plan for Jackson County (including shelters, shelter capacity, safe rooms, safe room capacity, and transportation routes).		
<i>Criteria</i>	Cost	Benefit	Comments



<i>Social</i>		+	Community benefit
<i>Technical</i>	-		Wiring update
<i>Administrative</i>	-		Cost of developing and maintain the generators
<i>Political</i>		+	Public service and safety
<i>Legal</i>	NA	NA	
<i>Economic</i>		+	Saves lives
<i>Environmental</i>	NA	NA	
<i>Priority</i>			5

<b>Objective</b>	Ensure all severe weather sirens have a back-up power source.		
<b>Strategy</b>	<p>Identify sirens that currently do not have a back-up power source. Refer to Table #25 for sirens that do and do not have backup power generation.</p> <p>Identify funding sources, when available, to purchase back-up power sources for severe weather sirens.</p>		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Community benefit
<i>Technical</i>	-		Local and equipment cost
<i>Administrative</i>	-		Cost of purchasing the battery backup
<i>Political</i>		+	Public service and safety
<i>Legal</i>	NA	NA	
<i>Economic</i>		+	Saves lives
<i>Environmental</i>	NA	NA	
<i>Priority</i>			5

<b>Objective</b>	Ensure all proper siren coverage within Jackson County.		
<b>Strategy</b>	Refer to the warning sirens gap on page 106 for parks and campgrounds in Jackson County that need warning sirens.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Community benefit
<i>Technical</i>	-		Local and equipment cost
<i>Administrative</i>	-		Cost of purchasing the sirens
<i>Political</i>		+	Public service and safety
<i>Legal</i>	NA	NA	
<i>Economic</i>		+	Saves lives
<i>Environmental</i>	NA	NA	
<i>Priority</i>			5

### ***Drought***

Goal: Minimize negative impacts of drought conditions in Jackson County.

<b>Objective</b>	Ensure accurate inventories of the recharge rates and capacities of Jackson County's aquifers are recorded.		
<b>Strategy</b>	Perform necessary studies to determine the capacities and recharge rates of Jackson County's aquifers in order to better assess use restrictions and provisions during times of drought.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Ensuring a sustainable water supply
<i>Technical</i>	-		Cost of studies
<i>Administrative</i>	-		Coordinating with parties listed in the objective
<i>Political</i>		+	Public service

<i>Legal</i>	NA	NA	
<i>Economic</i>	-		Need a reliable water source for maintaining our economy
<i>Environmental</i>	-		Water flow / water table
<i>Priority</i>			3

<b>Objective</b>	Any water supplier should have a wellhead protection plan.		
<b>Strategy</b>	Educate the public and private leaders of the importance of wellhead protection and water conservation in times of low rainfall.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Safer water supply
<i>Technical</i>	-		Developing the plan
<i>Administrative</i>	-		Administering the plan
<i>Political</i>		+	Public service
<i>Legal</i>	-		Cost of enforcing the plan
<i>Economic</i>		+	Safer water supply
<i>Environmental</i>		+	Helps to ensure safer water supply
<i>Priority</i>			3

<b>Objective</b>	Ensure all cities within Jackson County have the capability to restrict water use.		
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Strategy	Develop watering ban ordinances with the Cities of Alpha, Lakefield, Okabena, and Wilder.		
Criteria	Cost	Benefit	Comments
<i>Social</i>		+	Safer water supply
<i>Technical</i>	-		Developing the ordinance
<i>Administrative</i>	-		Administering the ordinance
<i>Political</i>		+	Public service
<i>Legal</i>	-		Cost of enforcing the ordinance
<i>Economic</i>		+	Safer water supply
<i>Environmental</i>		+	Helps to ensure safer water supply
<i>Priority</i>			3

### **Fire**

Goal: Eliminate or lessen the negative impacts from fire.

Objective	Partnership between landowners that limits the potential for wildfires to spread through the establishment of fire breaks.		
Strategy	Encourage township road authorities to cut back road ditches and bale where appropriate, which will limit potential for spreading of wildfires.		
Criteria	Cost	Benefit	Comments
<i>Social</i>		+	Limits the spread of wild fires
<i>Technical</i>		+	Limits the spread of wild fires
<i>Administrative</i>	-		oversight
<i>Political</i>	-		Some people like ditches mowed and others do not
<i>Legal</i>	-		DNR regulations
<i>Economic</i>	-	+	Cost of bailing / Profits from bailing (contracts)

<i>Environmental</i>	-		Ditch mowing impacts the availability of grounds for nesting
<i>Priority</i>			1

<b>Objective</b>	Increase fire prevention and safety for residential units throughout Jackson County including school districts.		
<b>Strategy</b>	Participate in the nationally coordinated “Firewise” program to increase resident education.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public safety
<i>Technical</i>		+	Firewise materials are provided
<i>Administrative</i>		+	Firewise materials are provided
<i>Political</i>		+	Public service
<i>Legal</i>	NA	NA	
<i>Economic</i>		+	Saving lives
<i>Environmental</i>	NA	NA	
<i>Priority</i>			4

<b>Objective</b>	Safer commercial structures by having building codes include alarms and sprinkler systems.		
<b>Strategy</b>	Encourage building construction to include fire/smoke alarms, sprinkler systems, and snow load minimum design standards.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Potentially safer buildings
<i>Technical</i>	-		Building inspections
<i>Administrative</i>	-		Building inspections
<i>Political</i>	-		Small towns resist having additional codes

<i>Legal</i>	-		Legal issues with building permits
<i>Economic</i>	-		Building costs and permit costs go up
<i>Environmental</i>	NA	NA	
<i>Priority</i>			4

<b>Objective</b>	Ensure accessibility for fire fighting vehicles and other emergency vehicles.		
<b>Strategy</b>	Outline streets and alleys that are and are not sufficient size to handle modern fire fighting vehicles and other emergency vehicles.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>	-		Restructure an alley
<i>Technical</i>	-		Assessing access
<i>Administrative</i>	-		Assessing access
<i>Political</i>	-		Cities fault for not planning ahead
<i>Legal</i>	-		Access issues (private / public) and cost of enforcement
<i>Economic</i>	-		Cost of restructuring
<i>Environmental</i>	-		Cutting down existing trees
<i>Priority</i>			2

<b>Objective</b>	Maintain existing mutual aid agreements.		
<b>Strategy</b>	Coordinate with regional fire departments outside of Jackson County who could directly assist in fighting fires in the county.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public safety / increased coordination between counties
<i>Technical</i>		+	Public safety
<i>Administrative</i>		+	Already established so maintaining them is not extensive

<i>Political</i>	-		Coverage areas for emergency response
<i>Legal</i>	-		Coverage areas for emergency response
<i>Economic</i>		+	Faster response
<i>Environmental</i>	NA	NA	
<i>Priority</i>			5

<b>Objective</b>	Ensure emergency response personnel are prepared for response to incidents at renewable energy facilities.		
<b>Strategy</b>	Facilitate education on best practices for response to incidents at renewable energy facilities (including the Heron Lake Ethanol Plant, Brewster Biodiesel Plant, wind farms, etc.).		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public safety / increased coordination
<i>Technical</i>		+	Public safety
<i>Administrative</i>		+	Already established so maintaining this is not extensive
<i>Political</i>		+	Community benefit
<i>Legal</i>	NA	NA	
<i>Economic</i>		+	Faster response
<i>Environmental</i>		+	Improved response
<i>Priority</i>			5

<b>Objective</b>	Ensure emergency response personnel are prepared for response to incidents at 302 Facilities		
<b>Strategy</b>	Annually check to ensure all 302 Facilities are inventoried and included in Jackson County's map of 302 Facilities.		
<i>Criteria</i>	Cost	Benefit	Comments

<i>Social</i>		+	Public Safety
<i>Technical</i>	-		Labor intensive
<i>Administrative</i>	-		Labor intensive / research intensive
<i>Political</i>	-		Compliance
<i>Legal</i>	-		Compliance
<i>Economic</i>		+	Containment
<i>Environmental</i>		+	Containment
<i>Priority</i>			4

<b>Objective</b>	Ensure information regarding 302 Facilities is easily accessible.		
<b>Strategy</b>	Develop an application to identify hazards at each 302 site, so emergency responders can more efficiently look up a facility they are responding to.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public Safety
<i>Technical</i>	-		Labor intensive
<i>Administrative</i>	-		Labor intensive / research intensive
<i>Political</i>	-		Funding
<i>Legal</i>	-		Compliance
<i>Economic</i>		+	Containment
<i>Environmental</i>		+	Containment
<i>Priority</i>			4

<b>Objective</b>	Ensure water access in rural areas is faster and more efficient.		
<b>Strategy</b>	Install dry hydrants at Clear Lake and Loon Lake		



<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public Safety
<i>Technical</i>	-		Cost of install and maintenance
<i>Administrative</i>	-		Maintenance costs
<i>Political</i>	-		Funding
<i>Legal</i>	-		Compliance – DNR regulations
<i>Economic</i>	-		Cost
<i>Environmental</i>		+	Water level
<i>Priority</i>			2

### ***Flooding & Dam Failure***

Goal: Minimize negative impacts resulting from flood events by identifying problem areas and potential solutions to correct them.

<b>Objective</b>	Ensure that any future developments constructed within Jackson County and each city within the county are located outside of 100-year flood plains.		
<b>Strategy</b>	Continuation of flood plain mapping and zoning in the official land use maps and zoning ordinances.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Less vulnerability to flooding
<i>Technical</i>	-		Updating the ordinance
<i>Administrative</i>	-		Administering zoning ordinances
<i>Political</i>	-	+	New land owners being identified in the flood plain
<i>Legal</i>	-		Working with land owners
<i>Economic</i>	-		Cost of updating plans
<i>Environmental</i>		+	More greenspace
<i>Priority</i>			1

<b>Objective</b>	Ensure cities that utilize centralized sewer treatment systems have compliant systems that keep inflow and infiltration to a minimum.		
<b>Strategy</b>	Work with cities to implement best practices in regards to inflow and infiltration.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public health
<i>Technical</i>	-		Difficult to identify areas
<i>Administrative</i>	-		Oversight
<i>Political</i>	-		Issues with MPCA
<i>Legal</i>	-		Issues with MPCA / compliance with sump pumps
<i>Economic</i>	-		Cost of reducing I and I
<i>Environmental</i>		+	Cleaner discharge
<i>Priority</i>			3

<b>Objective</b>	Update the Flood Insurance Rate Maps covering Jackson County.		
<b>Strategy</b>	Structures in floodplains should be identified for inclusion in acquisition, relocation, or elevation projects to reduce flooding risk.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public safety
<i>Technical</i>	-		Difficult to identify areas
<i>Administrative</i>	-		Oversight
<i>Political</i>	-		Issues with maps - FEMA
<i>Legal</i>	-		Issues with maps - FEMA
<i>Economic</i>	-		Cost of updating maps
<i>Environmental</i>		+	Potentially more greenspace
<i>Priority</i>			2

<b>Objective</b>	Update the Flood Insurance Rate Maps covering Jackson County.		
<b>Strategy</b>	Structures in floodplains should be identified for inclusion in acquisition, relocation, or elevation projects to reduce flooding risk.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public safety
<i>Technical</i>	-		Difficult to identify areas
<i>Administrative</i>	-		Oversight
<i>Political</i>	-		Issues with property owners
<i>Legal</i>	-		Issues with property owners
<i>Economic</i>	-		Cost of buying homes, structures, etc.
<i>Environmental</i>		+	Potentially more greenspace
<i>Priority</i>			2

<b>Objective</b>	Ensure developments in the flood hazard areas follow best practices to minimize risk.		
<b>Strategy</b>	Work closely with DNR on all development applications in identified flood hazard areas.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public safety
<i>Technical</i>	-		Difficult to identify areas
<i>Administrative</i>	-		Oversight
<i>Political</i>	-		Issues with maps - FEMA
<i>Legal</i>	-		Issues with maps - FEMA
<i>Economic</i>	-		Cost of updating maps
<i>Environmental</i>		+	Potentially more greenspace

<i>Priority</i>			2
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<b>Objective</b>	Decrease phosphorus, nitrogen, and sediment from entering rivers, streams, and ditches.		
<b>Strategy</b>	Promote a buffer system along creeks and streams that are prone to flooding (Grass Strips, CRP, RIM, etc.).		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public health
<i>Technical</i>	-		Identifying private ditches
<i>Administrative</i>	-		Administering buffer regulations
<i>Political</i>	-		Administering buffer regulations
<i>Legal</i>	-		Administering buffer regulations
<i>Economic</i>	-		Devaluing property / easements
<i>Environmental</i>		+	Cleaner water / wildlife
<i>Priority</i>			3

<b>Objective</b>	Determine the risk of flooding along the Des Moines River in Jackson County.		
<b>Strategy</b>	Monitor the effects of the Jackson Dam replacement on potential for flooding.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Reduced flood risk
<i>Technical</i>	-		Monitoring water flow
<i>Administrative</i>	-		Cost of monitoring water flow
<i>Political</i>	-		Water level decrease – recreational vehicles are more vulnerable to damage (rocks, trees, etc.)
<i>Legal</i>	NA	NA	

<i>Economic</i>	-	+	Access issues
<i>Environmental</i>		+	Less vulnerability to flooding
<i>Priority</i>			1

<b>Objective</b>	Have communities within the one percent floodplain participate in the NFIP.		
<b>Strategy</b>	Jurisdictions with identified flood hazard areas that do not currently participate in NFIP will consider participation during scheduled update of zoning ordinances.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>			
<i>Technical</i>			
<i>Administrative</i>			
<i>Political</i>			
<i>Legal</i>			
<i>Economic</i>			
<i>Environmental</i>			
<i>Priority</i>			Completed

<b>Objective</b>	Discourage development in the flood hazard areas		
<b>Strategy</b>	Discourage zoning variances in identified flood hazard areas.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Vulnerability to flooding
<i>Technical</i>	-		Administering zoning
<i>Administrative</i>	-		Administering zoning
<i>Political</i>	-		People like to live by lakes and rivers

<i>Legal</i>	-		Enforcement
<i>Economic</i>	-		Devaluation of property
<i>Environmental</i>		+	Vulnerability to flooding
<i>Priority</i>			2

### ***Civil Disturbance & Terrorism***

Goal: Protect Jackson County critical infrastructure and county residents from civil disturbance and terrorism.

<b>Objective</b>	Ensure new facility construction is responsive to potential terrorist activity, where appropriate.		
<b>Strategy</b>	Consider zoning and building code changes and updates that reflect building measures to withstand civil disturbances and terrorist attacks, where appropriate.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public safety
<i>Technical</i>		+	Schools and government facilities are starting to do this
<i>Administrative</i>	-		Cost of improvements
<i>Political</i>	NA	NA	
<i>Legal</i>	NA	NA	
<i>Economic</i>	-		Extra cost
<i>Environmental</i>	NA	NA	
<i>Priority</i>			4

<b>Objective</b>	Encourage safe county and city public facilities.		
<b>Strategy</b>	Consider limiting public access in high profile county and city locations in times of increased potential for civil disturbances and terrorist activity. These times should follow the Federal Department of Homeland Security warning system.		
<i>Criteria</i>	Cost	Benefit	Comments

<i>Social</i>		+	Public safety
<i>Technical</i>		+	Schools and government facilities are starting to do this
<i>Administrative</i>	-		Cost of improvements
<i>Political</i>	NA	NA	
<i>Legal</i>	NA	NA	
<i>Economic</i>	-		Extra cost
<i>Environmental</i>	NA	NA	
<i>Priority</i>			4

<b>Objective</b>	Increase the level of security of public facilities through landscape design, vehicle barriers, and separation of public and private functions.		
<b>Strategy</b>	When remodeling or building a new building consider the design to increase security. When landscaping around a public building consider the design to increase security.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public safety
<i>Technical</i>		+	Something to look into
<i>Administrative</i>	-		Cost of improvements
<i>Political</i>	NA	NA	
<i>Legal</i>	NA	NA	
<i>Economic</i>	-		Extra cost
<i>Environmental</i>	NA	NA	
<i>Priority</i>			3

<b>Objective</b>	Work with state and federal agencies engaged in the statewide domestic preparedness strategy to identify options for Jackson County.
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Strategy	Assess local capacity and risk of civil disturbances and terrorism, and security of critical facilities.		
Criteria	Cost	Benefit	Comments
<i>Social</i>		+	Public safety
<i>Technical</i>		+	Schools and government facilities are starting to do this
<i>Administrative</i>	-		Cost of improvements
<i>Political</i>	NA	NA	
<i>Legal</i>	NA	NA	
<i>Economic</i>	-		Extra cost
<i>Environmental</i>	NA	NA	
<i>Priority</i>			3

Objective	Increase response capabilities in Jackson County regarding civil disturbances and terrorism.		
Strategy	Update the local emergency plans to adequately address civil disturbances and terrorism.		
Criteria	Cost	Benefit	Comments
<i>Social</i>		+	Public safety
<i>Technical</i>		+	Schools and government facilities are starting to do this. Continuous training for active shooter and other scenarios
<i>Administrative</i>	-		Cost of improvements
<i>Political</i>	NA	NA	
<i>Legal</i>	NA	NA	
<i>Economic</i>	-		Extra cost
<i>Environmental</i>	NA	NA	
<i>Priority</i>			4



<b>Objective</b>	Increase coordination schools and other government agencies regarding scenario planning for lethal attacks and other terrorist events.		
<b>Strategy</b>	Conduct annual scenario trainings with schools in Jackson Counties and other government agencies.  School Shut down training could be one of the scenarios.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public safety
<i>Technical</i>		+	Schools and government facilities are continuing to develop trainings. Continuous training for active shooter and other scenarios.
<i>Administrative</i>	-		Include law enforcement and emergency management
<i>Political</i>	NA	NA	
<i>Legal</i>	NA	NA	
<i>Economic</i>	-		Extra cost
<i>Environmental</i>	NA	NA	
<i>Priority</i>			4

<b>Objective</b>	Increase safety at higher density public places.		
<b>Strategy</b>	Identify higher density locations in Jackson County. A non-exhaustive list includes: schools, AGCO, the race track, etc.  Coordinate and develop evaluation plans at these locations.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Increased public safety
<i>Technical</i>	-		Acceptance that this is an issue
<i>Administrative</i>		+	Work with safety coordinators at facilities

<i>Political</i>	-	+	Acceptance that this is an issue
<i>Legal</i>	-		Have to have a plan / safety coordinator
<i>Economic</i>	-		Additional costs
<i>Environmental</i>	NA	NA	
<i>Priority</i>			4

<b>Objective</b>	Increase security at government facilities in Jackson County.		
<b>Strategy</b>	Install security devices (metal detector, etc.) at the entrance to the court house. Evaluate other government facilities regarding the need for additional security.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public and employee safety
<i>Technical</i>	-		New technologies
<i>Administrative</i>	-		Number of facilities
<i>Political</i>	-	+	Support for the need of the improvement
<i>Legal</i>		+	Limits liability
<i>Economic</i>	-	+	Extra cost / potentially saves lives
<i>Environmental</i>	NA	NA	
<i>Priority</i>			3

### ***Hazardous Materials***

Goal: Improve the effectiveness and quality of the various agencies addressing hazardous materials that may impact Jackson County.

<b>Objective</b>	The ability to quickly map the affected disaster area as well as surrounding areas within Jackson County.
<b>Strategy</b>	Increase training of emergency personnel so that all types of potential spills will be readily recognized upon arrival.

<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public safety
<i>Technical</i>		+	Meth labs not as bad a 5 years ago
<i>Administrative</i>	-	+	App to identify hazardous material (cargo decoder) / app is not widely used (Fire, EMT, Law, and EM all have this app)
<i>Political</i>		+	Containment
<i>Legal</i>			
<i>Economic</i>	-	+	App is not expensive / GIS mapping would be more expensive
<i>Environmental</i>		+	Containment
<i>Priority</i>			3

<b>Objective</b>	To have properly trained HAZMAT personnel/emergency management personnel.		
<b>Strategy</b>	Continue to expand the use of mutual aid agreements and memoranda of understanding to improve coordination between state, local, and federal agencies, and appropriate private sector representatives.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public safety
<i>Technical</i>	-		HAZMAT training
<i>Administrative</i>	-		Availability of equipment and personnel
<i>Political</i>	-		Having a HAZMAT Team come out of Sioux Falls or IA (out of state)
<i>Legal</i>	-		Liability of local law enforcement / lack of appropriate training
<i>Economic</i>	-		Cost of equipment and training
<i>Environmental</i>	-		Containment
<i>Priority</i>			3

<b>Objective</b>	Make sure emergency personnel are able respond to and identify a variety of hazardous materials.		
<b>Strategy</b>	Work with state and federal agencies to identify and address hazardous materials that have the potential to impact Jackson County and region.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public safety
<i>Technical</i>	-		HAZMAT training
<i>Administrative</i>	-		Availability of trained personnel
<i>Political</i>		+	Local emergency responders that can identify hazards
<i>Legal</i>	-		Liability of local law enforcement / lack of appropriate training
<i>Economic</i>	-		Cost of training
<i>Environmental</i>	-		Containment
<i>Priority</i>			3

<b>Objective</b>	Support policies and programs that assist in creating factual and timely information about hazardous materials in Jackson County.		
<b>Strategy</b>	Develop a plan to implement Geographic Information Systems (GIS) to effectively plan for and respond to hazards.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public Safety
<i>Technical</i>	-		Adherence to 302 reporting
<i>Administrative</i>		+	Informal plan in place
<i>Political</i>	-		Reporting of 302 facilities to local government
<i>Legal</i>	-		Non reporting issues
<i>Economic</i>	-		Cost of mapping
<i>Environmental</i>		+	More factual information – containment

<i>Priority</i>			4
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Goal: Reduce the negative impacts found with methamphetamine labs in Jackson County.

<b>Objective</b>	Identify who is responsible for meth lab clean up and identify the responsibilities of the property owners.		
<b>Strategy</b>	Enforce Jackson County's ordinance that deals with who is responsible for the cleanup of a meth lab.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public safety
<i>Technical</i>	-		Abandon farms – number of potential locations
<i>Administrative</i>	-		Oversight
<i>Political</i>		+	Support to fight meth
<i>Legal</i>	-		Proper training for emergency responders – work comp issues
<i>Economic</i>	-		Cost of cleanup
<i>Environmental</i>	-		Containment
<i>Priority</i>			3

<b>Objective</b>	Educate the public about the warning signs of meth and potential dangers of the drug especially school officials, health officials along with mail carriers, cable repair men, plumbers, electricians, and delivery personnel (UPS, FEDEX).		
<b>Strategy</b>	Distribute fliers associated with commonly found materials involved with meth labs and risks of the drug.  Encourage the elimination of abandoned houses/buildings and make sure wooded areas are checked regularly.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public safety
<i>Technical</i>	-		Abandon farms – number of potential locations

<i>Administrative</i>	-		Oversight
<i>Political</i>		+	Support to fight meth
<i>Legal</i>	-		Educating the public
<i>Economic</i>	-	+	Cost of cleanup and educational material / identify a site before it is in use
<i>Environmental</i>	-		Containment
<i>Priority</i>			3

<b>Objective</b>	Educate landlords on the warning signs of a possible meth lab.		
<b>Strategy</b>	Educate landowners that they are responsible for the cost of Meth lab cleanups, so there is an increased economic incentive for monitoring properties (letter with tax statement).		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public safety
<i>Technical</i>	-		Rural farms – number of potential locations
<i>Administrative</i>	-		Oversight
<i>Political</i>		+	Support to fight meth
<i>Legal</i>	-		Educating landlords
<i>Economic</i>	-	+	Cost of cleanup and educational material / identify a site before it is in use
<i>Environmental</i>	-		Containment
<i>Priority</i>			3

<b>Objective</b>	Educate store owners on the ingredients used to make meth, and what they can do to prevent or limit the sale of the ingredients.		
<b>Strategy</b>	Conduct an annual education campaign to increase education of store owners, school officials, health care workers, and the general public about the warning signs of		

	meth.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public safety
<i>Technical</i>	-		Hard to reach all of these groups
<i>Administrative</i>	-		Hard to reach all of these groups
<i>Political</i>		+	Support to fight meth
<i>Legal</i>	NA	NA	
<i>Economic</i>		+	Addressing the issue before it is a problem
<i>Environmental</i>		+	Addressing the issue before it is a problem
<i>Priority</i>			3

<b>Objective</b>	Ensure that law enforcement and hazardous materials professionals (HAZMAT) are properly trained in the cleanup and evaluation of a meth lab.		
<b>Strategy</b>	<p>Work with local law enforcement and hazardous materials professionals (HAZMAT) to identify training and changes in policies and regulations.</p> <p>Work with law enforcement and HAZMAT personnel to evaluate needs for equipment to deal with meth-lab clean up.</p>		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public Safety
<i>Technical</i>	-		Changing policies and regulations
<i>Administrative</i>	-		Staffing costs / trainings
<i>Political</i>		+	Support to fight meth
<i>Legal</i>	-		Proper training – work comp issue
<i>Economic</i>	-		Cleanup costs
<i>Environmental</i>	-		Containment costs – response time

<i>Priority</i>			3
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### ***Public Health Emergencies***

Goal: Reduce the threat of infectious diseases through education and awareness.

<b>Objective</b>	Better coordination with local media in the case of medical emergencies.		
<b>Strategy</b>	Update the Jackson County Emergency Operations plan to reflect recent changes made to the State plan in regards to coordinating more effectively with the local media.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public Awareness
<i>Technical</i>	-		Continuous updates
<i>Administrative</i>	-		Continuous updates
<i>Political</i>		+	Public safety
<i>Legal</i>	NA	NA	
<i>Economic</i>	-		Cost of updating media plan
<i>Environmental</i>	NA	NA	
<i>Priority</i>			3

<b>Objective</b>	Increased distribution of medications and medical supplies in the case of emergency.		
<b>Strategy</b>	Encourage DVHHS to continue work with Minnesota Department of Health for the mass distribution of needed medicines and supplies for public health emergencies.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public health benefits
<i>Technical</i>	-		Maintaining supply (expiration dates)
<i>Administrative</i>	-		Medical regulations
<i>Political</i>		+	Public health benefits



<i>Legal</i>	NA	NA	
<i>Economic</i>	-		Cost of maintaining the supply
<i>Environmental</i>	NA	NA	
<i>Priority</i>			3

<b>Objective</b>	Develop an effective quarantine plan that limits the spread of highly contagious diseases.		
<b>Strategy</b>	Implement a quarantine plan in coordination with local doctors and other health professionals in Jackson County.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Decrease the risk of spreading the disease
<i>Technical</i>	-		Containment issues
<i>Administrative</i>	-		Containment issues
<i>Political</i>		+	Public health benefits
<i>Legal</i>	NA	NA	
<i>Economic</i>	-		Cost of implementing a quarantine
<i>Environmental</i>	NA	NA	
<i>Priority</i>			3

<b>Objective</b>	Maintain Health Alert Network (HAN).		
<b>Strategy</b>	Notify local medical providers of potential infectious disease threats.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Increased public awareness
<i>Technical</i>	-		Maintaining database
<i>Administrative</i>	-		Maintaining database

<i>Political</i>		+	Public health benefits
<i>Legal</i>	NA	NA	
<i>Economic</i>	-		Staff costs and maintaining the database
<i>Environmental</i>	NA	NA	
<i>Priority</i>			3

<b>Objective</b>	Decrease the health risk associated with the West Nile Virus.		
<b>Strategy</b>	Develop/adopt a West Nile Virus protection plan and a cooperative partnership with cities to spray for mosquitoes.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public health (prevention)
<i>Technical</i>	-		Changes in technology
<i>Administrative</i>	-		Changes in technology
<i>Political</i>	-	+	Public acceptance of spraying and other initiatives
<i>Legal</i>	NA	NA	
<i>Economic</i>	-		Costs associated with initiatives
<i>Environmental</i>	-		Spraying
<i>Priority</i>			3

### ***Transportation Infrastructure & Transportation Crashes***

Goal: Ensure transportation systems in Jackson County are efficient, cost effective, and safe for all users.

<b>Objective</b>	Ensure train tracks and airport are free of debris and visibility is sufficient so that people will see them.
<b>Strategy</b>	Make maintenance personnel keep the train tracks clear of debris when they are grading the roads.  Maintain adequate visibility and lighting at railroad crossings and airport.

<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public safety
<i>Technical</i>	-		Complex network
<i>Administrative</i>	-		Railroad administration is not local
<i>Political</i>	-		Railroads have a lot of political power
<i>Legal</i>		+	Public safety
<i>Economic</i>	-	+	Cost of improvements / potentially saves lives
<i>Environmental</i>	NA	NA	
<i>Priority</i>			3

<b>Objective</b>	Help to maintain culverts and ditches to ensure roads are not as vulnerable to erosion.		
<b>Strategy</b>	Identify culverts that are frequently in need of repair or are in poor condition.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public safety
<i>Technical</i>	-		Number of culverts
<i>Administrative</i>	-		Engineering costs / labor costs
<i>Political</i>	-	+	Road improvements / mitigation funding is needed for some of these projects to move forward
<i>Legal</i>	-		Water erosion issues / road support issues
<i>Economic</i>	-		Engineering costs / labor costs
<i>Environmental</i>	-		Downstream water flow issues
<i>Priority</i>			5

<b>Objective</b>	Reduce road closures due to drifting snow.		
<b>Strategy</b>	Identify locations that cause road closures occur due to drifting snow. Identify mitigation measures to mitigate road closures caused by drifting snow.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public safety / increased travel efficiencies
<i>Technical</i>		+	Easy to identify
<i>Administrative</i>	-		Cost of getting on paper
<i>Political</i>		+	Public safety / increased travel efficiencies
<i>Legal</i>	NA	NA	
<i>Economic</i>	-		Cost of clearing the road
<i>Environmental</i>	NA	NA	
<i>Priority</i>			5

<b>Objective</b>	Reduce the risk of crashes at intersections within Jackson County		
<b>Strategy</b>	The top ten problem intersections have been identified by the Jackson County Highway Department as part of the Jackson County Transportation Safety Plan. Identify traffic safety improvements to mitigation the risk of crashes at these intersections.  Identify funding sources to address to assist with reducing the risk of crashes at these intersections.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public Safety
<i>Technical</i>		+	Crash data is available
<i>Administrative</i>	-		Cost of identifying the areas and potential engineering solutions
<i>Political</i>		+	Public safety
<i>Legal</i>	-		Road design standards and sign regulations

<i>Economic</i>		+	Potentially saves lives
<i>Environmental</i>	NA	NA	
<i>Priority</i>			5

<b>Objective</b>	Increase visibility of pedestrians at higher traffic volume crossings.		
<b>Strategy</b>	Support projects outlined in local Active Living Plans, Safe Routes to School Plans, Land Use Plans, and Comprehensive Plans that increase pedestrian safety.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public Safety
<i>Technical</i>		+	Projects have been identified in Safe Routes to School Plans and Active Living Plans
<i>Administrative</i>	-		Cost of identifying the areas and potential engineering solutions
<i>Political</i>		+	Public safety
<i>Legal</i>	-		Road design standards and sign regulations
<i>Economic</i>		+	Potentially saves lives
<i>Environmental</i>	NA	NA	
<i>Priority</i>			5

### **Utility Failure**

Goal: Increase coordination between Rural Electrical Cooperatives, emergency response, DVHHS, and emergency management.

<b>Objective</b>	Ensure critical facilities have redundant service in case of utility failure.		
<b>Strategy</b>	Evaluate the needs and costs for providing backup generation where none currently exists. Refer to RA Table #8 for a list of facilities that need new or additional backup generators.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public safety

<i>Technical</i>	-		Funding and prioritizing projects
<i>Administrative</i>		+	Have identified need and locations for backup generators
<i>Political</i>	-	+	Continuity of government
<i>Legal</i>	-	+	Continuity of government
<i>Economic</i>	-		Cost of backup generators and associated project costs
<i>Environmental</i>	NA	NA	
<i>Priority</i>			5

<b>Objective</b>	Ensure that critical facilities such as hospitals and rural water suppliers have access to back up power generators.		
<b>Strategy</b>	Evaluate the needs and costs for providing back up generation to critical facilities, including: hospitals, rural water suppliers, and locations of Strategic National Stockpile of medicines and supplies.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public safety
<i>Technical</i>	-		Maintaining Strategic National Stockpile of medications and supplies
<i>Administrative</i>	-		Maintaining Strategic National Stockpile of medications and supplies
<i>Political</i>		+	Public safety
<i>Legal</i>	NA	NA	
<i>Economic</i>	-		Cost associated project costs
<i>Environmental</i>	NA	NA	
<i>Priority</i>			5

<b>Objective</b>	Ensure that citizens living in their own home dependent on oxygen or respiration
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	assistance have access to backup power or alternative life support.		
<b>Strategy</b>	Work with rural electric and Medicare to maintain a list of homes that are dependent on oxygen or respiration assistance and require backup power.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public safety
<i>Technical</i>	-		Identifying and maintaining the database of those in need
<i>Administrative</i>	-		Identifying and maintaining the database of those in need
<i>Political</i>		+	Public safety
<i>Legal</i>	NA	NA	
<i>Economic</i>	-		Cost associated project costs
<i>Environmental</i>	NA	NA	
<i>Priority</i>			5

Goal: Eliminate or reduce the effect of utility failures that occur within Jackson County.

<b>Objective</b>	Increase hardening of the electrical grid in Jackson County.		
<b>Strategy</b>	Examine need for redundant utility service/sources at critical facilities.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Reliability of utility grid
<i>Technical</i>	-		Engineering regarding redundancy of the grid
<i>Administrative</i>	-		Engineering regarding redundancy of the grid
<i>Political</i>		+	Reliability of utility grid
<i>Legal</i>	NA	NA	
<i>Economic</i>	-	+	Cost of economic loss / cost of grid hardening / long term savings
<i>Environmental</i>	NA	NA	

<i>Priority</i>			5
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<b>Objective</b>	Increase hardening of the electrical grid in Jackson County.		
<b>Strategy</b>	Encourage utility providers to bury electric lines where feasible.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Reliability of utility grid
<i>Technical</i>	-		Engineering regarding burying electrical lines
<i>Administrative</i>	-		Engineering regarding burying electrical lines
<i>Political</i>		+	Reliability of utilities
<i>Legal</i>	NA	NA	
<i>Economic</i>	-	+	cost of burying electrical lines / long term savings associated with not having to rebuild lines
<i>Environmental</i>	NA	NA	
<i>Priority</i>			5

<b>Objective</b>	Reduce the risk of damaging natural gas lines.		
<b>Strategy</b>	Require a permit when working along township roads.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Public safety
<i>Technical</i>		+	Process is already in place for county roads
<i>Administrative</i>		+	Consistency with county roads
<i>Political</i>	NA	NA	
<i>Legal</i>	-		Costs associated with non-permitted work
<i>Economic</i>	-		Cost of damaging the line and service interruption



<i>Environmental</i>	NA	NA	
<i>Priority</i>			3

<b>Objective</b>	Increase safety around substations.		
<b>Strategy</b>	Reduce the risk of substation vulnerability to disruption.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Reliability of utilities
<i>Technical</i>	-		Potential solutions (wall, cameras, etc.)
<i>Administrative</i>	-		Potential solutions (wall, cameras, etc.)
<i>Political</i>	NA	NA	
<i>Legal</i>	NA	NA	
<i>Economic</i>	-		Labor and project costs
<i>Environmental</i>	NA	NA	
<i>Priority</i>			3

### ***Water Supply Contamination***

Goal: Preserve and protect the quality of Jackson County's ground water resources.

<b>Objective</b>	Ensure that an emergency supply of clean drinking water is available even in the case of emergencies.		
<b>Strategy</b>	Provide updates to the Emergency Response Plan that identifies alternate sources of drinking water including the location of adequate amounts of bottled water.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Adequate amounts of safe drinking water
<i>Technical</i>	-		Identifying and maintaining inventory
<i>Administrative</i>	-		Identifying and maintaining inventory
<i>Political</i>	NA	NA	

<i>Legal</i>	NA	NA	
<i>Economic</i>	-		Costs associated with provided needed water
<i>Environmental</i>	-		Water supply contamination
<i>Priority</i>			3

<b>Objective</b>	Minimize contamination of groundwater from abandoned wells.		
<b>Strategy</b>	Promote an abandoned well sealing program within Jackson County.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Decrease risk of contamination
<i>Technical</i>	-		Identifying all wells
<i>Administrative</i>	-		Identifying all wells
<i>Political</i>		+	Proactive
<i>Legal</i>	NA	NA	
<i>Economic</i>	-		Costs associated with the well sealing program
<i>Environmental</i>		+	Proactive
<i>Priority</i>			4

<b>Objective</b>	Promote the interconnected water supply in the case of emergencies.		
<b>Strategy</b>	Maintain city wells that are accessible if Rural Water (current source) would need to shut down.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Reliability of water supply
<i>Technical</i>	-		Costs associated with engineering
<i>Administrative</i>	-		Getting all the players to work together

<i>Political</i>	-		Getting all the players to work together
<i>Legal</i>	NA	NA	
<i>Economic</i>	-		Costs associated with engineering
<i>Environmental</i>	NA	NA	
<i>Priority</i>			4

<b>Objective</b>	Minimize inflow and infiltration in sewer systems in Jackson County.		
<b>Strategy</b>	Work with cities in Jackson County to identify funding sources to improve sewer systems that are outdated and not meeting current standards regarding inflow and infiltration.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Improved sewer systems – public health
<i>Technical</i>	-		Locations of I&I are difficult to identify
<i>Administrative</i>	-		Locations of I&I are difficult to identify
<i>Political</i>		+	Improved sewer systems – public health
<i>Legal</i>	-		Compliance with regulations and changing regulations
<i>Economic</i>	-		Costs associated with improving the system
<i>Environmental</i>	-	+	Improved sewer systems – ground water contamination
<i>Priority</i>			4

<b>Objective</b>	Minimize runoff from feedlots in Jackson County.		
<b>Strategy</b>	Work with LMO and MPCA to ensure feedlots are compliant with existing regulations.		
<i>Criteria</i>	Cost	Benefit	Comments
<i>Social</i>		+	Improved feedlot design – public health
<i>Technical</i>	-		Maintaining a feedlot

<i>Administrative</i>	-		Compliance issues / feedlot permitting
<i>Political</i>		+	Improved feedlot design – public health
<i>Legal</i>	-		Compliance with regulations and changing regulations
<i>Economic</i>	-		Costs associated with improving the system
<i>Environmental</i>	-	+	Adequate feedlot systems in Jackson County
<i>Priority</i>			4

### Appendix C – Priority changes from previous plan to update

The plan must describe if and how any priorities changed since the plan was previously approved. If no changes in priorities are necessary, plan updates may validate the information in the previously approved plan.

Appendix C highlights the Hazard Identification Worksheet from the 2008 Jackson County All Hazard Mitigation Plan (AHMP) and the Hazard Identification Worksheet from the 2016 update. Below are the 2008 and 2016 Hazard Identification Worksheets for Jackson County.

The Hazard Identification Worksheets were used by the planning team to rank and quantify the natural and manmade hazards in Jackson County. Variables that impact the ranking include: potential frequency, spatial extent, potential severity, warning time, and risk level.

The sorting criteria for categories in the Hazard Identification Worksheet are as follows:

Potential Frequency:	Unlikely if <1% chance in the next 100 years, Occasional = 1% and 10% in next year, Likely =between 10% and 100% in next year, Highly Likely =greater than 10% in next year.
Spatial Extent:	Countywide or Local
Potential Severity:	Limited =<10% area affected destroyed, Minor =10% to 25% area affected, Major =25% to 50% area affected, Substantial =>50% area affected.
Warning Time:	Minimal, 6 – 12 hours, 12- 24 hours, 24+ hours
Risk Level:	Subjective ranking by planning team based on previous categories
Hazard Rank:	Subjective ranking by planning team based on previous categories

### Hazard Identification Worksheet – Planning Team

Hazard	Potential Frequency	Spatial Extent	Potential Severity	Warning Time	Risk Level	Hazard Rank
Ag Disease (animal or crop)	Occasional	Countywide	Minor	12 - 24 hours	Average	Low
Blizzards, Winter Storms, and Extreme Cold Events	Likely	Countywide	Major	12 - 24 hours	High	High
Drought	Occasional	Countywide	Major	24+ hours	Average	Moderate
Fire—Wildfires	Unlikely	Local	Limited	6 - 12 hours	Limited	Low
Fire—Structure Fires	Likely	Local	Minor	Minimal	Average	Moderate
Flooding	Occasional	Countywide	Minor	6 - 12 hours	High	Moderate
Severe Summer Storm, Lightning, Hail, and Extreme Heat Events	Likely	Countywide	Major	6 - 12 hours	High	Moderate
Tornadoes and Straight-line Wind Events	Occasional	Countywide	Major	6 - 12 hours	High	High
Earthquakes	Unlikely	Countywide	Minor	Minimal	Limited	Low
Dam Failure	Unlikely	Local	Limited	Minimal	Limited	Low
Civil Disturbance and Terrorism	Unlikely	Local	Minor	Minimal	Limited	Low
Hazardous Materials	Occasional	Countywide	Minor	Minimal	Average	Moderate
Public Health Emergencies	Occasional	Countywide	Minor	6 - 12 hours	Limited	Low
Transportation Infrastructure	Occasional	Local	Minor	Minimal	Average	Moderate
Transportation Crashes	Likely	Local	Minor	Minimal	Average	Low
Water Supply Contamination	Occasional	Countywide	Major	Minimal	Average	Low
Utility Failure	Occasional	Local	Major	Minimal	Average	Low
Hazard	Potential Frequency	Spatial Extent	Potential Severity	Warning Time	Risk Level	Hazard Rank

<i>Highly Likely</i>		<i>Substantial</i>	<i>Minimal</i>	<i>Very High</i>	
<i>Likely</i>	<i>Countywide</i>	<i>Major</i>	<i>6 - 12 hours</i>	<i>High</i>	<i>High</i>
<i>Occasional</i>			<i>12 - 24 hours</i>		
	<i>Local</i>	<i>Minor</i>		<i>Average</i>	<i>Moderate</i>
<i>Unlikely</i>		<i>Limited</i>	<i>24+ hours</i>	<i>Limited</i>	<i>Low</i>

For Potential Frequency, *Unlikely* if <1% chance in the next 100 years, *Occasional*= 1% and 10% in next year, *Likely*=between 10% and 100% in next year, *Highly Likely*=greater than 10% in next year.

For Potential Severity, *Limited*=<10% area affected destroyed, *Minor*=10% to 25% area affected, *Major*=25% to 50% area affected, *Substantial*=>50% area affected.

Risk Level is subjective ranking by Task Force members based on previous categories. *Adapted from Minnesota Planning*

### Hazard Identification Worksheet – Planning Team

Hazard	Potential Frequency	Spatial Extent	Potential Severity	Risk Level	Hazard Rank
<b>Blizzard</b>	Likely	Countywide	Major	High	High
<b>Meth Lab</b>	Occasional	Specific Locations	Minor	Limited	High
<b>Tornado</b>	Occasional	Countywide	Major	High	High
<b>Utility Failure</b>	Occasional	Countywide	Major	Limited	High
Drought	Occasional	Countywide	Major	Minimal	Moderate
Extreme Temperatures	Occasional	Countywide	Minor	Limited	Moderate
Fire	Occasional	Countywide	Major	Limited	Moderate
Flood	Occasional	Countywide	Minor	Limited	Moderate
Hailstorm	Occasional	Countywide	Major	Limited	Moderate
Hazardous Materials	Occasional	Roads and Cities	Major	High	Moderate
Ice/Sleet	Occasional	Countywide	Major	Limited	Moderate
Lightning	Occasional	Countywide	Minor	Limited	Moderate
Public Health Emergency	Unlikely	Countywide	Major	High	Moderate
Terrorism	Unlikely	Jackson, Lakefield	Minor	Minimal	Moderate
Water Supply Contamination	Unlikely	Countywide	Major	High	Moderate
Wildfire	Unlikely	Countywide	Minor	Limited	Moderate
Windstorm	Likely	Countywide	Major	Limited	Moderate
Agricultural Disaster	Unlikely	Countywide	Limited	Minimal	Low
Radiological	Unlikely	Jackson, Highways	Limited	Limited	Low

Source: 2008 Jackson County All Hazard Mitigation Plan

# Addendums

Addendums to the Jackson County All Hazard Mitigation Plan (AHMP) are available separately.

## I Capabilities Worksheet

The Capabilities Worksheet identifies planning capabilities, policies and ordinances, programs, studies and reports, staff, and community partners that are relevant to hazard mitigation.

<b>County Name</b>	Jackson County						
<b>Reviewer</b>	Jeff Johnson and Drew Hage						
<b>CAPABILITIES</b>	<b>WE HAVE ONE</b>	<b>THIS PLAN IS AVAILABLE ONLINE</b>	<b>POINT PERSON IS ON PLANNING TEAM</b>	<b>POINT PERSON SHOULD BE ON PLANNING TEAM</b>	<b>POINT PERSON CONTACT</b>	<b>LIST ADDITIONAL JURISDICTIONS THAT HAVE THEIR OWN</b>	<b>OTHER POINT PERSON CONTACT</b>
<b>Local Planning Plans and Tools</b>							
Capital Improvement Plan	Yes		Jackson County Administrator - Jan Fransen (Steve Duncan)				
Redevelopment Plan							
Growth Management Plan							
Emergency Operations Plan	Yes		EM Director - Jeff Johnson				
County / Local Emergency Plan	Yes		EM Director - Jeff Johnson				EM Deputy - Tawn Hall
County / Local Recovery Plan							
Local Mitigation Plan	Yes		EM Director - Jeff Johnson				EM Deputy - Tawn Hall
Economic Development Plan							
Land-use Plan (Comprehensive Plan)	Yes		Administrator - Jennifer Feely Bromeland		City of Jackson - Jennifer Feely Bromeland		
Land-use Plan (Comprehensive Plan)	Yes		Administrative Clerk - Kelly Rasche		City of Lakefield - Kelly Rasche		
Pandemic or Public Health Incident Response Plan	Yes		Jeff Johnson / DMHHS - Angela Naumann				
Transportation Plan	Yes		Wes Liepold – Assistant County Engineer		Public Works – County Engineer Tim Stahl		

School Disaster Plan	Yes		EM Director - Jeff Johnson				EM Deputy - Tawn Hall
Environment and Natural Resources Plan	Yes				SWCD - Chris Bauer		
Strategy Implementation Plan							
County Parks Plan	Yes				Jackson County Parks- Jacqueline Knips		
Water / Watershed Management Plan	Yes		Jackson County Planning and Zoning – Andy Geiger				
SWCD Local Water Management Plan	Yes				SWCD - Chris Bauer		
Wildfire Plan	No						
Critical Facilities Plan (Mitigation/Response/ Recovery)							
College Campus Plans							
Evacuation Route Map / Plan	Yes		EM Director - Jeff Johnson				EM Deputy - Tawn Hall
Critical Facilities Inventory	Yes		EM Director - Jeff Johnson				EM Deputy - Tawn Hall
Vulnerable Population Inventory							
Soil Conservations Plans	Yes				SWCD - Chris Bauer		
Continuity Operations Plan							
Storm Water Plan	Yes		Jackson County LMO – Andy Geiger		Jackson County LMO – Andy Geiger		
National Flood Insurance Program	Yes		Jackson County LMO – Andy Geiger		Jackson County LMO – Andy Geiger		
National Flood Insurance Program	Yes				City of Okabena - Sandy Kalfs		
National Flood Insurance Program	Yes		Administrator - Jennifer Feely Bromeland		City of Jackson - Jennifer Feely Bromeland		
Emergency Response Plan	Yes		EM Director - Jeff Johnson				EM Deputy - Tawn Hall
Emergency Action Plan	Yes		EM Director - Jeff Johnson				EM Deputy - Tawn Hall
Groundwater Protection Plan							
Wellhead Protection Plan	Yes		Administrator - Jennifer Feely Bromeland		City of Jackson - Jennifer Feely Bromeland		



Wellhead Protection Plan	Yes		Administrative Clerk - Kelly Rasche		City of Lakefield - Kelly Rasche		
Snow Removal Plan	Yes		Public Works – Maintenance Supervisor Bob Hummel				
Communications Plan	Yes		EM Director - Jeff Johnson				EM Deputy - Tawn Hall
Regional Development Plans	Yes		SRDC - Drew Hage				
NFIP Floodplain Management Plan	Yes – no dev in floodplain		Jackson County LMO – Andy Geiger				
Emergency Response Plan for Nuclear Generating Plant							
Local Planning Assistance Mock-Hazard Plan							
Road Closure Plan	Yes		Public Works – Maintenance Supervisor Bob Hummel				
Human Quarantine Plan	Yes		DMHHS - Angela Naumann				
Wildfire Integrated Response Plan							
National Fire Plan							
Water Emergency and Conservation Plan							
Community Needs Assessment							

## II Resolutions of Participation

The following jurisdictions signed resolutions to participate in the Jackson County AHMP.

- City of Alpha
- City of Heron Lake
- City of Jackson
- City of Lakefield
- City of Okabena
- City of Wilder

Jackson County has the land use authority over the townships, so Jackson County will represent the townships in the All Hazard Mitigation Plan (AHMP).

**RESOLUTION 13- 099**  
**AUTHORIZING PARTICIPATION IN PLANNING PROCESS**  
**AND EXECUTION OF SUB-GRANT AGREEMENT**

**WHEREAS**, the County of Jackson is participating in a hazard mitigation planning process as established under the Disaster Mitigation Act of 2000; and

**WHEREAS**, the Act establishes a framework for the development of a multi- jurisdictional hazard mitigation plan; and

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

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

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

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

**WHEREAS**, the draft plan will be shared with the State of Minnesota and the Federal Emergency Management Agency (FEMA) for coordination of state and federal review and comment on the draft; and

**WHEREAS**, approval of the all hazard mitigation plan will make the county eligible to receive Hazard Mitigation Assistance grants as they become available; and

**NOW THEREFORE**, Be it resolved that Jackson County will enter into a sub-grant agreement with the Division of Homeland Security and Emergency Management in the Minnesota Department of Public Safety for the program entitled Hazard Mitigation Assistance (HMA) for the development or update of the Jackson County Hazard Mitigation plan. Jeff Johnson, Emergency Management Director, is hereby authorized to execute and sign such sub-grant agreements and any amendments hereto as are necessary to implement the plan on behalf of Jackson County

I certify that the above resolution was adopted by the County Board of Commissioners of Jackson on March 12, 2013.

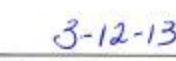
SIGNED:

  
County Board Chair

ATTEST:

  
County Coordinator

  
Date

  
Date

Statement of Interest in All-Hazard Mitigation Planning

City of Alpha

As a potential participant in the Hazard Mitigation Assistance Program, the City of Alpha, Minnesota hereby states their interest in participating in the multi-jurisdictional Jackson County All-Hazard Mitigation Plan.

After FEMA funding approval and during the planning implementation, the City of Alpha, Minnesota agrees to participate in the hazard mitigation planning process.

As signed, we understand this is a voluntary program and our participation may benefit our jurisdiction by identifying hazards and prioritizing potential projects to mitigate the effects of natural hazards.

[Signature]  
Signature of Authorized Representative

4-2-13  
Date

Mayor  
Title

Statement of Interest in All-Hazard Mitigation Planning

City of Heron Lake

As a potential participant in the Hazard Mitigation Assistance Program, the City of Heron Lake, Minnesota hereby states their interest in participating in the multi-jurisdictional Jackson County All-Hazard Mitigation Plan.

After FEMA funding approval and during the planning implementation, the City of Heron Lake, Minnesota agrees to participate in the hazard mitigation planning process.

As signed, we understand this is a voluntary program and our participation may benefit our jurisdiction by identifying hazards and prioritizing potential projects to mitigate the effects of natural hazards.

[Signature]  
Signature of Authorized Representative

Apr. 3 2013  
Date

Mayor  
Title

**Statement of Interest in All-Hazard Mitigation Planning**  
City of Jackson

As a potential participant in the Hazard Mitigation Assistance Program, the City of Jackson, Minnesota hereby states their interest in participating in the multi-jurisdictional Jackson County All-Hazard Mitigation Plan.

After FEMA funding approval and during the planning implementation, the City of Jackson, Minnesota agrees to participate in the hazard mitigation planning process.

As signed, we understand this is a voluntary program and our participation may benefit our jurisdiction by identifying hazards and prioritizing potential projects to mitigate the effects of natural hazards.

  
\_\_\_\_\_  
Signature of Authorized Representative

4/3/13  
\_\_\_\_\_  
Date

\_\_\_\_\_  
City Administrator

\_\_\_\_\_  
Title

**Statement of Interest in All-Hazard Mitigation Planning**  
City of Lakefield

As a potential participant in the Hazard Mitigation Assistance Program, the City of Lakefield, Minnesota hereby states their interest in participating in the multi-jurisdictional Jackson County All-Hazard Mitigation Plan.

After FEMA funding approval and during the planning implementation, the City of Lakefield, Minnesota agrees to participate in the hazard mitigation planning process.

As signed, we understand this is a voluntary program and our participation may benefit our jurisdiction by identifying hazards and prioritizing potential projects to mitigate the effects of natural hazards.

  
\_\_\_\_\_  
Signature of Authorized Representative

3-26-13  
\_\_\_\_\_  
Date

  
\_\_\_\_\_  
Title

**Statement of Interest in All-Hazard Mitigation Planning**

City of Okabena

As a potential participant in the Hazard Mitigation Assistance Program, the City of Okabena, Minnesota hereby states their interest in participating in the multi-jurisdictional Jackson County All-Hazard Mitigation Plan.

After FEMA funding approval and during the planning implementation, the City of Okabena, Minnesota agrees to participate in the hazard mitigation planning process.

As signed, we understand this is a voluntary program and our participation may benefit our jurisdiction by identifying hazards and prioritizing potential projects to mitigate the effects of natural hazards.

Pandra X. Kelp  
Signature of Authorized Representative

10/7/2013  
Date

Clerk/Treasurer  
Title

**Statement of Interest in All-Hazard Mitigation Planning**

City of Wilder MN

As a potential participant in the Hazard Mitigation Assistance Program, the City of Wilder, Minnesota hereby states their interest in participating in the multi-jurisdictional Jackson County All-Hazard Mitigation Plan.

After FEMA funding approval and during the planning implementation, the City of Wilder, Minnesota agrees to participate in the hazard mitigation planning process.

As signed, we understand this is a voluntary program and our participation may benefit our jurisdiction by identifying hazards and prioritizing potential projects to mitigate the effects of natural hazards.

Spencer Masters  
Signature of Authorized Representative

10-4-13  
Date

City Clerk  
Title

### III Resolutions of Adoption

The following jurisdictions signed resolutions to adopt the Jackson County AHMP.

- Jackson County
- City of Alpha
- City of Heron Lake
- City of Jackson
- City of Lakefield
- City of Okabena
- City of Wilder

*To be appended following FEMA approval and adoption by each participating jurisdiction.*

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