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Executive Summary

WHAT IS HAZARD MITIGATION PLANNING?

It is safe to say that “hazard mitigation” is not a term used by most people as they go about their lives. Still, hazard mitigation could be critical to people’s basic health, safety and welfare.

Simply put, hazard mitigation is defined as any action taken to reduce the chance of a natural hazard from happening, or to reduce a natural hazard’s impact on people or property when it does happen. Grant County can be affected by any number of natural and human-made hazards. These include major storms, extreme temperatures and disease outbreaks. However, over its history, Grant County has been most heavily impacted by flooding.

Hazard mitigation planning helps communities to develop consensus around actions to reduce or eliminate the long-term risk to human life, health, safety and property from hazards. This Multi-Hazard Mitigation Plan is a collection of the various actions that Grant County and local communities may take to mitigate hazards. The actions fall into various categories and priority levels, cover different geographic areas and address different types of hazards. The organization, contents and data in the Plan are driven in part by the planning requirements of the Federal Emergency Management Agency (FEMA).

GRANT COUNTY’S PLANNING PROCESS

The County prepared its original Multi-Hazard Mitigation Plan in 2006. This 2012 update continues to make the County and its communities eligible to apply for competitive grant funding for mitigation projects through FEMA. The Emergency Management/Disaster Services Committee guided the development of this Plan over the course of about a year. The Committee, its staff and consultants also pursued public input throughout the planning process. This included reaching out to local governments, state and federal agencies, property and business owners and the general public. Chapter 1: Planning Process further describes the process undertaken to develop this Plan.

HAZARD IDENTIFICATION AND RISK ASSESSMENT

Chapter 2: Planning Context begins by painting a picture of how natural and other hazards have affected the County and its communities today and in the past. Key information regarding the County’s geography, geology, climate, demographics, housing, employment, political jurisdictions, infrastructure and emergency services are laid out. For instance, much of the County’s population historically developed around rivers and streams—and their floodplains.

Based on historical research and reports from residents and agencies, the hazards that people and property are at risk of in Grant County generally include:

- Flash-flooding, particularly in the steep, rugged terrain found in the western areas of the County.
- Riverine flooding resulting from seasonal overflow of the Mississippi River and its tributaries.
- Severe storms, including hail, lightning, tornadoes and severe winds
- Severe winter storms, including snow storms, ice storms and blizzards.
- Extreme temperatures, including periods of extreme heat and extreme cold associated with Grant County’s position in the nation’s interior.

ACCOMPLISHMENTS

Since this Plan was last updated in 2005, Grant County Emergency Management has implemented numerous recommendations. Recent accomplishments include:

- Acquired 10 repetitive loss structures—buildings that had reoccurring damage due to flooding.
- Secured over \$1 million in funding for planning and mitigation projects.
- Implemented a multi-county hazardous materials response program in southwest Wisconsin and northwest Illinois.

The Plan includes a “risk assessment” for each of these identified hazards in Chapter 3: Hazard Identification and Risk Assessment. This assessment helps determine how severe each hazard is and how important hazard mitigation actions would be to address the hazard. The risk assessment includes a history of hazard occurrences, a projection of the future probability of occurrences of each hazard, an assessment of the County’s vulnerability to each hazard (e.g., how many people would be affected) and a projection of potential damages from future occurrences of each hazard.

OVERALL HAZARD MITIGATION GOALS

Armed with knowledge of the hazards that most affect Grant County, Grant County has developed the following seven hazard mitigation goals with input and review from the public:

- Protect human lives, both today and for future generations
- Protect human and environmental health
- Protect utilities, infrastructure and critical facilities
- Help people protect themselves
- Protect roads from washouts/landslides
- Prevent future risk of hazards in highly vulnerable areas
- Maximize the use of state and federal funds

These goals were used to prioritize hazard mitigation actions and strategies to address each hazard. Other factors were also critical in identifying and prioritizing strategies. These included community support, whether the strategy was technically feasible, where it would be cost-effective and what groups were available to carry them out. Chapter 4: Mitigation Goals and Strategies further describes the goal-setting process, identifies hazard-specific goals and then outlines all of the hazard mitigation strategies.

The rest of this summary covers some of the highest priority mitigation strategies identified in this Plan. Readers are encouraged to review the entire Plan for a more complete review of these and other strategies.

PRIORITY MITIGATION STRATEGIES FOR MULTIPLE HAZARDS

Certain strategies should be carried out to address nearly all of the hazards that Grant County confronts, such as:

1. **Community Outreach and Education:** State and County governments are best equipped to provide communities with information about the effect of disasters, methods for preventing damages and the actions to take when disasters threaten a locality. Ideally, such information would be distributed annually or at the beginning of each hazard season. Municipal and County meetings, building and zoning permitting processes, state and local parks and recreation permits and school classrooms are effective means to provide information and resources. Web sites, local cable and radio stations, newspaper articles and informational fliers can reach a large audience at little or no cost.
2. **Code Enforcement and Education:** Under Wisconsin law and by local decision, Grant County and its cities and villages have the power and often the obligation to enact and enforce regulations to limit development within floodplains, wetlands, shorelands and other areas susceptible to hazards. Enforcement of these regulations—critical in mitigating future hazards—depends both on the will to enforce, the knowledge of enforcement approaches and sometimes even basic understanding that the regulations exist, particularly if adopted many years ago. Educating new local elected officials, plan commissioners and local staff of these types of regulations and the importance of their enforcement to hazard mitigation, is a worthwhile initiative.
3. **New and Amended Ordinances:** When enforced, County and municipal zoning, land division and other ordinances are a powerful mitigation tool. The County and its cities and villages may consider the following new and amended ordinances.
 - a) **Zoning:** A zoning ordinance is the set of rules that a local or county government adopts to regulate the future use of land, particularly when new development is proposed. Zoning ordinances may also include rules for certain qualities of new development such as site planning, landscaping and signage. The County’s zoning

ordinance applies in 19 of the 33 towns in Grant County; the remaining towns are unzoned. Cities and villages enforce their own zoning ordinances. In addition to base requirements, County and local zoning ordinances could be amended to better mitigate against hazards, for example by requiring developers of mobile home and industrial parks to provide storm shelters and for mobile homes to have anchored tie downs.

- b) **Subdivision:** A subdivision ordinance is the set of rules that a government adopts to regulate the division of larger parcels of land into smaller lots for sale and development. A subdivision ordinance typically defines requirements that the subdivider must meet before lots may be sold. These requirements may include requirements for lot sizes, roads, utilities and grading. In addition to base requirements, local subdivision ordinances could be amended to better account for hazard-prone areas and require proper stormwater management.
 - c) **Erosion control and stormwater management:** These ordinances attempt to reduce stormwater run-off from construction sites and from new development projects. The overall goals of these efforts are to encourage erosion control practices during private development site construction and ongoing stormwater management after construction for subdivisions and other larger projects to prevent flooding and protect water quality. Stormwater management and erosion control ordinances could be either stand-alone regulation, or could be integrated into subdivision and zoning ordinances.
 - d) **Driveway:** A driveway ordinance ensures suitable dimensions and design for emergency vehicles, guides driveway placement to avoid steep slopes, promotes access control to adjacent roads and protects rural character. The County should consider developing a model driveway ordinance that can be adapted and adopted by interested towns then educate towns on its value.
4. **Encourage Use of NOAA Weather Radio:** The County will continue education and outreach efforts to encourage residents to have a National Oceanic and Atmospheric Administration (NOAA) weather radio on hand to provide warnings and directions regarding pending hazard events. NOAA weather radio continuously broadcasts National Weather Service (NWS) forecasts, warnings and other crucial weather information as well as provides direct warnings to the public for natural, man-made, or technological hazards. This network of radio stations is the primary trigger for activating the national Emergency Alert System (EAS) on commercial radio, television and cable networks.
 5. **Explore New Technology for Public Notification:** Digital communications such as the Internet, email and cell phone/smart phone technology are revolutionizing the way we communicate with one another. The County will continue to monitor such new technologies as a means to warn residents and visitors of pending natural or human-made hazards. Critical to making these technologies viable are steps to increase high-speed Internet and cell phone coverage in the County.

IMPLEMENTING THE PLAN: PARTNERSHIPS AND PERSEVERANCE

Adoption of this Plan provides the County and local communities with a coordinated approach for prioritizing hazard mitigation activities. Additional work, analysis and participation will be necessary before many of these strategies can be carried out through action. Chapter 5: Plan Adoption and Implementation details the implementation strategies.

Also, local communities will need the technical support of the Grant County Emergency Management Agency (GCEM) to implement many of the recommended mitigation strategies. GCEM will prioritize its mitigation efforts by focusing assistance on areas most vulnerable to the most significant hazards and where there is community support for hazard mitigation.

Finally, many of the strategies recommended in the Plan can occur only if outside financial support through FEMA and other sources is garnered. The Plan has been written to position the County and its communities for this support, with full recognition and respect for the funding criteria of these agencies. The County and local communities will pursue funding for priority strategies identified in the Plan as opportunities present themselves.

Chapter 1: Planning Context

Chapter 1 of the Grant County Multi-Hazard Mitigation Plan documents the process followed to develop the Plan, including how it was prepared and who was involved in the planning process.

PLAN DEVELOPMENT

Following the May 2001 Mississippi River flood, Grant County received funds for disaster recovery from the Federal Emergency Management Agency (FEMA). As a component of this declaration, all counties in Wisconsin were permitted to submit a grant proposal for funds through the FEMA Hazard Mitigation Grant Program. Grant County Emergency Management (GCEM) prepared a successful grant proposal and was awarded funds to prepare a multi-hazard mitigation plan in 2002. In May 2003, the County hired Vandewalle & Associates (V&A) and Community Development Alternatives (CDA) to help create a countywide multi-hazard mitigation plan. Work on the plan began in April 2003 and the plan was submitted to Wisconsin Emergency Management (WEM) for review in December, 2004. The consulting team worked with Grant County Emergency Management to address WEM's comments and a final plan was approved by the Grant County Board in 2005. The Plan was subsequently updated in 2012.

Disaster Mitigation Act of 2000

The development of the Grant County Multi-Hazard Mitigation Plan is a response to the passage of the Disaster Mitigation Act of 2000 (DMA), which was signed into law by the U.S. Congress on October 30, 2000, with the goal of reducing losses and future public and private expenditures and improving response and recovery from disasters. This act, Public Law 106-390, amended the Robert T. Stafford Relief and Emergency Assistance Act. A summary of the portions of DMA that relate to local governments and tribal organizations follows:

- Local governments and tribal organizations must prepare a multi-hazard mitigation plan in order to be eligible for funding from the FEMA Pre-Disaster Mitigation Assistance Program and Hazard Mitigation Program.
- Natural hazards need to be addressed in a risk assessment and vulnerability analysis sections of the multi-hazard mitigation plan. Assessment of human-caused hazards such as hazardous waste spills is encouraged but not required.
- Authorizes up to seven percent of Hazard Mitigation Grant Program funds available to a state following a federal disaster declaration to be used for development of state, local and tribal organization multi-hazard mitigation plans.
- Without an up-to-date multi-hazard mitigation plan, local governments and tribal organizations cannot obtain funds from the Pre-Disaster Mitigation Grant Program.

PLANNING PROCESS

Process Overview

The first step in the planning process was to organize the resources available through local, state and federal organizations and to work with elected officials from each municipality to identify members of the community who have a special interest in natural hazards and disasters and/or have knowledge of past disaster events.

The project team conducted research and worked with Grant County Emergency Management and volunteers from each participating community to identify the kinds of natural hazards that affect Grant County and to research the kind of damage that disasters have caused. After the hazards were identified, the project team determined the potential damage and impact of each hazard.

Armed with an understanding of the risks posed by natural hazards and knowledge of vulnerable areas, the project team identified possible ways to avoid or minimize the damage to these areas through new, as well as existing planning, education and regulatory measures.

The project team identified ways that the County and participating municipalities could bring the hazard mitigation plan to life. To ensure a successful long-term plan, a process for future reviews and updates to the plan and ways to measure the community’s progress in decreasing damage caused by hazards is identified in the Plan.

Plan Committee

The Plan was prepared under the guidance of an advisory committee that consisted of the current members of the Grant County Emergency Management/Disaster Services Committee (EMDS). The Grant County Emergency Management staff and EMDS directed the Plan process and public involvement efforts. The Grant County Emergency Management staff and EMDS reviewed and approved a draft Plan prior to submittal to WEM. There was opportunity for public comment at each EMDS meeting to review the draft Plan, although no comments were submitted. See Appendix F for EMDS agendas. The meeting agendas were publicly posted at three county buildings and were also published on the Grant County website in the meeting notices section.

INVOLVEMENT OF LOCAL GOVERNMENTS

Project Kick-off Meetings

GCEM hosted four kick-off meetings in February and March, 2012 to provide jurisdictional representatives with information about the benefits of mitigating hazards and the purpose and benefits of the plan. These four kick-off meetings were held in different locations and at varying days and times to provide a variety of alternatives for participants’ schedules. Each municipal representative was sent an invitation letter, an informational packet that described the goal of the project, the planning process, contact information for the project team and a disaster history worksheet that was designed to help community contacts collect historical disaster information and identify local vulnerabilities based on previous disaster events.

See Table 1 for a list of participants and Appendix E for a summary of the Goals Exercise completed at these meetings. The Villages of Mount Hope and Muscodia chose not to participate in the planning process.

Table 1: Local Government Participation

Participating Jurisdiction	Participant	Title	Project Participation		
			Attended Meeting	Completed Disaster History Worksheet	Provided Input Via Phone or Email
City of Boscobel	Steve Wetter	Mayor	Yes	Yes	
City of Cuba City	Gary Droessler	Public Works	Yes	Yes	
City of Cuba City	Troy Loeffelholz	Police Chief	Yes	No	
City of Cuba City	Steve Tranel	Fire Chief	Yes	No	
City of Fennimore	Charles Stenner	Mayor	No	Yes	
City of Lancaster	Jerry Wehrle	Mayor	Yes	Yes	Phone
City of Platteville	Larry Bierke	City Manager	Yes	Yes	Phone
Village of Bagley	David "Buck" Schott	Village President	Yes	Yes	
Village of Bagley	Wes Morse	Chaplain	Yes	No	
Village of Bloomington	Rick Udelhofen	Village President	Yes	Yes	
Village of Bloomington	Mary Culligen	Clerk/Treasurer	Yes	No	
Village of Bloomington	Tim Senn	Trustee	Yes	No	
Village of Blue River	Rodney Johnson	Village President	No	Yes	
Village of Cassville	Keevin Williams	Village President	No	Yes	
Village of Cassville	Mark Bartels	Public Works	Yes	No	
Village of Cassville	Dan Cooper	Trustee	Yes	No	

Participating Jurisdiction	Participant	Title	Project Participation		
			Attended Meeting	Completed Disaster History Worksheet	Provided Input Via Phone or Email
Village of Dickeyville	Dale Neis	Public Works	Yes	Yes	
Village of Dickeyville	Gary Kramer	Trustee	Yes	No	
Village of Hazel Green	Dale Leifker	Village Trustee	Yes	Yes	
Village of Hazel Green	Bill Wiegman	Trustee	Yes	No	Phone
Village of Hazel Green	Francis Temperly	Trustee	Yes	No	
Village of Livingston	Christina Christianson	Clerk	Yes	Yes	
Village of Montfort	Don Ford	Village President	No	Yes	
Village of Mount Hope	Judy Hazen	Village President	No	No	
Village of Muscoda	Brent Stadele	Village President	No	No	
Village of Patch Grove	William Morgan	Village President	No	Yes	
Village of Potosi	Frank Florenza	Village President	No	Yes	
Village of Tennyson	Erica Traver	Village Clerk	Yes	Yes	
Village of Woodman	Kelly Conley	Village Clerk	No	Yes	
Town of Beetown	Monroe "Skip" Raisbeck	Supervisor	Yes	Yes	
Town of Bloomington	Glen Myers	Supervisor	Yes	No	
Town of Bloomington	David Leamy	Chairman	Yes	Yes	
Town of Boscobel	Allan Fields	Chairman	Yes	Yes	
Town of Cassville	Douglas Schauff	Chairman	No	Yes	Phone
Town of Castle Rock	Steven Nelson	Chairman	No	Yes	
Town of Clifton	Grant Loy	Chairman	Yes	Yes	
Town of Ellenboro	Kathy M. Hottenstein	Chairman	Yes	Yes	
Town of Fennimore	Robert Reynolds	Chairman	Yes	Yes	
Town of Glen Haven	Stephen J. Adrian	Chairman	No	No	Phone
Town of Harrison	Nathan Niehaus	Chairman	No	Yes	
Town of Hazel Green	Donald Splinter	Chairman	Yes	Yes	
Town of Hazel Green	Ken Wiederholt	Supervisor	Yes	No	
Town of Hickory Grove	Robert Mertz	Chairman	Yes	Yes	
Town of Hickory Grove	Briant Russell	Supervisor	Yes	No	
Town of Jamestown	Faber A. Runde	Chairman	Yes	Yes	
Town of Jamestown	John Dalsing	Supervisor	Yes	No	
Town of Liberty	Patrick Schroeder	Chairman	No	No	
Town of Little Grant	Elaine Mumm	Clerk	Yes	Yes	
Town of Little Grant	Dean Porter	Chairman	Yes	No	Phone
Town of Lima	Pat Ostendorf	Chairman	No	No	
Town of Marion	Robert Frey, Jr.	Chairman	No	Yes	
Town of Millville	Tony Fischer	Chairman	No	Yes	
Town of Mount Hope	Scott Nichols	Chairman	Yes	Yes	
Town of Mount Ida	Robert Nelson	Chairman	No	Yes	

Participating Jurisdiction	Participant	Title	Project Participation		
			Attended Meeting	Completed Disaster History Worksheet	Provided Input Via Phone or Email
Town of Muscoda	Gary Ranum	Supervisor	Yes	Yes	
Town of North Lancaster	Delbert Reuter	Chairman	No	Yes	
Town of Paris	David McClain	Chairman	Yes	Yes	
Town of Patch Grove	Roy Quick	Chairman	No	Yes	
Town of Platteville	Jim Lory	Clerk	Yes	Yes	
Town of Potosi	Curtis Fetzek	Chairman	Yes	Yes	
Town of Potosi	Jerry Ames	Supervisor	Yes	No	
Town of Smelser	Robert Droessler	Supervisor	Yes	Yes	
Town of Smelser	Kim Kieler	Clerk	Yes	No	
Town of South Lancaster	Gary Schneider	Chairman	Yes	No	
Town of Waterloo	John Patcle	Chairman	No	Yes	
Town of Watterstown	Charles Baumeister	Chairman	Yes	Yes	
Town of Wingville	John Weigel	Supervisor	Yes	Yes	
Town of Woodman	James Morgan	Chairman	No	Yes	
Town of Wyalusing	Jon C. Cooley	Chairman	No	Yes	

Additional Outreach Efforts

Collection of the local government involvement packets required significant outreach efforts by the project team and GCEM.

INVOLVEMENT OF ADJACENT JURISDICTIONS AND OTHER AGENCIES

GCEM extended an invitation to emergency management staff from surrounding counties and local and state agencies to discuss agencies’ roles in hazard identification, mitigation, response and recovery, describe regional hazard vulnerabilities and share successful past and desired future mitigation approaches. The meeting was held on January 23, 2012, and was attended by representatives from Jo Daviess County (Illinois) Emergency Management, University of Wisconsin Extension, University of Wisconsin-Platteville Police Department and the State Patrol. See Table 2 for the invitation list and attendees. A summary of issues discussed include the following:

- State Patrol can augment local law enforcement during emergencies.
- A desired to continue the strong relationship between the emergency management departments in Jo Daviess County and Grant County.
- Jo Daviess County is working on tri-state agricultural emergencies planning effort and a tri-state communication system.
- University of Wisconsin Extension staff works with local governments on land use and public policy. They could help educate local governments on mitigation and prevention efforts like enforcing floodplain regulations.
- University of Wisconsin-Platteville is constructing a 600-bed residential facility and is planning for another similarly size facility; there is some concern about how these facilities will be evacuated in case of emergency.
- Siren testing and maintenance is important.
- Interoperability between radio communication systems is a concern. Some systems cannot communicate with others.

Table 2: Intergovernmental Participation

Participating Jurisdiction	Participant	Title	Attended Meeting
Grant County Emergency Management	Steve Braun	Director	Yes
Grant County Emergency Management	Julie Loeffelholz	Emergency Management Planner	Yes
Wisconsin Department of Natural Resources	Gary Heinrichs	Planner	No
Wisconsin Department of Natural Resources	Miriam Anderson	Planner	No
Wisconsin Department of Natural Resources	Beverly Pozega	Visitor Services Specialist	No
Wisconsin Emergency Management	Brian Satula	Administrator	No
Southwest Wisconsin Regional Planning Commission	Amy Seeboth	Planning Manager	No
Southwest Wisconsin Regional Planning Commission	Ed White	Economic Development Manager	No
Lafayette County Emergency Management	John Reichling	Director	No
Iowa County Emergency Management	Keith Hurlbert	Director	No
Richland Emergency Management	Darin Gudgeon	Director	No
Crawford Emergency Management	Roger Martin	Director	No
Dubuque County Emergency Management	Thomas Berger	Director	No
Clayton County Emergency Management	Joel Biggs	Director	No
Jo Davies County Sherriff's Office	Kevin Turner	Sheriff	Yes
Jo Davies County Local Emergency Planning Committee	Charles Pedersen	Committee Member	No
Jo Davies County Local Emergency Planning Committee	Thomas Lange	Committee Member	Yes
Jo Davies County Local Emergency Planning Committee	Ron Data	Committee Member	Yes
Jo Davies County Local Emergency Planning Committee	Colin Fulrath	Committee Member	Yes
University of Wisconsin – Platteville	Scott Marquardt	Police Chief	Yes
University of Wisconsin – Platteville	Wayne Weber	Professor	Yes
University of Wisconsin Extension – Grant County	Todd Johnson	Community Development	Yes
WI State Patrol Southwest Region	Luke Yahn	Officer	Yes
District 49 Representative	Travis Tranel	Representative	No
Salvation Army	Terri Leece	Emergency Disaster Services Director	No

INVOLVEMENT OF COUNTY DEPARTMENTS

GCEM extended an invitation to County department heads to present the planning process, identify recent hazards and County department roles associated with hazard mitigation and discuss focus areas for this Plan update process. The meeting was held on January 23, 2012, and was attended by representatives from the zoning, highway, sheriff, health and land conservation departments, the tax lister’s office and the Aging and Disability Resource Center. A summary of issues discussed include the following:

- The Zoning Department administers floodplain and sanitation ordinances for unincorporated parts of the entire County. The 2011 floodplain maps are still based on models except where detailed studies have been conducted along the Mississippi River. There is no base-study elevation for the internal parts of the County. Although much the western part of the County is prone to flash-flooding, many of the susceptible areas are not in the mapped floodplain.

- The Highway Department provides damage assessments for roads and bridges after flooding events and puts up and removes barricades during flood events. It also evaluates and implements appropriate and cost-effective mitigation solutions as County infrastructure is repaired or replaced.
- The Health Department focuses on education and partnerships with other County departments to improve the health of residents. They play an important role in the recovery process and have a hazard mitigation responsibility of their own which could be (and was) incorporated into this Plan.
- The Aging and Disability Resource Center works closely with the Health Department on recovery efforts including distributing flood clean up kits and assistance with completing federal flood programs applications.
- The Incident Command System has been an important addition to the emergency management framework. Other County departments have training and understand how it works. The County should continue training County staff in this approach. Since this system is used across the State, Grant County responders can also assist in emergency response in other counties.

PUBLIC INVOLVEMENT

Opportunities for public comment and plan review were provided during the drafting stages and prior to adoption. A copy of the draft Plan was made available on the GCEM website and at the Schreiner Memorial Library in Lancaster. Comments and questions about the Plan were directed to the Grant County Emergency Management Department. The Plan was presented and discussed at the August 13, 2012 Grant County Emergency Management/Disaster Services Committee meeting and at the March 19, 2013 Grant County Board Meeting.

INCORPORATED PLANS, STUDIES, REPORTS AND TECHNICAL DATA

The following is a list of references and data sources used for preparation of this Plan:

- Hazard Analysis for the State of Wisconsin (Wisconsin Emergency Management, November, 2002)
- State of Wisconsin Hazard Mitigation Plan (Wisconsin Emergency Management, December, 2008)
- Flood Analysis for Grant County – Wisconsin Pre-Disaster Mitigation Plan (Polis Center, May, 2008)
- Economic Flood Recovery Strategy (Southwestern Wisconsin Regional Planning Commission, September, 2010)
- Flood Insurance Study...for Grant County and Incorporated Areas (1984)
- Flood Insurance Study... for selected areas between Blue River and Boscobel (1999)
- Flood Insurance Study... for Blue River (1993)
- Flood Insurance Study... for Boscobel (1998)
- Flood Insurance Study ...for Cassville (1988)
- Flood Insurance Study... for Platteville (1996)
- Department of Natural Resources Dam Safety Data
- National Oceanic and Atmospheric Administration (NOAA) National Database of U.S. Storm Events
- National Earthquake Information Center
- Grant County Continuity of Operations Plan (Grant County Emergency Management, March, 2004)
- Grant County Emergency Operations Plan (August, 2003)
- Grant County Hazardous Materials Response Plan (August, 2003)
- Grant County Zoning Ordinance (Adopted May, 1995)
- Grant County Subdivision Ordinance (Adopted February, 1971)

CURRENT MITIGATION EFFORTS

Education and Outreach

Since the early 1990s, there has been a statewide Tornado Awareness Week in March or April of each year, which includes extensive public education through the media and tornado safety drills. Media information packets re-emphasize and alert the public to tornado warning procedures. Grant County actively promotes tornado safety public information as well as other summer severe weather public awareness and educational efforts. The County also assists the National Weather Service in sponsoring tornado and severe weather spotting training and organizes local tornado spotter networks. There are several hundred trained spotters in Grant County, including law enforcement, fire and emergency responders, trained civilians and amateur ham radio operators.

Floodplain/Shoreland Zone Management

Determining and enforcing acceptable land uses through planning and regulation will not prevent flooding of flood-prone areas, however, they can minimize the risk of damage by limiting exposure in such hazard areas. The County also regulates development within shoreland zones adjacent to navigable waters, but only in the unincorporated areas; such regulations are also supposed to apply over lands annexed to cities and villages after 1982. Although such regulation initiates appropriate land use planning within these hazard-prone areas, it is important to recognize that these ordinances provide baseline regulation. The state-wide coverage and mandate for these ordinances inherently means that such regulations may be overly restrictive in low-risk areas or may be not restrictive enough in high-risk areas, and that enforcement of such regulations can be uneven. Given Grant County's frequent County-wide flooding issues, regulation beyond the State's baseline requirements should be considered by the County as a whole, as well as within separately managed jurisdictions and education on and enforcement of current regulations is essential.

Mutual Aid/Intergovernmental Agreements

Currently, all local Fire Departments maintain informal mutual aid agreements as does GCEM with surrounding county emergency management departments. Additional possibilities include mutual aid agreements for utility and communications systems, including 9-1-1. In addition to the improved response time of fire, EMS, and police departments that is achieved through mutual aid and interagency agreements, such arrangements also have value for preventing or responding to disasters.

NOAA Weather Radio

NOAA weather radio continuously broadcasts National Weather Service (NWS) forecasts, warnings and other crucial weather information. NOAA Weather Radio also provides direct warnings to the public for natural, man-made, or technological hazards and it is the primary trigger for activating the national Emergency Alert System (EAS) on commercial radio, television and cable systems. Grant County Emergency Management encourages residents to have a NOAA weather radio on hand to provide up-to-date warnings and directions regarding pending hazard events.

Warning Systems

An effective warning system is the single most important method to alert the public of severe weather hazards. In addition to the use of local radio stations and NOAA weather radio warnings, GCEM uses warning sirens and Emergency Alert Systems to broadcast warnings. GCEM estimates that warning sirens in cities and villages reach 60 percent of the County population. The portion of the population that is not covered includes the majority of unincorporated lands, the portions of urban areas that have experienced significant growth in the past 10 years, particularly the industrial parks located in the Cities of Lancaster and Platteville and the Village of Bagley. Warning sirens are tested and maintained by each individual municipality and some upgrades to systems have occurred in recent years.

Tone Alert Receivers (TAR) allow state and local officials to send messages to radio, television and cable systems that are targeted to a specific area. The information can be sent electronically through broadcast stations and cable systems even if those facilities are unattended. Currently the hospitals, nursing homes and schools in the County are also equipped with TARs. GCEM generally conducts monthly tests of the TARs and annual outreach to users. However, often these users are unaware of the benefits of the TAR and place them out of hearing range of staff who would be

responsible for organizing a response or evacuation. Continued lack of funding also affects the TAR, as the regional topography requires additional antennas for clear signals to reach transmitters.

There are limitations to the aforementioned warning systems due to the onset speed, predictability or pattern of some natural hazards. Tornados, lightning and fast-forming storm cells are often difficult to forecast because of our limited knowledge and their erratic patterns.

Continuity of Operations Planning

The goal of Continuity of Operations Planning (COOP) is to ensure that the essential functions of an organization can continue to operate during and after an emergency incident that may prevent access to normally operating systems, such as physical plant, data or communication networks, or transportation. A COOP plan for County government was prepared by GCEM in 2003. That plan has been partially implemented; additional training and follow-up with department heads is necessary. Most departments are unaware of their responsibilities and roles. Additionally, wastewater treatment facilities and utilities are not included in the plan. Implementation of the County COOP plan should be a priority, as during previous disaster events, many departments could only focus on internal response, rather than being able to assist with response and recovery efforts for the public. The plan is in need of updating; however, no funds are available for this effort.

GCEM believes that some of the larger communities may have a COOP plan; however, churches, schools and smaller communities do not. Currently GCEM encourages residents to own a NOAA weather radio and prepare a “Pills, Purses, & Pets” survival kit, which focuses on preparation for short-term disasters. Outreach to businesses, other organizations and families should include recommendations to regularly back up computer drives, copying essential files and/or important family information and storing these items in a separate location, such as a safety deposit box or with a remote parent company. GCEM urges preparation for longer-term disasters that could require evacuation times of a week or more. Currently, the County Emergency Operations Plan includes livestock and domesticated animal evacuation and handling arrangements based on State planning guidance. Identifying alternative housing or work locations should also be considered.

Participation in National Flood Insurance Rate Program (NFIP)

In 1968, Congress created the National Flood Insurance Program (NFIP) to help provide a means for property owners to financially protect themselves. The NFIP offers flood insurance to homeowners, renters, and business owners if their community participates in the NFIP. Participating communities agree to adopt and enforce floodplain zoning ordinances that meet or exceed FEMA requirements to reduce the risk of flooding.

As of 2012, Grant County was a participant in the NFIP, which makes all property owners within unincorporated portions of the County eligible for flood insurance. In addition, the following cities and villages in Grant County currently participate in the NFIP:

- City of Boscobel
- City of Cuba City
- City of Fennimore
- City of Lancaster
- City of Platteville
- Village of Bagley
- Village of Bloomington
- Village of Blue River
- Village of Cassville
- Village of Dickeyville
- Village of Hazel Green
- Village of Livingston
- Village of Montfort
- Village of Muscoda
- Village of Patch Grove
- Village of Potosi
- Village of Tennyson
- Village of Woodman

To maintain continued compliance with NFIP requirements, Grant County and the above communities should (a) educate elected officials, staff, and community members on the opportunities and constraints associated with NFIP participation; (b) consistently administer and enforce floodplain regulations; and (c) keep floodplain regulations up to minimum federal and state standards as they may change over time.

To date, the only community in Grant County which has elected not to participate in the NFIP is the Village of Mount Hope. The reasons that this community has chosen not to participate include that it does not feel comfortable or capable of administering the floodplain regulations associated with participation and/or that some have prioritized other activities above flood mitigation and management.

OVERALL HAZARD MITIGATION GOALS

Armed with knowledge of the hazards that most affect Grant County, the Committee developed the following seven hazard mitigation goals, with input from the public:

- Protect human lives, both today and for future generations
- Protect human and environmental health
- Protect utilities, infrastructure and critical facilities, including police, fire and EMS stations
- Help people protect themselves
- Protect roads from washouts/landslides
- Prevent future risk of hazards in highly vulnerable areas
- Maximize the use of state and federal funds

These goals were used to prioritize hazard mitigation actions and strategies to address each hazard. Other factors were also critical in identifying and prioritizing strategies. These included community support, whether the strategy was technically feasible, where it would be cost-effective and what groups were available to carry them out. Chapter 4: Mitigation Goals and Strategies further describes the goal-setting process, identifies hazard-specific goals and then outlines all recommended hazard mitigation strategies.

Chapter 2: Existing Conditions

Chapter 2 of the Grant County Multi-Hazard Mitigation Plan provides geographic, demographic and political context for the County. The information provided in this chapter provides a backdrop for hazard mitigation strategies.

PHYSICAL GEOGRAPHY

Grant County is located in the southwestern corner of Wisconsin. It is the 10th largest County in the state and has an area of 1,148 square miles, with 35 square miles of lakes, rivers, streams and wetlands. Grant County is bordered on the east by Lafayette and Iowa Counties. The northern border is marked by the Wisconsin River, a boundary shared with Crawford and Richland Counties. The western and southwestern border follows the Mississippi River and the southern border is shared with Illinois (See Figure 1).

Grant County is in an unglaciated region of Wisconsin called the Driftless Area. The lack of glacial erosion preserved many scenic hills and valleys that make this one of the most attractive landscapes in the state. Grant County is part of the western upland region and contains many spectacular bluffs along the Mississippi and Wisconsin Rivers, as well as many steep-sided valleys from the smaller tributaries.

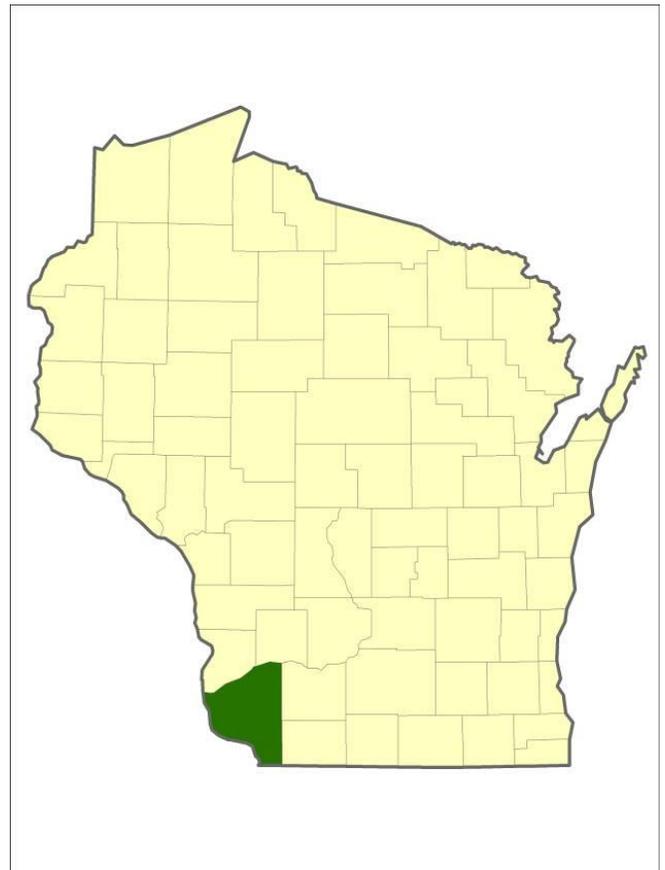
The most prominent topographical feature in Grant County is Military Ridge, a steep escarpment that divides the Wisconsin and Mississippi Watersheds and runs through the towns of Montfort, Fennimore, Mount Ida and Mount Hope. There is a long, gentle back slope south of Military Ridge with a gradual elevation drop of about six feet per mile. Mount Ida, at an elevation of 1,212 feet, is the highest point in the County and is located in the north-central part of the County.

The rivers in Grant County have cut deeply into the landscape, with valley bottoms about one-quarter to two miles wide and at least 300 feet lower than the ridge tops. The valleys are the deepest and widest near the Wisconsin and Mississippi Rivers with valley elevations around 650 feet near Cassville (in the Mississippi River valley) and Boscobel (in the Wisconsin River valley).

Grant County is affected by flooding on many scales. Large scale flooding of the Mississippi River affects communities in the western part of the County, flooding in the Lower Wisconsin River affects communities near the northern border of the County and localized flooding in the Grant-Little Maquoketa and Apple Plum watersheds affects the central and southern portions of the County.

Adequately assessing flood hazards requires acknowledging that floods occur over geographical areas defined by watershed and not within the bounds of political jurisdictions. A watershed is an area that drains to a common waterway, such as a river, wetland, lake or ocean. The boundaries of a watershed run along the ridges and high points of the land. Every small watershed is part of a larger one; for example, the Platte River runs to the Mississippi and therefore the Platte River's watershed is part of the Upper Mississippi Watershed. This hierarchy of watersheds demands that jurisdictions within watersheds work together to effectively manage flood risk and minimize potential damage. Within a watershed, development upstream directly affects communities downstream. Urbanization, sprawl and development of wetlands contribute to flash-flooding downstream.

Figure 1: Grant County Geographic Context



Grant County is in the Upper Mississippi Watershed and all rivers in the County eventually drain to the Mississippi (see Figure 2). Smaller, local watersheds feed into the Mississippi River, including the Lower Wisconsin, Grant-Little Maquoketa and Apple-Plum watersheds. Military Ridge is the main division between watersheds in Grant County. The Wisconsin River catches runoff from the north side of Military Ridge and then flows into the Mississippi. South of the ridge, the Platte, Grant and Sinsinawa Rivers and Sandy Creek, as well as other small creeks, drain to the Mississippi River.

Figure 2: Watersheds of Grant County



Grant County Floodplain Map

The lands south of Military Ridge have the highest erosion rates in Grant County. In recent years, erosion of the valleys and slopes increased because of farming practices, deforestation, mining and quarrying and a dramatic increase in paved surfaces. The increased erosion leads to sediment buildup in rivers and streams, resulting in slow drainage and an increased risk of flooding. Erosion rates north of Military Ridge are not as significant because the area is flatter and is heavily forested thus tree roots help anchor the topsoil. The erosion process is particularly damaging because it causes the slope of the landscape to increase, which results in poor growth of crops and more exposure of bare soil that can easily be eroded. This cycle has the potential to remove fertile soil and affect the farming yield. Farmers can use soil conservation methods to break this cycle and retain their topsoil and help everyone in the watershed by decreasing the flood potential.

GEOLOGY

Galena and Platteville dolomite make up the largest portion of bedrock in Grant County. Dolomite is easily dissolved by weak acids in the groundwater and substantial dissolution can lead to the formation of sinkholes, especially given the prominence of lead mining in the County in the 1800s.

Large outcrops of Prairie du Chien dolomite and Trempealeau, Franconia and Dresbach sandstones are exposed in the northern part of the County and along the bluffs of the Mississippi River. The St. Peter sandstones are exposed between the Prairie du Chien dolomite and the Galena and Platteville dolomites, especially in the central parts of the County and along the walls of the deeper valleys. The dolomites and sandstone bluffs create a high potential for rock falls in the areas beneath them.

Maquoketa shale underlies some soils in Jamestown, Hazel Green and Smelser. This type of shale becomes pliable when wet and is moderately susceptible to landslides in areas where it is overlain by dense or heavy rock. Additionally, the Maquoketa Shale acts as a water barrier, essentially preventing the flow of rain or snowmelt through the rock and making the region more susceptible to flash-flooding and prohibits the surface runoff from recharging the aquifer. All uplands and many valley slopes and terraces are covered with a thin layer of loess. This clayey or silty rock-type ranges from one to twenty-two feet in thickness.

CLIMATE

The Grant County climate experiences wide changes in temperature in all seasons. The precipitation is distributed evenly throughout the County, with much of the rain falling after spring floods. Annual snowfall averages about 40 inches and there are typically 123 to 204 days without frost. The frost-free season is longer in areas near the Mississippi River than in the rest of the County. The growing season is long enough for corn and other crops to mature. Small grains and hay grow well because they tolerate low temperatures and light frosts.

POLITICAL JURISDICTIONS

Governmental units within the County include five cities, 14 villages and 33 townships. The County seat is at Lancaster, located near the center of the County. Platteville is the largest city, with a 2010 population of 11,224. All County residents have access to two large metropolitan centers, Madison and Dubuque, Iowa. Madison is approximately 70 miles east of Lancaster and Dubuque, Iowa is approximately 30 miles south of Lancaster. The County has 92 voting precincts. It is governed by a 17-member County Board of Supervisors.

DEMOGRAPHICS

The overall population of Grant County grew by 3.2 percent between 2000 and 2010, from 49,597 to 51,208. In the same decade, the population of persons younger than 18 dropped 8 percent (from 11,768 to 10,886), whereas the population of persons over 65 grew by more than 5 percent (from 7,585 to 7,974).

The highest growth rates of incorporated communities in the County occurred in the Villages of Woodman (38 percent), Mount Hope (21 percent) and Patch Grove (19 percent) from 2000 to 2010. Other high growth communities included the City of Platteville and the Village of Bagley, each at about 12 percent growth over the decade. The Villages of Cassville and Muscoda saw the largest decrease in population over the decade, with Cassville

down nearly 13 percent and Muscoda down 11 percent. Notably, Muscoda was the second fastest growing community in Grant County between 1990 and 2000, with a 13 percent growth rate during that decade.

INCOME

Grant County's median household income grew by 21 percent between 2000 and 2010 (from \$36,268 to \$43,889). The median family income in the County grew by 26 percent (from \$43,428 to \$54,743) and the per capita income increased by 21 percent (from \$16,764 to \$20,758). The number of people below the poverty level increased by 18 percent during this period, from 11.2 percent to 13.3 percent.

HOUSING

Between 2000 and 2010, Grant County saw an 8 percent increase in total housing units (19,940 to 21,581) and a 5 percent increase in occupied housing units (18,465 to 19,396). The number of owner-occupied housing units in the County increased by 3 percent. The median value of owner-occupied homes was \$78,000 in 2000. Home values increased by 51 percent from 2000 to \$118,300 in 2010. The number of renter occupied housing units rose by nearly 11 percent from 2000 to 2010. In the same decade, median rent increased by from \$395 to \$535 and the number of renters paying more than 35 percent of their household income for rent increased from 22 to 36 percent, reinforcing the suggestion that poverty and related housing stress is increasing in the County.

EDUCATION AND EMPLOYMENT

In Grant County, the percentage of people in the labor force decreased by 2.5 percent between 2000 and 2010. The unemployment rate dropped from 3.1 percent to 2.8 percent during the same decade.

The number of high school and college graduates increased by 6.3 percent and 11.6 percent, respectively. At the same time, the number of persons employed in the farming, forestry, fishing, hunting and mining industry dropped by 8 percent since 2000. The three largest employers in the County are University of Wisconsin-Platteville, Grant County and Southwest Heath Center. These trends reflect the evolving nature of the local economy as more jobs are created in the service sector.

DEVELOPMENT TRENDS

While the population of Grant County has not experienced significant growth over the last 15 years, certain geographic areas and housing markets are experiencing growth. There is significant second /vacation /full time retirement home development. Specific areas of concern include River of the Lakes Resort and Jays Landing, which are fast growing residential developments along the Mississippi River in or near the Village of Bagley. In the past, development of properties in the flood fringe of the floodplain was a common occurrence. In the southern portion of the County there has been substantial residential development, primarily first homes, associated with Dubuque, Iowa-area growth. There has also been new development on the northeast and northwest sides of Platteville and UW-Platteville is increasing student enrollment and associated housing, with a 600-bed dormitory with another 1,000-bed facility in the planning stages.

The population of urban areas is increasing rapidly, while the more rural communities are growing at a much slower rate or not growing. The City of Platteville is the fastest growing community in the County, with a significant portion of that growth occurring to the south of the City. Development of a new community hospital in this area has encouraged residential, commercial and industrial growth. Additionally, residential development for Dubuque, Iowa commuters is starting to occur in the southern portion of the County.

In late 2000s, many Grant County communities prepared comprehensive plans that identified planned areas for future growth. Both existing and planned growth areas have been considered in this Plan.

UTILITIES

"Lifeline" systems, including communication, transportation, power, water and sewer, should be designed to be as hazard-resistant as economically possible. Damage to any one of these infrastructure components can cripple a

community at any time. If these lifelines are disrupted due to a disaster, recovery is made much more difficult. Risk of system failure is high in hazard-prone areas; therefore, backup systems, including alternatives such as cellular phones, secondary transportation networks and power generators, should be identified prior to disasters and emergencies.

Power and telephone lines are often damaged in severe weather events in Grant County. Approximately 75 percent of storms cause damage to utility networks. Cellular phone coverage and provision of backup power generators are still limited in the County and few utilities in the County have system redundancies. Alliant Energy and local power cooperative Scenic Rivers provide electricity to the majority of the County. US Cellular provides the majority of cellular phone coverage; however, additional towers are necessary for many communities to receive service.

In the western portion of the County, natural gas is provided by We Energies and the far eastern portion of the County is serviced by Alliant/Wisconsin Power and Light.

The provision of clean public water supply and protection of local water bodies against potential contamination from hazards such as flooding is an important component of hazard mitigation planning. Periods of high water and flooding pose a threat to potable and wastewater facilities, as the additional volume can overload the pumping and treatment infrastructure. This risk is higher for such facilities that are located within the floodplain. Currently, all cities and villages have sanitary sewer and provide water to residents and residents of unincorporated areas (towns) are on septic and well water. All cities and villages maintain their own wastewater treatment facilities. Of these communities, the wastewater treatment facilities for the City of Platteville and the Villages of Bloomington, Bagley and Cassville are located in the floodplain.

TRANSPORTATION INFRASTRUCTURE

Surface Roads

Grant County is well supplied with roads through a system of federal, state and county trunks. The main highways in the County are US Highways 18, 61 and 151, and State Highways 11, 35, 80, 81, 129 and 133. A study of the road systems shows an average of three to five trucks per minute enter Grant County carrying various hazardous materials. Grant County has a number of bridges that are susceptible to flood damage.

The Wisconsin Department of Transportation recently reconstructed US 151 through Grant County as part of a major highway project in Wisconsin. The project included expanding US 151 to four lanes and constructing bypasses around the cities of Platteville and Dickeyville in Grant County.

Railroads

The Burlington Northern-Santa Fe Railroad runs along the Mississippi River from Chicago to the Twin Cities. In 1994, 28,798 rail cars traveled this track. Included in the total numbers of cars were 15,531 cars with mixed and full loads of hazardous materials, including one tank of mustard gas. The Wisconsin and Southern Railroad runs along the Wisconsin River from Muscoda to the Village of Woodman where it crosses the Wisconsin River into Crawford County. This train carries large quantities of coal, grain and lumber.

River Transport

Barge traffic travels the Mississippi River hauling petroleum products, crude oil, gasoline, jet fuel, kerosene, benzene, asphalt, naphtha, alcohol, fertilizers, potash, phosphorous coal, styrene, anhydrous ammonia, vegetable oils and soybean oil until the river freezes over.

Airports

There are four public airports in operation in Grant County. Boscobel has two runways, with 3,658 and 5,000 feet of hard surface, with fuel and a beacon. Cassville Airport has one 3,000 foot, hard surface runway and is lighted, but has no services. Platteville Municipal Airport has two runways, with 3,999 and 3,599 feet of hard surface, is lighted with a radio beacon and fuel service. The Lancaster Airport has one lighted runway, 3,850 of hard surface, with fuel and a beacon.

Ferry Service

Cassville Ferry runs from Memorial Day through Labor Day across the Mississippi River to Turkey River in Iowa depending on River conditions.

EMERGENCY SERVICES**Police Services**

The Grant County Sheriff's Office and the Platteville Police Department are the only 24-hour dispatch centers in the County. With the exception of Platteville, the Sheriff's Department dispatches for all police, fire, rescue, DNR (secondary), coroners, health department and social services in Grant County. Communities in the County provide varying levels of law-enforcement services.

Fire Protection and EMS Services

Fire protection is provided by 22 volunteer Fire Departments that maintain cooperative aid agreements. All communities in Grant County rely on volunteer Fire Departments, whereby trained citizens are summoned to a fire either by a fire siren or pagers. All farms and residences in the County are served by one or more Fire Departments. Fire Departments provide mutual aid in the case of extreme demand. All rural residences have been assigned a fire number to facilitate identifying and locating fires. Grant County is served by 13 ambulance services and four first responder units, all staffed by volunteers.

Haz-Mat Team

At the time of Plan adoption, GCEM was working with WEM to form a regional hazardous material response team which would serve Grant, Iowa and Lafayette Counties (and Jo Daviess County in Illinois).

Chapter 3: County-Wide Risk Assessment

Analyzing the hazards in the County is an important and necessary step to help identify potential risks and to prioritize mitigation projects that will minimize those risks. Chapter 3 includes:

- Identification of the natural hazards that can affect Grant County
- Description and risk assessment of the identified hazards
- The County's vulnerability to future hazard events
- A probability estimate of future occurrences of different hazards

HAZARD IDENTIFICATION

The sources that were used to identify the hazards that are addressed in this Plan include the following:

- National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center
- National Weather Service
- GCEM records
- The 2006 Grant County Multi-Hazard Mitigation Plan
- Newspaper archives
- Interviews with local historians
- Participation of representatives from local governments and other interested parties

Disaster history worksheets were prepared by the project team and were completed by 40 of the 52 municipalities. The goal of the worksheets was to help document local disaster histories, which are summarized at the end of this chapter. Please see Appendix D for a sample worksheet.

Based on historic occurrences, the County then assessed the probability of future occurrences and threat to human safety and property damage. With approval of the Emergency Management Committee, the project team ranked the applicable hazards based on probability of threat to human safety and property damage. The priority ranking is as follows:

- | | |
|--|------------------------------|
| 1. Overland and Flash-Flooding | 7. Wildland and Forest Fires |
| 2. Landslides/Embankment Failures | 8. Subsidence |
| 3. Severe Thunderstorms (including hail, lightning severe winds) | 9. Drought |
| 4. Tornados | 10. Extreme Temperatures |
| 5. Hazardous Material Incidents | 11. Insect Infestation |
| 6. Winter Storms | 12. Earthquakes |

Since 2000, Grant County has received over \$14 million to address natural hazards, summarized in Table 3. This emphasizes the importance of hazard mitigation planning to the County.

Table 3: Grant Awards Obtained by Grant County, 2000-2011

2000	Local Govt	Homeowners	Mitigation Project	Mitigation Planning
Federal Disaster Aid to Local Govt (Spring Flash-Floods)	\$560,436.33			
Federal Aid to Homeowners and Businesses (Spring Flash-Floods)		\$ 502,945.00		
CDBG Housing Repair		\$363,000.00		
2001				
Federal Aid to Local Governments (Mississippi River Flood)	\$197,692.00			
Federal Disaster Aid to Homeowners and Businesses (Mississippi River Flood)		\$811,489.00		
CDBG Housing Repair		\$125,000.00		
2003				
Hazard Mitigation Project Funding			\$500,876.00	
Hazard Mitigation Planning Funding				\$50,000.00
2004				
Federal Disaster Aid to Local Govt (Flash-Floods)	\$1,680,017.83			
Federal Disaster Aid to Homeowners and Businesses (Flash-Floods)		\$353,116.00		
CDBG Housing Repair		\$297,000.00		
2005				
Federal Disaster Mitigation Funding			\$115,268.63	
2007				
CDBG Emergency Housing Grant		\$401,500.00		
WHEDA Temporary Housing Grant		\$5,000.00		
Wisconsin Disaster Fund Assistance	\$137,000.00			
2008				
Federal Disaster Aid to Local Governments	\$2,246,460.00			
Federal Disaster Aid to Homeowners and Businesses		\$1,772,942.00		
2009				
Hazard Mitigation Project Funding			\$467,300.00	
NRCS Emergency Streambank Protection		\$53,000.00		
2010				
Federal Disaster Aid to Local Governments (2010 Flash-Flooding)	\$1,179,428.12			
Federal Disaster Aid to Homeowners and Businesses (2010 Flash-Flooding)		\$1,202,451.00		
CDBG-Emergency Assistance Program		\$283,200.00		
2011				
HMGP Planning Grant				\$45,475.00
Federal Disaster Aid to Local Governments (February 2011 Blizzard)	\$484,438.98			
Totals:	\$6,485,473.26	\$6,170,643.00	\$1,083,444.63	\$95,475.00

Although the history of grant awards in Grant County highlights the most severe disasters, it is not a full representation of past disasters. Flooding and/or storm damage are annual events in Grant County; however, many of these events go unreported to County or State Emergency Management or by the National Oceanic and Atmospheric Administration (NOAA). NOAA National Database of U.S. Storm Events identifies 579 severe weather events from 1950 to present, which resulted in 74 deaths, 40 injuries, \$44,831,000 of property damage and \$24,208,000 of crop damage. Although one of the only databases with such information, these tallies significantly under-represent the frequency of events and the damages that they cause. The dearth of reliable data and underrepresentation of damages pose significant issues in understanding and evaluating the true impact of disasters.

In addition to the NOAA’s County-wide data discussed below, each participating jurisdiction provided a local record of disaster incidents in the historic disaster worksheets. To avoid potential duplication of events and damage reports, locally reported events are not included in the County totals below; rather all locally reported data is listed by disaster event in each municipality’s respective disaster history table, in the following chapter of this Plan.

Table 4: Severe Weather in Grant County

Hazard	# of Events	Reported Deaths	Reported Injuries	Property Damage	Crop Damage
Flood/Flash-Flood	59	0*	0	\$30,368,000	\$5,672,000
Severe Thunderstorms and Winds	199	2	2	\$5,172,000	\$1,811,000
Tornados and Funnel Clouds	50	0	7	\$5,304,000	\$53,000
Hail	180	0	0	\$3,494,000	\$16,175,000
Winter Storms	62	0	9	\$118,000	N/A
Lightning	5	1*	1	\$6,000	N/A
Extreme Temperatures	20	71	21	N/A	N/A
Landslide/Embankment Failure	N/A	0	0	N/A	N/A
Totals	325	7	37	\$44,462,000	\$23,711,000

Source: NOAA, collected February, 2012.
**According to GCEM data, there were two fatalities attributed to flooding in Ellenboro in 1961 and two deaths attributed to lightening.*

VULNERABILITY ASSESSMENT

The following section provides a vulnerability assessment of each of the hazards which have historically affected Grant County. The following topics are discussed for each hazard:

- A brief description of the hazard
- Recount of historical events
- Identification of potential vulnerability
- Estimation of probability of future events and potential losses

The following table identifies the value of property improvement within each municipality and the County total. These values will serve as the estimate of potential economic vulnerability to hazards that display risk evenly throughout the County, without a specific pattern of occurrence, such as severe thunderstorms, tornados, severe winter storms and drought.

Table 5: 2011 Valuation of Property Improvements in Grant County

Municipality	Value of Improvements	Municipality	Value of Improvements
Town of Beetown	\$31,145,500	Village of Bagley	\$14,062,200
Town of Bloomington	\$13,778,000	Village of Bloomington	\$21,009,500
Town of Boscobel	\$17,766,400	Village of Blue River	\$12,410,960
Town of Cassville	\$17,112,400	Village of Cassville	\$33,599,300
Town of Castle Rock	\$9,562,100	Village of Dickeyville	\$44,857,400
Town of Clifton	\$19,922,800	Village of Hazel Green	\$38,388,900
Town of Ellenboro	\$24,965,200	Village of Livingston	\$20,180,100
Town of Fennimore	\$23,491,800	Village of Montfort	\$20,889,500
Town of Glen Haven	\$18,660,800	Village of Mt Hope	\$5,913,400
Town of Harrison	\$24,411,900	Village of Patch Grove	\$6,324,100
Town of Hazel Green	\$44,723,900	Village of Potosi	\$27,550,000
Town of Hickory Grove	\$16,192,500	Village of Muscoda	\$51,903,000
Town of Jamestown	\$116,230,800	Village of Tennyson	\$11,759,500
Town of Liberty	\$24,703,600	Village of Woodman	\$3,228,700
Town of Lima	\$32,697,900	City of Boscobel	\$86,602,600
Town of Little Grant	\$16,494,500	City of Cuba City	\$73,264,900
Town of Marion	\$17,310,500	City of Fennimore	\$84,383,900
Town of Millville	\$5,746,100	City of Lancaster	\$165,142,800
Town of Mt. Hope	\$12,411,100	City of Platteville	\$449,565,100
Town of Mt. Ida	\$18,214,250		
Town of Muscoda	\$28,474,300	Total	\$2,067,576,760
Town of North Lancaster	\$28,272,900		
Town of Paris	\$38,459,700		
Town of Patch Grove	\$13,848,400		
Town of Platteville	\$79,784,200		
Town of Potosi	\$36,271,000		
Town of Smelser	\$42,677,300		
Town of S. Lancaster	\$39,138,000		
Town of Waterloo	\$25,085,200		
Town of Watterstown	\$14,558,500		
Town of Wingville	\$18,631,650		
Town of Woodman	\$8,030,300		
Town of Wyalusing	\$17,767,400		
<i>** This table represents the most current valuation estimates as of February 2012.</i>			
<i>Source: Grant County</i>			

OVERLAND AND FLASH-FLOODING

Flooding is defined as a partial or total inundation of normally dry land from the overflow of inland waters or rapid accumulation or run-off of surface waters from any source. Flood events constitute 90 percent of federal disaster declarations; their occurrence is frequent and response and recovery costs can be extremely high. Recent major flooding events confirm that Grant County is no exception to this rule. Therefore, where risks are apparent, the County and included jurisdictions should take actions to prevent damage.

The majority of flood damage in Grant County is a result of flash-flooding in areas with significant topography and bluff terrain, unrelated to a water body. Generally, the timing and location of this type of flooding is unpredictable and can occur quickly, with little time for evacuation of people and most personal property. Far fewer events are related to the Mississippi or Wisconsin Rivers. Such floods tend to occur in the early spring when melting snow adds to normal runoff when the ground is often still frozen or in the summer and early fall after intense rainfall. Spring flooding is characterized by a slow buildup of flow and velocity in rivers over a period of days. This buildup continues until the river or stream overflows its banks, for weeks to months then slowly recedes. Generally, the timing and location of this type of flooding is predictable and allows substantial time for evacuation of people and most personal property.

Historic Flooding Events

Bordered by the Mississippi and the Wisconsin Rivers, Grant County is one of the most flood-prone areas of the state. According to disaster history worksheets, significant flooding along the Mississippi River, Wisconsin River and tributaries occurred in the following years:

Table 6: Flooding Events by Year

Flood Year	Wisconsin River	Mississippi River	Tributaries
1828		X	
1844		X	
1851		X	X
1859		X	X
1862		X	
1870		X	
1876			X
1880		X	
1881		X	
1888		X	
1892		X	
1900	X		
1908			X
1920		X	
1933		X	
1935		X	
1936		X	
1938		X	
1939		X	
1942		X	
1943		X	
1944		X	XX*
1945		X	
1947		X	X
1948			X

Flood Year	Wisconsin River	Mississippi River	Tributaries
1949		X	X
1950	X		X
1951		X	X
1952		X	
1961			X
1965		X	X
1967		X	
1969		X	X
1974			X
1975		X	X
1976			X
1977		X	
1978			X
1979			X
1980		X	
1981			X
1982		X	X
1983		X	
1984		X	X
1986		X	
1989			X
1990			X
1991		X	X
1992			X
1993		X	X

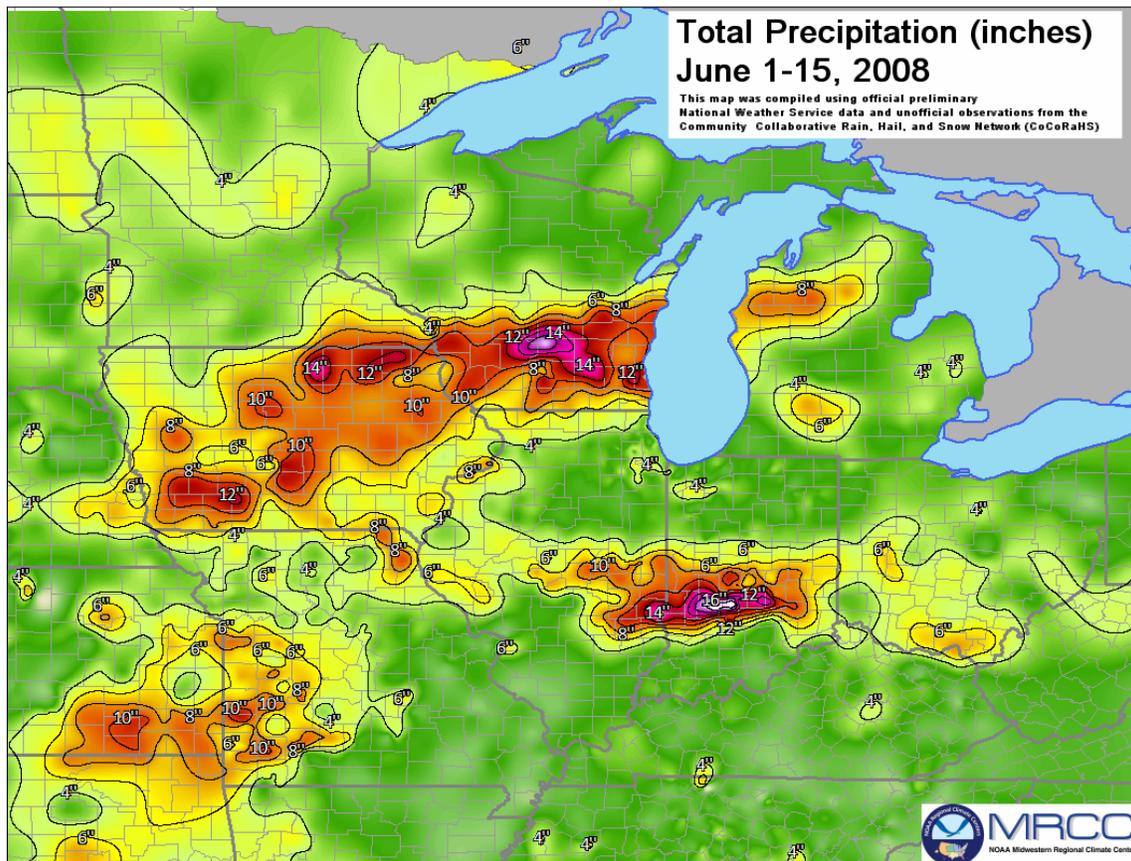
Flood Year	Wisconsin River	Mississippi River	Tributaries
1994			X
1996		X	X
1997		X	X
1998	X	X	X
1999			X
2000			X
2001		X	X
2002			X
2003		X	X

Flood Year	Wisconsin River	Mississippi River	Tributaries
2004	X	X	X
2006	X	X	
2008	X	X	
2009	X		
2010			X
2011			X

**Two events occurred*
 Source: NOAA, collected February, 2012; Disaster History Sheets.

Given the frequency of flooding events and the significant economic and social impact of these flood events, it is economically logical to employ mitigation techniques that lessen the damage. Recovery assistance has only been provided for 65 percent of floods. Of recent flooding events, the County received federal Disaster Declarations in 1990, 1993, 2000, 2001, 2002, 2004, 2005, 2007, 2008 and 2010. Most of these events were flash-floods associated with surface water run-off, not from riverine flooding.

In June 2008, heavy rain caused severe flooding across southern Wisconsin. The floods were aggravated by saturated soils that persisted from unusually wet antecedent conditions from a combination of floods in August 2007, more than 100 inches of snow in winter 2007–08 and moist conditions in spring 2008. The flooding caused immediate evacuations and road closures and prolonged, extensive damages and losses associated with agriculture, businesses, housing, public health and human needs and infrastructure and transportation. The graphic below illustrates total precipitation in the Midwest in June 2008. While the south central portion of Wisconsin experienced the highest rain totals, Grant County was severely impacted as well.



There are four repetitive loss properties in Grant County as identified in the FEMA/NFIP database. These properties are all single family residences and are located in Cuba City, Dickeyville, and the Towns of Beetown and Jamestown.

Vulnerability Assessment

Flooding is the most common disaster that affects Grant County. Since 1950, flooding has caused two known fatalities and resulted in millions of dollars of damage to property and crops. Public recovery assistance for the last 10 years exceeds \$14 million in Federal, State and local funding.

Based on data from the National Weather Service and disaster history worksheets, the following are common effects of flooding in Grant County:

- Transportation Network: washed-out roads and bridges, undermined riverbanks, embankment failures and debris cleanup
- Drainage Systems: damaged and destroyed culverts and tubes and debris cleanup
- Public Property: flooded public facilities such as schools and parks and damaged recreational amenities, lands and historic sites
- Utilities: downed transmission lines and poles, damaged transformers and telecommunication networks, damaged water treatment systems, diminished water quality from overflow and backup of sanitary sewer
- Residential Structures: flooded basements, collapsed foundations, damaged septic systems, collapsed wells and destroyed/severely damaged homes
- Agricultural Lands: inundated cropland, injured livestock and soil erosion
- Businesses: inventory and revenue loss and permanent closure
- Local Economy: additional public expenditures for response and recovery personnel, repair materials and equipment; and lost revenue from closed businesses and destroyed cropland and livestock

As previously discussed, vulnerability is based on the value of property and infrastructure within a high-risk area. Two methods were employed to assess vulnerability to flood damage in Grant County: evaluation of the number and assessed value of properties within the floodplain and evaluation of the number and assessed value of properties within flood-prone areas. Each of these methodologies involved review and/or analysis of the resources listed and discussed below:

- Wisconsin Repetitive Loss Report (December 2011)
- HAZUS-MH Hazard Analysis (May 2008)
- Grant County Floodplain Maps
- Aerial photos
- GCEM records

HAZUS-MH Hazard Analysis

“HAZUS” is a computer modeling tool used to evaluate potential losses associated with flood events. Flood analysis for Grant County was performed using HAZUS-MH MR3 in 2008 by the Polis Center. The model relies on data from a variety of sources. The bundled aggregated general building stock was updated by Dun and Bradstreet in 2006. Building valuations were updated by R.S. Means in 2006. Building counts are based on U.S. Census housing unit counts and divided by RES1 (single-family dwellings) and RES2 (manufactured housing).

HAZUS-MH was used to generate the flood depth grid for a 100-year return period calculated for 1 square mile drainage areas. The riverine model was determined from a user provided USGS 30m DEM and peak discharge values obtained for 17 reaches tabulated in the 1999 Grant County Flood Insurance Study.

Figure 3 depicts the 100-year flood boundary from the HAZUS-MH analysis (note that some of the labels in Figure 3 are incorrect). While this analysis indicates that the majority of projected damages due to flooding occur along the Wisconsin River, past experience suggests that most damage results from flash-flooding associated with stormwater run-off in valley areas.

Figure 3: Grant County HAZUS-MH Analysis (100-Year Flood)



Source: HAZUS-MH analysis by the Polis Center, 2008.

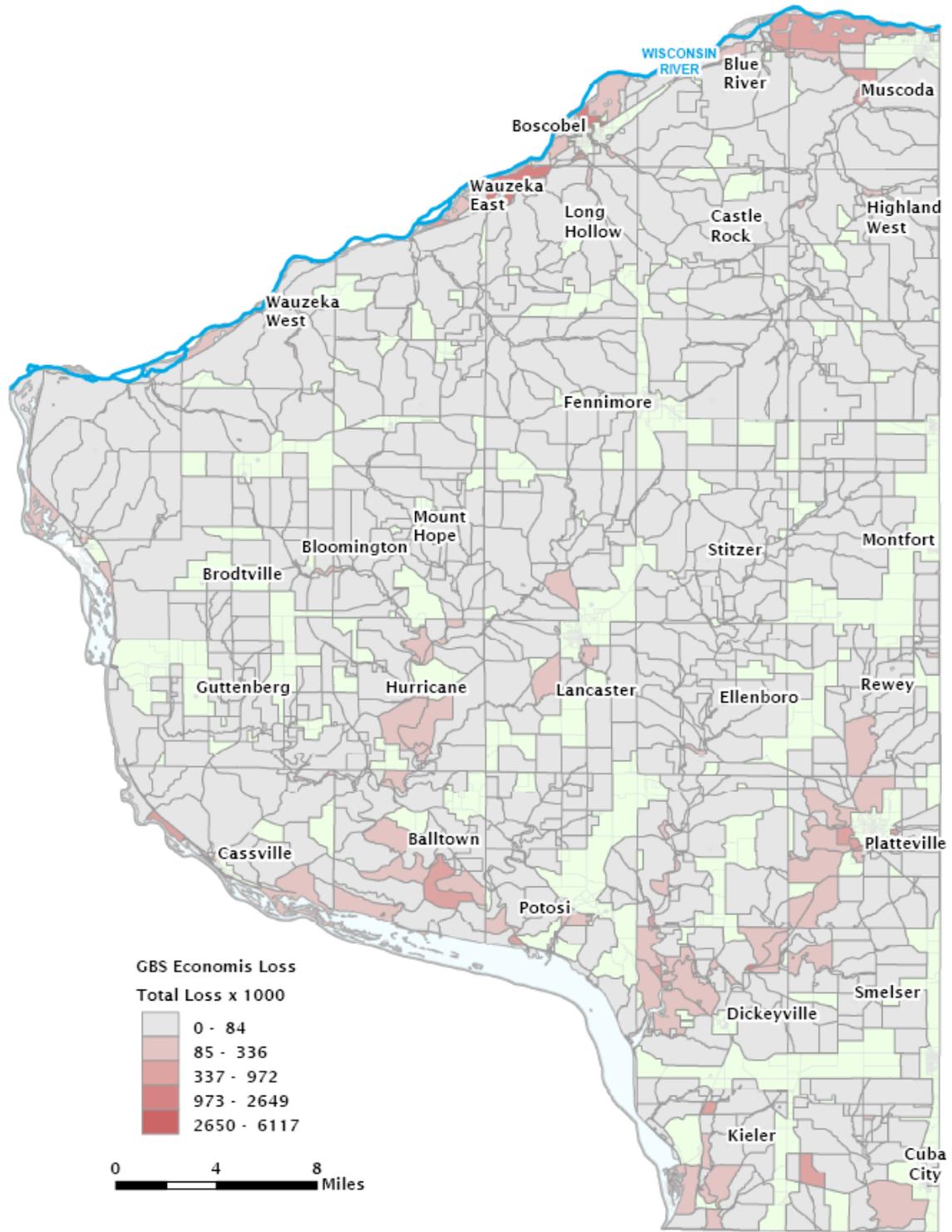
HAZUS-MH Aggregate Loss Analysis

HAZUS-MH was used to project the damages for a 100-year flood event in Grant County. The total projected number of damaged buildings, total building losses and estimated total economic losses for the entire County are shown in Table 5. A projected 72 buildings would be damaged totaling \$28 million in building losses and \$60 million in total economic losses. The reported building counts should be interpreted as degrees of loss rather than as exact numbers of buildings exposed to flooding. HAZUS-MH projects 6 Census blocks with losses exceeding \$1 million, depicted in Figure 4 (note that some of the labels in Figure 4 are incorrect). Census blocks of concern should be reviewed in more detail to determine the actual distribution of flood hazard areas.

Table 7: Grant County Total Potential Economic Loss - 100-Year Flood

General Occupancy	Estimated Total Buildings	Total Damaged Buildings	Total Building Exposure x1000	Total Economic Loss x1000	Building Loss x1000
Agricultural	1	0	\$110,747	\$5,536	\$1,552
Commercial	113	0	\$505,915	\$13,844	\$3,757
Education	2	0	\$116,250	\$173	\$24
Government	8	0	\$38,912	\$1,294	\$162
Industrial	15	1	\$116,936	\$6,256	\$1,518
Religious/Non-Profit	6	0	\$73,703	\$1,636	\$212
Residential	17,034	71	\$2,391,799	\$31,421	\$20,323
Total	17,179	72	\$3,354,262	\$60,160	\$27,548
Source: HAZUS-MH MR3, 2008, Polis Center					

Figure 4: Grant County Total Economic Loss - 100-Year Flood



Source: HAZUS-MH analysis by the Polis Center, 2008.

HAZUS-MH Essential Facility Loss Analysis

Essential facilities encounter the same impacts as other buildings within the flood boundary: structural failure, extensive water damage to the facility and loss of facility functionality (i.e., a damaged police station will no longer be able to serve the community). The HAZUS-MH analysis suggests that the Blue River Fire Station may be subject to flooding due to its location in the floodplain. A list of the essential facilities within Grant County and damage potential is included in Table 6.

Table 8: Grant County Potential Essential Facility Loss - 100-Year Flood

Class	Building Count	At Least Moderate Damage	At Least Substantial Damage	Loss of Use
Care Facilities	13	0	0	0
Emergency Operations Command	1	0	0	0
Fire Stations	20	1	0	0
Police Stations	18	0	0	0
Schools	43	0	0	0
Total	95	1	0	0

HAZUS-MH Shelter Requirement Analysis

HAZUS-MH projects the number of households expected to be displaced from their homes due to the flood and the associated potential evacuation. HAZUS-MH also estimates those displaced people that will require accommodations in temporary public shelters. The model projects that 420 Grant County households will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 283 people are projected to seek temporary shelter in public shelters.

HAZUS-MH State Property Loss Analysis

The flood boundaries were overlaid with the State of Wisconsin property boundaries as provided by the Department of Natural Resources. Table 7 provides a list of state properties projected to be impacted by the flood boundary. Figures 5 and 6 show examples of the inundated areas.

Table 9: Grant County State Property Flood Inundation

State Property (general location)	Percent Inundated	Acres Inundated
Wyalusing State Park (Town of Wyalusing)	6%	151
Nelson Dewey State Park (Cassville)	11%	79
Lower Wisconsin State Riverway (northern border of the County)	47%	6,503
Snow Bottom State Natural Area (Blue River)	22%	37

Figure 5: Boundary of 100-Year Flood Overlaid with State of Wisconsin Properties

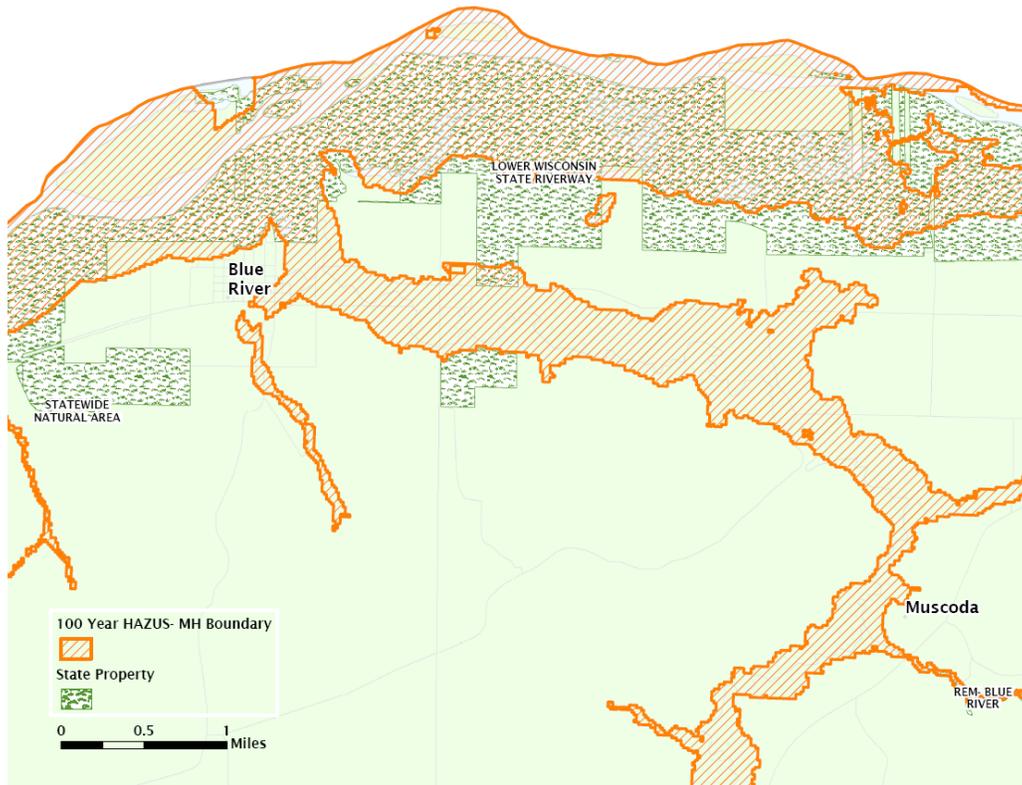
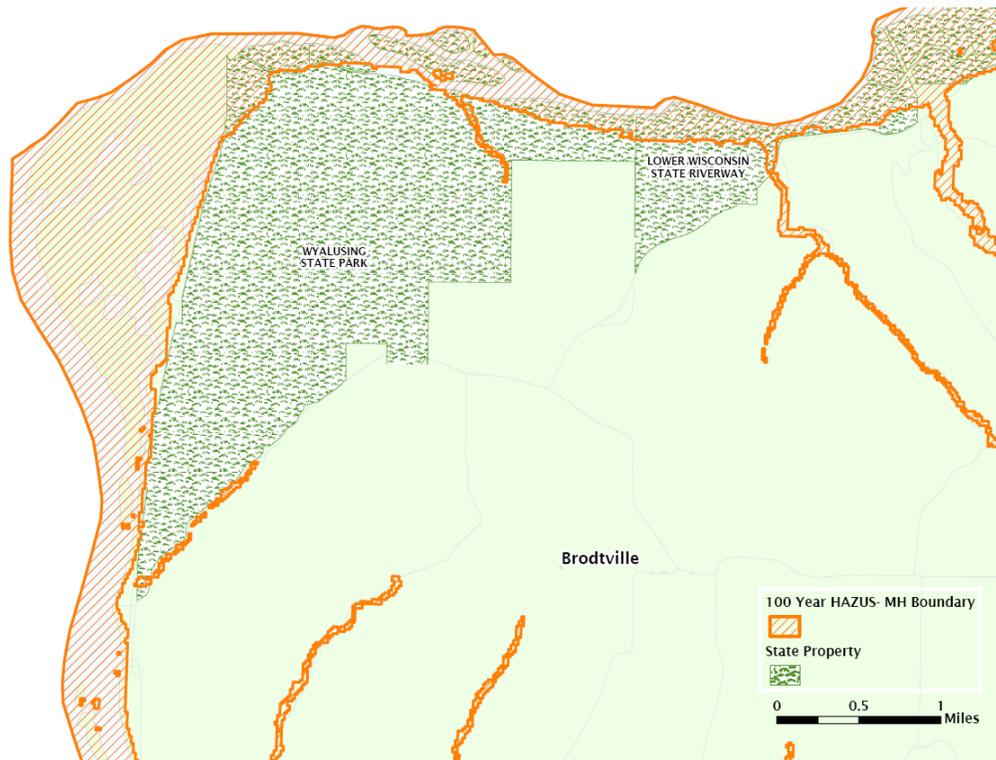


Figure 6: Boundary of 100-Year Flood Overlaid with State of Wisconsin Properties



In addition to the vulnerability projected under the HAZUS model above, flood events significantly affect the economic stability of municipalities, farms and businesses. Agriculture and agriculture-related businesses account for the majority of employment in Grant County and agriculture is the primary sector of the County economy. Given the importance of agriculture to the County economy, flood losses can be devastating to the financial security of farmers and the County as a whole.

Flooding can cause numerous economic setbacks to the agricultural sector:

- Delayed planting/reduced growing season
- Seed and agricultural chemicals washed out of fields into drainage systems
- Root and plant rotting due to excessive moisture
- Stunted growth, immature development, or decreased nutritional value of crops
- Expenditures to repair and/or structurally mitigate flood damages

From 1950 to present, approximately 55 incidents of extensive crop loss due to flooding were identified in the data set. Based on disaster history worksheets and NWS data, crop damage is most prevalent in the Towns of Lancaster, Harrison, Smelser and Fennimore.

The forest product industry is similarly impacted by flood events. According to the State Forest Service, approximately 29 percent of Grant County is forested and the majority of the wood volume produced for consumption is oak, which also hold the majority of the financial value of the woodland. The most recent forest inventory of Grant County indicates an approximate value of \$77,965,000 in standing oak trees and approximately \$4,637,000 in standing ash trees. The 2007 summary of County economic sectors of industry output, employment and employee compensation by Wisconsin DNR shows annual industry output of \$100,000,000, employment at 430 people and employee compensation at \$15,000,000 per year. Grant County forest products and processing industrial output makes up 3.59 percent of the total County industrial output and 1.64 percent of total employment. Further, for every ten statewide jobs in the forest related industries an additional 21 jobs are produced in other sectors of the State's economy.

Approximately 75 percent of storms cause damage to utility networks. Additionally, a vast majority of storm damage that occurs is to transportation networks.

According to FEMA, approximately 30 percent of flood-impacted businesses do not reopen following a disaster. These closures result in restricted access to goods and services, as well as lost tax revenue that can lead to decreased services provided by local governments.

Future Probability

Based on historical flood events identified by NOAA, local newspapers and in the disaster history worksheets completed as part of this Plan, 59 severe floods of the Mississippi or Wisconsin Rivers or their tributaries were recorded from 1950 to 2011. These 59 floods occurred during 36 years within this 61 year timeframe. This equates to an approximately 60 percent probability of at least one of the three river systems flooding each year. However, more recent data suggests that flooding events are becoming more frequent. Between 1990 and 2011, 31 flood events occurred on these rivers. These events occurred during 19 years within this 21 year timeframe which equates to a 90 percent probability of at least one of the three flooding in any given year.

It is important to note that the County experiences flooding associated with rivers as well as with stormwater runoff. The future probability of this second type of flooding is difficult to estimate given the lack of historic data.

Dams

There are approximately 123 dams and two levees in Grant County. Only six of the dams are considered "large" by the Department of Natural Resources Dam Safety Program and three of these have areas of high population density downstream in the hydraulic shadow.

Most of the dams were constructed many decades ago with funds from the Army Corps of Engineers, ASC and Federal Housing Administration to limit flash-flooding through valleys from upland areas. They are essentially earthen berms constructed between valley walls, designed to retain flood waters behind them. No program was developed or

funded for ongoing maintenance of these dams. Since construction, soil and debris have backed up behind these dams, in some cases filling the retention area. Stormwater run-off then runs around or quickly over the dams causing similar flooding problems in the lower areas of the watershed compared to the time before they were built.

Two levees are located in the Village of Cassville and the Town of Glen Haven. The Cassville levee plays a dual role as a community open space; its maintenance costs are programmed into the park district budget. The Glen Haven levee is deteriorating and the Town does not have funds for maintenance.

Although dams and levees may have been constructed properly, inadequate maintenance can cause stress and damage during a flood event and eventually lead to loss of life and damage when the dam or levee is breached. An inspection, maintenance and enforcement program ensures continued structural integrity. Unnecessary and structurally unsound dams should generally be removed. Also, given the potential for large dam failure, development in a dam's hydraulic shadow should be highly regulated.

In addition to the dams and levees previously discussed the Burlington Northern-Santa Fe Railroad bed along the Mississippi in the Town of Glen Haven and Villages of Cassville and Bagley functions as a de facto levee. Although it is an effective barrier to debris deposits from the Mississippi River, the opening that allows stormwater to drain to the River does not restrict overflow of the Mississippi from flooding adjacent lands. GCEM and the affected communities are aware of the limitations of the railroad as a levee and have begun to take appropriate educational and mitigation actions.

LANDSLIDES/EMBANKMENT FAILURES

Landslides and embankment failures, generally referred to as mudslides and landslides, are most often caused by the same high water levels or heavy rain that result in flooding. Landslides can also be triggered by the shaking of earthquakes. Although many mitigation measures resemble those for flooding, landslides pose unique considerations.

Historical Occurrences

GCEM estimates that each period of excessive rain results in an average of four embankment failures in each jurisdiction. However, embankment failures tend to be more common in the hilly, southern portion of the County. See Chapter 4 for local occurrences. Most of these events were immediately following an intense rainfall and primarily occurred in areas with steeper slopes. Due to funding constraints, often mitigation projects are delayed or unfunded because these funds must be used to address embankment failures.

Vulnerability Assessment

Embankment failures most often occur in the spring and summer with snowmelt and seasonal rains. Recent significant events occurred in June, 2002, July and August, 2007, July, 2008 and May 2010. However, based on GCEM observations, the occurrence of debris flows are erratic in both frequency and are primarily located along roads with relatively steep embankments on either the uphill or downhill side. According to GCEM, embankment failures are often related to improper construction and land management practices. Communities that are most vulnerable to significant damages due to large-scale landslides include the Villages of Cassville, Glen Haven, Potosi and Wyalusing and the Towns of Beetown, Ellenboro, Potosi, Harrison and Paris.

Future Probability and Potential Loss

Based on historical occurrence, each local jurisdiction should expect approximately four embankment failures per incident of excessive rain or over 112 embankment failures County-wide. These failures will continue to cause road closures and incur costs for debris removal, replacement and repair. GCEM estimates that the average cost of response is approximately \$8,000 per embankment failure.

SEVERE THUNDERSTORMS

The National Weather Service definition of a severe thunderstorm is a thunderstorm event that produces any of the following: downbursts with winds of 58 miles per hour or greater (often with gusts of 74 miles per hour or greater), hail of $\frac{3}{4}$ of an inch or greater or a tornado. Strong winds, hail and lightning will be addressed in this section; however, tornados are addressed separately below. A thunderstorm cell travels between 30 and 50 miles per hour and

generally runs its course of creation and dissipation within 30 minutes. Lightning travels between and among the ground, clouds and tall structures and is associated with thunderstorms. Hail is developed when there are sufficiently strong and persistent up-draft wind speeds and water has accumulated in a super-cool state in the upper parts of the storm. Although injury and loss of life is rarely associated with hailstorms, property damages can be extensive. Hail ranges in size from barely visible to the size of softballs and larger and tend to fall in swaths that may be from 20 to 100 miles. Lightning can cause death and injury to humans and animals, set fire to buildings and cause damaging surges within the power grid.

Severe thunderstorm frequency is measured in terms of incidents observed per year. Wisconsin averages 30-45 thunderstorms per year; Grant County averages approximately 4 to 6 per year. Severe thunderstorms can occur throughout the year, with the highest frequency between May and September and between the hours of noon and midnight.

Historical Severe Thunderstorm Events

NOAA data reports five occurrences of lightning strikes in Grant County, causing one fatality and one injury. However, according to information collected through community outreach efforts, there have been at least two fatalities and extensive damage to property and death of farm animals. Disaster history worksheets show that lightning strikes caused at least three fires.

Table 10: Reported Severe Thunderstorms in Grant County

Date	Time (CST)	Location	Wind Speed (knots)	Reported Deaths	Reported Injuries	Estimated Damage
8/16/1958	0015	Mount Hope	N/A	0	0	N/A
7/10/1959	1730	Platteville	N/A	0	0	N/A
6/17/1962	1645	Platteville	N/A	0	0	N/A
8/17/1965	1420	Hickory Grove	N/A	0	0	N/A
7/5/1966	1200	Platteville	N/A	0	0	N/A
6/10/1968	2100	Lancaster	N/A	0	0	N/A
10/1/1969	1930	Boscobel	N/A	0	0	N/A
6/24/1971	1835	Boscobel	N/A	0	0	N/A
6/16/1973	1120	Platteville	N/A	0	0	N/A
6/30/1973	1730	Boscobel	N/A	0	0	N/A
6/30/1973	1730	Lancaster	N/A	0	0	N/A
6/14/1974	1245	Ellenboro	N/A	0	0	N/A
6/20/1974	1600	Bloomington	N/A	0	0	N/A
6/20/1974	1620	Platteville	N/A	0	0	N/A
8/26/1974	2000	Fennimore	N/A	0	0	N/A
5/23/1975	1440	Lancaster	N/A	0	0	N/A
6/4/1975	0440	Kieler	N/A	0	0	N/A
6/13/1975	1525	Lancaster	56	0	0	N/A
6/22/1975	1445	Fennimore	74	0	0	N/A
11/9/1975	2010	Potosi	N/A	0	0	N/A
11/9/1975	2015	Platteville	N/A	0	0	N/A
6/12/1976	2140	Hazel Green	N/A	0	0	N/A

Date	Time (CST)	Location	Wind Speed (knots)	Reported Deaths	Reported Injuries	Estimated Damage
5/16/1977	1230	Hazel Green	N/A	0	0	N/A
7/6/1977	1725	Muscoda	N/A	0	0	N/A
7/16/1977	2107	Fennimore	N/A	0	0	N/A
7/16/1977	2107	Bloomington	N/A	0	0	N/A
7/16/1977	2200	Lancaster	N/A	0	0	N/A
6/16/1978	2250	Mount Hope	N/A	0	0	N/A
7/20/1978	1315	Platteville	N/A	0	0	N/A
8/5/1979	0800	Platteville	52	0	0	N/A
11/7/1979	1700	Boscobel	N/A	0	0	N/A
8/7/1980	1725	Lancaster	N/A	0	0	N/A
6/23/1981	2330	Boscobel	60	0	0	N/A
7/19/1983	1845	Boscobel	N/A	0	0	N/A
7/19/1983	1915	Lancaster	N/A	0	0	N/A
8/10/1983	1600	Cuba City	N/A	0	0	N/A
9/5/1983	2230	Platteville	N/A	0	0	N/A
9/5/1983	2230	Lancaster	N/A	0	0	N/A
6/17/1984	1700	Lancaster	N/A	0	0	N/A
6/26/1984	2025	Fennimore	N/A	0	0	N/A
7/9/1984	2047	Boscobel	N/A	0	0	N/A
10/16/1984	1935	Lancaster	N/A	0	0	N/A
10/16/1984	1950	Blue River	N/A	0	0	N/A
5/30/1985	2240	Livingston	N/A	0	0	N/A
7/29/1987	2000	Mount Hope	N/A	0	0	N/A
5/8/1988	1528	Muscoda	N/A	0	0	N/A
5/24/1989	2045	Mount Hope	N/A	0	0	N/A
5/24/1989	2055	Fennimore	N/A	0	0	N/A
6/26/1989	1000	Boscobel	74	0	0	N/A
6/26/1989	1030	Livingston	N/A	0	0	N/A
8/4/1989	1925	Boscobel	N/A	0	0	N/A
8/4/1989	1930	Muscoda	N/A	0	0	N/A
6/2/1990	1310	Boscobel	N/A	0	0	N/A
8/17/1990	2010	Boscobel	N/A	0	0	N/A
3/22/1991	2010	Ellenboro	N/A	0	0	N/A
3/22/1991	2030	Muscoda	N/A	0	0	N/A
3/22/1991	2043	Cuba City	N/A	0	0	N/A
5/23/1994	1414	Wyalusing	N/A	0	0	\$5,000

Date	Time (CST)	Location	Wind Speed (knots)	Reported Deaths	Reported Injuries	Estimated Damage
5/23/1994	1440	Fennimore	N/A	0	0	\$6,000
4/18/1995	0920	Hazel Green	N/A	0	0	N/A
4/18/1995	1508	Boscobel	N/A	0	0	N/A
4/18/1995	1508	Potosi	N/A	0	0	N/A
4/18/1995	1516	Cuba City	N/A	0	0	N/A
4/18/1995	1525	Hazel Green	N/A	0	0	N/A
6/7/1995	1700	Castle Rock	N/A	0	0	N/A
6/7/1995	1702	Mount Hope	N/A	0	0	N/A
6/7/1995	1705	Fennimore	N/A	0	0	N/A
7/4/1995	2046	Cassville	N/A	0	0	N/A
7/4/1995	2055	Cuba City	N/A	0	0	N/A
7/27/1995	1420	Millville	N/A	0	0	N/A
7/27/1995	1440	Lancaster	N/A	0	0	N/A
8/28/1995	1755	Boscobel	N/A	0	0	N/A
8/7/1996	0227	Lancaster	52	0	0	\$4,000
4/5/1997	0440	Platteville	55	0	0	\$10,000
4/5/1997	1645	Cassville	52	0	0	\$3,000
4/6/1997	1530	Grant County	61	0	0	\$45,000
6/15/1997	1520	Blue River	56	0	0	\$10,000
6/21/1997	0130	Lancaster	56	0	0	\$18,000
6/21/1997	0150	Hazel Green	52	0	0	\$6,000
6/21/1997	0205	Hazel Green	56	0	0	\$10,000
6/23/1997	0015	Cassville	52	0	0	\$5,000
9/16/1997	1755	Fennimore	52	0	0	\$30,000
5/15/1998	1840	Hazel Green	53	0	0	\$28,000
5/31/1998	0110	Potosi	65	0	0	\$30,000
5/31/1998	0112	Mt Hope	67	0	0	\$70,000
5/31/1998	0048	Fennimore	57	0	0	\$45,000
6/18/1998	1545	Bagley	56	0	0	\$95,000
6/18/1998	1620	Lancaster	58	0	0	\$180,000
6/18/1998	1625	Montfort	57	0	0	\$40,000
6/18/1998	1630	Blue River	53	0	0	\$48,000
6/18/1998	1032	Lancaster	N/A	0	0	N/A
6/28/1998	0100	Lancaster	N/A	0	0	\$221,000
7/19/1998	0110	Bagley	70	0	0	\$50,000
7/19/1998	0130	Fennimore	67	0	0	\$48,000

Date	Time (CST)	Location	Wind Speed (knots)	Reported Deaths	Reported Injuries	Estimated Damage
7/19/1998	0130	Livingston	65	0	0	\$65,000
7/19/1998	0130	Platteville	70	0	0	\$75,000
7/20/1998	1631	Bagley	52	0	0	N/A
11/10/1998	0800	Grant County	81	1	2	\$1,700,000
5/16/1999	1415	Bagley	52	0	0	\$15,000
5/16/1999	1437	Blue River	54	0	0	\$10,000
5/8/2000	0645	Platteville	52	0	0	\$1,000
5/8/2000	0655	Montfort	52	0	0	\$2,000
7/10/2000	0110	Bagley	53	0	0	\$13,000
9/11/2000	1600	Kieler	52	0	0	\$4,000
9/11/2000	1608	Dickeyville	52	0	0	\$9,000
9/11/2000	1610	Dickeyville	52	0	0	\$7,000
9/11/2000	1620	Dickeyville	55	0	0	\$43,000
9/11/2000	1624	Big Patch	54	0	0	\$11,000
9/11/2000	1700	Potosi	55	0	0	\$23,000
4/7/2001	0900	Grant County	64	0	0	\$12,000
4/11/2001	1740	Glen Haven	53	0	0	\$20,000
4/11/2001	1740	Potosi	55	0	0	\$6,000
4/11/2001	1815	Boscobel	52	0	0	N/A
5/10/2001	1800	Bloomington	55	0	0	\$8,000
9/7/2001	1650	Mt Hope	53	0	0	\$12,000
9/7/2001	1704	Mt Hope	53	0	0	\$11,000
9/7/2001	1705	Fennimore	52	0	0	\$9,000
9/7/2001	1705	Patch Grove	53	0	0	\$9,000
9/7/2001	1710	Platteville	54	0	0	\$16,000
9/7/2001	1718	Lancaster	53	0	0	\$11,000
9/7/2001	1727	Boscobel	54	0	0	\$14,000
10/25/2001	0300	Grant County	56	0	0	N/A
4/18/2002	1924	Mt Hope	52	0	0	N/A
4/18/2002	2000	Hazel Green	52	0	0	N/A
6/13/2002	1730	Lancaster	55	0	0	\$45,000
7/31/2003	1243	Muscoda	53	0	0	\$1,000
8/20/2003	1745	Potosi	70	0	0	\$20,000
8/20/2003	1750	Potosi	65	0	0	\$35,000
8/20/2003	1758	Stitzer	52	0	0	\$2,000
8/20/2003	1807	Patch Grove	60	0	0	\$15,000

Date	Time (CST)	Location	Wind Speed (knots)	Reported Deaths	Reported Injuries	Estimated Damage
8/20/2003	1815	Patch Grove	52	0	0	\$2,000
8/20/2003	1832	Boscobel	52	0	0	\$2,000
8/20/2003	1833	Boscobel	60	0	0	\$3,000
5/17/2004	1808	Potosi	52	0	0	N/A
5/23/2004	0218	Kieler	55	0	0	\$8,000
6/4/2005	23:05	Sinsinawa	55	0	0	\$3,000
6/29/2005	23:50	Platteville	53	0	0	\$1,000
6/29/2005	22:23	Boscobel	52	0	0	\$2,000
6/29/2005	23:40	Burton	52	0	0	\$1,000
7/24/2005	22:10	Mt Hope	61	0	0	\$2,000
7/1/2006	16:53	Millville	55.	0	0	\$1,000
7/9/2006	16:50	Fennimore	55.	0	0	\$25,000
7/20/2006	2:15	Cassville	56	1	0	\$1,000
6/7/2007	14:50	Wyalusing	56	0	0	\$1,000
6/21/2007	18:57	Fennimore	50	0	0	\$1,000
7/3/2007	20:15	Fennimore	N/A	0	0	\$1,000
8/14/2007	1:40	Muscoda	53	0	0	\$1,000
8/14/2007	2:05	Potosi	56	0	0	\$15,000
8/21/2007	23:10	Fennimore	56	0	0	\$1,000
8/22/2007	16:00	Bloomington	56	0	0	\$1,000
8/22/2007	16:10	Cassville	52	0	0	N/A
8/22/2007	16:15	Five Points	56	0	0	\$1,000
8/22/2007	16:35	Cuba City	56	0	0	\$4,000
8/22/2007	16:00	Hazel Green	56	0	0	\$1,000
9/18/2007	18:51	Boscobel	52	0	0	N/A
9/18/2007	18:51	Boscobel	58	0	0	\$5,000
9/18/2007	18:53	Fennimore	56	0	0	\$2,000
4/25/2008	13:52	Cassville	52	0	0	N/A
6/8/2008	17:24	Cassville	52	0	0	\$1,000
6/8/2008	17:35	Homer	55	0	0	\$1,000
6/8/2008	18:35	Dickeyville	52	0	0	N/A
6/12/2008	12:45	Cornelia	55	0	0	\$25,000
6/12/2008	13:29	Union	52	0	0	\$13,000
6/12/2008	13:30	Union	70	0	0	\$13,000
6/12/2008	13:30	Union	60	0	0	\$20,000
7/7/2008	18:36	Lancaster	56	0	0	\$2,000

Date	Time (CST)	Location	Wind Speed (knots)	Reported Deaths	Reported Injuries	Estimated Damage
7/31/2008	10:24	Lancaster	52	0	0	\$1,000
7/31/2008	10:39	Platteville	58	0	0	\$25,000
6/19/2009	7:46	Dickeyville	52	0	0	\$2,000
6/19/2009	7:55	Dickeyville	50	0	0	\$1,000
7/24/2009	16:46	Platteville	N/A	0	0	N/A
7/24/2009	17:48	Platteville	N/A	0	0	N/A
7/24/2009	15:55	Platteville	55	0	0	\$23,000
7/24/2009	17:15	Louisburg	56	0	0	\$90,000
7/24/2009	17:35	Sinsinawa	58	0	0	\$100,000
7/24/2009	17:27	Louisburg	68	0	0	\$2,500,000
7/27/2009	19:30	Blue River	N/A	0	0	N/A
7/27/2009	20:00	Platteville	N/A	0	0	N/A
7/27/2009	17:25	Muscoda	57	0	0	\$50,000
8/9/2009	14:02	Potosi	54	0	0	N/A
8/9/2009	14:15	Hazel Green	56	0	0	\$12,000
5/25/2010	12:30	Cuba City	50	0	0	\$2,000
5/25/2010	12:30	Happy Corners	50	0	0	\$8,000
6/17/2010	22:47	Blue River	48	0	0	\$1,000
6/23/2010	3:20	Kieler	52	0	0	\$1,000
7/23/2010	21:45	Burton	N/A	0	0	N/A
7/23/2010	21:45	Rockville	N/A	0	0	N/A
8/8/2010	7:30	Cuba City	N/A	0	0	N/A
8/9/2010	0:05	Lancaster	60	0	0	\$20,000
9/2/2010	15:58	Mt Hope	56	0	0	\$4,000
9/2/2010	16:00	Lancaster	56	0	0	\$4,000
10/26/2010	12:00	Grant County	55	0	0	\$25,000
6/8/2011	18:11	Ellenboro	59	0	0	\$59,000
7/11/2011	4:59	Kieler	65	0	0	\$660,000
7/27/2011	17:30	Sinsinawa	N/A	0	0	N/A
7/27/2011	18:07	Sinsinawa	52	0	0	N/A
9/3/2011	0:25	Mt Hope	52	0	0	\$1,000
9/3/2011	0:53	Boscobel	52	0	0	\$1,000
9/3/2011	1:24	Georgetown	52	0	0	\$2,000
Totals				2	2	\$6,983,000
<i>Source: NOAA, completed February, 2012.</i>						

Vulnerability Assessment

The National Weather Service can forecast and track a line of thunderstorm cells that are likely to produce severe high winds, hail and lightning; however, where these related hazards form or touch down and their magnitude remains unpredictable. Distribution of severe thunderstorms and related hazard events have been widely scattered throughout the County.

In the past, severe thunderstorm events caused substantial property and infrastructure damage and it is logical to assume they will continue to do so. In order to assess the vulnerability of Grant County to severe thunderstorms and related storm hazards, a review of past events identifies significant impacts to the following:

- Utilities: downed and damaged electrical lines, poles and antennae; damaged transformers, telephone lines and interrupted radio communications
- Transportation Network: debris cleanup and road damage
- Drainage Network: debris cleanup, damaged and destroyed culverts and tubes
- Residences: damaged or destroyed houses, mobile homes, garages, trees, siding, roofs and windows
- Businesses: closures and building and inventory damages
- Agricultural Lands: damage or destroyed buildings, crops and livestock and soil erosion
- Personal Property: damaged cars, trucks and recreational vehicles

Based on review of the historic patterns of thunderstorms and associated wind, hail and lightning events, there are no specific patterns or jurisdictions that have unusual risk. The frequency and occurrence of these events are relatively uniform and constitute a County-wide risk.

Future Probability and Potential Loss

According to NOAA data, 199 significant thunderstorms occurred in Grant County from 1950-2011. Approximately \$6,983,000 in damage was caused by these storms and related hazard events. Frequency data of the National Weather Service indicates that the probability of a thunderstorm with damaging winds occurring in Grant County is higher than that of the State of Wisconsin. Historic frequency indicates that the County will be affected by a severe thunderstorm about five times each year.

Wisconsin averages two to three hail days per year, usually between May and August. Most hail damage is in rural areas as the hail season corresponds with the growing and harvesting season for most crops. NOAA data reports that there have been 180 occurrences of hail in Grant County from 1950-2011, which caused \$3,494,000 of property damage and \$16,175,000 of crop damage. Historic frequency indicates that the County will be affected by a thunderstorm with damaging hail (3/4 of an inch or greater) in Grant County three times in any given year.

Insurance records show that annually one of every 50 farms is struck by lightning or has a fire. Specific insurance data on dates, locations, property damages, injuries and deaths in Grant County are not available. However, NOAA data indicates there has been one fatality in the County due to lightning (GCEM indicates a total of two fatalities) and disaster history worksheets indicate that livestock have been killed by lightning strikes. Disaster history worksheets also identified several instances of damages from lightning strikes, including fires and damage to electrical systems.

Also based on historical data, the average annual damages due to severe thunderstorms is \$621,333.

TORNADOS

A tornado is a violently rotating, funnel shaped column of air that may or may not touch the ground. Average winds in a tornado are 175-250 miles per hour and may produce winds in excess of 300 miles per hour. The path of tornados are generally not wider than 1/4 a mile and not longer than 16 miles. The destructive power of a tornado lies primarily in its high wind velocities and sudden changes in pressure, which are thought to account for over 90 percent of resulting damages. Tornados are associated with storm systems and therefore usually are accompanied by hail, torrential rain and intense lightning. Tornados can strike anywhere and cause extensive damage. In the U.S., tornados are classified according to the Enhanced Fujita Scale and generally land into one of six intensity categories, F0-F5. These categories are based on 28 damage indicators and the estimated maximum wind speed occurring within the funnel.

Table 11: Tornado Wind and Damage Scale

Tornado Scale	Wind Speeds (mph)	Damages	National Average Frequency of Occurrence
F0	65-85	(Light Damage) Chimneys are damaged, tree branches are broken, shallow-rooted trees are toppled.	29%
F1	86-110	(Moderate Damage) Roof surfaces are peeled off, windows are broken, some tree trunks are snapped, unanchored manufactured homes are over-turned and attached garages may be destroyed.	40%
F2	111-135	(Considerable Damage) Roof structures are damaged, manufactured homes are destroyed, debris becomes airborne (missiles are generated); large trees are snapped or uprooted.	24%
F3	136-165	(Severe Damage) Roofs and some walls are torn from structures, some small buildings are destroyed, non-reinforced masonry buildings are destroyed and most trees in forest are uprooted.	6%
F4	166-200	(Devastating Damage) Well-constructed houses are destroyed, some structures are lifted from foundations and blown some distance, cars are blown some distance and large debris becomes airborne.	2%
F5	Over 200	(Incredible Damage) Strong frame houses are lifted from foundations, reinforced concrete structures are damaged, automobile-sized debris becomes airborne and trees are completely debarked.	Less than 1%
<i>Source: NOAA</i>			

Wisconsin lies along the northern edge of the nation’s tornado belt, which extends northeastward from Oklahoma to Iowa and then across Michigan and Ohio. Statewide, the southwestern portion of Wisconsin has the highest frequency of tornados.

Historical Occurrences

Tornados most frequently occur between April and September, in late afternoon and early evening hours. However, their occurrence in Grant County has been recorded in every month except February and at various times throughout the day. Since 1950, 43 tornados have been recorded by the National Weather Service in Grant County. There were no fatalities from any of these events.

Table 12: Reported Tornadoes in Grant County 1950-Present

Date	Time (CST)	F-Scale	Location	Length (miles)	Width (yards)	Reported Injuries	Estimated Damage
4/26/1954	16:00	F1	Fairplay	1	33	0	\$3,000
5/25/1957	16:30	F2	Bloomington	16	400	0	\$25,000
5/19/1959	17:15	F2	Five Points	5	200	0	\$25,000
7/13/1966	15:00	F2	Platteville	3	200	0	\$250,000
6/7/1967	18:00	F0	Bloomington	0	7	0	\$0
5/31/1969	13:00	F1	Bagley	16	50	0	\$3,000
6/4/1969	13:00	F2	Cassville	4	200	0	\$250,000
6/4/1969	13:45	F2	Union	24	200	0	\$250,000
6/26/1969	09:00	F2	Fennimore	2	100	2	\$25,000
6/29/1969	16:30	F1	Potosi	1	100	0	\$25,000
9/9/1970	17:15	F2	Tennyson	16	200	0	\$250,000
9/9/1970	18:40	F1	Rutledge	8	200	0	\$25,000
5/18/1971	20:02	F1	Five Points	2	100	0	\$0
5/18/1971	22:30	F1	Grant County	-	-		\$25,000
6/7/1971	01:05	F1	Bagley	4	100	0	\$25,000
6/24/1971	18:45	F1	Bagley	34	50	0	\$25,000
9/9/1971	13:50	F1	Lancaster	1	50	0	\$0
10/30/1971	21:00	F1	Union	1	50	0	\$3,000
5/1/1972	19:00	F0	Lancaster	1	50	0	\$3,000
9/28/1972	15:30	F1	Hazel Green	-	-	0	\$3,000
6/26/1973	18:00	F1	Muscoda	-	-	2	\$250,000
8/19/1980	03:30	F1	Annaton	1	50	0	\$250,000
5/30/1985	21:56	F3	Bagley	14	1500	2	\$2,500,000
5/30/1985	22:50	F2	Livingston	2	500	0	\$250,000
5/8/1988	14:48	F1	British Hollow	1	20	0	\$25,000
5/8/1988	14:52	F1	Beetown	2	30	0	\$0
5/8/1988	14:54	F1	Bloomington	10	40	0	\$0
5/8/1988	14:55	F2	Mount Hope	10	40	0	\$250,000
5/8/1988	15:00	F1	Ellenboro	1	33	0	\$0
5/8/1988	15:15	F1	Boscobel	1	30	0	\$0
5/8/1988	15:15	F2	Stitzer	8	200	0	\$250,000
4/8/1991	14:19	F0	Potosi	1	23	0	\$0
6/16/1996	19:00	F0	Bagley	2	30	0	\$0
6/18/1998	16:10	F0	Lancaster	0	35	1	\$220,000
8/18/2005	15:40	F1	Muscoda	2	30	0	\$120,000
3/31/2007	17:18	F0	Potosi	-	-	0	\$8,000
5/26/2007	17:15	F0	Cuba City	-	-	0	\$0
6/3/2007	14:22	F0	Potosi	-	-	0	\$3,000
6/3/2007	14:30	F0	Potosi	-	-	0	\$1,000
6/3/2007	14:40	F0	Tennyson	-	-	0	\$1,000

Date	Time (CST)	F-Scale	Location	Length (miles)	Width (yards)	Reported Injuries	Estimated Damage
6/7/2008	12:52	F0	Millville	-	-	0	\$1,000
6/12/2008	13:29	F0	Union	-	-	0	\$13,000
4/26/2009	17:45	F0	Tennyson	-	-	0	\$0
Totals						7	\$5,357,000
<i>Source: NOAA, completed February 2012.</i>							

Vulnerability Assessment

Though the most common tornado path in Grant County appears to run from the Town of Bloomington northeast to the Town of Fennimore, concentrations of population are the areas generally most vulnerable to tornados. In order, the largest developed areas in the County are the City of Platteville, City of Lancaster, City of Boscobel, City of Fennimore and the City of Cuba City. Population counts and growth predictions are included for each community within each individual disaster history. Past impacts from tornado events have included severe damage to property and crops, as well as deaths and injury. NOAA data indicates that tornados have caused \$5,357,000 of damage in Grant County from 1950 to 2011.

Mobile homes and camping trailers are more vulnerable to damage than traditionally built structures. According to research by the NWS, 40 percent of all tornado-related deaths between 1985 and 1998 occurred in mobile homes, 20 percent were in permanent homes and 11 percent were in vehicles. Although many mobile homes are scattered throughout the County, the majority are concentrated within mobile home parks. Locations of mobile home parks are identified on each local jurisdiction’s disaster history map, presented later in this Plan.

In addition to mobile home parks, campgrounds and industrial parks are also vulnerable to tornados. Like mobile home parks, campers and pole-shed style industrial buildings do not provide protection against the wind velocities of a tornado and often there is no shelter provided. According to 2006-2010 American Community Survey 5-Year Estimates, there are 1,455 mobile homes in the County, which account for 6.8 percent of homes in the County. GCEM estimates that less than 1 percent of trailer parks and no industrial parks have storm shelters or safe rooms. This presents a major vulnerability issue.

Future Probability and Potential Loss

Based on historic data, there is a 41 percent chance of a tornado (of any magnitude) each year. The probability of tornados of a specific magnitude is indicated below.

Table 13: Probability of Tornados by Magnitude

Tornado Scale	F0	F1	F2	F3	F4	F5
Number of Tornados Reported	13	19	10	1	0	0
Annual Probability of Occurrence	13%	15%	11%	2%	<1%	<1%
<i>Source: Vandewalle & Associates</i>						

Past tornados have caused up to \$2,500,000 in damages in one event; nine of the 43 tornados reported by NOAA caused \$250,000 in damages and nine caused \$25,000 in damages. On average, damages per tornado were \$124,581.

HAZARDOUS MATERIAL INCIDENTS

Hazardous materials incidents involve the uncontrolled release or threatened release of hazardous materials from a fixed site or during transport that may impact public health and safety and the environment. Under the Emergency Planning and Community Right to Know Act (EPCRA), a hazardous material is defined as any chemical that is a physical or health hazard [defined at 29 CFR 1910.1200(c)] for which Occupational Health and Safety Administration requires a facility to maintain a Material Safety Data Sheet. An extremely hazardous substance is defined as one of the

500,000 substances on the U.S. Environmental Protection Agency Title III List of Lists, as identified at 40 CFR Part 370.

EPCRA of 1986, also known as SARA Title III, brings industry, government and the general public together to address emergency planning for accidental chemical releases. The law requires communities to prepare for hazardous chemical releases through emergency planning. This planning effort provides essential information for emergency responders. The community right-to-know component of the law increases public awareness of chemical hazards in their community and allows the public and local governments to obtain information about these chemical hazards.

As of June 2012, 28 facilities in Grant County reported that an extremely hazardous substance is present at any one time in the amount equal to or exceeding the chemical-specific threshold planning quantity. Of these facilities, most of the substances are for agricultural use. The most common extremely hazardous substances at fixed locations in Grant County are anhydrous ammonia, sulfuric acid, phorate (organophosphate pesticide) and chlorine.

Transportation Network

Trucks carry the bulk of hazardous materials to and through the County. Regular shipments of gasoline, propane, acids and other substances are delivered across the State. Although every roadway in the County is a potential route for hazardous material transport, major transportation routes include US Highways 18, 61 and 151, State Highways 11, 35, 80, 81, 129 and 133.

The Wisconsin-Calumet and Burlington Northern-Santa Fe railroads follow the Wisconsin and Mississippi Rivers, respectively. Trains along the Wisconsin-Calumet primarily carry coal. Trains along the Burlington Northern-Santa Fe pose a significant risk, as mixed and full loads of hazardous material are transported on this line.

Pipelines

Approximately four miles of pipeline carrying liquid propane crosses the southeast corner of the County.

As is required by federal legislation, the Grant County Local Emergency Planning Committee (LEPC) is responsible for implementation of EPCRA at the County level. The County Emergency Management Director is a member of the LEPC to ensure continuity and coordination of emergency planning services. To meet the requirements of Title III of EPCRA, the Emergency Management Committee developed a hazardous materials response plan that establishes policies and procedures for responding to hazardous material incidents. Methods for notification and reporting an incident are outlined in the plan. This plan also works in conjunction with the County emergency operations plan, in which community alert, communication and response protocols are outlined. LEPC is required to review, test and update this plan every two years. Testing involves tabletop, functional and full-scale exercises and actual response situations.

Historical Occurrences

In August 1980, a train derailed in downtown Cassville near the high school. Although the old depot and railroad tracks were damaged by the derailment, the only cargo spilled by the derailment was lumber. In April 1989, a train derailed near Cassville, causing a hazardous material spill of 11,000 gallons of molten sulfur. The Fire Department participated in cleanup by spraying water on the spill to solidify the molten sulfur and allow it to be hauled from the site. There are several residences and a restaurant near the derailment site, but there were no evacuations. The derailment caused \$700,000 in damage to equipment and \$100,000 in damage to the tracks.

Vulnerability Assessment

Glen Haven, Potosi, Cassville and Bagley are vulnerable to additional hazardous material incidents along the rail right-of-way due to transport along the Burlington Northern-Santa Fe Railroad.

A future concern involves the transport of nuclear waste from the Genoa Nuclear Power Plant. Optional routes for transport include the Burlington Northern-Santa Fe Railroad. Prior to transport, the Department of Energy should work with the railroad to ensure that the rail infrastructure is in good repair. Local and regional coordination efforts have already begun and additional training is planned.

At the time of Plan adoption, GCEM was working with WEM to form a regional hazardous material response team based on Grant County that would serve Grant, Iowa and Lafayette Counties (and Jo Daviess County in Illinois).

Future Probability and Potential Loss

Based on disaster history worksheets in the last 30 years, four hazardous materials incidents have occurred in Grant County. However, GCEM estimates that six to eight hazardous materials spills occur each year and usually two of these require a response from a HAZMAT team. GCEM believes that many hazardous materials spills go unreported and projects that overall frequency will increase given the numerous hazardous material transport routes and the high volume of hazardous materials that are transported on the Burlington Northern-Santa Fe railroad.

Historic data on which to base an estimate of potential dollar losses from hazardous materials incidents are limited. However, based on statewide occurrences, damages range from \$95 to \$1.5 million per incident.

SEVERE WINTER STORMS

Winter storms include heavy snowstorms, blizzards and ice storms. The winter storm season in Wisconsin generally runs from November to March. Ice and sleet storms occur any time throughout the winter season from November to April. A snowfall with accumulation of four inches or more per hour is considered a snowstorm. A blizzard combines heavy snowfall with sustained winds in excess of 30 miles per hour. An ice storm occurs when rain falling from warm upper layers in the atmosphere meets a cold and dry layer of air near the ground, causing it to freeze upon contact with the ground. Damage to utility wires and trees usually occurs once they accumulate a ½ inch of ice. Sleet storms produce pellets of ice that do not adhere to surfaces, but act like ball bearings on roads and make driving hazardous. Extremely cold temperatures accompanied by strong winds can result in temperatures that can cause frostbite and death. Proper preparation can decrease the risks of injury that can occur during cold weather and snowstorms.

Although the majority of snowfalls in Wisconsin total between one and three inches per occurrence, storms that result in ten inches or more occur four or five times per typical season. Snowfall in Wisconsin varies between 30 inches in southern counties to 100 inches in northern counties. Storms that originate in the southern Rockies or Plains states tend to produce the heaviest precipitation, while storms that originate in the northwest tend to produce light snowfalls. Although blizzard-like conditions often exist during heavy snowstorms when gusty winds cause blowing and drifting snow, actual blizzards are rare.

Historical Occurrences

The most recent severe winter storms were reported on February 2, 2011, several days in December 2010, and December 8, 2009. With each of these storms, Grant County received more than six inches of snow in a short period, requiring additional municipal expenditures for snow removal. NOAA records of historic events are listed below.

Table 14: Reported Severe Winter Storms in Grant County

Date	Time (CST)	Type	Reported Injuries*	Estimated Damage
1/13/1993	00:00	Heavy Snow	0	\$0
1/26/1994	20:00	Heavy Snow/Ice Storm	0	\$0
2/22/1994	18:00	Heavy Snow	0	\$0
2/25/1994	06:00	Heavy Snow	0	\$0
12/5/1994	21:00	Heavy Snow	0	\$0
12/8/1995	15:00	Blowing Snow	0	\$0
2/26/1995	21:00	Ice Storm	0	\$0
3/6/1995	10:00	Heavy Snow	0	\$0
11/26/1995	20:00	Heavy Snow	1	\$0
12/13/1995	10:00	Glaze	0	\$0
11/20/1996	13:00	Winter Storm	0	\$100,000
12/23/1996	12:00	Winter Storm	0	\$0

Date	Time (CST)	Type	Reported Injuries*	Estimated Damage
12/25/1996	14:00	Heavy Snow	0	\$0
1/15/1997	19:00	Winter Storm	0	\$0
2/4/1997	02:00	Winter Storm	0	\$0
3/8/1998	05:00	Winter Storm	0	\$0
1/1/1999	22:00	Winter Storm	6	\$0
3/8/1999	08:00	Winter Storm	0	\$0
2/17/2000	21:00	Winter Storm	0	\$0
4/7/2000	08:00	Winter Storm	0	\$0
12/11/2000	00:00	Winter Storm	0	\$0
12/18/2000	06:00	Winter Storm	0	\$0
12/28/2000	11:00	Winter Storm	0	\$0
2/7/2001	18:00	Ice Storm	0	\$0
2/8/2001	17:00	Winter Storm	0	\$0
2/24/2001	04:00	Ice Storm	0	\$0
3/1/2002	15:00	Winter Storm	0	\$0
3/4/2003	06:00	Winter Storm	0	\$0
2/5/2004	15:00	Winter Storm	0	\$0
1/4/2005	19:00	Winter Storm	0	\$0
1/21/2005	12:00	Winter Storm	0	\$0
2/15/2006	19:00	Winter Storm	0	\$0
2/23/2007	18:50	Winter Storm	0	\$0
2/24/2007	15:41	Blizzard	0	\$0
4/11/2007	0:00	Winter Storm	0	\$0
12/1/2007	9:00	Winter Storm	0	\$0
12/11/2007	3:00	Winter Storm	0	\$0
12/22/2007	19:00	Winter Storm	0	\$0
1/16/2008	20:00	Heavy Snow	0	\$0
1/21/2008	2:00	Heavy Snow	0	\$0
2/5/2008	15:30	Winter Storm	0	\$0
2/17/2008	0:00	Winter Storm	0	\$0
2/17/2008	8:02	Blizzard	0	\$0
12/8/2008	12:00	Winter Storm	0	\$0
12/18/2008	22:00	Winter Storm	0	\$0
12/20/2008	10:00	Winter Storm	0	\$0
2/18/2009	15:30	Winter Weather	2	\$8,000
12/8/2009	4:00	Winter Storm	0	\$0

Date	Time (CST)	Type	Reported Injuries*	Estimated Damage
12/8/2009	4:00	Blizzard	0	\$0
12/23/2009	14:55	Winter Storm	0	\$0
1/6/2010	18:35	Winter Storm	0	\$0
1/21/2010	20:15	Winter Weather	0	\$0
11/24/2010	15:00	Winter Weather	0	\$0
12/3/2010	16:00	Heavy Snow	0	\$0
12/11/2010	13:08	Blizzard	0	\$0
12/20/2010	11:00	Winter Weather	0	\$0
12/24/2010	0:15	Winter Storm	0	\$0
12/24/2010	0:15	Winter Weather	0	\$2,000
12/29/2010	16:00	Winter Weather	0	\$8,000
2/1/2011**	19:00	Blizzard	0	\$0
2/20/2011	5:45	Winter Weather	0	\$0
Totals			9	\$118,000
<i>Source: NOAA, completed February 2012.</i> <i>* Non-traffic injuries.</i> <i>** FEMA declaration – awarded \$282,965.</i>				

Vulnerability Assessment

Winter storms present a serious threat to the health and safety of residents and can result in significant damages to property. Heavy snow and accumulated ice can cause structural collapse of buildings, down power lines and isolate people from assistance and services, particularly in rural areas such as Grant County. Historical damages reported include the following:

- Infrastructure: additional hours and equipment for emergency services and diminished operation of public facilities and schools
- Utilities: downed power lines and frozen pipes
- Private Property: damaged or collapsed roofs and damaged vehicles
- Businesses: diminished profits due to closure or destroyed inventory
- Agriculture: injured or killed livestock and damaged crops

Review of historic patterns indicates no specific patterns or jurisdictions that have unusual risk. The frequency and occurrence of these events are relatively uniform and constitute a County-wide risk.

Future Probability and Potential Loss

Based on historical frequency, Grant County can expect one major winter storm per two years, an annual probability of 50 percent. Damages and losses due to winter storms are generally minor and widespread. Increased automobile accidents and additional municipal expenditures for emergency response and snow removal are common and such claims are not tallied or tracked. Potentially extreme impacts of winter storms usually involve ice storms. Damages were only reported for four storms, totaling \$118,000; however, numerous municipalities reported unquantified, significant costs for fuel, sand, overtime labor to clear and/salt roads.

WILDLAND AND FOREST FIRES

A wildland fire is any instance of uncontrolled burning in brush, marshes, grasslands or field lands. A forest fire is an uncontrolled fire that occurs in a forest of woodland outside of the limits of incorporated villages or cities. For the purposes of this analysis, forest and wildland fires are evaluated together. The causes of these fires includes lightning, human carelessness and arson. Significant accumulated underbrush can be a contributor to the occurrence and severity of fires.

The forest fire season in Grant County begins in March and continues through November; however, fires can occur during any month of the year particularly whenever vegetation is dry because of a dry winter or a summer with little precipitation. Fires can occur naturally; however though they are often initiated and enhanced by human activities. The length and peak months of the forest fire season can vary from year to year. The main determinants of vulnerability and risk are land use, forest cover, amount of combustible material present and weather conditions. Specifically, lack of precipitation, high wind and low humidity are conditions that can contribute to the intensity of the fire season. Although preventing or controlling forest fires is preferable, many mitigation efforts prevent or alleviate damage to homes and communities when fires inevitably occur.

Grant County has a well-balanced forest protection network that includes agencies and organizations at the State, County and local levels. This network includes a public information program that reaches all sectors of the public and conveys how to use the forest and recreational areas responsibly. State programs include Wisconsin Department of Natural Resources (DNR) fire suppression plan, the Wisconsin Fire Control Program and Rural Community Fire Protection Program. Local fire response is comprised of 22 volunteer departments, with approximately 1,000 volunteer fire fighters. Forest fire prevention is shared between the State, County and towns. Although the State will help cover the costs of fire suppression on state-owned lands, towns frequently fund the local cost unless a responsible party is identified, who would then be accountable for the costs incurred by the State and/or town.

The DNR is responsible for forest fire protection across the State. The U.S. Forest Service also provides protection for area under their jurisdiction and local Fire Departments retain responsible for the remaining forest area. The following towns in Grant County are included in the State's extensive forest fire control area: Wyalusing, Millville, Woodman, Marion, Boscobel, Hickory Grove, Watterstown, Castle Rock and Muscoda. The total area of these towns is 170,525 acres.

Historical Occurrences

While the number of projected forest fires has decreased over the years, the potential danger to lives and property has not. As the number of vacation homes and recreational facilities in the County increase, more people and more property are vulnerable to injury and damages due to fires. According to the DNR, 405 acres were burned from 1974 to 1986, causing \$29,048 in damages. In 1980, the lack of snow over the winter exacerbated the fire season, resulting in 13 fires in January; by April the fire season was critical. From 1987 to 1991, 81 forest fires occurred, burning a total of 73 acres. Forest fires in 1992 burned 28 acres and caused \$2,218 in damages. In 1993, 11 acres burned and caused \$1,432 in damages. Due its dense growth of pine, the Town of Muscoda maintains the highest risk of forest fire. Because of frequent small fires in the immediate area, the community is aware of the potential danger. GCEM estimates that approximately 200 brush fires occur each year.

Vulnerability Assessment

Approximately 26 percent of Grant County is forested and the majority of the wood volume produced for consumption is oak, which also hold the majority of the financial value of the woodland.

Future Probability and Potential Loss

According to the State Forest Service, approximately 26 percent of Grant County is forested. The most recent forest inventory of Grant County indicates an approximate value of \$77,965,000 in standing oak trees and approximately \$4,637,000 in standing ash trees. The 2007 summary of County economic sectors of industry output, employment and employee compensation by Wisconsin DNR shows annual industry output of \$100,000,000, employment at 430 people and employee compensation at \$15,000,000 per year. Grant County forest products and processing industrial output makes up 3.59 percent of the total County industrial output and 1.64 percent of total employment. Further, for

every ten statewide jobs in the forest related industries an additional 21 jobs are produced in other sectors of the State's economy.

There is a very high risk of future forest fires in Grant County due to the amount of underbrush in many forested areas, which has accumulated since there has not been a large forest fire in many years. Significant damage to County forests could result in extensive loss of timber sales, jobs and state revenue and a major forest fire could also affect private property and human lives.

DROUGHT

Drought can be agricultural or hydrologic. Agricultural drought is a dry period of sufficient length and intensity that markedly reduces crop yields. Hydrologic drought is a dry period of sufficient length and intensity to affect lake and stream levels and the height of the groundwater table. Agricultural and hydrologic droughts may, but do not necessarily, occur at the same time. Drought conditions may vary from below normal precipitation for a few weeks to severe lack of normal precipitation for a couple of months to years. Agricultural areas are primarily affected by drought as the amount and timing of precipitation has a significant impact on crop production. Therefore, the severity of a drought must be measured in terms of crop yield as well as precipitation. Drought mitigation measures focus on conservation and preparation management.

Historical Occurrences

Drought occurs relatively often in Wisconsin, specifically in 1895, 1910, 1939, 1948, 1958, 1976, 1977, 1987, 1988, 1989, 1992, 1993 and 2003 according to local disaster histories. Grant County was one of the most drought-stricken counties in the State in 1976, 1977, 1993 and 2003.

Vulnerability Assessment

Droughts significantly reduce crop yield as well as dry up many wells in the County, requiring new wells to be drilled. Localized areas of the County with sandy soils, such as the Town of Muscodia, report almost annual drought-like conditions. However, review of other resources indicates no specific patterns or jurisdictions that have unusual risk.

Future Probability and Potential Loss

Based on historical occurrence, Grant County can expect a drought once every nine years, or there is an 11 percent probability that a drought will occur each year. Damages from previous droughts vary; however, farmers are most severely affected.

EXTREME TEMPERATURES

Extremely high or extremely low temperatures pose danger to the health of people and animals. Although such extremes cannot be avoided, planning for their occurrence will minimize their impact.

Historical Occurrences

In mid-July, 1995 at least 57 deaths were directly attributed to an unprecedented combination of temperatures between 100 and 109 and dew points in the upper 70s to lower 80s. Even nighttime temperatures were torrid. Heat indices peaked at 120 to 130 degrees on the 13th and 110 to 122 on the 14th, while only dropping to 85 to 100 at night. Approximately 100,000 animals perished due to the oppressive heat, among them cattle, pigs, milk cows, sheep, turkeys, chickens, pheasants and horses

On December 9, 1995, bitter-cold arctic air swept into Wisconsin on northwest winds of 20 to 40 miles per hour, dropping temperatures as much as 15 degrees Fahrenheit in 15 minutes. Wind chill values ranged from 25 below to 50 below zero. Many schools canceled evening activities and retailers across the state reported very little holiday shopping activity. The AAA Club and service stations were overwhelmed with requests for assistance with stalled vehicles. There were also a scattering of frozen water pipes, which resulted in flooded rooms or basements.

On July 31, 2001, temperatures climbed into the middle to upper 90s to 100. Excessive heat combined with high humidity pushed heat indices dangerously high, with values of 105 to 115, causing two fatalities. Similar temperatures continued through the first week and a half of August.

A cold spell hit the region to start the New Year in 2010 with temperatures below zero for several days and extremely low wind chills at times. It was the coldest first few days of a January since 1979 and one of the coldest starts to the New Year in history with average temperatures just above zero. Wind chills were well below -30 on January 2. Wind chills hit -20 near Dickeyville on January 2 and a low temperature of -17 was recorded near Lancaster on January 3.

Table 15: Grant County Extreme Temperatures

Date	Type	Reported Deaths	Reported Injuries
1/13/1994	Cold	0	0
6/14/1994	Heat Wave	0	0
6/17/1995	Extreme Heat	9	0
7/13/1995	Extreme Heat	57	0
10/12/1995	Record Warmth	0	0
12/9/1995	Cold	2	21
1/16/1997	Extreme Wind Chill	0	0
7/4/1999	Excessive Heat	0	0
7/23/1999	Excessive Heat	0	0
7/28/1999	Excessive Heat	1	0
7/31/2001	Excessive Heat	2	0
8/1/2001	Excessive Heat	0	0
1/30/2008	Extreme Wind Chill	0	0
2/10/2008	Extreme Wind Chill	0	0
12/14/2008	Cold/Wind Chill	0	0
12/21/2008	Cold/Wind Chill	0	0
1/14/2009	Extreme Wind Chill	0	0
12/10/2009	Cold/Wind Chill	0	0
1/1/2010	Cold/Wind Chill	0	0
1/28/2010	Cold/Wind Chill	0	0
Total		71	21

Source: NOAA, collected February, 2012.

Vulnerability Assessment

Recent trends indicate that frequency of temperature extremes is increasing. Populations that are vulnerable to such extremes will continue to sustain injuries and/or fatalities. Vulnerable populations tend to include the elderly and individuals that live in substandard housing. Based on data from the US Census, population of Grant County over 65 grew by 5 percent from 2000 to 2010, now totaling 7,974 individuals in this age cohort of the County’s total population, which is 51,208.

Future Probability and Potential Loss

Based on historical events, injuries and fatalities associated with extreme temperatures are increasing. Grant County can expect to experience extreme cold temperatures one of every five years or there is a 20 percent chance of such an event each year. The County can expect to experience extreme heat one year out of every 1.25 years, or there is an 80 percent chance of such an event each year.

INSECT INFESTATION AND DISEASE DISASTERS

Historic Occurrences

Recent infestations include the Asian Beetle, which has been present since 2002 and the Army Worm, which affected Blue River in 1980. The emerald ash borer is also present in the County. Others threats, such as the gypsy moth and sudden oak death disease have the potential for disastrous damages and expensive eradication treatments.

Vulnerability Assessment

Approximately 26 percent of Grant County is forested and the majority of the wood volume produced for consumption is oak, which also hold the majority of the financial value of the woodland. The economic significance of the forestry sector is documented in previous sections.

Future Probability and Potential Loss

The major threats include the gypsy moth, emerald ash borer and sudden oak death disease. Although the advance of the gypsy moth cannot be stopped, the spread can be slowed. The emerald ash borer threatens all ash trees. Emerald ash borer has caused over \$13,600,000 in damages to the landscape industry and lost nursery stock sales in Michigan. Potential damages from these pests could be enormous. While Grant County does not have an emerald ash borer response plan in place, the County has been working with partners to educate the public and increase awareness to minimize impacts.

SUBSIDENCE

Areas that are susceptible to collapse of subsurface soils pose risk to human safety and damage of property. Collapse of subsurface soils and bedrock can be caused by changes in soil structure. Often defunct mine shafts collapse, or cause collapse of adjacent areas as they become structurally unsound.

Historical Occurrences

The majority of subsidence areas that were identified by disaster history worksheets occurred in the City of Platteville and the Village of Montfort.

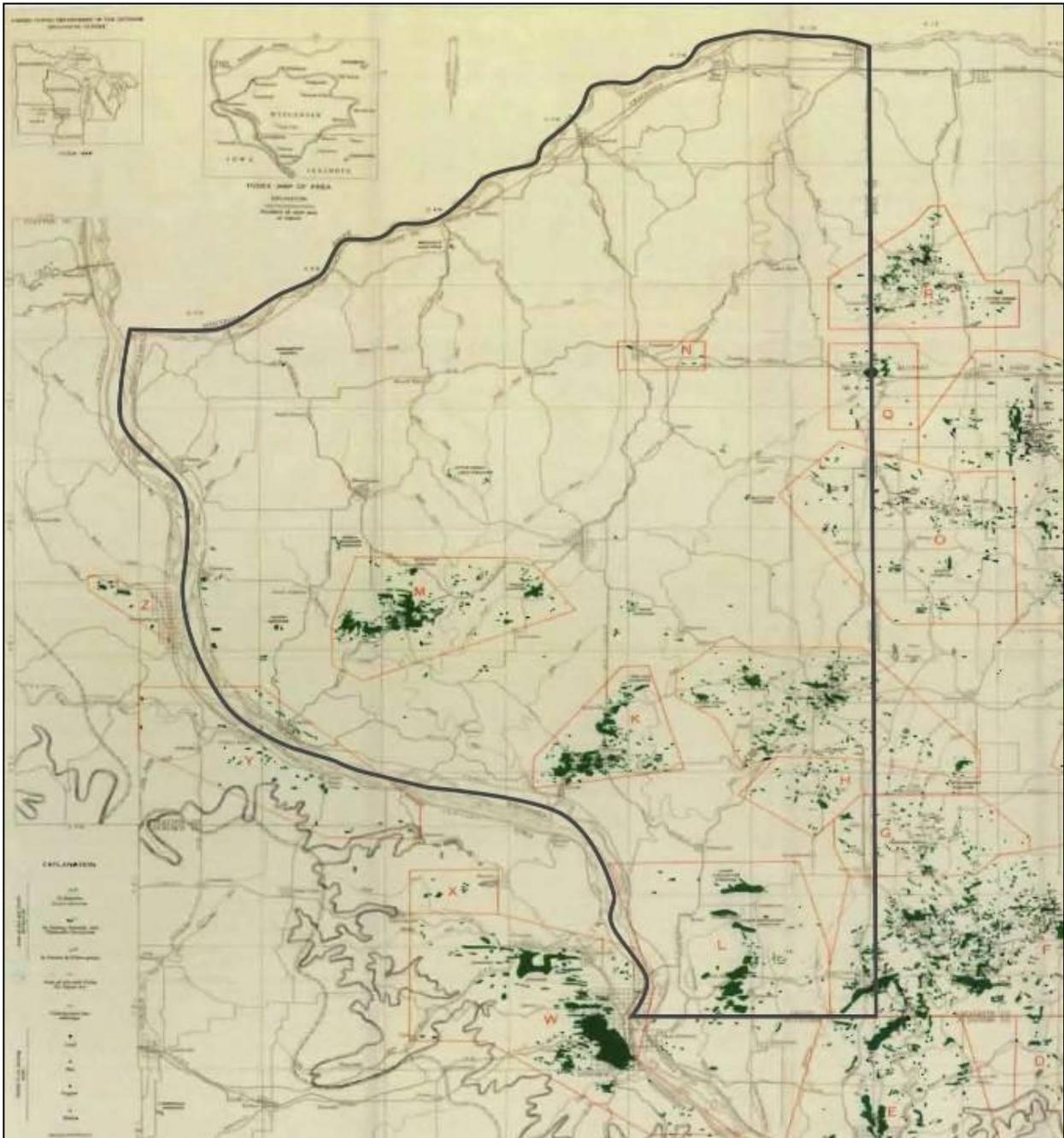
Vulnerability Assessment

According to *The Geology of the Upper Mississippi Valley Zinc-Lead District* (United States Geological Survey publication, 1959), Platteville, Montfort and Beetown and the central and southeastern portion of the County were historically mined for lead (see Figure 7). The publication documents over 50 named mines in Grant County that operated mainly in the first half of the twentieth century. These areas with Galena and Platteville dolomite bedrock have the highest risk of subsurface collapse. Dolomite is easily dissolved by weak acids in the ground water and substantial dissolution can lead to the formation of subsidence areas. Such events may increase in frequency during periods of heavy rain, as additional percolation may accelerate the rate at which the dolomite dissolves.

Future Probability and Potential Loss

GCEM feels that these incidents are related to the development of areas that were previously mined without appropriate geotechnical studies that would determine structural stability. As development continues in previously mined areas, the frequency of and damages associated with subsidence will continue.

Figure 7: Historic Mining Sites



EARTHQUAKE

An earthquake is caused by slipping plates that make up the earth's crust. Earthquakes result in a sometimes violent shaking or trembling of the ground. An earthquake does not need to be of large magnitude to cause extensive damage. Areas that are less prone to this hazard event are usually less prepared, which can result in significant damage. Although progress is being made in our ability to predict earthquakes, the most effective mitigation tools are through management of the built environment and community education.

Historic Occurrences

In 1909, the Dubuque *Telegraph-Herald* reported an earthquake that was felt in Benton and Cuba City and caused substantial structural damage to a school in Platteville. For the past 21 years, Wisconsin earthquakes have been monitored using the Modified Mercalli Intensity Scale, which records earthquake intensity on a scale of I (low intensity) to XII (high intensity). As recently as 1948, Mercalli measurements have been recorded as high as IV in the Madison area. The most recent earthquakes were recorded by the National Earthquake Information Center in 1974, 1985, 1999 and June 28, 2004, which were all rated as III on the Mercalli scale. The June 2004 incident centered approximately 75 miles southwest of Chicago near LaSalle/Peru, Illinois. It was reported to U.S. Geological Survey that residents in the Platteville, Prairie du Chien and Lancaster areas felt weak ground movement.

Vulnerability Assessment

Because earthquakes are so infrequent in the Midwest, buildings are not constructed to withstand these types of events and the population tends to neither be aware of, nor prepared for, the potential impacts. Grant County is in an area with seismic activity and there is a reasonable risk from this hazard.

Future Probability and Potential Loss

Based on historical events, the County should expect to experience an earthquake once every 7.7 years, or there is a 13 percent chance of an earthquake each year. Although no damages were reported with recent quakes, the City of Platteville sustained damages from quakes in 1909 and 1912; therefore, there is a possibility that the County will sustain damages due to future earthquakes.

CLIMATE CHANGE

Climate is the long-term average of weather conditions in a specific location. It is determined through statistical analysis of weather data collected over a long period of record. "Climate change" affects more than just a change in the weather; it refers to seasonal changes over a long period of time. These climate patterns play a fundamental role in shaping natural ecosystems and the human economies and cultures that depend on them.

The data in this section is from the *Wisconsin's Changing Climate: Impacts and Adaptations* (2011) report by the Wisconsin Initiative on Climate Change Impacts.

Historic Data

Wisconsin's climate is changing. Temperature and precipitation data from 1950 to 2006 indicate that on average our State has become warmer and wetter. In Wisconsin, the average temperature rose by about 1.1 degree Fahrenheit during that period. However, southwestern Wisconsin was one of the areas of the State that saw little change in annual temperature. In addition, Grant County was the only county in the State where the frequency of days per year over 90 degrees decreased, by 6 days. This one degree increase statewide coincides with the shorter length of time that lakes remain frozen, the change in timing of some bird migrations, the emergence and flowering of certain plants, increase in the length of the growing season and other effects that indicate milder winters and earlier springs.

Annual precipitation over the same period has also increased statewide by 3.1 inches, an increase of approximately 10 percent. Grant County experienced an increase similar to the state average, except in the far south where annual precipitation increased by around 5 inches.

Vulnerability Assessment and Future Probability

According to this report, Wisconsin's warming trend will not only continue, it will increase considerably by the middle of the century. The report's projections show that Wisconsin's annual average temperature is likely to warm by 4 to 9 degrees by the middle of the 21st century, with winter temperatures increasing more than those of other seasons. Overall, the expected rate of warming is about four times greater than what we have experienced since 1950. At the same time, the number of days over 90 is expected to double to 25 in southwestern Wisconsin and the number of nights below 0 degrees is projected to decrease by 12. By mid-century, the growing season is projected to lengthen by 4 weeks.

Although future precipitation patterns are difficult to discern, Wisconsin climatologists say the State is likely to continue its trend toward more precipitation overall, with the greatest increase in winter, spring and fall. By mid-century, Wisconsin will likely have two to three more heavy rain events—at least two inches in a 24-hour period—per decade, about a 25 percent increase in frequency, with these changes concentrated in spring and fall. The heaviest rainfall events are projected to also increase slightly in magnitude. For example, the magnitude of a 100-year storm event is projected to increase by about 10 percent.

Potential Loss

Climate change trends will likely make the most common natural hazard events in the County more frequent and severe. For example, flooding, flash-flooding and landslides may be worse as a result of heavier rainfalls, which may cause more damage to roads, infrastructure and private property. A greater frequency of extreme temperatures could affect crops, livestock and forest fires if associated with drought. More extreme temperature occurrences may also disproportionately impact vulnerable populations, such as the elderly and young children.

Chapter 4: Summary of Local Risk and Disaster Histories

The following section provides historic risk and disaster information that was collected for each municipality in Grant County and by the Grant County Highway Department (included with the County History). These summaries are intended to provide local focus to the County-wide risk assessment information. Recommended mitigation actions follow the summary for each municipality. Recommended County mitigation strategies are addressed in Chapter 5.

The local government involvement packet used to help collect information can be found in Appendix C. The unabridged local disaster histories from the 2004 Plan process can be found in a separate document – Grant County Multi-Hazard Mitigation Plan 2004 Disaster Histories. As in the 2004 Plan, flash-flooding, particularly in the steep, rugged terrain found in the western areas of the County and riverine flooding resulting from seasonal overflow of the Mississippi River and its tributaries continue to pose the highest disaster risk in Grant County.

GRANT COUNTY AS A WHOLE

Record of a trader/trapper by the name of Grant can be found as early as 1810, which document his trading with the Winnebago Indians. The County was set in March of 1837. Please refer to Chapter 2 for a summary of County demographics, physical geography, political structure and other defining elements. Disaster events that were not reported by the National Weather Service are included in the table below.

Summary of Grant County Historical Disaster Events not Reported by NWS

Disaster	Location	Date	Descriptions	Funding Awarded
Flooding		4/22-23/2004	County road system sustained heavy damage from washouts, gravel loss, debris and plugged culverts.	\$40,000
		1965, 1971, 1975 and 1993	Flood of the Mississippi River. Millions of dollars in damage to property and crops.	
		7/1993	Heavy rains resulting in flooding of the Mississippi River. Damage included: CTY D at Mill Rd., CTY A at STH 80, CTH Z – bridge at Sinsinawa Creek, CTH B – bridge at B-28, CTH D – bridge over Blockhouse Creek, CTH D just north of USH 151, CTH V from Glen Haven to CTH VV, CTH V just above Glen Haven, CTH HHH between STH 35 and CTH H, CTH O 1/10 of a mile west of Big Platte, CTH O west of USH 151, CTH O east of Rock Quarry near Oak Rd., CTH H ¼ mile west of CTH Z, CTH HH at Shoestring Rd., CTH H west of Shoestring Rd., CTH HH east of STH 35, CTH D at Bluff Lane, CTH U at STH 35, CTH Z 1¼ miles west of Sinsinawa, CTH D between Lone Rd. and Prairie Rd., CTH B just west of the Platte River bridge, CTH X – shoulder damage, CTH A under the bridge – replace the rip rap, CTH A at Bridge B-22-62 clean road and shoulder and under the bridge, CTH Q south of Stanek Rd. – repair road and shoulder, CTH Q ½ miles west of Castle Rock – repair shoulder, CTH E 1/10 mile south of Annaton Rd. – repair ditches and shoulders, CTH A 2/5 miles west of bridge 13-22-126 – repair ditches and shoulder, CTH Q from Shemak Rd. to	

Disaster	Location	Date	Descriptions	Funding Awarded
			Spring Valley Rd. – repair ditches and shoulders, CTH Q 4/10 mile south of CTH G – shoulder repair, CTH Q west of Highland – culvert and shoulder repair, CTH A to CTH J to Bloomington – shoulder and ditch work, CTH K at bridge P92-91 – shoulder and ditch repair, CTH C ¼ mile north of STH 18 – shoulder and ditch repair.	
		7/1990	Heavy rains required lost fill and gravel to be replaced on various roads and cleaning of ditches—specific locations are not in records—rip rap was replaced on CTH Q under the bridge and the riverbed was rebuilt at bridges B-17 and B-11.	\$14,387
Flash-Flooding		4/10-5/29/2001	Funds were used for emergency protective measures that included implementing warning devices such as barricades and signs, as well as roadway clearance projects. Specifically areas of concern included CTH W, N, C and X.	\$2,099
		6/29/1990	County suffered severe losses from heavy rains and flash-flooding. A Presidential Disaster Declaration was made, which included Grant County as one of several counties eligible for federal disaster assistance.	
Winter Storms		4/7/2000	Southwest Wisconsin was affected by an early spring snowstorm, which brought 3-4 inches of accumulation. The snow, combined with brisk northeast winds of 15-25 mph, created poor traveling conditions.	
		2/17-18/2000	Heavy snow accompanied a winter storm, which affected the southwest portion of Wisconsin. Law enforcement reported accumulations of 6 inches in Platteville, while 8½ inches of snow was reported in Cuba City.	
		3/8-9/1999	Parts of west central and southwest Wisconsin received 6-10 inches of snow. Strong southeast winds gusting to 40 mph caused considerable blowing and drifting, with drifts in some places 3-4 feet deep.	
		1976, 1977, 1986, 1994 and 1996	Excessive snow and ice disrupted transportation and power systems and caused multiple roofs to collapse.	
Drought		1976-1977	The drought severely reduced the crop yield and many wells in the County dried up, requiring new ones to be drilled.	
Earthquake		6/10/1987	Tremors were felt in various parts of Grant County that registered 5.0 on the Richter scale.	

Note: Unless otherwise noted, funding awards are from Federal Emergency Management Agency (FEMA) and disaster locations are generalized within the jurisdiction.

Hazard-Prone Roadways in Grant County

The County Highway Department and GCEM have compiled an inventory of roads in Grant County that are frequently and/or severely affected by flooding, landslides and other natural hazards.

Road with flooding issues include the following:

- Several roads in the Towns of Jamestown, Hazel Green and Harrison, which experienced numerous road washouts in 2010.
- All roads in the Town of Wyalusing, which were closed in 2008.
- US 61 north of the Village of Tennyson.
- STH 81 in the Town of Ellenboro.
- Old US 151 in the City of Platteville, between Water Street and Chestnut Street.
- CTH X three-tenths of a mile west of Big Pond, by the beach and Wyalusing State Park is a low area in the highway which fills with water.
- CTH C near STH 18 is often flooded by the Wisconsin River, which requires residents to detour via north C rather than south.
- STH 133 from Blue River west to the bridge. The water flows over the road as a means of bypass when the river is flooded. FEMA funds were received following the 2000 Declaration. (More information about this can be found later in this section of the report.) The road was closed approximately 6 hours and cows were floating in the river.
- Portions of USH 151 during periods of heavy rain.
- STH 133 through the Village of Cassville. During the Mississippi River flooding events, the highway is closed when floodwaters cover the streets of Cassville.
- STH 133 just to the east of Cassville (between Jack Oak and Anker Inn) has a low spot that water collects when it rains and begins to encroach on the highway. There is no means of drainage.
- CTH VV west of Nelson Dewey at the Closing Dam Road intersection. The road is often encroached by water during heavy rains and flooding of the Mississippi River.
- CTH O between Big Platte Road and the bridge floods during periods of heavy rain; two creeks merge at this point causing the flooding. There are also numerous areas on CTH O where embankment failures often occur.
- Far-Nuff Road at McCartney boat landing is often flooded when the Mississippi River flood waters backfill under the railroad bridge.
- CTH V in the west side of the Town of Glen Haven.
- Glen Haven area has many issues with slides and the Mississippi River backing up into the Village. (See the Town of Glen Haven section.)
- STH 133 just west of Potosi, near the Yacht Club, are several low spots that collect water and often the shoulder of the highway is washed out or flooded.

Roads with embankment or landslide issues include the following:

- CTH O, nearly the entire road.
- CTH X, nearly the entire road.
- STH 133 in the Towns of Potosi and Cassville.
- STH 81 in the Town of Beetown.
- CTH C, nearly the entire road.
- CTH A, south of Bagley in the Town of Bloomington.
- CTH U south of Beetown. There are several places where large boulders are hanging from the bluffs and are a danger to passing motorists. There is no way to reach the boulders in question and the Highway Department identified that boulders will often unexpectedly drop off the bluff.

- CTH X between Wyalusing and Bagley, which would benefit from a wall system to hold back falling debris.
- STH 133 between Cassville and Potosi, where Jersey barriers or k-rails are used to keep rocks and boulders from falling onto the highways.
- CTH VV by the Nelson Dewey Generating Station west of Cassville, where Jersey barriers or k-rails are used to keep rocks and boulders from falling onto the highways.
- CTH N through Burton, where Jersey barriers or k-rails are used to keep rocks and boulders from falling onto the highways.

Roads with wind blown snow issues include the following:

- STH 80 between Cuba City and Platteville is a major problem for wind-blown snow. There are no wind breaks on the west side of the road to mitigate snow blowing from the open fields.
- STH 81 from Platte Road to the west of Jentz-Baker Road and half way down the Ellenboro Hill on the Lancaster side and areas near Orchard Manor nursing home.
- Other County or State Highway issues:
 - The Highway Department proposed raising CTH X near Wyalusing in 2001; however, the State denied the project, as it did not meet the State's mitigation prioritization criteria.
 - CTH X near Bagley is a safety concern, as the road shoulder and the railroad bed are one. The Highway Department recommends a barrier be installed to maintain a separation.
 - The Highway Department also noted the need for the Burlington Northern-Santa Fe Railroad to improve its maintenance of the tracks and railroad beds and for communication from the Railroad to improve.

Local Action Recommendation

- The County should work with each jurisdiction and the State of Wisconsin to prioritize road repairs, stormwater management upgrades and road sealing, as well as to address the issues identified above
- GCEM should make sure that the NWS has a complete list of historic natural hazards that have affected Grant County.

Please see Chapter 5 for County mitigation goals and strategies.

CITY OF BOSCOBEL

The City of Boscobel is located along the Wisconsin River, adjacent to the Lower Wisconsin River State Wildlife Area. It became a Town in 1859 and was incorporated in 1873. Its 2011 estimated population was 3,240 persons, making it the County’s third most populous jurisdiction after Platteville and Lancaster. The City has a mix of residential and commercial land uses and is known as the “Birthplace of the Gideon Bible” as well as “Wisconsin’s Wild Turkey Hunting Capital”. The City is expected to grow rather quickly between 2000 and 2030, with a 42 percent increase, which equates to an additional 1,263 residents.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding	Sanders Creek at STH 61	Every year	Sanders Creek culvert is too small, causing backups into the City affecting residential areas.
	Sanders Creek	5/21/2004	Sanders Creek flooded following six inches of rainfall, affecting one house on the northern edge of the City.
		7/20/1950	Sanders Creek overflowed its banks after a rain measuring over seven inches. An area of between 16 and 20 blocks was inundated in the First Ward, also some of the Second Ward on Bluff Street.
		6/19/1947	City Cleaning up After the Worse Flood In Its History– Highest flood level in Sanders Creek ever reached in Boscobel inundated an area of about 12 square blocks. Crooked Creek washed out a section of railroad tracks 100 feet wide and 14 feet deep in one place and washed out two smaller sections. 7,000 tons of fill were required to replace the grade. Mud covered an area of 12 blocks around East Bluff, Oak, LeGrand and Superior Streets.
	Sanders and Crooked Creeks	6/22/1944	Damage to homes and businesses caused by flooding of the Sanders Creek and Crooked Creek.
		10/15/1900	Because of heavy rains, the Wisconsin River exceeded the flood mark set in 1899. The flooding caused thousands of dollars in damage and destruction to buildings and hay fields. <i>Dial Enterprise, October 17, 1900</i>
Flash-Flooding	Grey Street	5/22-23 and 6/16/2004	Flash-flooding damaged a residence. A temporary levee minimized the potential impact of the flood.
		6/15/1997	Torrential rains of 3-4 inches in less than an hour turned small creeks into raging rivers and caused mud and rockslides. <i>NWS</i>
Severe Thunderstorms		8/20/2003	60 mph thunderstorm winds caused major damage throughout the City and toppled trees and power lines causing a power outage to ¾ of the City. <i>The Boscobel Dial</i>

Disaster	Location	Date	Descriptions
		6/28/2003	Law enforcement and amateur radio operators reported hail approximately 1.75 inches in diameter caused crop damage. <i>NWS</i>
		9/7/2001	54 mph thunderstorm winds caused property and crop damage and toppled trees and power lines. <i>NWS</i>
		8/1/2000	A lightning strike damaged ten runway transformers at the airport.
		6/1/2000	A lightning strike caused damage to the wastewater treatment facility, knocking out power to the backup generator and emergency phone and causing pump failure, which resulted in 20 feet of water in the control room. The main control panel was completely submerged and damaged and local control stations suffered damage. Insurance only covered the damage to the control panel.
		6/20/1998	Clusters of storms hit southwest Wisconsin with damaging winds gusts and 1.75 inch hail, causing property and crop damage. The storm blew down numerous large trees and caused minor damage to farm buildings. <i>NWS</i> This event may have resulted in the 1998 Presidential Disaster Declaration. <i>NWS</i>
Tornado	Boma Ridge	6/12/1915	Tornado reported in the <i>Boscobel Dial</i> , March 28, 1985.
		6/1/1916	Unknown damage.
Winter Storms		1/1/1910	No specific record.
		Spring 1959	A severe blizzard closed roads for several days.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- The City of Boscobel has four mobile home parks, none of which has a storm shelter. The units are in various states of repair and it is unlikely that many have tie-downs. The Friendly Mobile Home Park has nine mobile homes and approximately twenty-five residents. The Evergreen Mobile Home Park has nineteen mobile homes and approximately fifty residents. Shady Lane Mobile Home Park has seven mobile homes and approximately twenty residents. The Becwar Mobile Home Park has two mobile homes with approximately five residents. According to GCEM, none of these mobile home parks has storm shelters.
- In the 1950s, a levy was built and some of the bends were removed from Sanders Creek. The creek now runs about 10-12 feet wide and 1–2 feet deep. Flooding of residential property has been recorded since construction of the levee.
- The DNR is active in floodplain management of publicly held land along the Wisconsin River and provides assistance with fire response.
- In this part of the County, DNR requires a burning permit anytime the ground is not snow-covered during the months of January, February, March, April and May.
- High volumes of truck traffic on Highways 61 and 133 and train traffic on the Wisconsin-Calumet Railroad increase the possibility of a hazardous materials spill.
- The City of Boscobel Fire Department building is undersized, leaving no space for housing additional equipment.
- There are annual problems with flooding along Sanders Creek at the STH 61, the railroad crossing and the Bluff Street bridge.

Local Action Recommendation

- Prevent additional development in the floodplain and proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Coordinate with the owners of the mobile home parks to identify a temporary storm shelter until one can be built in those locations; ideally, the City should identify one centralized shelter in the community.
- Consider moving the EMS/Rescue Squads to another building to address space issues.
- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- Help prevent forest and wildland fires by:
 - Making residents aware that a burn permit may be required by the DNR between January and May.
 - Ensuring the Fire Department is prepared and equipped to respond to this type of hazard.
 - Encouraging fire safe “clear zones” around all homes that are free of trees and brush.
- Identify stormwater management issues along roadways and make repairs as funds are available.
- Work with private property owners to improve stormwater management in problem areas.
- Identify areas prone to embankment failure and make repairs as funds are available.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s—the City of Boscobel

adopted its plan in 2009—few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

- Update local land use regulations including zoning, land division and floodplain ordinances as necessary to respond to local plan revisions and hazard mitigation concerns. In particular, within planned growth areas (see map) ensure proper erosion control and stormwater management facilities in new subdivisions and other new developments.
- Maintain active participation in the National Flood Insurance Program (NFIP) by educating elected officials, staff, and community members on the opportunities and constraints associated with NFIP participation; consistently administering and enforcing floodplain regulations; and keeping floodplain regulations up to minimum federal and state standards as they may change over time.

City of Boscobel Map

CITY OF CUBA CITY

The City of Cuba City is located in southwest Grant County along STH 80. It was platted in 1875 and grew quickly because of easy railroad access to agricultural markets in Galena. Its 2011 estimated population is 1,873 persons. The City has a mix of commercial, civic, industrial and residential land uses. It is known as “The City of Presidents” because of a display of presidential shields that is arranged along Main Street. The presidential shields were erected in honor of the nation's bicentennial. Cuba City is expected to grow at a moderate pace of 2 percent between 2000 and 2030, which equates to an additional 39 residents.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding		7/23-25/2010	Flooding caused extensive damage: storm sewer inlets damaged, lift station pump burned out and had to be repaired, additional sewer treatment cost for treating system overflow.
		7/1993	Flooding required emergency pumping and swept away aggregate on Splinter and School Streets. High winds downed power lines; damaged transformers, poles, cross arms, meters and substations; and left debris on public property.
		1969	Flooding covered all main highways and streets leading from the City.
Severe Thunderstorms	Lincoln Street	5/22-23 and 6/16/2005	Heavy rains destroyed 1,060 feet of the south end of Lincoln Street when stormwater run-off eroded the subsurface of the street and the side of the street next to the curb and gutter. Although all damage was within Cuba City limits, a portion of the damaged street lies in Lafayette County. Because Lafayette County was not designated as eligible for assistance, the City was not eligible to receive funds to assist with repairs of this portion of the road. The City was not approved for FEMA public assistance to assist with other damages.
		7/1998	High winds left debris on public property. Severe rains required emergency temporary pumping at the City limits north lift station and the waste treatment plant.
Tornado		1930s	A tornado destroyed a chicken house.
Winter Storms		2/2-4/2011	Record snowfall in a short period of time completely closed all streets in the Village.
		1978	An ice storm toppled trees and power lines and downed branches. Sewer lift stations had to be run by generator.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- Stormwater surface run-off and high groundwater levels are responsible for the majority of flooding. The water table is quite close to the surface, causing residents to run their sump pumps continuously during extended periods of rain to keep water from causing damage to their homes. Three new lift stations, each with their own generator, were installed in the 2000s, reducing sewage back-flow into homes.
- Some homes do not have basements, which presents a storm shelter challenge.

- Catch basins along Main Street and Sunset Drive are a combination of concrete bricks and poured concrete. Over the past few years, the concrete bricks have loosened due to storm run-off and the pressure from the surrounding soils, causing the catch basins to sink and become nearly dysfunctional.
- The northern well, City Hall, all lift stations, the sewer plant and the Fire Department are equipped with generators for use during electrical outages.
- During periods of heavy, blowing snow, the City is cut off from the northern part of the County due to severe drifting across U.S. Highway 80.
- The industrial park is located on the south edge of the City. Approximately ninety employees work in the park and no adequate storm shelters are provided in or near these buildings. The City expects that growth in the industrial park will be toward the east and into Lafayette County.
- There are three mobile homes located within the City, all located on the same piece of property. Approximately three residents live in these homes. There are no tie downs. Residents would have to go to another location for storm shelter. Residents have relied on the neighborhood bank, but most storms in the area seem to occur when the bank is closed.
- The City has become a bedroom community to Dubuque and current growth trends indicate that growth will continue at the current average of four or five houses per year over the next few years. However, there is limited ability to construct basements.
- High volumes of truck traffic on Highways 80 and 11 increase the possibility of a hazardous materials spill.

Local Action Recommendation

- Consider construction of a community storm shelter, particularly for mobile home park residents and industrial park employees and the limited ability to construct basements in the area in general.
- Pursue the following stormwater management system upgrades identified, as funds are available: add three larger pumps at the wastewater treatment facility, or to add submersible pumps at the wet well to pump water faster during wet weather and periods of heavy rain; build retention ponds north and southeast of the municipality to help prevent City stormwater run-off from causing damage to neighboring farm fields.
- Proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Work with private property owners to improve stormwater management in problem areas.
- Identify stormwater management issues along roadways and make repairs as funds are available.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s—the City of Cuba City adopted its plan in 2009—few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.
- Update local land use regulations including zoning, land division and floodplain ordinances as necessary to respond to local plan revisions and hazard mitigation concerns. In particular, within planned growth areas (see map) ensure proper erosion control and stormwater management facilities in new subdivisions and other new developments.
- Maintain active participation in the National Flood Insurance Program (NFIP) by educating elected officials, staff, and community members on the opportunities and constraints associated with NFIP participation; consistently administering and enforcing floodplain regulations; and keeping floodplain regulations up to minimum federal and state standards as they may change over time.

City of Cuba City Map

CITY OF FENNIMORE

The City of Fennimore is located on Military Ridge at the intersection of USH 61 and USH 18. The City was platted in 1868, incorporated as a Village in 1885 and incorporated as a City in 1919. The City has a mix of commercial, civic, industrial and residential land uses. Its 2011 estimated population was 2,505 persons. Fennimore is expected to grow at a modest pace of 2 percent between 2000 and 2030, which equates to an additional 38 residents.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding		8/5/1951	6.29 inches of rain fell in a 3-hour period, which set a new record for Grant County. <i>NWS</i>
Severe Thunderstorms		8/7/2001	52 mph thunderstorm winds caused property and crop damage. Winds toppled trees and power lines. <i>NWS</i>
		6/19/1998	67 mph thunderstorm winds caused property and crop damage. <i>NWS</i>
		5/31/1998	57 mph thunderstorm winds and large hail caused property and crop damage. <i>NWS</i>
Winter Storms		1994	Snow collapsed roof of skating rink.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- Stormwater run-off at Sixth and Cleveland Streets does not enter homes, but does cause erosion.
- There is potential for Roger Hollow Creek to cause damage to properties.
- Blowing and drifting snow is a problem along Dodge Street in the Industrial Park.
- The City’s comprehensive plan identifies the area to the north of the City as the primary future growth area. Historical data indicates that this area is frequently in the path of tornado activity.
- The City has its own diesel power plant in the downtown area, which can be put on line in the event a natural hazard eliminates electrical service.
- High volumes of truck traffic on Highways 61 and 18 increase the possibility of a hazardous materials spill.

Local Action Recommendation

- Consider construction of a community storm shelter, particularly given the mobile home park and that the future growth area is in the path of historic tornado activity.
- Identify and execute improvements to their stormwater management system as funds are available.
- Work with the Grant County Highway Department and property owners to install snow fences along Dodge Street.
- Proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Coordinate with the owners of the mobile home parks to identify a temporary storm shelter until one can be built in those locations.
- Work with private property owners to improve stormwater management in problem areas.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and

intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s—the City of Fennimore adopted its plan in 2003—few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

- Update local land use regulations including zoning, land division and floodplain ordinances as necessary to respond to local plan revisions and hazard mitigation concerns. In particular, within planned growth areas (see map) ensure proper erosion control and stormwater management facilities in new subdivisions and other new developments.
- Maintain active participation in the National Flood Insurance Program (NFIP) by educating elected officials, staff, and community members on the opportunities and constraints associated with NFIP participation; consistently administering and enforcing floodplain regulations; and keeping floodplain regulations up to minimum federal and state standards as they may change over time.

City of Fennimore Map

CITY OF LANCASTER

The City of Lancaster is centrally located and is the county seat of Grant County. One of Lancaster’s landmarks is the Grant County Courthouse, a grand brownstone building built in 1905 with octagonal glass and a copper dome. Lancaster’s 2011 estimated population is 3,855, making it the second most populous jurisdiction in Grant County, after Platteville. Lancaster’s population is projected to decrease slightly by 2 percent between 2000 and 2030, which equates to a loss of 86 residents.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding		2010	Heavy rains and saturated grounds caused extensive damage, mainly to residential foundations. <i>Source: GCEM.</i>
		2008	Heavy rains and saturated grounds caused extensive damage, mainly to residential foundations. <i>Source: GCEM.</i>
		2007	Heavy rains and saturated grounds caused extensive damage, mainly to residential foundations. <i>Source: GCEM.</i>
		5/22-23 and 6/16/2004	Extensive damages to residences. Basement walls in numerous houses collapsed; several more are expected to collapse and/or have significant foundation damage.
		7/1993	FEMA funds were dedicated to removal of wind-blown debris on public property, bituminous surface and embankment failure at Shreiner Park on Monroe Street (the park walking bridge was damaged), pumping of catch basins and sewer lines after they became blocked with debris Citywide, damage at Memorial Park to a culvert.
	Klondyke Park	7/1992	Flood waters overflowed river and inundated park fences and facilities at Klondyke Park.
Severe Thunderstorms		5/22-23 and 6/16/2004	Lightening damaged two pump stations and structures at the golf course and caused electrical general damage.
		7/9/2001	53 mph thunderstorm wind caused property and crop damage. Thunderstorm winds toppled trees and power lines. <i>NWS</i>
		6/18/2001	1-inch hail caused property and crop damage. The public, law enforcement and amateur radio operators reported hail the size of golf balls. Wind gusts of 60-70 mph toppled trees and power lines. <i>NWS</i>

Disaster	Location	Date	Descriptions
		6/2000	FEMA funds were received following a declaration. The grant was used for the following: <ul style="list-style-type: none"> ▪ Removed debris and replaced sand on the Memorial Park volley ball courts and replaced galvanized fence surrounding the park. ▪ Replaced topsoil on putting greens at the municipal golf course. ▪ Replaced two electric motors at the Memorial Park lift station. ▪ Repaired asphalt, replaced a concrete storm sewer inlet and 10 feet of curb and gutter on Hickory Street. ▪ Replaced two concrete storm sewer inlets and 30 feet of curb and gutter on Maple Street. ▪ Gravel replaced in two alleys ▪ Repaired asphalt at the Lincoln and Grant Street intersection ▪ Repaired three sections of asphalt on Washington Street. ▪ Repaired one section of asphalt on Willow Street.
		5/17/2000	1.50-1.75-inch hail was observed by law enforcement. Numerous cars and the roof of the Lancaster law enforcement center sustained damage. <i>NWS</i>
		6/28/1998	Thunderstorm wind caused property and crop damage. A line of intense thunderstorms swept in from Minnesota and caused widespread straight-line wind damage to many areas of central and western Wisconsin. This was one of the worst storms to hit the region in over 25 years. Wind gusts of 90-120 mph left two main paths of concentrated damage. Numerous large trees and power lines were toppled. Ten counties, including Grant, were declared Federal Disaster areas. <i>NWS</i> FEMA funds were used to remove wind-generated debris on public property.
		6/18/1998	Thunderstorm wind toppled trees. Later that day 58 mph winds caused an additional property and crop damage. <i>NWS</i>
		6/16/1977	Golf ball sized hail broke windows, dented cars and siding and stripped the leaves and fruit from trees.
Tornado		6/18/1998	A tornado touched down in the City causing damage to several homes and knocking down hundreds of trees, resulting in property and crop damage. One person was injured. <i>NWS</i>
Disease Outbreak		1854	Cholera and Small Pox.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- Recent population growth has placed some areas, including the industrial park and some residential areas, outside the range of the warning sirens.
- County government buildings are constructed to withstand a moderate earthquake.
- High volumes of truck traffic on Highways 35, 61 and 81 increase the possibility of a hazardous materials spill.
- In 2011, the City purchased and demolished two repetitive loss structures using FEMA funds. The City constructed retention ponds on these properties to mitigate future flooding.

Local Action Recommendations

- Work with GCEM to identify the most appropriate location for additional warning sirens and purchase and install the sirens, as funds are available.
- Consider construction of a community storm shelter, particularly for mobile home park residents and industrial park employees.
- Work with the local public works department to identify stormwater management issues along roadways and make repairs as funds are available.
- Work with private property owners to improve stormwater management in problem areas.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s—the City of Lancaster adopted its plan in 2009—few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.
- Update local land use regulations including zoning, land division and floodplain ordinances as necessary to respond to local plan revisions and hazard mitigation concerns. In particular, within planned growth areas (see map) ensure proper erosion control and stormwater management facilities in new subdivisions and other new developments.
- Maintain active participation in the National Flood Insurance Program (NFIP) by educating elected officials, staff, and community members on the opportunities and constraints associated with NFIP participation; consistently administering and enforcing floodplain regulations; and keeping floodplain regulations up to minimum federal and state standards as they may change over time.

City of Lancaster Map

CITY OF PLATTEVILLE

The City of Platteville is located in southeast Grant County. Platteville was incorporated as a Village in 1841 and then as a City in 1880. Its 2011 estimated population is 11,247 persons, making it Grant County’s most populous municipality. Platteville is expected to grow at the moderate pace of 8 percent between 2000 and 2030, which equates to an additional 825 residents.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding		2010	Heavy rains and saturated grounds caused extensive damage, mainly to residential foundations. <i>Source: GCEM.</i>
		2008	Heavy rains and saturated grounds caused extensive damage, mainly to residential foundations. <i>Source: GCEM.</i>
		2007	Heavy rains and saturated grounds caused extensive damage, mainly to residential foundations. <i>Source: GCEM.</i>
		6/2000	Heavy rains induced flooding and caused damage to Rountree Branch Trail and in 17 locations throughout the City. North Court Street was reported in FEMA documentation as flooded.
		1993	2-5 inches of rainfall caused property damage. The private property damaged at the northern end of Water Street and along the south side of Highway 151 behind businesses. The sanitary sewer system was damaged and temporary pumps were needed for additional capacity. East Mineral, West Madison, West Main, Water and Hathaway Streets sustained damage.
Flash-Flooding		5/22-23 and 6/16/2004	Minor damage reported and some storm sewers plugged.
		5/16-17/1999 (may have occurred in 1993)	Flash-flooding caused property and crop damage County-wide. Union Street was flooded due to undersized sanitary sewers, which has been corrected. <i>NWS</i> Several feet of water rushed under mobile homes in a park near Platteville and required residents to be evacuated. (Mobile home park no longer exists.)
Severe Thunderstorms		9/7/2001	54 mph thunderstorm winds caused property damage and crop damage. Winds toppled trees and power lines. <i>NWS</i>
		5/18/2000	1.50-inch hail caused property and crop damage. <i>NWS</i>
		5/8/2000	52 mph thunderstorm winds caused damage. Law enforcement officials reported power poles and trees toppled during wind gusts of up to 60 mph. <i>NWS</i>
		7/1998	Heavy rain and wind. FEMA award was used to remove

Disaster	Location	Date	Descriptions
			debris from public property.
		6/19/1998	70 mph thunderstorm winds caused property and crop damage. <i>NWS</i>
Subsidence		1997	The street in front of 290 Lutheran Street subsided due to an abandoned mineshaft.
	Water Street		Subsurface changes caused a spring to appear in a resident's yard. The water was diverted into street and storm sewers.
	Jackson Street and Jefferson Street		Soil subsidence required filling with breaker rock and soil.
Earthquake		1/2/1912	Two tremors caused minor structural damage. <i>WEM</i>
		5/26/1909	Tremors caused minor structural damage. <i>WEM</i>

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- The City of Platteville Fire Station is antiquated and undersized, leaving no space for storage of additional equipment. The Fire Station doors are too low for new equipment unless special ordered at an additional cost. The EMS facility is also too small for equipment storage.
- Localized flooding issues with storm and sanitary sewers often cause minor property damage. Inadequate stormwater management on Water Street frequently causes flooding.
- The City recently updated its emergency siren system.
- The existing fencing surrounding the Platteville Municipal Airport is inadequate. A complete perimeter fence would be approximately 28,700 feet, plus assorted gates.
- There are many underground mines and mineshafts in and around the City. Although partially addressed, sinkholes in the northeast portion of the City still cause problems on Lutheran, Jackson, Water, East Mineral and East Main Streets.
- The majority of businesses in the Business 151 and Valley Road commercial districts, the City wastewater treatment plant and the City impoundment site and area Chamber of Commerce are located in the floodplain.
- There has been no earthquake evaluation for public buildings in the City.
- The Platteville Industrial Park employs approximately 450 people and does not have a storm shelter.
- High volumes of truck traffic on Highways 80, 81, Business 151 and CTH XX increase the possibility of a hazardous materials spill.

Local Action Recommendation

- Identify and execute improvements to their stormwater management system as funds are available.
- Identify areas with risk of subsidence (see map in Chapter 3) to best inform the public of potentially hazardous locations.
- Build a new Fire Station and EMS facility and work with business and property owners to improve safety at the Industrial Park.
- Prevent additional development in the floodplain and proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Coordinate with the tenants of the industrial park to identify a temporary storm shelter until one can be built.

- Encourage coordination with University of Wisconsin-Platteville and local and County law enforcement about evacuation plans for student housing facilities.
- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- Identify stormwater management issues along roadways areas prone to embankment failure and make repairs as funds are available.
- Work with private property owners to improve stormwater management in problem areas.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s—the City of Platteville is in the process of preparing a joint plan with the Town of Platteville—few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.
- Update local land use regulations including zoning, land division and floodplain ordinances as necessary to respond to local plan revisions and hazard mitigation concerns. In particular, within planned growth areas (see map) ensure proper erosion control and stormwater management facilities in new subdivisions and other new developments.
- Maintain active participation in the National Flood Insurance Program (NFIP) by educating elected officials, staff, and community members on the opportunities and constraints associated with NFIP participation; consistently administering and enforcing floodplain regulations; and keeping floodplain regulations up to minimum federal and state standards as they may change over time.

City of Platteville Map

VILLAGE OF BAGLEY

The Village of Bagley is located in northwest Grant County, adjacent to the Town of Wyalusing. The Village, with a 2011 estimated population of 378 persons, is situated at the base of the bluffs along the Mississippi River. It is one of the youngest Villages in the County, founded in 1884 when the Burlington and Northern railroad built the Chicago-Minneapolis line. The Village was incorporated in 1919. The Village is expected to grow by 25 percent, or 86 new residents, between 2000 and 2030.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding		2010, 2008, 2007	Significant flash-flooding in the central part of the Village. Destroyed numerous developed properties (see Other Flood Prone Areas on map). Associated with inadequate out flow capacity at Dry Hollow Creek.
		6/16/2004	A water main broke due to the height of the Mississippi River and the pressure of the ground water from the excessive rains.
		5/1-18/2001	Mississippi River flooding caused significant damage. The river crested in April 2001 to near record levels. The river remained above flood stage until the middle of May, causing ongoing flooding. Damages to homes and businesses were most significant in Prairie du Chien and south through Grant County. Six counties, including Grant County received federal disaster relief funds. <i>NWS</i>
		4/13/2001	Heavy rains, combined with snowmelt run-off, caused the Mississippi River to reach near record levels. On April 18 th , the river crested at 16.4 feet in La Crosse, marking the 3 rd highest flood on record. Hardest hit was the Prairie du Chien area and points southward (Grant County), where floodwaters did considerable damage to businesses and homes. This flood resulted in six counties, including Grant to be eligible for federal disaster relief funds. Water levels began dropping during the latter part of the month, but remained above flood stage through early May. <i>NWS</i>

Disaster	Location	Date	Descriptions
		6/2000 (estimated date)	Nearly 6 inches of rain fell over 7 hours. Debris plugged the railroad bridge at the south end of Main Street, before River of Lakes Resort causing back up into Bagley and Main Street. The lumberyard suffered inventory loss. Property owners also suffered damage from flooded basements, which was mostly covered by homeowners insurance. The interviewed group believes that the railroad finally paid the lumberyard for some of their losses. Originally, there was clearance for a truck to pass under the bridge, now there is approximately a 4-foot clearance. From resident's descriptions, the ditch under the bridge collects debris and water from Dry and Glass Hollows.
		4/3/1997	Several homes and businesses were damaged when the Mississippi River reached its 3 rd highest flood level on record. The river crested at 15 feet in La Crosse, causing roads to close and disrupting barge and rail traffic. Six counties were affected. <i>NWS</i>
		8/1/1981	6 inches of rainfall caused damage to basements, the lumberyard and Village streets.
		1967	Spring flood of the Mississippi River damaged River of the Lakes Area.
		1965	Railroad considered particularly responsible for the damage. The Mississippi River reached 25.4 feet in Prairie du Chien. Water accumulated in basements and caused problems at the wastewater treatment facility. 75 percent of cottages in River-of-Lakes Resort were flooded and many mobile homes had to be moved. All access to the area was by boat. Volunteers built a 10,000-sandbag dike around the living quarters, office and main store building. The dike required 24-hour watch for 4 days but sustained through the flood.
		1948	Heavy rain totally isolated the Village. The interviewed group believes that the railroad's failure to maintain a railroad bridge and adjacent ditch caused these flooding problems. The interviewed group believes that some maintenance was done in the 1950s, but that none has occurred since. The railroad is not responsive to working with the Village.
		1939	Sandy Bridge was washed out by floodwaters. The bridge had to be rebuilt.
	Mississippi River	Spring, 1935	Flooding from snow, sleet and rain caused debris buildup along the railroad bridge at the south end of Main Street, before River of Lakes Resort. Shortly after this event, the railroad dug ditches to divert water from Dry and Glass Hollows.

Disaster	Location	Date	Descriptions
Severe Thunderstorms		7/10/2000	53 mph thunderstorm winds. Wind gusts of 60-65 mph damaged trees, power lines and crops. <i>NWS</i>
		5/16/1999	1-inch hail. <i>NWS</i> 52 mph thunderstorm winds. Spotters and law enforcement officials reported hail as large as golf balls and wind gusts of 60-65 mph. Trees and power lines were toppled. <i>NWS</i>
		6/19/1998	70 mph thunderstorm winds caused property and crop damage. <i>NWS</i>
	Jellystone Campground	6/18/1998	56 mph thunderstorm winds caused damage to campers and facilities at Jellystone Campground. <i>NWS</i>
		1993	FEMA monies were received and used to clean up wind generated debris on public property.
Tornado		5/1/1985	Tornado hit the south side of Bagley and the vicinity of the rock quarry.
Winter Storms		1976 or 1977 (exact date unknown)	An ice storm, possibly in February, left the Village without electricity for three days.
		1957 or 1958 (exact date unknown)	Roofs on buildings collapsed and a passenger train was stuck in Bagley forcing passengers to stay in resident's homes.
Disease		1911	Diphtheria outbreak killed several children from the same family.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- Flooding due to spring rain events relating to the Mississippi River and heavy rainfall events during other times of the year have caused the most damages of applicable natural hazards. The community is susceptible to two kinds of flooding:
 - Mississippi River flooding, which is slow and predictable.
 - Flash-flooding, which is frequent and devastating. This type of flooding is unpredictable due to bluff terrain surrounding the community.
- The Village received FEMA funding in 2001 following flooding on the Mississippi River. The funds were used to remove debris at the water treatment plant; repair damaged electrical service and replace meter pedestals and one electric box pedestal. During this time, the Village also received FEMA funds to reimburse for costs of dumpster rental, Village overtime, the use of a dump truck, portable toilet rental and emergency repair of the sewage grinder pump cabling.
- In the past, there were two or three train derailments with cars jumping the tracks that were considered minor. Additional derailments are possible due to the high rate of speed going through the area. Risk of hazardous material spills is increased by the frequency of transport on the Burlington Northern-Santa Fe railroad. Residents



These homes in Bagley could only be reached by boat in the 1965 flood.

feel that the railroad track is not safe, maintenance of the tracks and ties is inadequate and they are not well educated about the proper response to a train derailment. Education and outreach should include local response and should occur at least every 5 years. Additionally, sedimentation under the railroad bridge has made the bridge too short for emergency vehicles to pass; thereby restricting emergency response access to Jay's Landing. The railroads typically do not remove debris which clogs railroad bridges and causes flooding in the Village and the railroad also refuses assistance from the Village to keep the bridges clear.

- There is not a storm shelter in River of the Lakes Resort and the Village's warning sirens are not audible at the resort.
- In 2003, GCEM purchased two repetitive loss properties in the Village through the FEMA buyout program.
- There is significant rates of vacation home construction and rapid annexation of flood-prone areas without regard for potential flood risk. Jay's Landing and River of the Lakes Resort are prime concerns and excellent examples of the type of growth occurring in the area.
- The railroad bed serves to impede flood waters in the Dry Hollow Creek basin from reaching the Mississippi River in an expedited manner, with devastating impacts on developed properties in the Village from 2007 to 2010.
- The Village wastewater treatment plant is in the floodplain.

Local Action Recommendations

- Dry Hollow Creek basin west of the railroad bridge needs to be dredged and railroad bridge needs to be lengthened to better allow waters to flow during flash-flooding events without flooding developed properties within the Village.
- Continue outreach efforts to the Railroad with the goal of establishing a track, bridge and vegetation/debris maintenance program.
- Work with homeowners to add wastewater back flow devices in flood affected areas.
- Prevent additional development in the floodplain and other flood prone areas (see map) and proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Increase the number of warning sirens to ensure that all residents are within range.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Coordinate with the owners of the mobile home parks to identify a temporary storm shelter until one can be built.
- Work with private property owners to improve stormwater management in problem areas.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s—the Village of Bagley adopted its plan in 2009—few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.
- Update local land use regulations including zoning, land division and floodplain ordinances as necessary to respond to local plan revisions and hazard mitigation concerns. In particular, within planned growth areas (see map) ensure proper erosion control and stormwater management facilities in new subdivisions and other new developments.
- Maintain active participation in the National Flood Insurance Program (NFIP) by educating elected officials, staff, and community members on the opportunities and constraints associated with NFIP participation; consistently administering and enforcing floodplain regulations; and keeping floodplain regulations up to minimum federal and state standards as they may change over time

Village of Bagley Map

VILLAGE OF BLOOMINGTON

The Village of Bloomington is located on a high ridge in west central Grant County. STH 133 and STH 35 are the primary arteries of the community. The Village has a 2011 estimated population of 733 persons. The Department of Administration expects the Village to lose population between 2000 and 2030 at the rate of 14 percent, which equates to the loss of 96 residents. The Village was formally incorporated in 1880 and at one time had a college, Tafton College, which no longer exists.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding		2010	Took out foot bridge in park and washed out the banks of the Blake Fork, which had been damaged before. The road and parking lot were also washed out.
		7/31/2000	5 inches of rain caused damage to the park and sewer plant. Sewer backups were reported at two residences.
	Hermson's Sheds	1994	Flooding caused a backup of 6-8 inches of raw sewage into a home and Hermson's office space and sheds, causing damage to items stored in the sheds. Backflow stops have since been installed in the affected home and business.
		7/1993	FEMA monies were used to make repairs at the sampler and sewer plant. Damage was also repaired at the Village Park.
Flash-flooding		5/22-23 and 6/16/2004	Flooding took a bridge out in the park and deposited gravel and debris. Storm sewer damage occurred behind St. Mary's School.
	Blakes Fork Creek	1982	Warehouses and feed storage warehouses were flooded and contents were damaged or destroyed.
	Blakes Fork Creek	Late 1850s	The flood washed out a bridge and part of the dam behind the flourmill. The mill closed when the owners could not afford to rebuild the dam.
Severe Thunderstorms		5/10/2001	60-65 mph thunderstorm wind gusts toppled several trees, dropped large branches and damaged a feed mill. <i>NWS</i>
		8/14/1998	4.5 inches of rain, high wind and hail caused damage to area south of Village.
		8/5/1998	4 inches of rain and high wind caused damage to area south of Village.
		8/4/1998	2 inches of rain caused damage to area south of Village.
		7/1998	Two installments of FEMA monies were used to repair a storm sewer collapse, remove storm-generated debris from streets and parks and embankment collapses around the Village.

Disaster	Location	Date	Descriptions
	Fairground and North Roads	Summer, 1939	Grandstands at Bloomington Fairgrounds were destroyed.
Winter Storms		2/2/2010	Snow closed roads and snow had to be hauled out of the Village.
		3/1976	An ice storm caused a 3-day power outage. There were not enough generators available and many residents lost contents of freezers and refrigerators.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- Flooding in the area of Blakes Fork Creek damaged warehouses and feed storage warehouses in this area in August 1998. These warehouses are under constant threat during times of high water and flash-flooding. Blakes Fork Creek also causes frequent flooding at the park and the Village sewer plant.
- The Village cleaned out the storm drain on South Pleasant Street by the car wash and replaced a collapsed five foot storm sewer pipe near the West Grant Rescue Squad building on Wall Street.
- Wind-blown snow causes problems from Mill Street to East Front Street; the north end of Bluebird Lane and Fairground Road to Ash Lane; and on Mill Street by the Middle School, Warco Lane and 4th Street.
- The Village wastewater treatment plant and much of the commercial district are in the floodplain.

Local Action Recommendation

- Prevent additional development in the floodplain and explore eventual relocation of the wastewater treatment plant.
- Work with Grant County Highway Department to install snow fences on problem roads.
- Proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Consider construction of a community storm shelter, particularly for mobile home park residents and industrial park employees. Coordinate with the owners of the mobile home parks to identify a temporary storm shelter until one can be built.
- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- Work with private property owners to improve stormwater management in problem areas.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s—the Village of Bloomington adopted its plan in 2009—few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

- Update local land use regulations including zoning, land division and floodplain ordinances as necessary to respond to local plan revisions and hazard mitigation concerns. In particular, within planned growth areas (see map) ensure proper erosion control and stormwater management facilities in new subdivisions and other new developments.
- Maintain active participation in the National Flood Insurance Program (NFIP) by educating elected officials, staff, and community members on the opportunities and constraints associated with NFIP participation; consistently administering and enforcing floodplain regulations; and keeping floodplain regulations up to minimum federal and state standards as they may change over time.

Village of Bloomington Map

VILLAGE OF BLUE RIVER

The Village of Blue River is located at the base of the bluffs along the Wisconsin River, adjacent the Lower Wisconsin River State Wildlife Area. STH 133 is the major transportation facility through Blue River. The Town of Watterstown is adjacent to the Village. Its 2011 estimated population is 435 persons. Population projections prepared by the Department of Administration expect the Village’s population to modestly decrease at a rate of 0.2 percent between 2000 and 2030, losing one resident.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding		Summer, 1950	Flooding through the Village and the river valley. A bull was washed from the Castle Rock area to a road south of Blue River Park. The bull suffered cuts and bruising but survived.
	Brown Spring Creek at CTH T	5 or 6/1947 or 1948	Creek overflowed in the fields and streets of the Village. Boats had to be used to access properties.
Severe Thunderstorms		5/16/1999	54 mph winds caused property damage. Spotters and law enforcement officials reported wind gusts of 60-65 mph toppling trees and power lines. <i>NWS</i>
		6/20/1998	1.25-inch hail caused property and crop damage. A cluster of storms hit southwest Wisconsin with damaging wind gusts and large hail. Large trees were toppled and farm buildings sustained minor damage. <i>NWS</i>
		6/18/1998	53 mph winds caused property and crop damage. <i>NWS</i>
		1994	Trees damaged and electrical blackouts.
Winter Storms		1980s	A severe ice storm toppled trees and power lines and dropped branches. Power outages and debris issues continued for several days.
Drought		Summer, 2003	Crops, fields and yards were damaged.
Insect Infestation		Summer, 2003	Army worms infested fields east of Blue River bordering Highway 133. They ate corn root systems, resulting in poor yields for farmers.
		Late 1980s	Armyworms damaged corn and hay fields east of Blue River bordering Highway 133.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- There are several mobile homes throughout the community. The community building is the only storm shelter and it is only unlocked during business hours.
- The intersections of Grant and Jay Streets and Exchange and Jay Streets are often flooded by stormwater.
- The HAZUS-MH analysis suggests that the Blue River Fire Station may be subject to flooding due to its location in the floodplain.

- In this part of the County, DNR requires a burning permit anytime the ground is not snow covered during the months of January, February, March, April and May.

Local Action Recommendation

- Work with GCEM and UW Extension on local official and staff education on floodplain locations and associated zoning controls within floodplain areas. Generally, new housing may not be constructed in the floodplain (see map).
- Prevent additional development in the floodplain and proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Consider installing a back-up generator to help manage electrical interruptions with the municipal water system.
- Explore options to protect the Blue River Fire Station from future flooding.
- Work with private property owners to improve stormwater management in problem areas.
- Help prevent forest and wildland fires by:
 - Making residents aware that a burn permit may be required by the DNR between January and May.
 - Ensuring the Fire Department is prepared and equipped to respond to this type of hazard.
 - Encouraging fire safe “clear zones” around all homes that are free of trees and brush.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s—the Village of Blue River adopted its plan in 2009—few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.
- Update local land use regulations including zoning, land division and floodplain ordinances as necessary to respond to local plan revisions and hazard mitigation concerns. In particular, within planned growth areas (see map) ensure proper erosion control and stormwater management facilities in new subdivisions and other new developments.
- Maintain active participation in the National Flood Insurance Program (NFIP) by educating elected officials, staff, and community members on the opportunities and constraints associated with NFIP participation; consistently administering and enforcing floodplain regulations; and keeping floodplain regulations up to minimum federal and state standards as they may change over time.

Village of Blue River Map

VILLAGE OF CASSVILLE

The Village of Cassville is located at the base of the bluffs along the Mississippi River in southwest Grant County. The Cassville Ferry, which was put into service in 1912, transports people across the Mississippi River into Iowa. Flood stage along the river at Cassville is 18 feet. Its 2011 estimated population is 946. The Department of Administration expects Cassville to lose population between 2000 and 2030 at the rate of 15 percent, which equates to 164 residents.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding		3/1/2012 (and most rain events)	River flooding entering residential area and school through storm sewer inlets under railroad tracks.
		5/1-18/2001	Mississippi River flooding. The river crested in April and remained above flood stage with continued flooding through mid-May. High water levels caused damage to homes and businesses, especially in Prairie du Chien and south through Grant County. Due to the extensive damage caused by floodwater, six counties, including Grant County received federal disaster relief funds. NWS Several basements were flooded and furnaces damaged. Sanitary sewer backed up throughout the village. Significant damage to Jack Oak Road Motel and the Eagle's Roost.
		4/10-30/2001	Heavy rains combined with snowmelt run-off caused the Mississippi River to reach near record levels. On April 18th, the river crested at 16.4 feet in La Crosse, marking the 3rd highest flood on record. Hardest hit was the Prairie du Chien area and south through Grant County, where floodwaters did considerable damage to businesses and homes. This flood resulted in six counties, including Grant to be eligible for federal disaster relief funds. Water levels began dropping during the latter part of the month, but remained above flood stage through early May. <i>NWS</i>
		7/1998	Heavy rains caused damage that resulted in wind-generated debris, the use of security and search patrols, replacement of flag brackets and several storm sewer catch basins that eroded away and repairs to the ferry landing.
		4/17/1997	Mississippi River level rose from 19.92 to 20.12 feet in 24 hours. Volunteers operated pumps in an effort to keep flooding from local basements and businesses. Riverfront Park was totally covered with water. <i>Grant County Herald</i>
		4/3-21/1997	Several homes and businesses were damaged when the Mississippi River reached its 3rd highest flood level on record. A crest of 15 feet occurred in La Crosse, closing roads and disrupting barge and rail traffic. Six counties were affected. <i>NWS</i>

Disaster	Location	Date	Descriptions
		1993	Water in basements of homes along river. Some furnaces were damaged. The Car Ferry was closed to operations due to high water and debris in the water. The sanitary sewer backs up. Funds were raised for debris clearance from a channel that runs throughout the village and in the public park. Pavement was washed out in areas, culvert on Arthur St. was replaced. Rip rap near the beach was replaced and emergency pumping was necessary.
		1969	Water in most basements, sanitary sewers backed up and some furnaces damaged. Stan’s Landing was completely flooded causing a wall to collapse. <i>Grant Co. Herald</i>
		1967	Mississippi River above flood stage for 13 days. <i>Grant Co. Herald</i>
		1965	Mississippi River crested at 24.1 feet on April 24th and remained above flood stage for 19 days. Approximately 67 families were evacuated and thousands of dollars in damages were done to businesses and homes. Most basements were flooded, some furnaces damaged and storm sewers throughout the village were backed up. There were no serious injuries or loss of life and no looting was reported. Dozens of pumps ran the duration of the flood. The Nelson Dewey generating station (then the Dairyland Co-op Power Plant) used barges to protect the plant from rising floodwaters. E.J. Stoneman Station was protected by a sandbag and dike system. Stonefield, a State historical site, was completely flooded. Additional law enforcement from the Grant County Sheriff’s Department, Platteville, Richland Center, Lancaster and Vernon County and approximately 1000 volunteers assisted. The Red Cross provided of the food and clean-up kits. <i>The Cassville American, 4/29/1965</i>
	Mississippi River	1880, 1951, 1952, 1958	Mississippi River at 20.2 feet. <i>Grant Co. Herald</i>
Flash-flooding		5/22-23/2004	Park trees and several piers were damaged with the rise of the Mississippi River. The City decided not to apply for FEMA funding.
	Bluff Street and Brewery Creek	6/4/2002	3.5-5 inches of rain caused flash-flooding. Furnace and Brewery Creeks in the northwest part of the Town were choked with debris. 25 homes had to be evacuated, eight of which incurred significant damage. Cars were reported as floating in 2-3 feet of water. <i>NWS</i> West Bluff Street storm and sanitary sewer systems were plugged. The municipal pool filled with mud and the pumps had to be replaced prior to reopening. Several liquid propane tanks washed away. Foundations of several homes caved in

Disaster	Location	Date	Descriptions
			and residents were relocated for several days to several months. Only one home in this area had flood insurance. Several of the residents were elderly and required help from volunteers with debris removal and sanitation efforts as much of the mud and debris had come from a barnyard on the hill above the flood zone. (Similar to the 7/1947 flooding.)
	Bluff Street	5/7/1947	Mud and debris in basements, streets and at the creamery.
Severe Thunderstorms		1996 or 1997	All over the village, trees were blown down. Power outages caused by downed lines occurred throughout the village. Several homes had severe roof damage and one home on Jack Oak Road was destroyed.
		7/22/1962	Hail damage to oats and other small grains. <i>Grant County Herald</i>
Tornado		1940	A tornado destroyed a house on Main Street.
Hazardous Material Incident	Near Nelson Dewey Power Plant	4/30/1989	Power was lost due to a train derailment. The Fire Department was called to spray water on a leaking tanker containing 11,000 gallons of molten sulfur. There are several residences in the area and a restaurant near the derailment site and there were no evacuations. The derailment caused damage to equipment and the tracks. <i>Telegraph Herald</i>
		8/20/1980	Derailment caused damage to the village snowplow and to Jack Oak and Prime Streets.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- Several properties in the Town are susceptible to flash-flooding.
- Storm sewer and sanitary sewer replacements in the Village are ongoing. Gate valves were installed on Iowa and Wisconsin Streets to stop back flow from the river.
- There is one privately owned trailer park located in an area in the Village often flooded by the Mississippi River. The park contains five mobile homes, which house approximately 8-10 residents. There is no storm shelter at this park.
- GCEM helped elevate a structure in the Village in 2005.
- The Village’s main water well, wastewater treatment plant and a coal-fired power plant (which has hazardous materials) are located in the floodplain.
- The Village of Cassville Fire Department building is undersized, leaving no space for storage of additional equipment.

Local Action Recommendation

- Work with home owners to add wastewater back flow devices in flood affected areas.
- Install a flood gate and pump to address recurring flooding problems at railroad tracks south of Cassville High School along STH 133.
- Prevent additional development in the floodplain and proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.

- Consider construction of a community storm shelter, particularly for mobile home park residents. Coordinate with the owners of the mobile home park to identify a temporary storm shelter until one can be built.
- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- Work with private property owners to improve stormwater management in problem areas.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s—the Village of Cassville adopted its plan in 2009—few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.
- Update local land use regulations including zoning, land division and floodplain ordinances as necessary to respond to local plan revisions and hazard mitigation concerns. In particular, within planned growth areas (see map) ensure proper erosion control and stormwater management facilities in new subdivisions and other new developments.
- Maintain active participation in the National Flood Insurance Program (NFIP) by educating elected officials, staff, and community members on the opportunities and constraints associated with NFIP participation; consistently administering and enforcing floodplain regulations; and keeping floodplain regulations up to minimum federal and state standards as they may change over time.

Village of Cassville Map - East

Village of Cassville Map - West

VILLAGE OF DICKEYVILLE

The Village of Dickeyville is located on a ridge in southwest Grant County. The Village serves as a local hub of activity for rural residents and Villagers alike. It was founded in 1841 and named after Charles Dickey. The Dickeyville Grotto is a well-known tourist destination featuring intricate stonework built by Father Mathias Wernerus between 1925 and 1931. With an estimated 1,060 people in 2011, it is the third most populous Village in the County. Dickeyville is expected to grow at a moderate pace of 12 percent or 122 new residents between 2000 and 2030.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Severe Thunderstorms		Summer 2009	Hail caused major damage to roofs and siding.
		9/11/2000	52 mph thunderstorm winds caused property damage. Spotters, amateur radio operators and law enforcement reported wind gusts of 60-65 mph as well as hail the size of dimes and quarters. The area from Platteville to Dickeyville was the hardest hit, where numerous trees and power lines were toppled, leaving hundreds of people without power for several hours. <i>NWS</i>
		5/11/2000	1 inch hail caused damage. <i>NWS</i>
		7/1951	A thunderstorm with heavy rain, hail and flooding affected a large portion of eastern Iowa, northern Illinois and southwest Wisconsin. Corn in the Dickeyville bottoms was washed out and heavy winds lifted the roof from the barn on the Ferdinand Ginter farm.
Tornado		6/1993	Tornado, not confirmed by the NWS, tore roofs from several houses, leveled sheds and blew-out windows. There was no warning from the NWS and the sirens were not sounded.
Winter Storms		2/1/2010	18 inches of snow during a two day storm event.
Straight Line Winds	Southern portion of the Village	Summer 2011	High winds caused damage to trees and property.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- The Village Clerk reports no known issues with flooding or stormwater run-off, as all past problem areas in the Village were recently repaired.
- High volumes of truck traffic on Highways 61 and 151 increase the possibility of a hazardous materials spill.
- The Fire Department’s main pumper is outdated.
- At times there are communication issues between the Village and emergency personnel.
- The possibility of a tanker rupture at the intersection of USH 61/STH 35 and North Main Street is of concern. Many thousands of vehicles pass through the Village at all times of day. Storm sewer system susceptibility and damage to nearby property is a concern.
- A few years ago the Village ran an emergency scenario that included many units from outside the Village. All that were involved thought it was a very eye opening experience.

Local Action Recommendation

- Enhance hazard warning system including purchasing two weather radios for the Community Center and the Wastewater Treatment Plant. Install a new siren when the new industrial area by the US 151 interchange develops.
- Improve coordination and communication among governments and emergency responders.
- Explore options to provide emergency water and power sources at the Fire Station and Wastewater Treatment Plant.
- Run trial emergency scenarios with units from outside the Village on a regular basis to promote better response in emergency situations.
- Promote “best management practices” for lawns to reduce water consumption.
- Consider replacing the main fire pumper and purchasing a second ambulance for the Fire Department.
- Proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- Work with private property owners to improve stormwater management in problem areas.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s—the Village of Dickeyville adopted its plan in 2009—few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.
- Update local land use regulations including zoning, land division and floodplain ordinances as necessary to respond to local plan revisions and hazard mitigation concerns. In particular, within planned growth areas (see map) ensure proper erosion control and stormwater management facilities in new subdivisions and other new developments.
- Maintain active participation in the National Flood Insurance Program (NFIP) by educating elected officials, staff, and community members on the opportunities and constraints associated with NFIP participation; consistently administering and enforcing floodplain regulations; and keeping floodplain regulations up to minimum federal and state standards as they may change over time.

Village of Dickeyville Map

VILLAGE OF HAZEL GREEN

The Village of Hazel Green was the first Village in the County. It was formed as part of a group of early settlements between Dubuque and Galena founded as mining towns in the 1820's and 1830's. It is located in the far southeastern part of the County on fairly high ground (elev. 250 feet) and surrounded by gently rolling agricultural land. STH 11 and STH 80 intersect in Hazel Green. Its 2011 estimated population was 1,242 persons. Based on historic population data, the Department of Administration expects the Village to lose 4 percent of its population, or 47 residents, between 2000 and 2030.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding	Wastewater Treatment Plant	7/20-7/24 2010	Heavy rains resulted in high velocity water flow. The sanitary lift station at 1205 Oak Street was flooded in both pits.
	Sewer Plant Road	2000	Stormwater run-off caused high flow in the storm sewer system. Washouts occurred on 22 nd Street west of Oak Street and east of Church Street and 14 th Street east of Birch Street. FEMA funds were used to repair 22 nd Street west of Oak Street (same drainage chute as damaged in 1993 flood) and to replace aggregate material to stop erosion on 22 nd Street east of Church Street and 14 th Street east of Birch Street.
	22nd Street, west of Oak Street	1993	Run-off washed out the drainage area. FEMA funds reimbursed the Village for the cost of emergency pumping, but not for erosion in the drainage ditch at Oak and 22 nd Streets because it was under construction at the time and therefore not eligible for FEMA funding.
Flash-Flooding		5/22-23/2004	The access road to the wastewater treatment plant sustained significant damage. Although within the Village limits, this street lies in Lafayette County, which was not approved for public assistance, so the Village must fund repairs. For the same reason, the Village was not approved for 404 Mitigation funds.
	Sewer Plant Road	5/15/1998 and 2000	Flash-flooding occurred on Sewer Plant Road, southeast of 14th Street.
Severe Thunderstorms		5/15/1998	Thunderstorm winds caused property and crop damage. 60-70 mph winds toppled trees and power lines. <i>NWS</i>
		1873, 1874, 1875	Several damaging windstorms.
Tornado	Crawford Lane from CTH W, South	5/1999	Tornado and flash-flooding from stormwater run-off. Crawford Lane lies in Lafayette County but is within the Village limits of Hazel Green.

Disaster	Location	Date	Descriptions
		3/10/1876	Tornado killed nine people and injured 50. A solid mass of heavy rubbish moved east -northeast across Hazel Green, cutting a destruction path two blocks wide, carrying parts of a church steeple more than three miles and destroying a large part of the town. <i>Galena Gazette</i>
Hazardous Material Incident		1873-1875 (exact date unknown)	HAZMAT explosion, nitroglycerin.
Winter Storms		1/31-2/3 2011	Record snowfall in the Village.
		1976	An ice storm caused minor electrical damage throughout the village.
Disease		1873-1875 (exact date unknown)	Plague of scarlet fever.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- Drainage area on East 23rd Street is an issue. Run-off from Boston and Chicago Streets is channeled to Detroit Street then to the East 23rd Street drainage area. This additional flow may exacerbate existing issues.
- Drainage area on West 22nd Street has problems.
- Flooding on Crawford Lane; Crawford Lane lies in Lafayette County, but is within the Village limits of Hazel Green.
- 14th Street is without storm sewers, curbs and gutters and has potential for drainage problems.
- No storm sewer on Sewer Plant Road poses potential for flooding.
- There are two privately owned mobile home parks in the Village, totaling fourteen units and housing approximately twenty-seven residents. It is doubtful that the mobile homes have tie-downs and neither park has a storm shelter.
- The west lift-station site is of concern and the Village wastewater treatment plant is in the floodplain.
- The overhead power system is very sensitive to storms. None of the buildings in the Village has back up power.
- A natural gas line runs through the Village and a liquid propane line runs through the Town, just south of the Village.
- FEMA’s County jurisdiction-based disaster relief system causes issues because the Village limits extend into Lafayette County. Damages incurred on roads in this area ineligible to receive disaster relief funds from FEMA, when only directed to Grant County.
- High volumes of truck traffic on Highways 11 and 80 and CTH W increase the possibility of a hazardous materials spill.

Local Action Recommendation

- Initiate planning and fund procurement for stormwater system upgrades and possible relocation of the wastewater treatment plant out of the floodplain, or better flood proofing.
- Proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.

- Consider construction of a community storm shelter, particularly for mobile home park residents and industrial park employees. Coordinate with the owners of the mobile home parks to identify a temporary storm shelter until one can be built.
- Identify stormwater management issues along roadways and make repairs as funds are available.
- Work with private property owners to improve stormwater management in problem areas.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s—the Village of Hazel Green adopted its plan in 2009—few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.
- Update local land use regulations including zoning, land division and floodplain ordinances as necessary to respond to local plan revisions and hazard mitigation concerns. In particular, within planned growth areas (see map) ensure proper erosion control and stormwater management facilities in new subdivisions and other new developments.
- Maintain active participation in the National Flood Insurance Program (NFIP) by educating elected officials, staff, and community members on the opportunities and constraints associated with NFIP participation; consistently administering and enforcing floodplain regulations; and keeping floodplain regulations up to minimum federal and state standards as they may change over time.

Village of Hazel Green Map

VILLAGE OF LIVINGSTON

The Village of Livingston is in east central Grant County along the Iowa County border. It is situated at the intersection of STH 80 and CTH E, adjacent to the Town of Clifton. The Village maintains a strong connection to its rural heritage. The 2011 population estimate is 657. The Village is expected to slowly lose population at a rate of 0.5 percent between 2000 and 2030, a loss of 3 residents during that period.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flash-Flooding		August 2008	The village experienced heavy rain in a short time causing up rooted trees, flooded basements, problems with the storm sewers and municipal sewer system.
		5/22-23/2004	Streets were damaged and/or washed out.
Severe Thunderstorms		7/1998	Wind-generated debris on public property was removed. Sections of curb, gutter and sidewalk were damaged when trees were uprooted by the wind. Damage also occurred when rainwater leaked into storage areas in the library, damaging a quantity of books.
		6/19/1998	65 mph thunderstorm winds caused property and crop damage. Law enforcement officials reported winds of 70-80 mph, toppling trees and power lines and blowing the roof off a house and a business. <i>NWS</i>
Winter Storms		February 2011	Heavy snow and high winds.
Tornado		6/19/1998	A tornado was reported, but was not confirmed by <i>NWS</i> .
	Trelay Farms	4/4/1992	<i>NWS</i> reported a tornado. No damage information is available.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- The Village has many places without curbs and/or gutters, most importantly a stretch along CTH E, which exacerbates the flooding of the streets. The Village received a grant for installation of curb and gutter several years ago, but could not come up with matching funds and had to turn the grant down.
- The Village has had issues with high winds and storm damage. There are no estimates or specific examples of damage.
- During periods of heavy rain, Barber and Watson Streets have standing water; and the area from Woodward to Barber Street often floods.
- High volumes of truck traffic on Highway 80 increase the possibility of a hazardous materials spill.

Local Action Recommendation

- Initiate planning and fund procurement (grant and local match) for installation of curb and gutter.
- Work with private property owners to improve stormwater management in problem areas.
- Proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations.

A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s—the Village of Livingston adopted its plan in 2004—few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

- Update local land use regulations including zoning, land division and floodplain ordinances as necessary to respond to local plan revisions and hazard mitigation concerns. In particular, within planned growth areas (see map) ensure proper erosion control and stormwater management facilities in new subdivisions and other new developments.
- Maintain active participation in the National Flood Insurance Program (NFIP) by educating elected officials, staff, and community members on the opportunities and constraints associated with NFIP participation; consistently administering and enforcing floodplain regulations; and keeping floodplain regulations up to minimum federal and state standards as they may change over time.

Village of Livingston Map

VILLAGE OF MONTFORT

The Village of Montfort is located in east central Grant County, adjacent to the Town of Wingville and the Iowa County border. It is an agricultural area, situated on high ground. Montfort was settled in 1827 and was originally a fort during the Black Hawk War. In 2011 the population is estimated to be 621. Montfort is expected to grow at a rate of 12 percent between 2000 and 2030, representing an addition of 70 residents.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flash-Flooding		5/22-23/2004	Damages required reinstallation of the drainage system.
Severe Thunderstorms		5/8/2000	52 mph winds caused property damage. Law enforcement reported gusts of up to 60 mph and toppled power poles and trees. Winds caused minor damage to several businesses along Highway 18.
		6/18/1998	57 mph winds caused property damage (primarily damage to siding and roofs). <i>NWS</i>
		8/1994	Hail caused major property damage.
		7/1991	Wind and hail caused moderate property damage.
		7/1990	Severe storms caused culvert and roadway damage.
		6/16/1973	A lightning strike burned Farm Service office to the ground.
		1/1970	An antiquated wood water tower collapsed due to strong winds. 60,000 gallons of water was released onto the Village's streets. Debris damaged Eastman and Cartwright Lumber Co. and a garage.
Tornado		1885	Historically referred to as a "cyclone."
Winter Storms		3/1974	An ice storm downed power lines, causing a 3-day power outage and extensive property damage.
Subsidence	South Fountain Street	1978	A mining air-shaft became exposed. It was filled with two dump trucks full of dirt. Bushes were planted to keep people off the area.
	Park Street	1970s	A cave-in was filled with dirt and rock and covered with concrete.
	West Main Street	1960s	A cave-in was filled with dirt and rock and covered with concrete.
	South Fountain Street	1940s and 1996	Two cave-ins occurred at the same residence; both were filled with large amounts of dirt.
	East Main Street	Mid 1930s	A team of horses fell into a sink-hole.
Disease		6/1850	Cholera led to many deaths that left the village deserted and a small pox epidemic spread to five counties.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- Stormwater run-off after moderate or heavy rains causes erosion of gravel and some blacktop. Debris then clogs and backs-up drainage ditches—two problem locations are located in Iowa County, but within the Village of Montfort.
- High volumes of truck traffic on Highways 18 and 80 increase the possibility of a hazardous materials spill.

Local Action Recommendations

- Consider purchasing a second ambulance for the Fire Department.
- Initiate planning and fund procurement for stormwater management system upgrades.
- Work with private property owners to improve stormwater management in problem areas.
- Work with the Grant County Highway Department to identify stormwater management issues along roadways and make repairs as funds are available.
- Identify areas with risk of subsidence (see map in Chapter 3) to best inform the public of potentially hazardous locations.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s—the Village of Montfort adopted its plan in 2009—few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.
- Update local land use regulations including zoning, land division and floodplain ordinances as necessary to respond to local plan revisions and hazard mitigation concerns. In particular, within planned growth areas (see map) ensure proper erosion control and stormwater management facilities in new subdivisions and other new developments.
- Maintain active participation in the National Flood Insurance Program (NFIP) by educating elected officials, staff, and community members on the opportunities and constraints associated with NFIP participation; consistently administering and enforcing floodplain regulations; and keeping floodplain regulations up to minimum federal and state standards as they may change over time.

Village of Montfort Map

VILLAGE OF MOUNT HOPE

The Village of Mount Hope is located on Military Ridge, just south of USH 18/STH 133 in northwest Grant County. The Village was platted and named in 1836. The Village had an estimated population of 227 persons in 2011. Mount Hope’s population is projected to gradually decline at a rate of 8 percent between 2000 and 2030, which equates to a loss of 14 residents.

The Village of Mount Hope did not participate in the public outreach component of the planning process. Emergency Management obtained the following information from existing files and the local library.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flash-Flooding		5/22-23/2004	Part of the new water tower project was damaged, there was also gravel washouts.
Severe Thunderstorms		9/7/2001	53 mph thunderstorm winds caused property and crop damage. Winds toppled trees and power lines.
		5/31/1998	67 mph thunderstorm winds caused property and crop damage. Winds gusted to nearly 80 mph, toppling trees and power lines and damaging several farms. Roofs were blown off homes and a tree was driven through the side of a house. <i>NWS</i>
		1885	Lightning struck a stone school originally constructed in 1867.
Winter Storms		1959	No additional information.
Earthquake		4/3/1974	A magnitude 4 earthquake, centered in southern Illinois was felt within the Village limits.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- The Village of Mount Hope Fire Department building is antiquated and undersized, leaving no space for storage of additional equipment. The Department is currently looking for grants to finance an addition.

Local Action Recommendations

- Initiate planning and fund procurement for the expansion of the local Fire Department building.
- Identify stormwater management issues along roadways and make repairs as funds are available.
- Work with private property owners to improve stormwater management in problem areas and explore funding opportunities to establish a stormwater management system.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s—the Village of Mount

Hope adopted its plan in 2009—few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

- Update local land use regulations including zoning, land division and floodplain ordinances as necessary to respond to local plan revisions and hazard mitigation concerns. In particular, within planned growth areas (see map) ensure proper erosion control and stormwater management facilities in new subdivisions and other new developments.
- Consider participation in the National Flood Insurance Program (NFIP) to allow property owners in the community to obtain flood insurance and to help protect against flood damage.

Village of Mount Hope Map

VILLAGE OF MUSCODA

The Village of Muscoda is located in northeast Grant County, along the Wisconsin River, where Grant County meets Iowa and Richland Counties. The Village was surveyed and platted in 1850 and incorporated in 1894. It had an estimated population of 1,245 persons in 2011. Muscoda’s population is projected to decline between 2000 and 2030 at a rate of 1.6 percent, which equates a loss of 22 residents.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding		Winter 2001	According to the clerk-treasurer, flooding in the residential area at Beech and 2 nd Streets often occurs with rainfall or heavy snowmelt.
		6/1/2000	Thunderstorms produced 3-6 inches of rain with localized amounts of over 7 inches. Numerous roads were closed due to high water and one vehicle was swept away when the driver attempted to cross a foot of moving water. Vernon, Crawford, Grant and Richland Counties were declared federal disaster areas. <i>NWS</i>
		3/30/1998	3 inches of rain in 2 hours caused mudslides and small streams to overflow their banks. A charter bus carrying the University of Wisconsin Band sustained minor damage when it hit a mudslide on Highway 60 near Muscoda. <i>NWS</i>
		1929	High water delayed the construction of bridge.
		1908	The Big Green River flooded.
Severe Thunderstorms		6/25/1998	1.75 inch hail caused property damage. <i>NWS</i>
Tornado		Unknown year	Wooden bridge built in 1868 was destroyed by a cyclone.
		8/1988	Severe windstorm/tornado.
Hazardous Materials Incident		8/6/1911	A fire destroyed the City building after oil stored in the building spontaneously combusted.
Winter Storms		Spring 1948	Bad storm.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- The Village is at an extremely high risk of forest fires due to dense growth of pine trees.
- The two mobile home parks and the industrial park do not have storm shelters. There are approximately 100 people employed at the industrial park. Rux’s Mobile Home Court east of the Industrial Park contains 32 units and houses between 75 and 85 people. (Although located in Iowa County, the mobile home park is within the Village limits.) Evergreen Trailer Court is located on Beech Street, between 6th and 7th Streets, contains 24 units and houses between 50 and 60 people.
- There are some drainage and stormwater run-off issues at the intersection of Warehouse and 2nd Streets and on Industrial Drive in the Industrial Park.

- In this part of the County, DNR requires a burning permit anytime the ground is not snow covered during the months of January, February, March, April and May.
- High volumes of truck traffic on Highways 80 and 133 increase the possibility of a hazardous materials spill.

Local Action Recommendations

- Help prevent forest and wildland fires by:
 - Making residents aware that a burn permit may be required by the DNR between January and May.
 - Ensuring the Fire Department is prepared and equipped to respond to this type of hazard.
 - Encouraging fire safe “clear zones” around all homes that are free of trees and brush.
- Consider construction of a community storm shelter, particularly for mobile home park residents and industrial park employees. Coordinate with the owners of the mobile home parks to identify a temporary storm shelter until one can be built.
- Work with private property owners to improve stormwater management in problem areas.
- Identify stormwater management issues along roadways and make repairs as funds are available.
- Prevent additional development in the floodplain and proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s—the Village of Muscodia adopted its plan in 2009—few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.
- Update local land use regulations including zoning, land division and floodplain ordinances as necessary to respond to local plan revisions and hazard mitigation concerns. In particular, within planned growth areas (see map) ensure proper erosion control and stormwater management facilities in new subdivisions and other new developments.
- Maintain active participation in the National Flood Insurance Program (NFIP) by educating elected officials, staff, and community members on the opportunities and constraints associated with NFIP participation; consistently administering and enforcing floodplain regulations; and keeping floodplain regulations up to minimum federal and state standards as they may change over time.

Village of Muscoda Map

VILLAGE OF PATCH GROVE

Incorporated in 1921, the Village of Patch Grove is located in northwest Grant County on Military Ridge, along STH 133/STH 35, south of USH 18. The Village had an estimated population of 198 persons in 2011. The Department of Administration expects Patch Grove to experience a loss of population between 2000 and 2030 based on historic data at the rate of 24 percent, or a loss of 40 people.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flash-Flooding		5/22-23/2004	Main and North Streets had dirt, debris and gravel washouts from the flooding.
Severe Thunderstorms		9/7/2001	53 mph winds caused property and crop damage. Winds toppled trees and power lines. <i>NWS</i>
		1910	St. John’s Catholic Church was struck by lightning and burned to the ground.
Winter Storms		2/2/2011	Significant snow fall required extra resources to remove.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- There is not a storm shelter in the mobile home park, which contains 14 units and houses approximately 50 residents. It is uncertain whether the mobile homes have tie-downs.
- The Village Board and the GCEM report issues with stormwater during periods of heavy rain.
- High volumes of truck traffic on Highways 18 and 35 increase the possibility of a hazardous materials spill.
- The Village of Patch Grove Fire Department building is undersized, leaving no space for storage of additional equipment.

Local Action Recommendation

- Initiate planning and fund procurement for stormwater management system upgrades.
- Consider construction of a community storm shelter, particularly for mobile home park residents and industrial park employees. Coordinate with the owners of the mobile home park to identify a temporary storm shelter until one can be built.
- Identify stormwater management issues along roadways and make repairs as funds are available.
- Work with private property owners to improve stormwater management in problem areas.
- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s—the Village of Patch Grove adopted its plan in 2009—few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

- Update local land use regulations including zoning, land division and floodplain ordinances as necessary to respond to local plan revisions and hazard mitigation concerns. In particular, within planned growth areas (see map) ensure proper erosion control and stormwater management facilities in new subdivisions and other new developments.
- Maintain active participation in the National Flood Insurance Program (NFIP) by educating elected officials, staff, and community members on the opportunities and constraints associated with NFIP participation; consistently administering and enforcing floodplain regulations; and keeping floodplain regulations up to minimum federal and state standards as they may change over time.

Village of Patch Grove Map

VILLAGE OF POTOSI

The Village was incorporated in 1844 and was an early lead mining community. It is located near the Village of Tennyson, on a ridge just above a valley sloping towards the Mississippi River. The Village of Potosi had an estimated population of 684 persons in 2011. Potosi is expected to lose population between 2000 and 2030 at a rate of 10 percent, which equates a loss of 69 residents.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding	Tennyson Street	2011	Heavy rain and flooding washed out areas in front of residences on Tennyson Street.
	Lift Stations	2010 and 2011	Significant flooding. Two emergency dumps were needed at lift stations due to rain.
	North and South Main Streets	7/23/2010	Debris (rocks and trees) blocked roadways. Basements flooded, sewer lines damaged and culverts blocked. 4 th Street, White Street and Cross Street were washed out.
	North and South Main Streets	6/8/2008	Debris (rocks and trees) blocked roadways. Basements flooded, sewer lines damaged and culverts blocked. Plant Street was washed out.
		2007 and 2008	Significant flooding.
		6/16/2004	Several homes flooded from the street and a creek that runs through the Village. Debris exacerbated the flooding and damaged culverts.
	Point Road	Spring, 2001	Potosi Recreation Area boat ramp was cracked and heaved by flood waters.
		5/31/2000	6 inches of rain fell in a short time causing flash-flooding on North and South Main Streets, which resulted in basement flooding, bank erosion, sidewalk damage and washed gravel. FEMA funds were used for costs of dumpster rental; tuckpointing, cleaning and disinfecting, replacing the carpeting in City Hall and replacing the sidewalk on 10 th Street that broke up when the base materials were eroded away. This flood occurred while the Village was replacing sections of a storm sewer; sheet flow over the torn up street pushed debris into and clogged an adjacent stream. Numerous homes and businesses were also flooded.
Severe Thunderstorms		9/11/2000	55 mph winds caused property and crop damage.
		5/31/1998	65 mph winds caused property and crop damage. <i>NWS</i>
		5/29/1953	Tornado-like winds caused wide-spread tree damage and uprooting, television antennas were torn off roofs, roofs were blown off buildings, the chimney was torn from the Francis Reding home and entire structures were twisted out of shape. A smokehouse on the Milke property was tipped over and the chicken house on the Stoker farm was torn from its foundation. Immense trees on the Salnave property

			were torn out by the roots. <i>Grant County Herald Independent</i>
Winter Storms		2/2/2011	Streets were impassable. Excess amounts of snow had to be hauled away. Lots of ice requiring salt.

Comments

- The Village is situated between two bluffs. The Civilian Conservation Corps installed several earthen barriers to hold back stormwater (unknown date).
- In 2012, GCEM purchased and demolished two repetitive flood damage properties on South Main Street.
- Flash-flooding and stormwater run-off cause damage to, and debris buildup in, drainage systems. Riprap needs to be replaced north of Milke Drive. Debris clogging the drainage way along Highway 133 and along railroad bridges and has caused issues in the past. The Village periodically maintains the channelized drainage way up to Mineral Street; however, it is not clear who is responsible for maintenance south of that point. South of Mineral Street, the drainage is a natural channel that often causes flooding in low-lying areas.

Local Action Recommendation

- Conduct a comprehensive study of stormwater management issues in the Village, including reconstruction, dredging, or reinforcement of earthen dams; issues associated with the engineered channel along STH 133; exploration of how increased development in the higher end of the Village is affecting existing development elsewhere and future solutions; options to reduce velocity and quantity of flood water through the downtown area; solutions to areas prone to embankment failures; and other issues. Attempt to coordinate with a similar earthen dam maintenance effort advised within the Town of Muscoda. Implement the recommendations of this study, with use of state and federal grants wherever possible and working with private property owners and with highway departments.
- With the assistance of GCEM and DNR, continue to try to identify the entities that are responsible for maintenance of the drainage south of the engineered channel along STH 133. Once ownership is determined, establish a regular maintenance schedule including upstream care to not increase the amount of water within these areas.
- Limit development in flood prone areas and manage development in areas that could worsen flooding downstream.
- Prevent development in the floodplain and proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- Identify stormwater management issues and areas prone to embankment failure along roadways and make repairs as funds are available.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Consider acquiring an auxiliary generator at the East Street pumping station, which would provide water to residents in the case of a power outage.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s—the Village of Potosi

adopted its plan in 2003—few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

- Update local land use regulations including zoning, land division and floodplain ordinances as necessary to respond to local plan revisions and hazard mitigation concerns. In particular, within planned growth areas (see map) ensure proper erosion control and stormwater management facilities in new subdivisions and other new developments.
- Maintain active participation in the National Flood Insurance Program (NFIP) by educating elected officials, staff, and community members on the opportunities and constraints associated with NFIP participation; consistently administering and enforcing floodplain regulations; and keeping floodplain regulations up to minimum federal and state standards as they may change over time.

Village of Potosi Map

VILLAGE OF TENNYSON

The Village of Tennyson is located near the Village of Potosi, on a ridge just above a valley sloping towards the Mississippi River. The Village had an estimated population of 354 persons in 2011. The Department of Administration expects Tennyson to experience a population loss of 51 residents, or loss at the rate of 14 percent, between 2000 and 2030.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding	Tennyson Street	2011	Heavy rain and flooding washed out areas in front of residences on Tennyson Street
	Lift Stations	2010 and 2011	Two emergency dumps were needed at lift stations due to rain.
		5/2000	Heavy rains flooded the sewer plant and damaged roads. Some basements were also reported flooded, specifically 121 Tennyson Street (CTH O). CTH O at County Road was washed out. Most washed out areas have since been repaired and problem areas corrected.
Severe Thunderstorms		February 2011	Heavy/wet snow snapped power lines and stripped trees.
	Tennyson Heights/Crestview Drive	Summer 2011	Lightning struck power line and knocked out power.
		December 2011	Heavy/wet snow snapped power lines and stripped trees.
		July 2010	Hail damaged roofs, siding, vehicles and crops.
		8/20/2003	High winds caused damage to the Catholic and public school buildings. Falling trees damaged homes.
		1980s	High winds took the roof off the school.
			Lightning strike caused a garage door to open, letting wind and rain into the garage. Several homes sustained wind damage and damage from falling trees.
Embankment Failure	CTH O/Bunkerhill Street Church Street/Bunkerhill Street	2010	Excessive rain/flooding made 2 hillsides by the church give way.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- Stormwater run-off and drainage cause damage to roads.
- High volumes of truck traffic on Highways 61 and 133 increase the possibility of a hazardous materials spill.

Local Action Recommendation

- Initiate discussions with the Wisconsin Department of Transportation to mitigate the washout problems caused by the completed Highway 133 reconstruction project.
- Initiate planning and fund procurement for stormwater management system upgrades.
- Identify stormwater management issues along roadways and make repairs as funds are available.
- Work with private property owners to improve stormwater management in problem areas.
- Proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s—the Village of Tennyson adopted its plan in 2003— few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.
- Update local land use regulations including zoning, land division and floodplain ordinances as necessary to respond to local plan revisions and hazard mitigation concerns. In particular, within planned growth areas (see map) ensure proper erosion control and stormwater management facilities in new subdivisions and other new developments.
- Maintain active participation in the National Flood Insurance Program (NFIP) by educating elected officials, staff, and community members on the opportunities and constraints associated with NFIP participation; consistently administering and enforcing floodplain regulations; and keeping floodplain regulations up to minimum federal and state standards as they may change over time.

Village of Tennyson Map

VILLAGE OF WOODMAN

The Village of Woodman was incorporated in 1917. It is located right along the Wisconsin River, adjacent the Lower Wisconsin River State Wildlife Area, southwest of Boscobel. The Village of Woodman had an estimated population of 132 persons in 2011, making it the least populous jurisdiction in the County. Based on historic population data, the Department of Administration expects the Village to experience a moderate population loss between 2000 and 2030 at the rate of 26 percent, which is equivalent to 25 residents.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Severe Thunderstorms		2002	Winds damaged trees and caused branches and trees to fall onto houses along Main Street.
Tornado		1947	Wind toppled trees and power poles and caused damage to buildings at the south end of Village.
Landslide		1979 (estimated date)	Landslides occurred on a hillside southeast of Village following a heavy rain.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- All properties have their own wells and septic systems and most of the homes have basements. However, there is no storm shelter for the residents of mobile homes in the Village.
- There is no cellular coverage in the Village. Telecommunication tower construction is limited near the Lower Wisconsin Riverway state-administered land use controls and aesthetic standards.
- Spencer Street between Lamus and Smith Streets, the center of the block on Smith Street and the intersection of Lockwood and Smith Streets has stormwater management issues. A lack of curbs and gutters throughout the Village contributes to stormwater management problems.
- The Village frequently experiences power surges and periods of low voltage.
- High volumes of truck traffic on Highway 133 and train traffic on the Wisconsin and Calumet Railroads increase the possibility of a hazardous materials spill.
- In this part of the County, DNR requires a burning permit anytime the ground is not snow covered during the months of January, February, March, April and May.

Local Action Recommendation

- Prevent additional development in the floodplain and proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- Identify stormwater management issues along roadways and make repairs as funds are available.
- Work with private property owners to improve stormwater management in problem areas.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Help prevent forest and wildland fires by:
 - Making residents aware that a burn permit may be required by the DNR between January and May.
 - Ensuring the Fire Department is prepared and equipped to respond to this type of hazard.
 - Encouraging fire safe “clear zones” around all homes that are free of trees and brush.

- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s—the Village of Woodman adopted its plan in 2010—few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.
- Update local land use regulations including zoning, land division and floodplain ordinances as necessary to respond to local plan revisions and hazard mitigation concerns. In particular, within planned growth areas (see map) ensure proper erosion control and stormwater management facilities in new subdivisions and other new developments.
- Maintain active participation in the National Flood Insurance Program (NFIP) by educating elected officials, staff, and community members on the opportunities and constraints associated with NFIP participation; consistently administering and enforcing floodplain regulations; and keeping floodplain regulations up to minimum federal and state standards as they may change over time.

Village of Woodman Map

TOWN OF BEETOWN

The Town of Beetown, founded in 1827, is situated south of Military Ridge in west central Grant County. Comprising over 48 square miles, the Town is the second largest jurisdiction in the County in terms of land area. The Town is primarily agricultural and has no incorporated communities. The Town is characterized by the Grant River and at least six of its tributaries, including the Hackett Branch, Blake Fork, the Little Grant, Pigeon Creek, Beetown Branch and Muskellunge Creek. Floodplain forests dominate the land adjacent to these waterways and a rolling topography is typical in the rest of the Town. Lead ore was an important commodity in Beetown’s early history. The Town’s estimated 2011 population is 780 people. The Town’s population is expected to grow substantially between 2000 and 2030, at a rate of 39 percent, adding about 287 people by 2030.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding		2008	Rainfall and river flooding caused washout on Porter Hill Road and embankment failure on Porter Bridge Road.
		2006	Rainfall caused washout on University Farm Road.
		5/22-23 and 6/16/2004	Flash-flooding destroyed one road and significantly damaged others. Major embankment failure was reported on Slabtown Road. The Grant River bottoms sustained significant damage. The June 16 th storm left ruts 3 feet deep on Bee Lane.
		7/6/2002	Rainfall of 3-6 inches caused localized flooding, resulting property and crop damage. Law enforcement reported a propane tank* floating in 2-3 feet of water near Beetown. <i>NWS</i> <i>*NWS data Corrected by GCEM</i>
		6/4/2002	Run-off from flash-flooding caused the Grant River to flood farm fields. <i>NWS</i>
		7/1998	Flash-flooding resulted in gravel and rip rap being swept away along Grant River.
	Porter Hill and Porter Bridge Road	1993	Flash-flooding resulted in the loss of gravel from roads.
	Blake Fork, Schildgen Lane	1991	Over 6 inches of rain caused significant flash-flooding and tore out the bridge on Schildgen Lane just a few hundred feet from where it joined the Grant River. The new bridge was built higher with a bigger outlet to prevent future washouts.
	Slabtown and Schildgen Roads	1991	Flash-flooding resulted in a bridge washout.

Disaster	Location	Date	Descriptions
		1851	Flash-flood nearly wiped out the town. Every building in the village had water knee-deep. Several businesses, including a warehouse, livery stable and harness shop were swept away. Many opted to move rather than rebuild. The community has essentially stopped growing since this event.
	University and Slabtown Roads	unknown	Flash-flooding caused a bridge to washout. A full description can be found in the narrative from Town Clerk John F. Patterson in the appendix.
Severe Thunderstorms		5/18/2000	1 inch hail caused crop damage. <i>NWS</i>
		5/17/2000	1 inch hail caused crop damage. <i>NWS</i>
		1974 and 1993	Almost every year there is localized damage from hail. There is no record of large-scale damage.
Tornado		1957 and 1993	F1 tornados occurred in 1957 and 1993, neither of which followed a defined path. Damages were minimal. (Community members think the 1957 event could have been in 1953.)
		1940	No documented record.
Winter Storms		3/1959	There were three heavy snows storms in March 1959. New equipment has been able to handle most subsequent storms.
		1940, 1948, 1973 and 1982	No documented record.
Drought		Periodically from 1938 – 1988 and 2003	The Town received moderate damage from droughts. 1983 and 1995 were the worst.
		1983 and 1988	Nearly 50 percent of crops were lost because of drought.
Extreme Temperatures		1974	The Town experienced frost damage in every month through July.
Disease		1850	Cholera outbreak

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- Beetown is highly vulnerable to flash-flooding. There are reports of flooding-related problems as far back as 1851. Before the 1930s, when soil conservation practices were introduced, floods were much worse as most of the surrounding crop land did not hold storm run-off. The four ravines, Pigeon Creek, Rattlesnake Creek, Marlow Branch and Hackett Branch of the Grant River, feed through an unincorporated settlement. The valley is less than 300 feet wide, in places and rains of 5-10 inches cause flooding. County highways that run down each ravine and lack of curbs and gutters in developed areas exacerbate the flooding problem. An eight mile section of the Grant River is notorious for flash-flooding.

- Although over half of Town roads are now hard surfaced, which has reduced road damage, flash-floods continue to strip gravel from unpaved roads. The five major bridges over the Grant River have bypass outlets for stormwater to prevent the bridges from breaking loose in a flood. Of these bridges, four are on Town roads and one is on STH 35-81.
- According to GCEM, 98 percent of the settled area in the Town is in the FEMA FIRM floodplain, which limits the types and locations of new developments and land uses. The Town believes a zoning ordinance that increases floodplain restrictions and additional floodplain management efforts developed through the 2000s comprehensive planning efforts should greatly reduce property loss.
- The Town is concerned that problems could become worse in the future as many soil conservation practices are being ignored and stormwater run-off is leaving surrounding cropland faster. Additionally, the introduction of soybeans as the primary crop may exacerbate flooding, as this crop does not absorb water quickly and roots are too shallow to hold top soil in the event of a severe rainfall. John Patterson, Town Clerk, reports that: “We have done as many things as we can to mitigate problems and yet a 15-inch rainfall or a 150 mph wind could negate all our precautions.”
- High volumes of truck traffic on Highway 81 increase the possibility of a hazardous materials spill.

Local Action Recommendations

- In partnership with the Town, the County should prevent additional development in the floodplain and proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Work with the County Planning and Zoning Department and the Southwest Wisconsin Regional Planning Commission to develop and implement a flood hazard mitigation overlay zoning district or other similar protections to identify building practices and land use patterns that will better withstand flood events.
- Consider construction of a community storm shelter, particularly for mobile home park residents. Coordinate with the owner of the mobile home park to identify a temporary storm shelter until one can be built.
- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- Work with the Grant County Highway Department to identify stormwater management issues and identify areas prone to embankment failure along roadways and make repairs as funds are available.
- Work with private property owners to improve stormwater management in problem areas.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Work with the local cellular service provider to establish additional cell towers in the area.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s, few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

Town of Beetown Map

TOWN OF BLOOMINGTON

The Town of Bloomington is a community of approximately 350 people in west central Grant County, according to 2011 population estimates. The entire western edge of the Town borders the Mississippi River. The 40 square miles that comprise the area are predominately agricultural and marked by steep, wooded bluffs along the Mississippi River and Sandy Creek in the northwest corner of the Town. Limestone and sandstone bluffs along the Mississippi River are prone to rock fall. Rattlesnake Creek and its small tributaries comprise the dominant water features in the central part of the Town. The Department of Administration is projecting 16 percent population decline or a loss of 63 residents for the Town between 2000 and 2030.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding	Dugway Road	4/17/1997	Flooding caused water to go over Dugway Road. <i>Herald Independent</i>
		6/1974	Flooding caused damage across entire Town.
Flash-Flooding		2008	Flash-flooding caused road washouts on Sandy Road, Dugway Road, Cottonwood Road and Hickory Road.
		5/22-23/ and 6/16/2004	Flash-flooding caused road washouts. 50-75 loads of gravel were needed for repairs.
		8/2/2001	1-2 inches of rain fell in about an hour causing property damage near the Mississippi River. Trees were washed down hills near the Mississippi River. (Damage estimates are not available.) <i>NWS</i>
		4-8/1993	Widespread damage to roads followed a series of record rainstorms. FEMA monies were received to repair gravel washouts on Dugway, Holly, Sandy, Texas, Cottonwood, Maple, Maine, Aspen and Holley Roads and Mississippi Lane.
		6/1991	Flash-flooding caused widespread damage to road banks and culverts.
		6/1978	Flash-flooding caused widespread damage to roads and culverts.
Severe Thunderstorms		8/22/2001	A man struck and killed by lightning in a cornfield.
Tornado		5/1985	A tornado caused damage to trees and buildings in the northwest corner of Town.
		6/25/1957	A tornado caused localized damage.
Drought		1988	A drought caused severe crop damage.
		1983	A drought caused moderate crop damage.
Extreme Temperatures		7/1995	High temperatures and high humidity caused crop damage and the loss of some livestock.
		Spring and Fall, 1974	Frost damaged new crop plantings, significantly shortening the growing season.

Disaster	Location	Date	Descriptions
Insect Infestation		6-7/1992	An army worm infestation caused widespread crop damage, especially to hay and pasture lands.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- A 3-mile length of Dugway Road on the western border of the Town that is tucked between the river bluffs and the railroad tracks is plagued by landslides, fallen rocks and downed tree limbs.
- There is limited phone coverage within the Town.
- High volumes of truck traffic on Highways 35 and 133 and train traffic on the Burlington Northern-Santa Fe Railroad increase the possibility of a hazardous materials spill.

Local Action Recommendations

- Initiate planning and fund procurement to undertake road improvements to Dugway Road.
- In partnership with the Town, the County should prevent additional development in the floodplain and proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- Work with the Grant County Highway Department to identify stormwater management issues along roadways and areas prone to embankment failure and make repairs as funds are available.
- Work with private property owners to improve stormwater management in problem areas.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Work with the local cellular service provider to place additional cell towers in the area.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s, few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

Town of Bloomington Map

TOWN OF BOSCOBEL

The Town of Boscobel is located in northern Grant County along the Wisconsin River, bordering Crawford County. At just over eight square miles, it is the smallest Town in the County. The majority of the Town is part of the Department of Natural Resource’s *Lower Wisconsin River State Wildlife Area* and a large wetland complex adjacent to the Wisconsin River is a dominant characteristic of this wildlife area. A large portion of the Town is wooded, although there is agricultural land on the Town’s west side. The Town’s population was estimated at 374 persons in 2011. The population is estimated to decline at a rate of 7 percent between 2000 and 2030; a loss of 31 residents.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flash-Flooding	Sanders Creek and Crooked Creek at CTH MS	Spring, 2000	Flash folding caused several private bridge approaches to wash out.
Severe Thunderstorms	Oak Street Area	8/2003	Severe thunderstorm winds caused damage to trees, power lines and Oak Street area. <i>NWS</i>
		8/20/2003	Winds estimated as high as 80 mph toppled trees and downed power lines, causing property damage.
Winter Storms	CTH MS	Winter, 1976	Ice storms caused damage to power lines.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- There is inadequate stormwater management in the Town, which exacerbates flood damages.
- The mobile home park in the Town does not have storm shelters and the units do not have tie downs. Halls Trailer Court has six to eight units and houses approximately 20 residents.
- High volumes of truck traffic on Highways 61 and 133 and train traffic on the Wisconsin and Calumet Railroads increase the possibility of a hazardous materials spill.
- In this part of the County, DNR requires a burning permit anytime the ground is not snow covered during the months of January, February, March, April and May.

Local Action Recommendations

- Initiate planning and fund procurement for stormwater management system upgrades.
- In partnership with the Town, the County should prevent additional development in the floodplain and proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Consider construction of a community storm shelter, particularly for mobile home park residents. Coordinate with the owners of the mobile home park to identify a temporary storm shelter until one can be built.
- Help prevent forest and wildland fires by:
 - Making residents aware that a burn permit may be required by the DNR between January and May.
 - Ensuring the Fire Department is prepared and equipped to respond to this type of hazard.
 - Encouraging fire safe “clear zones” around all homes that are free of trees and brush.
- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- Work with the Grant County Highway Department to identify stormwater management issues along roadways and areas prone to embankment failure and make repairs as funds are available.

- Work with private property owners to improve stormwater management in problem areas.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Work with the local cellular service provider to improve coverage in the area.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s, few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

Town of Boscobel Map

TOWN OF CASSVILLE

The Town of Cassville is in southwestern Grant County. The Mississippi River runs the length of the Town’s western border. Although the Mississippi dominates the landscape of Cassville, smaller tributaries, such as Muddy Creek, Furnace Branch, Mill Branch and McCartney Branch are also important water features. The eastern portion of the Town is more conducive to farming than the steeper and more dramatic topography adjacent to the Mississippi River. Nelson Dewey State Park is a significant natural area with sweeping vistas of the Mississippi River and Clayton County, Iowa. The Dewey Heights Prairie is also a unique natural feature. The Stonefield Village, adjacent to the State Park, is a museum of agricultural history. The Town’s 2011 population was estimated to be 414. The Town is expected to lose population at a rate of 15 percent, or 73 residents, between 2000 and 2030.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding		Spring 2003 and others	Two weeks of flooding inundated Closing Dam Road. At Schleicher’s Landing, 7110 Closing Dam Road, the campground was inundated by floodwaters closing the campground for several weeks and causing damage. The 2003 flood closed the campground over Memorial Day weekend, causing financial losses for the owners.
		7/1993	Flooding damage closed Closing Dam Road.
Flash-Flooding	Far-Nuff Road	6/16/2004	Embankment failure on downhill side of road.
		6/4/2002	Nelson Dewey State Park and Stonefield Village Historical Site suffered significant property damage due to flash-flooding. Many houses outside of the Village that have private access bridges were damaged by debris and rushing water.
	Cadwell Road and Millstream Lane	N/A	Flash-flooding caused roads to wash out.
	Furnace Creek Road	N/A	Flash-flooding caused a basement to cave in.
Severe Thunderstorms		5/17/2000	1.75 inch hail damage. Ping-pong and golf ball size hail was observed by law enforcement. Numerous cars were damaged. NWS
Tornado		5/3/1954	A tornado, unconfirmed by NWS, destroyed the barn, a windmill and a brooder house at the Ray Eckstein farm, northeast of Cassville. It was reported that several other farms in this area were similarly damaged.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- The two mobile home park in the Town does not have a storm shelter and it is doubtful that the units have tie downs. The mobile home park at 10714 Highway 133 has approximately 38 units and houses approximately 100 people.
- Stonefield Village consistently floods when the Mississippi River floods. The museum is on the river side of the railroad tracks.
- Inappropriate agricultural practices contribute to flood damages.
- High volumes of truck traffic on Highways 81 and 133 and train traffic on the Burlington Northern-Santa Fe Railroad increase the possibility of a hazardous materials spill.

Local Action Recommendations

- In partnership with the Town, the County should prevent additional development in the floodplain and proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Consider construction of a community storm shelter, particularly for mobile home park residents. Coordinate with the owners of the mobile home park to identify a temporary storm shelter until one can be built.
- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- Work with the Grant County Highway Department to identify stormwater management issues along roadways and areas prone to embankment failure and make repairs as funds are available.
- Work with private property owners to improve stormwater management in problem areas.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s, few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

Town of Cassville Map

TOWN OF CASTLE ROCK

The Town of Castle Rock is located north of Military Ridge in eastern Grant County. The landscape is marked by numerous tributaries to the Wisconsin River, notably the Blue River, Fennimore Fork, Six-mile Branch and Big Spring Branch. Three major ridges; the Bohemian, Red Oak and Farmers; allow for sweeping views of the steep, wooded terrain and agricultural areas in the flatter areas adjacent to the waterways. The Town had a 2011 estimated population of 251 people. The Town is expected to slowing gain in population at a rate of 11.5 percent between 2000 and 2030, adding 36 new residents.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flash-Flooding		5/22-23/2004	Flooding caused standing water on Biba Road and a rockslide on Spring Valley Road. A fallen tree and debris had to be removed from Biba Road. Extensive grading was needed on Pine Tree Road. Wepking and Spring Valley Roads had significant gravel washouts. Spring Valley Road had a tube wash out that later needed to be replaced.
Severe Thunderstorms		7/1998	Heavy rain caused damage including road embankment failure on Hrubes, Johnsrude and Stanek Roads. Eroded materials were removed and replaced. Gravel and culverts also were replaced.
		7/1993	FEMA funds were used to replace damaged roadway surface on Everson Road, Shemak Road (two locations), Stanek Road (two locations), Cedar Rock Road, Biba Road, Pine Tree Road, Spring Valley Road and Johnsrude Road.
		7/1990	FEMA monies were used to remove debris from bridges on Pine Tree Road and two locations on Shemak Road. Culvert replacement and work had to be done at both of these locations also. Included was work on Spring Valley Road and Witek Road.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- In this part of the County, DNR requires a burning permit anytime the ground is not snow covered during the months of January, February, March, April and May.

Local Action Recommendations

- Help prevent forest and wildland fires by:
 - Making residents aware that a burn permit may be required by the DNR between January and May.
 - Ensuring the Muscoda and Fennimore Fire Departments are prepared and equipped to respond to this type of hazard.
 - Encouraging fire safe “clear zones” around all homes that are free of trees and brush.
- Identify and address roadways most susceptible to damage and initiate planning and fund procurement for stormwater management system upgrades and possible slope revegetation along these roads.
- In partnership with the Town, the County should prevent development in the floodplain and proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.

- Consider construction of a community storm shelter for mobile home park residents. Coordinate with the owners of the mobile home park to identify a temporary storm shelter until one can be built.
- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- Work with the Grant County Highway Department to identify areas prone to embankment failure and make repairs as funds are available.
- Work with private property owners to improve stormwater management in problem areas.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s, few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

Town of Castle Rock Map

TOWN OF CLIFTON

The Town of Clifton is located just south of Military Ridge on the east-central border of Grant County. Covering a land area of approximately 36 square miles, Clifton is predominately agricultural, although there are some forested areas adjacent to Martinville Creek, the Platte River and Crow Branch. The majority of the streams flow into two watersheds—the Platte River and Little Platte River watersheds. A very small portion of the Town is in the Upper West Branch Pecatonica watershed. The Town had an estimated 2011 population of 387. The Town is expected to grow at a rate of 17 percent between 2000 and 2030, adding about 51 people.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding		8/2010	Flooding damaged numerous Town roads.
		6/2008	Flooding damaged numerous Town roads.
		6/2000	County Line, New California, Lake, Hake School, Pine Knob, Mill Dam, Hopewell, Goldman Lane, Martinville, Hickory Grove, Crow Branch Roads were washed out and debris deposits were left following the flood.
		7/1998	Martinville, Rock Church, Hopewell, Mill Dam, Iceland and Old Hwy 80 were washed out and debris deposits were left following the flood.
		7/1993	FEMA funds were to remove debris from public roads and replace gravel. The culverts on Mill Dam Road and County Lane were damaged. Rip Rap had to be replaced and debris removed.
		6/1990	Hickory Grove, Crow Branch, Martinville, Rock Church, Mill Dam, Pine Knob Roads sustained flooding that caused gravel wash outs that were repaired with FEMA funds.
	Annaton Road	1950	Flood waters took out bridge.
Flash-Flooding		5/22-23/2004	Flash-flooding damaged all gravel roads. Mill Dam, Crow Branch and New California Roads sustained the most damage.
Severe Thunderstorms	Hickory Grove Road	1997	Straight-line winds and severe thunderstorms.
	USH 80 North	1994	Hail destroyed corn crops at Trelay and Bollant Farms.
	Rock Church Road	1978	Severe Thunderstorm with heavy rains washed out Crow Branch culvert.
	Hickory Grove Road		Heavy winds damaged trees and a house and washed out roads.
Tornado	Hopewell Road	Summer, 1985	A tornado, not verified by the NWS, caused damage to a residence.
	Factory Road	1940s	A tornado caused damage to barns and buildings.

Disaster	Location	Date	Descriptions
Winter Storms		2/2011	Significant snow storm.
		3/1976	An ice storm caused broken power lines and downed trees.
		4/1973	A snow storm caused minor damage.
		1958	A snow storm caused people to be snowed in for two days.
Drought		Summer 1976, 1979, 1988 and 2003	

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- The Town has a significant amount of land in the Conservation Reserve (CREP) program.
- There have been significant problems associated with wind-blown snow on Old Highway 80 and New California and Pine Knob Roads. New California Road also has issues with ice build-up because the sun does not reach sections of the road.
- The intersections at Greenwood and New California and New California and US Highway 80 are dangerous.
- The Town has a culvert maintenance program.
- Inappropriate agricultural practices contribute to flooding problems.
- High volumes of truck traffic on Highway 80 increase the possibility of a hazardous materials spill.

Local Action Recommendations

- Work with the Grant County Highway Department to install snow fences along problem roadways and could initiate planning and fund procurement for stormwater management system upgrades and ongoing maintenance.
- In partnership with the Town, the County should proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- Work with the Grant County Highway Department to identify stormwater management issues along roadways and areas prone to embankment failure and make repairs as funds are available.
- Work with private property owners to improve stormwater management in problem areas.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s, few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

Town of Clifton Map

TOWN OF ELLENBORO

The Town of Ellenboro is located in east central Grant County. Ellenboro is a predominantly agricultural community that is dominated by the Platte River Valley as it winds its way to the Mississippi River. There are also floodplain forests along the streams and the Platte River. The Town had an estimated population of 522 persons in 2011. Ellenboro is expected to experience modest population growth of approximately 14 percent between 2000 and 2030. This equates to approximately 84 new residents.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding		7/1993	FEMA monies were used to remove wind-generated debris and repair aggregate surfaces on several roads. On Lincoln Road, the Rip Rap had to be repaired and several drainage channels had to be cleared of debris.
	Ellenboro Bottoms	1991	Flooding caused road closure on US Hwy 81.
	Ellenboro Bottoms	1990	Flood closed U.S. Highway 81 in the “Ellenboro Bottoms.” Debris and rock collected under the bridge blocking the water flow. FEMA monies were used to replace the bridge approach. It was also used to replace gravel on various Township Roads.
	USHWY 81 at Ellenboro Bottoms	1961	Flooding caused two fatalities.
Flash-Flooding		2008 and 2009	Storms caused several road washouts including Winkler Lane, Hollenberger Road, Ellenboro Road, Vesperman Road, Kabele Road and Willow Branch Road.
		5/22-23 and 6/16/2004	Widespread damages included gravel washouts, plugged drainage tubes and debris deposits. Ellenboro Road was closed for several days. An embankment failure and accompanying downed trees damaged Bluff Road. Bridges suffered damages. The June 16 th storm caused damage from washed gravel and severe bridge damage on Vesperman Lane.
	Kingsford, Grainey and Buckwheat Ridge Roads	1950	Heavy rain caused creeks to rush out of their banks, sweeping away three bridges: Kingsford, Grainey and Buckwheat Ridge. One County-owned bridge was also lost on CTH A. According to residents, a 12-foot high wall of water came down the river destroying everything in its path. Trees swept away by the water became lodged under bridges and caused additional backup.
Severe Thunderstorms		February 2011	Heavy snow impacted the entire Town.
		9/11/2000	Hail caused crop damage. <i>NWS</i>
		5/17/2000	2 inch hail caused property damage crop damage. Numerous cars were damaged. <i>NWS</i>

Disaster	Location	Date	Descriptions
Tornado		Summer 2011	A tornado destroyed buildings and trees.
	Buckwheat Ridge Road	Early 1940s	A tornado destroyed the barn and the house was moved from its foundation on the farm at 2561 Buckwheat Ridge.
Drought		1988	Drought caused crop losses and a shortage of hay.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- A spring running under Kingsford Road causes road damage. A drainage tube was installed; however, the blacktop is still buckling and crumbling.
- McPherson Brook, which runs parallel with Hudson Hollow Road, is part of the DNR Stream Rehabilitation Program. They are in the process of installing riprap.
- GCEM has identified agricultural lands that flood repeatedly, causing flooding on Ellenboro Road.
- High volumes of truck traffic on Highway 81 increase the possibility of a hazardous materials spill.
- Bridge at Airport and Hudson Hollow Road was damaged during 2008/2009 flooding and is still in dangerous condition.

Local Action Recommendations

- Correct the drainage issues at Kingsford Road.
- In partnership with the Town, the County should prevent additional development in the floodplain and proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- Work with the Grant County Highway Department to identify stormwater management issues along roadways and areas prone to embankment failure and make repairs as funds are available.
- Work with private property owners to improve stormwater management in problem areas.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s, few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

Town of Ellenboro Map

TOWN OF FENNIMORE

The Town of Fennimore is located in northeast Grant County. Part of the Town is south of Military Ridge and part is north of it. This is one of the highest points in the County, draining water to both the Mississippi and Wisconsin Rivers. There are four watersheds in the Town, which is more than any other Town except for Patch Grove, which also straddles Military Ridge. The southern part of the Town is more agricultural than the northern half, which is predominantly forested uplands. The Town had an estimated population of 610 in 2011. The Town is expected to see population growth at a rate of 6 percent between 2000 and 2030, adding about 36 residents.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding		2005-2010	Heavy rainfall caused washouts around bridges. Rip rap was installed in these areas.
	Orr Road	1996	Flooding caused culvert and gravel wash-out. The culvert was replaced with a box culvert.
		7/1993	FEMA monies in the amount of were received to replace gravel on Birdseye, Baumgartner, Tormey, Blue School, Robin Roads. Erosion repair on Orr and Ebeneser Roads.
	Weinbrenner Road	6/29/1990	Flooding resulted in the replacement of a culvert and gravel.
Flash-Flooding		5/22-23 and 6/16/2004	Flash-flooding caused damage. The June 16 th storm caused additional damage to roadways.
Severe Thunderstorms	2 miles south of Fennimore	8/20/2003	Winds estimated as high as 80 mph toppled trees and downed power lines.
		5/1998	1.75 inch hail caused property and crop damage. Law enforcement officials reported hail as large as golf balls. <i>NWS</i>
Tornado		1899	Tornado hit Roger's.
Winter Storms		12/1993	An unverifiable amount of snow required extra fuel and overtime hours to clear roads.
		1976	Ice caused power loss for the Town of Fennimore.
		1959	Heavy snow required the Town to fund costs for fuel and overtime hours in order to clear roads.
Drought		1988	A drought caused crop loss.
		Summer 1988 and 2003	Drought caused crop loss.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- Historical data indicated that the northern portion of the Town is frequently in the path of tornados.
- High volumes of truck traffic on Highways 18 and 61 increase the possibility of a hazardous materials spill.

Local Action Recommendations

- Work with the Grant County Highway Department to identify stormwater management issues along roadways and areas prone to embankment failure and make repairs as funds are available.
- Work with the County to encourage heightened building construction standards (e.g., basements required) or limit building in the areas that are in the demonstrated tornado path.
- In partnership with the Town, the County should prevent additional development in the floodplain and proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- Work with private property owners to improve stormwater management in problem areas.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s, few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

Town of Fennimore Map

TOWN OF GLEN HAVEN

The Town of Glen Haven is situated along the Mississippi River in west central Grant County. There is a ridge running north and south through the Town that separates the water flowing directly into the Mississippi River from the water flowing into the Lower Grant River. With a little more than 35 square miles of land area, the Town is predominantly agricultural. Steep limestone and sandstone bluffs that run along the Mississippi River are forested. The Town’s population was estimated to be 416 in 2011. The Department of Administration expects the Town to lose population at a rate of 22 percent between 2000 and 2030, equating to a loss of 109 residents.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding	Mississippi River	4/9/1998	The Mississippi River crested at 16.9 feet. <i>Rod Walz</i>
	Mississippi River	4/17/1997	Volunteers manned pumps in an effort to keep flooding from local basements and businesses. Riverfront Park was totally covered with water. <i>Grant County Herald Independent</i> . The river stage on 4/13/1997 was 21 feet. <i>Rod Walz</i>
	Mississippi River	10/1996	Mississippi River flood waters backed up along the drainage ditch causing flooding in the Village of Glen Haven.
	Mississippi River	4/1996	Mississippi River flood waters backed up along the drainage ditch causing flooding in the Village of Glen Haven. The river crested at 18.5 feet.
	Mississippi River	4-7/1993	Mississippi River flood waters backed up the drainage ditch, causing flooding in the Village of Glen Haven. This event lasted approximately 3 months. <i>Rod Walz</i>
	Mississippi River	10/04 - 13/1986	Mississippi River flooding caused water back up along the drainage ditch, resulting in the flooding of the Village of Glen Haven.
	Mississippi River	9/30/1986	The GCEM provided sandbags to help alleviate problems associated with Mississippi River flooding. The river crested at approximately 21 feet. <i>Telegraph Herald</i>
	Mississippi River	4/10/1986	Mississippi River flooding caused backed up along the drainage ditch causing flooding of the Village of Glen Haven. The river reached 20.1 feet on April 10. <i>Rod Walz</i>
	Mississippi River	5/9 and 6/25/1984	The Mississippi River crested at 13.9 feet; then, a heavy rain caused the river to rise to 15.4 feet on 5/9/1984. <i>Rod Walz</i>
	Mississippi River	3/1983	Mississippi River flooding caused water to back up along the drainage ditch, resulting in flooding of the Village of Glen Haven. The river crested at 18.9 feet on 3/15/83. <i>Rod Walz</i>
	Mississippi River	4/22/1982	Heavy snow and rain in Minnesota and Northern Wisconsin caused a second water crest. This time the water reached 17.9 feet. <i>Rod Walz</i>

Disaster	Location	Date	Descriptions
	Mississippi River	4/11/1982	Flooding caused the Mississippi River to crest at 16.6 feet. <i>Rod Walz</i>
	Mississippi River	5/4/1975	Floodwater from the Mississippi River backed up into the drainage ditch, causing some flooding in the Village of Glen Haven.
	Mississippi River	4/1965	Flooding caused damage to millions of dollars in property and crops.
	North of Glen Haven	7/12-18/1903	The Milwaukee and Burlington Railroads suffered washouts due to heavy rains.
	Mississippi River	1859, 1862, 1870, 1880, 1881, 1888, 1892, 1920, 1922, 1935, 1936, 1938, 1939, 1942, 1943, 1944, 1945, 1947, 1967, 1969 and 1977	The Mississippi River flooded as sourced by Army Corp of Engineers.
	Mississippi River	1828, 1844 and 1851	Flooding events were recorded when Cassville and Glen Haven were one Town. <i>Army Corp of Engineers</i>
Flash-Flooding		5/22-23 and 6/16/2004	Flash-flooding caused damage to Eagle Valley Road and the edges of all roads.
		7/8/1993	Flash-flooding along the drainage ditch caused many cars to wash out into the Mississippi River. Businesses, homes and the roadway along Main Street were damaged. Significant interior, structural and personal possession damage was realized at two houses on Bluff Street. According to one owner, the basement was dry enough to store flour and sugar before the 1930s when the Army Corp of Engineers completed the lock and dam system on the Mississippi River. Following this flood, an engineering plan was prepared for retention ponds; however, there are no funds for the project.
	Village of Glen Haven	6/15/1991	Flash-flooding along the drainage ditch caused debris and water damage to homes and businesses.
	North Andover	6/1978	Flash-flooding caused Rattlesnake Creek to overflow into the lumberyard office.
	Village of Glen Haven	6/28/1949	Flash-flooding deposited a foot of water and mud in several basements along the main street. Well pits and pump motors were damaged. Several hundred dollars worth of damage was done to the corn sheller and motors in the underground pits at the Walz Feed store. Klinkhammer Saw Mill and the Walz Lumber Company also sustained damage. Transformer

Disaster	Location	Date	Descriptions
			damage left homes and streetlights without electricity. All train traffic was stopped due to a signal problem. County staff helped clear roads. Estimated damage was greater than either the 1933 or the 1947 floods. <i>Grant County Herald</i>
		1947	According to articles in the <i>Grant County Herald</i> , the event discussed above happened three times within two weeks. Creeks were clogged with logs and boulders, causing them to overflow easily.
	Village of Glen Haven	Summer, 1933	A flash-flood, estimated at 4 feet deep, swept away cars, filled basements and flooded the first floor of many buildings. Page 53, <i>Holy Mary Help of Christians</i> .
Severe Thunderstorms		4/11/2001	53 mph winds caused property damage. Emergency Management officials reported that a 1800 square foot pole barn building near Glen Haven was ripped apart by wind gusts estimated around 60-65 mph.
		5/17/2000	1.5 inch hail caused property damage. Ping-pong and golf ball size hail was observed by law enforcement. Numerous cars were damaged by the hail.
		7/26/1962	Hail destroyed crops. Oats and other small grains were damaged. <i>Grant Co. Herald</i> .
Tornado		6/25/1957	A tornado, rated F2, caused damage Countywide. <i>NWS</i>
		5/21/1918	F4 tornado, one of the largest during an outbreak of 19 in Iowa, touched down in Clayton County, Iowa and did not lift until it hit Sauk County, Wisconsin, some 80 miles east-northeast. The tornado crossed the Mississippi River 1 mile south of Glen Haven. Farms were slightly damaged in Grant County. <i>NWS</i>
Extreme Temperatures		1995-1996	Very cold and windy winter with heavy snow.
		1959-1960	Very cold winter.
Disease		1902	Small Pox Epidemic.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments:

- The lock and dam system on the Mississippi River was completed in 1930.
- According to the Town Chairperson, water seeps through the railroad bed, causing flooding into the Village of Glen Haven.
- Rain water and natural spring water from four hollows congregate at the base of the bluff and cause flash-flooding events like the ones in 1933, 1947 (two flash-floods), 1949 and 1993. The water is supposed to funnel into a drainage ditch and out into the Mississippi River. The drainage ditch is cement-sided but has a natural bottom. The Town maintains the ditch, but weeds and sand and silt deposits form in the bottom of the ditch. There is no regular maintenance program established for the drainage ditch.

- Following flash-flooding in 1993, Conservation Warden Mike Lorenz suggested that holding or retention ponds be built into some of the valleys, resulting in water being held so it could be released a little bit at a time rather than it rushing down the valleys causing the damage. This project was not completed due to a lack of funding. There is still no money available for the construction of these ponds.
- In early April 2001, in anticipation of flooding on the Mississippi River, the sides of the levee were raised to keep river water from backing up in the drainage ditch and then overflowing into the Village.
- The Burlington Northern-Santa Fe Railroad runs along the west edge of the Village of Glen Haven. There has only been one derailment, on January 1, 1978. Numerous trains carry hazardous materials along these tracks.
- Town roads with issues include:
 - Petry Lane is a very narrow densely forested, gravel road north of Glen Haven Village. The road serves as the only access to several residences. One of the bridges along this road is considered inadequate and vulnerable to flash-flooding damage. There is no maintenance program for the creek or ravine. Rushing water often floods into the yard of 13 CTH V, which is at the bottom of Petry Lane.
 - Rock School Road generally has no concerns until it reaches the Village, where water has to make a sharp right-hand turn to run into the drainage ditch. The water often runs over CTH V and then joins water coming from Petry Lane and CTH V. A naturally running spring can be found along this hollow.
 - The bridge on Squirrel Hollow Road is in poor condition and should be replaced in the next 5-10 years.
 - May Lane is a steep gravel road flanked by several houses. A naturally occurring spring runs under the road and behind several houses. Following periods of heavy rain, the road has to be re-graded. In addition, water that normally passes under the road and through a newly installed pipe, travels over the road.
 - Duncan Road has had a problem with the stormwater pipe washing out.
 - Ramsey Road has a 4 foot drainage pipe that runs under the road is often too small.
 - The hollows leading down to the Village of Glen Haven are densely wooded. There is no maintenance plan in place to keep fallen branches from collecting in the creek and dry beds to be swept away in the event of a flash-flood.
 - Bessie and Cook Lanes have had issues with rushing water.
 - Embankment failures and floods repeatedly damage Dugway Road.
 - According to one owner, flooding was not a problem until the Army Corps of Engineers completed the lock and dam system on the Mississippi River in the 1930s.
- GCEM purchased a repetitive loss property in the Town in 2006.
- Inappropriate agricultural practices increase flooding.
- The railroad bed serves as a de facto levee for the Mississippi River, which causes a false sense of security, as the railroad bed was not constructed to function as a levee. The Town reports that the Burlington Northern-Santa Fe Railroad neglects track maintenance.
- Currently the levee is not being maintained by the Town, which was recently identified as the owner.
- The Town of Glen Haven Fire Department building is antiquated and undersized, leaving no space for storage of additional equipment or staging area for emergency services and training sessions.

Local Action Recommendations

- In partnership with the Town, the County should prevent additional development in the floodplain and proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Establish a regular levee and drainage ditch maintenance program, coordinating with GCEM and work with the Railroad to establish a maintenance program for the rail road bed and bridges.
- Identify potential funding sources and attempt to secure funds to undertake the proposed retention pond system to limit flash-flooding.

- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and to explore the possibility of volunteer groups assisting with the clearing of dead and down timber from forests.
- Address roadways with persistent problems related to flooding, inadequate drainage, or landslides.
- Work with GCEM to identify and remove potential repetitive loss structures, with federal or state funding assistance.
- Work with the Grant County Highway Department to identify stormwater management issues along roadways and areas prone to embankment failure and make repairs as funds are available.
- Work with private property owners to improve stormwater management in problem areas.
- Explore opportunities to expand or replace the fire station.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s, few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

Town of Glen Haven Map

TOWN OF HARRISON

The Town of Harrison is located in south central Grant County, west of Platteville. The Town’s topography is hilly and rolling, mostly in agricultural production, with a prominent north-south ridge line that splits the Town into two watersheds—the Platte River and the Little Platte River watersheds. The Town’s population was estimated to be 496 in 2011. The Department of Administration projects the Town to slowly increase in population at a rate of 3 percent between 2000 and 2030, adding about 15 residents.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding		5/31/2000	8 inches of rain in 10 hours caused widespread damage. Debris build-up behind bridges caused flooding in low-lying areas. FEMA funds were used to replace gravel on ten roads, including: Oak Road, Schuster Road, Beagle Lane, Substation Road, Angel Lane, Stanton Road, Maple Ridge Road and Platte Road; repair an embankment failure on Maple Ridge Road; and repair damages to Big Platte Road. It was recommended that the existing 48-inch culvert be replaced with a 72-inch culvert. GCEM does not know if this upgrade has been done. Funds were also used for embankment repair and protection riprap on Oak Road, this section washed out. Three layers of chip and seal were replaced, riprap at a box culvert was restored and rock and gravel was removed from Schuster Road. Riprap was replaced at the inlet of a bridge and rock and gravel was removed on Quarry Road.
		7/1993	FEMA monies were used for debris removal on the Platte River. It was also used to replace the roadways on Big Platte Road. Embankment failure was repaired on Rockwell and Oak Roads.
		7/1990	FEMA monies were used to replace stream-crossing approaches on Platte Road, three locations and Baker Ford Road. It was also used to replace gravel at these sites.
		Mid 1960s	Major flooding.
Flash-Flooding		7/28/2008	Flash-flooding caused road washouts on Pine Lane, Harrison Road, Morris Road, Travis Road and Angels Lane.
		5/22-23 and 6/16/2004	Flash-flooding caused gravel to wash off Shuster, West Road, Oak Road and Bill Lane. Trees and debris were deposited on Big Platte Road. Culverts were plugged on Morris and Maple Ridge Roads.
Severe Thunderstorms		8/20/2003	A thunderstorm destroyed the barn on Red Dog Road. Many trees were severely damaged on Maple Ridge Road and Beagle Lane.
Winter Storm		2/2011	Winter storm with record snowfall.
		1978 or 1979 (exact date unknown)	Ice storm.

Disaster	Location	Date	Descriptions
Landslide/ Embankment Failure	Big Platte Road	4-5/2003	Heavy rain caused a landslide that completely blocked the road. Reshelfing of the embankment was recommended. Soil erosion caused by improper farming techniques was not the cause of this damage.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- The Town has a major storm every five to eight years with notable damages, washouts, downed trees, etc.
- Big Platte Road has two areas that are prone to embankment failures with 3-5 inches or more of rain. One area is 50-75 feet in length and the other is 100-150 feet long. *Robert W. Acton, Town of Harrison Chair.*
- The bank of Section 20 of Quarry Road needs to be taken back and possibly stair-stepped to stop erosion of sandy soil.
- Inappropriate agricultural practices increase flooding.

Local Action Recommendations

- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- Work with the Grant County Highway Department to identify stormwater management issues along roadways and areas prone to embankment failure and make repairs as funds are available, particularly on Big Platte and Quarry Roads.
- In partnership with the Town, the County should prevent additional development in the floodplain and proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Work with private property owners to improve stormwater management in problem areas.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Work with the local cellular service provider to improve coverage in the area.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s, few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

Town of Harrison Map

TOWN OF HAZEL GREEN

The Town of Hazel Green is located in the far southeast corner of the County. The area is predominantly agricultural. The terrain is gently rolling hills, marked by the Galena River and its tributaries, which run north to south through the Town. The Town’s population was estimated to be 1,135 in 2011. The Town is expected to grow at a rate of 24 percent between 2000 and 2030, which equates to the gain of 249 residents.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding		5/22-23 and 6/16/2004	Park Lane and Clay Lane had damages to the blacktop when rushing water undercut and eroded the blacktop.
	Sinsinawa Road and Louisburg Road	7/1993	FEMA monies were used for security patrols and search and rescue, embankment failure on Park Lane, gravel washouts on Sinsinawa Road, Line Road, York Road, Church Road, Hill Road, Logan Road and Mill Road, an embankment failure on HyView Road, Hill Road, Model Road and North Hollow Road. Seal coating had to be replaced on Center Road.
	Church Road		The road is frequently washed out during periods of heavy rain. A new landowner is considering the Town’s request to cut down the bank and cut back the ditch to mitigate some of the washouts. The Town would also consider building up the road.
Road Washout	Sinsinawa Road	2008	Road washout.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- Most Town roads have been recently re-ditched. The process will need to be done again if farming practices do not change.
- Inappropriate agricultural practices increase damages from flooding.
- High volumes of truck traffic on Highways 11 and 80 increase the possibility of a hazardous materials spill.
- The Town is concerned about stormwater flow capacity along and under Model Road near the City of Cuba City, due to recent housing development in the City.

Local Action Recommendations

- In partnership with the Town, the County should proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Address flooding issues along Model Road and coordinate with Cuba City to assure that future development incorporates stormwater management facilities.
- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- Work with the Grant County Highway Department to identify stormwater management issues along roadways and areas prone to embankment failure and make repairs as funds are available.
- Work with private property owners to improve stormwater management in problem areas.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.

- Work with the local cellular service provider to improve coverage in the area.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s, few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

Town of Hazel Green Map

TOWN OF HICKORY GROVE

The Town of Hickory Grove is located in north east Grant County and lies north of Military Ridge. The area is heavily forested, with agricultural operations in level areas along the river valleys and along some ridges. Most of the Town is in the Blue River watershed, although the western portion is in the Green River and Crooked Creek watershed. The Town’s waterways flow into the Wisconsin River. The Town’s population was estimated to be 455 in 2011. The Town is expected to see moderately high population growth at a rate of 34 percent between 2000 and 2030, adding about 151 new residents. Much of this growth will likely be situated close to the City of Boscobel, which is just northwest of the Town.

The Town did not participate in the public outreach component of the planning process. Emergency Management obtained the following information from existing files and the local library.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding		6/2000	FEMA funds were used to repair damage to Town roads caused by heavy rains. Specifically, road bases were restored, double seal coats were replaced and rock and gravel were removed from the box culvert on Johnson Road; the culvert that washed out in 1998 was replaced; the road base was restored on Sleepy Hollow Road; gravel was replaced on Murley Road; and embankments were restored on Dry Hollow and Level Valley Roads.
		7/1998	FEMA funds were used to replace lost gravel, install a new culvert and regrade surface and ditches on Sleepy Hollow Road and Larson Lane (Fecht Lane). Sleepy Hollow Road damages were to an area with a combination of a stone bridge and box culvert that had eroded on the ends and collapsed.
		7/1993	Heavy rains caused embankment failures on Homer, Coon Valley and Golf Roads.
		7/1990	FEMA monies were used to repair bridges on Homer and Larson Roads. Gravel at these sites had to be replaced.
Flash-Flooding		5/22-23/2004	Flash-flooding caused Sleepy Hollow, Merley, Larson and Coon Valley Roads to wash out. Six trees on Sleepy Hollow and Coon Valley Roads were washed down the embankment. Box culverts on Merley and Sleepy Hollow Roads were plugged.
		Summer 2008	Flash-flooding caused landslides and washouts on Sleepy Hollow Road, Level Valley Road and Larson Lane.
Winter Storm	Breezy Hill Road	December 2010	Severe drifting of snow that required the Town to hire an outside company to remove it.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- Inappropriate agricultural practices increase damages caused by flooding.
- In this part of the County, DNR requires a burning permit anytime the ground is not snow covered during the months of January, February, March, April and May.

Local Action Recommendations

- Work with the Grant County Highway Department to identify stormwater management issues along roadways and areas prone to embankment failure and make repairs as funds are available.
- In partnership with the Town, the County should prevent development in the floodplain and proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Help prevent forest and wildland fires by:
 - Making residents aware that a burn permit may be required by the DNR between January and May.
 - Ensuring the Fire Department is prepared and equipped to respond to this type of hazard.
 - Encouraging fire safe “clear zones” around all homes that are free of trees and brush.
- Consider construction of a community storm shelter, particularly for mobile home park residents and industrial park employees. Coordinate with the owners of the mobile home parks to identify a temporary storm shelter until one can be built.
- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- Work with private property owners to improve stormwater management in problem areas.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Work with the local cellular service provider to improve coverage in the area.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s, few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

Town of Hickory Grove Map

TOWN OF JAMESTOWN

The Town of Jamestown is located far southwest Grant County along the Mississippi River, adjacent to Lock and Dam #11. Jamestown is the County’s most populous township with an estimated 2,092 persons in 2011, many of which reside in the unincorporated communities of Kieler and Fairplay. Many residents of the Town commute to Dubuque or Platteville for work. The region is predominately agricultural, with significant forest cover along the river. The limestone and sandstone bluffs that run along the Mississippi River are prone to rock fall. A majority of the Town’s streams flow into the Galena River before entering the Mississippi. The Town is expected to grow in population at the rate of 1.2 percent, adding about 24 residents between 2000 and 2030.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding	Timber Lane	July 2008	Flooding washed out Timber Lane.
	Mississippi River	2001	FEMA funds were used for debris removal and repairs at the dock and boat ramp at O’Leary’s Landing near Lock and Dam # 11. A residence at O’Leary’s Landing was purchased in 2003, as part of the FEMA buyout program.
	Mound Road	5/1999	Flooding washed out a drainage tube. 26 inches of water in a machine shed was reported.
		7/5/1993	Heavy Rains caused washouts and mudslides.
	Louisburg	6/1975	Louisburg Creek went out of its banks, flooding many buildings.
Flash-Flooding		5/22-23 and 6/16/2004	Flash-flooding caused gravel on several roads to washout.
Severe Thunderstorms	Elm Street, Kieler	5/1975	Winds tore a roof off a house, causing extensive damage. Many trees toppled.
Winter Storms		4/1973	19 inches of snow blocked all Town roads.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- FEMA money was received in 2000. The amount or reason for award was not found in GCEM files.
- There are several residences in the Town that may be possible buyout properties and there are numerous recurring loss properties outside of the FEMA floodplain.
- Inappropriate agricultural practices increase damages from floods.
- High volumes of truck traffic on Highways 11, 35, 61 and 151 increase the possibility of a hazardous materials spill.
- The Town of Jamestown Fire Department building is undersized, leaving no space for storage of additional equipment.

Local Action Recommendations

- In partnership with the Town, GCEM could research and determine other properties that may be potential buyout properties due to repetitive loss and pursue acquisition of mutually-agreed properties.
- In partnership with the Town, the County should prevent additional development in the floodplain and proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.

- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- Work with the Grant County Highway Department to identify stormwater management issues along roadways and areas prone to embankment failure and make repairs as funds are available.
- Work with private property owners to improve stormwater management in problem areas.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Explore opportunities to expand or replace the fire station.
- Work with the local cellular service provider to improve coverage in the area.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s, few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

Town of Jamestown Map

TOWN OF LIBERTY

The Town of Liberty is located south of Military Ridge, just south of Fennimore. The majority of the Town is located at the headwaters of the Platte River. The Town’s terrain is rolling hills and valleys and agriculture is the dominant land use. Forested tracts are found on some steeper slopes and in the floodplain of the Platte River. The Town had an estimated population of 554 in 2011. The Town is expected to add one resident between 2000 and 2030.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding		7/1993	FEMA monies were used for gravel road and embankment repairs on No Name, Hill (two locations), Ridge (three locations), Dead End, Pine Grove, Tormey, Rock School, Hi Point (six locations), Sleepy Hollow, Coon Hollow (two locations), Fairview and Willow Roads and Harold’s Lane.
	Village of Stitzer	1991	Flooding caused stormwater run-off into houses and basements. Floodwater took out the bridge on the east end of Rock School Road, requiring rerouting of the school bus.
		1990	FEMA monies were used to replace gravel on 15 Township roads. It was also used to replace rip rap at the bridge on Rock School Road. A wing wall had to be replaced on Factory Road, as did the rip rap at the bridge. A bridge on Pine Grove Road had to have the rip rap replaced.
Flash-Flooding		5/22-23 and 6/16/2004	Flash-flooding caused mudslides, washouts and edge damage on Fairview, Pine Grove and Coon Hollow Roads.
Severe Thunderstorms	Village of Stitzer	8/20/04	Winds estimated as high as 80 mph toppled trees and downed power lines.
		7/3/1975	Golf-ball sized hail accompanied by heavy rains and strong winds did extensive crop damage and farms, including broken windows and damaged doors.
Tornado	Village of Stitzer	Mid-1980s	A tornado damaged the Klais Farm on Grandview Road and the Keller farm on County E.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- Wind-blown snow causes problems on Grandview Road.
- Willow Road has a road bank that protrudes out and obscures view of Grandview Road on the north end and has a bridge that needs to be replaced which is not eligible for the Federal Bridge program.
- There is a natural gas metering station on Coon Hollow Road.
- The Village of Stitzer has only a fire siren and no tornado siren.
- There is limited cellular phone coverage in the Town.
- The Village of Stitzer water tower, built in 1988, has frozen twice since constructed. According to the Town patrolman, the tower was designed for use in a community in warmer climates. The Village has adjusted the water controls to keep the water moving and to keep it from freezing.
- Across from Reddy Ag, stormwater run-off over and ice on CTH E makes travel hazardous.

- High volumes of truck traffic on Highway 61 increase the possibility of a hazardous materials spill.
- The Town of Liberty Fire Department building is undersized, leaving no space for storage of additional equipment.

Local Action Recommendations

- Initiate planning and fund procurement for stormwater management system upgrades on Commercial Street and elsewhere as needed.
- Work with the Grant County Highway Department and property owners to install snow fences and address icing on problem roads.
- Explore opportunities to expand or replace the fire station.
- Work with the Grant County Highway Department to identify stormwater management issues along roadways and areas prone to embankment failure and make repairs as funds are available.
- In partnership with the Town, the County should prevent additional development in the floodplain and proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- Work with private property owners to improve stormwater management in problem areas.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Work with the local cellular service provider to improve coverage in the area.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s, few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

Town of Liberty Map

TOWN OF LIMA

The Town of Lima is located just south of Military Ridge on the east border of Grant County due north of Platteville. Much of the Town’s 36.5 square miles is agricultural, although there are some forested tracts along the Little Platte River, which runs north-south through the center of the Town. The northwest corner of the Town is in the Platte River watershed. The Town’s population was estimated to be 808 in 2011. The area is expected to see a moderate population growth of around 28 percent between 2000 and 2030, which would result in an additional 200 persons.

The Town did not participate in the public outreach component of the planning process. GCEM obtained the following information from existing files and the local library.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Severe Thunderstorms		7/1993	Wind generated debris was deposited on roadways. Culverts and gravel were replaced on Crosscut, Waterfall and Shady Roads. Gravel was replaced on Badland Road and Sam and Dan Lane.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- Inappropriate agricultural practices increase damages from flooding.
- High volumes of truck traffic on Highway 80 increase the possibility of a hazardous materials spill.

Local Action Recommendations

- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- In partnership with the Town, the County should prevent additional development in the floodplain and proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Work with the Grant County Highway Department to identify stormwater management issues along roadways and areas prone to embankment failure and make repairs as funds are available.
- Work with private property owners to improve stormwater management in problem areas.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s, few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

Town of Lima Map

TOWN OF LITTLE GRANT

The Town of Little Grant is one of the least populated Towns in the County. Located south of Military Ridge in west central Grant County, the area is mostly agricultural with some forested areas. The Little Grant River runs through this region of ridges and valleys and the Blake Fork in the southwest corner of the Town flows directly into the Grant River. The Town’s population was estimated to be 283 in 2011. The Department of Administration expects the Town to lose population between 2000 and 2030 at a rate of 25 percent, which equates to the loss of 63 residents.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding		6/6/2008 6/12/2008	Heavy rains caused road washouts on University Farm Road and McClusky Road. Debris on University Farm Road, McClusky Road, Hampton Road, Bouden School Road, Wilson Hill Road and Pleasant Valley Road.
		5/2000	Heavy rains caused flooding. FEMA funds were used to repair eight Town roads. Gravel was replaced, debris removed and drainage ditches cleared on McCluskey, Hampton, University Farm, Slabtown, TeRonde and Bowen School Roads.
		6/1998	Flooding was similar to 2000 event above.
		7/1993	FEMA monies were used to replace road embankments on Hampton, Cemetery (three locations), University Farm, Bedrock (two locations), Pleasant Valley, Badger (two locations) Roads and Meadowbrook Lane.
Flash-Flooding		5/22-23/2004	Flash-flooding caused some damage to gravel roads, debris deposit and blocked culverts.
Winter Storm		2/2/2011	Heavy snow.
Tornado		6/25/1957	Tornado caused unspecified damage.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- Inappropriate agricultural practices increase damages from flooding.

Local Action Recommendations

- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- Work with the Grant County Highway Department to identify stormwater management issues along roadways and areas prone to embankment failure and make repairs as funds are available.
- In partnership with the Town, the County should prevent development in the floodplain and proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Work with private property owners to improve stormwater management in problem areas.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Work with the local cellular service provider to improve coverage in the area.

- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s, few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

Town of Little Grant Map

TOWN OF MARION

The Town of Marion is north of Military Ridge in the Green River and Crooked Creek watershed. The Town is mostly an agricultural community, with some pockets of forested land and open space. The Lower Wisconsin River State Wildlife Area has a presence in the northwest corner of the County, especially around Bullhead Slew. The Town’s population was estimated to be 575 in 2011. The Town is expected to be the fastest growing town in the County at the rate of 43 percent between 2000 and 2030, projected to add 224 new residents. Growth may be attributed to growth pressures from the City of Boscobel, which is directly north of the Town line.

The Town did not participate in the public outreach component of the planning process. GCEM obtained the following information from existing files and the local library.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flash-Flooding		5/22-23/2004	FEMA funds were used to repair collapsed and damaged tubes that plugged on Wisconsin Valley Road. Flooding caused Peer and Sandhill Roads to close.
Severe Thunderstorms		6/2000	FEMA funds were used to repair embankments and washouts on Wisconsin Valley (two locations), Peer and Dutch Hill Roads. Gravel was replaced on Tower, Pine Knob, Town Hall and Riley Roads. A culvert and gravel were replaced on Dry Hollow Road. A box culvert inlet on Town Hall Road was backfilled.
		7/1998	FEMA monies were used to replace road embankments on Peer, Riley, Hill and Boebel Roads damaged by heavy rains. Work was done on a culvert on Boebel Road.
		7/1993	FEMA funds were used to repair roads damaged by heavy rains. Wind-generated debris was removed on Wisconsin Valley Road. Trees, rocks, sand, stumps and other debris was removed; and a concrete box culvert that clogged under the bridge on Wisconsin Valley and Town Hall Road was replaced. Gravel on Virgin Road (Back Road) was replaced. Gravel was replaced on Tower, Town Hall, Smokey Hollow and Hickory Hill. Culverts and gravel were replaced on Dutch Hill and Boebel Roads. Funds also were received for search, rescue and placement of road-closed signs.
		7/1990	FEMA funds were used to repair Town roads damaged by heavy rains. Replace gravel and remove slides on Virgin Road (Back Road). Gravel was replaced on Riley Road and Hickory Hill Road. Excavated plugged culvert inlet and replaced gravel from the washout on Sand Hill Road. Slides were on Dry Hollow Road and Old Hwy 61.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- Inappropriate agricultural practices increase damages from flooding.
- High volumes of truck traffic on Highways 61 and 133 and train traffic on the Wisconsin Calumet Railroad increase the possibility of a hazardous materials spill.
- In this part of the County, DNR requires a burning permit anytime the ground is not snow covered during the months of January, February, March, April and May.

Local Action Recommendation

- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- Work with the Grant County Highway Department to identify stormwater management issues along roadways and areas prone to embankment failure and make repairs as funds are available.
- Help prevent forest and wildland fires by:
 - Making residents aware that a burn permit may be required by the DNR between January and May.
 - Ensuring the Fire Department is prepared and equipped to respond to this type of hazard.
 - Encouraging fire safe “clear zones” around all homes that are free of trees and brush.
- In partnership with the Town, the County should prevent additional development in the floodplain and proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Work with private property owners to improve stormwater management in problem areas.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Work with the local cellular service provider to improve coverage in the area.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s, few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

Town of Marion Map

TOWN OF MILLVILLE

The Town of Millville is a densely wooded Town along the Wisconsin River. Property along the Wisconsin River is in the Lower Wisconsin River State Wildlife Area—Woodman Millville Unit. The topography is quite steep throughout the Town. At 21.7 square miles, it is the second smallest Town in the County. The Town’s population was estimated to be 168 in 2011. The Department of Administration expects the Town to grow in population at a rate of 20 percent between 2000 and 2030, which equates to the addition of 29 residents.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding		2009	Flooding occurred and debris plugged tube on Millville Hollow Road.
		2008	Flooding occurred and debris plugged tube on Millville Hollow Road.
		2005	Flooding occurred.
		8/11/2000	Flooding-related damage included an embankment washout on Kussmaul Road, a shoulder washout on Dark Hollow Road, culvert erosion at an inlet on Millville Hollow Road, embankment erosion on Campbell Hollow and Campbell Ridge Roads, box culvert erosion and general damage to Barker Hollow Road.
		4/17/1997	The Wisconsin River flooded parts of CTH C. <i>Herald Independent</i>
		7/1993	FEMA monies were used to replace gravel on Walnut Grove, Campbell Hollow Roads and Winkers Lane. All three also had locations where culverts had to be replaced.
		1876	Flooding occurred.
Flash-Flooding		5/22-23 and 6/16/2004	Flash-flooding caused widespread road damage; including washouts, mudslides and debris deposits. Major amounts of gravel on Campbell Hollow Road washed away during the middle of a construction project. June 16th rains washed gravel from Kussmaul and other roads.
Winter Storms		4/5/2011	Heavy snow fall
Insect Infestation		Fall 2001, 2002 and 2003	Asian beetles were abundant.
Disease		1852	Cholera outbreak.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- Inadequate stormwater management and inappropriate agricultural practices increase damages from flooding.
- In this part of the County, DNR requires a burning permit anytime the ground is not snow covered during the months of January, February, March, April and May.

Local Action Recommendations

- Initiate planning and fund procurement for stormwater management system upgrades.
- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- Work with the Grant County Highway Department to identify stormwater management issues along roadways and areas prone to embankment failure and make repairs as funds are available.
- Help prevent forest and wildland fires by:
 - Making residents aware that a burn permit may be required by the DNR between January and May.
 - Ensuring the Fire Department is prepared and equipped to respond to this type of hazard.
 - Encouraging fire safe “clear zones” around all homes that are free of trees and brush.
- In partnership with the Town, the County should prevent additional development in the floodplain and proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Work with private property owners to improve stormwater management in problem areas.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Work with the local cellular service provider to improve coverage in the area.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s, few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

Town of Milville Map

TOWN OF MOUNT HOPE

The Town of Mount Hope is located in north central Grant County and straddles Military Ridge. This area is one of the highest points in the County, draining water to three different watersheds. The Millville Creek, Green River and Crooked Creek watersheds flow into the Wisconsin River; the Upper Grant River watershed flows into the Mississippi River. The land cover in this region is mostly agriculture with forested land cover more prevalent north of Military Ridge. The unincorporated community of Mount Hope lies roughly in its center. The Town’s population was estimated to be 302 in 2011. The Department of Administration expects the Town to lose population between 2000 and 2030 at the rate of 15 percent, which equates to the loss of 33 residents.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding		2010	Flooding washed out roads including Ridge Road, Big Green Road, South Ridge Road, Lost Hollow Road.
		2008	Flooding washed out roads including Rice Road and Blackburn Lane.
		5-6/2000	Flooding washed out roads and damaged a bridge.
		7/1998	FEMA monies were used to clean up wind-generated debris and to replace the road embankment on Shady Dell Road.
		7/1993	FEMA monies were used to repair the road embankments on Birds Eye, Hilltop, Graham, Bollard and Green River Roads. Gravel was replaced on Bollard and Green River Roads. A box culvert was replaced on Hilltop Road.
		1990	Heavy rains caused flooding that resulted in a County-wide disaster declaration. FEMA funds were used to clear debris on public roads; make repairs to roads, bridges and culverts; and remove personal property items that were deposited on the roadway. Box culverts were damaged on Big Green Road and Lost Hollow Roads.
Flash-Flooding		4/22-23/2004	Flash-flooding plugged drainage tubes on Werley and Woodman Roads. Debris was deposited on Alderson Road.
Severe Thunderstorms		9/7/2001	53 mph thunderstorm winds caused property and crop damage. Trees and power lines were toppled. <i>NWS</i>
Winter Storms		3/1976	An ice storm caused widespread damage. Power lines were damaged and toppled, leaving locations without power for up to three days.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- Inappropriate agricultural practices increase damages from flooding.
- High volumes of truck traffic on Highways 18 and 133 increase the possibility of a hazardous materials spill.

Local Action Recommendations

- Initiate planning and fund procurement for stormwater management system.
- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- Work with the Grant County Highway Department to identify stormwater management issues along roadways and areas prone to embankment failure and make repairs as funds are available.
- Work with private property owners to improve stormwater management in problem areas.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Work with the local cellular service provider to improve coverage in the area.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s, few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

Town of Mount Hope Map

TOWN OF MOUNT IDA

The Town of Mount Ida is located in north central Grant County, straddling Military Ridge. This area is one of the highest points in the County, draining water to two different watersheds. The Green River and Crooked Creek watersheds flow into the Wisconsin River and the Upper Grant River watershed flows into the Mississippi River. Much of the 36 square miles of the Town are involved in agricultural production, although forested land is more prevalent north of Military Ridge. The Town's population was estimated to be 561 in 2011. The Town is expected to see modest population growth at a rate of 15 percent, or the addition of 77 residents, between 2000 and 2030.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding		6/23/2000	Heavy rains led to road and crop damage.
		6-7/1993	Heavy rains led to road damage and severe crop loss.
		6/1990	Flooding occurred in all rivers and streams. Some roads washed out when tubes and bridges washed out. Road and crops were heavily damaged.
	Big Green River Valley	4-5/1876	All bridges, roads and CN and W Railroad tracks were washed out. Train engines and cars were caught in the floodwaters and destroyed. The Town of Werley was completely flooded.
Flash-Flooding		5/22-23/2004	Flash-flooding resulted in washouts; requiring gravel replacement and removal of mud from roads.
		Spring, 1948	Fences were destroyed, cattle were lost, two bridges were washed out and roads were heavily damaged.
		Spring, 1908	CN and W Railroad was washed out. Roads, bridges and crops were also damaged.
Severe Thunderstorms		6/1927	Hail destroyed crops and damaged roads.
		6/15/1909	Hail destroyed crops and stripped shingles from homes.
Tornado		6/25/1957	An F2 tornado caused property damage in Grant County. Several hundred mink were killed on one farm and trees were damage. <i>NWS</i>
		Summer, 1952	A tornado destroyed one farm.
		6/1896	A tornado destroyed a racetrack on the east edge of the Town by the City of Fennimore. Trees and property were also destroyed.
Winter Storms		4/1976	An ice storm caused the power to go out in some locations for three weeks. Residents had to find alternate houses with heat and water. Water and feed for cattle had to be hauled in.
		2-3/1936	Extreme cold and heavy snowfall left residents homebound for 2-3 days.

Disaster	Location	Date	Descriptions
Drought		7-8/2003	Drought and extreme heat caused widespread crop damage and started drying up wells. Cattle suffered and milk production decreased causing additional hardship for farmers.
		6/1936	Drought caused farmers to cut down trees in order to feed their cattle leaves.
Extreme Temperatures		8/26/1915	Early frost killed all crops.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- Inappropriate agricultural practices increase damages from flooding.
- High volumes of truck traffic on Highway 18 increase the possibility of a hazardous materials spill.

Local Action Recommendations

- Initiate planning and fund procurement for stormwater management system upgrades.
- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- Work with the Grant County Highway Department to identify stormwater management issues along roadways and areas prone to embankment failure and make repairs as funds are available.
- Work with private property owners to improve stormwater management in problem areas.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Work with the local cellular service provider to improve coverage in the area.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s, few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

Town of Mount Ida Map

TOWN OF MUSCODA

The Town of Muscoda is located in the far northeastern tip of the County. The region is largely forested, except along the Blue River where agriculture is the primary land use. Sandy soils require periodic irrigation and have made the Town prone to wildfires and drought-like conditions. Property along the Wisconsin River is in the Lower Wisconsin River State Wildlife Area. The Town’s population was estimated to be 770 in 2011. The Town is expected to experience a strong population growth of approximately 40 percent between 2000 and 2030, adding roughly 263 people.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding	Studnicka Road	2010	Flooding caused road bed and pavement erosion and the bridge supports were undercut by current. (Both road and bridge were repaired.)
	Studnicka Road	6/2000	Flooding caused damage on Studnicka Road. The road’s seal coating was washed away. There was damage to Bluff Road where the embankment was eroded away, covering 50 feet of the roadway. Sand Branch Road was damaged when debris from a landslide covered the road. Debris was trucked to Ridge Road to use as fill in areas that eroded.
	Blue River Valley	1993	Repairs included the removal of debris from culverts on Forest and Ridge Roads. Pavement was washed out and ditches were regraded on Forest, Ridge and Studnicka Roads. Aggregate surfaces on several other roads washed away.
		7/1990	FEMA monies were used to repair Studnicka Road bridge. The riprap had to be replaced around the bridge abutment.
	Blue River Valley	1951	Flooding occurred in the Blue River Valley at CTH G, past CTH Q. Debris collected under the bridge, causing flooding in adjacent farmlands and washing away cattle.
Flash-Flooding		2010	Flash-flooding caused road washouts and erosion. (Town later seal coated road slope to prevent future washouts.)
		5/22-23 and 6/16/2004	The flooding of Forest Road required gravel to be replaced and debris removed.
Severe Thunderstorms		4/17/2004	1 inch hail and wind gusts of 60 to 65 mph caused property damage.
		1998	Wind destroyed several barns on CTH Q and G.
Winter Storms		11/8/1986	Early snow caused severe crop loss.
		1976	An ice storm caused the power to go out for 4-5 hours.
	Ridge Road	1959	Snow on Ridge Road was too deep to plow. Community members shoveled for a day and only made 200 feet of progress.

Disaster	Location	Date	Descriptions
Wild/Forest Fires		1950	Fire.
		4/1998	20 acres burned near Highway 133, west of the Village of Muscoda. The fire was started by a torch. No structures were lost.
		1960	200 acres were burned between the Wisconsin River and Highway 133 and the Muscoda and Blue Rivers. No structures were lost.
Insect Infestation		1982-83	Alfalfa weevils.
		2000-present	Asian beetles.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- The earthen dams in the valley continue to be a concern of the Town Board. The dams, primarily located in farm fields, were constructed from the 1960s forward with funds from the ASC and FHA. Initially designed to provide water retention ponds, soil and materials have backed up behind the dams, in some cases filling retention areas; water then runs over and around the dams causing problems in the lower areas of the watershed. The Town Board feels that an initial debris removal and regular maintenance program is needed to make the dams functional. Unfortunately, GCEM staff indicated that FEMA funds are not available for this type of project on private property. Locations of the dams identified by the Town include:
 - Jerry Aid property, one dam, Section 27 (1960)
 - Ronny Bompkamp property, one dam, Section 35 (1960)
 - Roland Kovars property, one dam, Section 31 (1960)
 - William Tracy property, one dam, Section 32 (1960)
 - Ron Kovars property, one dam, Section 31 (1970)
 - Phillip Schwabe property, two dams, Section 15 (1983)
 - Matthews Farms, three dams, Sections 19 and 20 (1990s)
 - Ralph Delton, one dam, Section 34 (1990s)
- Sandy soils cause drought-like conditions nearly every other year.
- The Town does not put up any snow fences in the winter.
- A bridge needs to be replaced on Sand Branch Road; however, the adjacent landowner refuses to grant the Town necessary permission to complete the project. The Town is concerned that the bridge will collapse. Although the school bus was re-routed to avoid the bridge, several farmers are forced to haul loads of cattle across the bridge to market.
- A bridge on Forrest Road has issues with flooding during periods of high water.
- The Town has seal-coated many of the roads and these roads withstood heavy rains better than gravel roads. Seal-coating more roads may decrease washouts and repair expenses.
- A natural gas pipeline that runs through the Town is only buried four feet deep. There are some concerns of flooding and washing where the pipeline runs through the Sand Branch and the Blue River.
- There are homes in the floodplain in the Town. The DNR has attempted to purchase properties but the owners are not willing to sell them.
- According to the Town Board, if the Montfort area gets 4-5 inches of rain, the valley floods.
- The Fennimore Branch Creek often floods and causes damages.
- In this part of the County, DNR requires a burning permit anytime the ground is not snow covered during the months of January, February, March, April and May.

- Inadequate stormwater management and inappropriate agricultural practices increase damages from flooding.
- Surrounding vegetation and undergrowth increase the potential for wild/forest fires.
- High volumes of truck traffic on Highway 133 and train traffic on the Wisconsin Calumet Railroad increase the possibility of a hazardous materials spill.

Local Action Recommendations

- Work with GCEM to pursue maintenance of the several earthen dams located throughout the Town. This may include dredging in water retention areas behind the dams, repairs as needed and an ongoing maintenance program. Pursue State and federal funds and property owner cooperation for such an initiative as is possible and attempt to coordinate with a similar effort advised for Potosi.
- Replace bridge on Sand Branch Road, explore and implement options for the bridge on Forrest Road that floods and seal-coat roads to limit washouts.
- Help prevent forest and wildland fires by:
 - Making residents aware that a burn permit may be required by the DNR between January and May.
 - Ensuring the Fire Department is prepared and equipped to respond to this type of hazard.
 - Encouraging fire safe “clear zones” around all homes that are free of trees and brush.
- Support buyout of properties identified as having had flooding issues during more than one flooding event.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- In partnership with the Town, the County should prevent additional development in the floodplain and proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Consider construction of a community storm shelter, particularly for mobile home park residents. Coordinate with the owners of the mobile home parks to identify a temporary storm shelter until one can be built.
- Work with the Grant County Highway Department to identify stormwater management issues along roadways and areas prone to embankment failure and make repairs as funds are available.
- Work with private property owners to improve stormwater management in problem areas.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s, few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

Town of Muscoda Map

TOWN OF NORTH LANCASTER

The Town of North Lancaster is located in central Grant County directly north of the City of Lancaster. Almost all of the 36 square miles is within the Upper Grant River watershed, although a small portion in the southeast corner is split between the Platte River watershed and the Middle Grant River watershed. The area is predominantly agricultural, although there are woodlands along the creeks in southern portion of the Town. The Town’s population was estimated to be 508 in 2011. The Town is expected to see modest population growth of around 17 percent between 2000 and 2030, corresponding to an additional 87 residents.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding		6/16/2004	Flooding caused damage.
	Borah Creek	2000	Flooding caused the creek to overrun bridges. FEMA monies were used to make repairs to Scenic Road, Circle Road, High Lane, Bluff Road, Pine Knob Road. Repairs included replacing gravel, 2 culvert replacements, debris clearance, rip rap replacement, grading and slide removal.
		7/1998	FEMA monies were used to replace gravel on Pine, Bluff, Oak, Circle, Crest Trail, High Land Roads and Lake Lane.
		7/1993	FEMA monies were used to replace gravel on roadways and culverts on Naomi Lane and embankment failures on Parkview, Circle and Borah Roads.
		7/1990	FEMA monies were used to repair Studnicka Road bridge. The riprap had to be replaced around the abutment.
Severe Thunderstorms		2000	Hail damaged siding and roofs on houses.
		7/3/1975	Golf-ball sized hail accompanied by heavy rains and strong winds severely damaged crops and farm property, including broken windows and damaged doors.
Tornado		5/21/1918	A tornado destroyed Rowdon School.
Drought		1988	

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- Inappropriate agricultural practices increase damages from flooding.
- High volumes of truck traffic on Highway 61 increase the possibility of a hazardous materials spill.

Local Action Recommendations

- Work with the Grant County Highway Department to identify stormwater management issues and areas prone to embankment failure along roadways and make repairs as funds are available.
- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- The County should work with the Town to discourage additional development in the floodplain and proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Work with private property owners to improve stormwater management in problem areas.

- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s, few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

Town of North Lancaster Map

TOWN OF PARIS

The Town of Paris is located in southern Grant County. The area is mostly agricultural, although there are wooded hillsides and floodplain forest along various creeks and rivers. The terrain is steep and scenic, with numerous hills and valleys. The majority of the Town is either in the Platte River or the Little Platte River watershed; the far southeast edge of the Town marks the spot where the Platte River joins the Mississippi River. The ridge south of Dickeyville marks the point where water begins to flow into the Galena River. The Town’s population was estimated to be 704 in 2011. The Town is expected to experience slow population decline at a rate of 2 percent between 2000 and 2030, representing a loss of 14 residents.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding		6/1/2000	Flooding caused Airport Road to washout; requiring 225 yards of gravel. Gravel washouts included 90 yards on Elmers Lane, 105 yards on Charlie Lane, 45 yards on Church Road, 45 yards on Blockhouse Lane, 15 yards on Stanton Road and 30 yards on Kelly Lane. A mudslide on Cliff Lane required 30 yards of gravel.
	Oak Road, Morgan Road and Charlie Lane	5/20/1999	Flooding caused Oak Road, Morgan Road and Charlie Lane to be covered with mud and debris. 10 yards of gravel had to be replaced on Oak Road. Bridge abutments were washed out and concrete had to be poured over the rocks to reinforce the bridge on Morgan Road. Mud had to be cleared and 135 yards of gravel had to be replaced on Charlie Road.
	Oak Road	6/3/1997	135 yards of gravel and debris were deposited on Oak Road after the flood. The road was resealed in September.
		7/1993	FEMA monies were used for debris removal, gravel and embankment replacement and repair culverts on Block House and Line Roads.
		4/1965	Flooding on the Mississippi River backed up the Platte River. Homes and low-lying areas flooded.
Flash-Flooding		5/22-23 and 6/16/2004	Flash-flooding closed Oak Road. Airport Road was covered in water, but only for a short time.
		9/11/2000	5-6 inches of rain in 2-3 hours caused property and crop damage. Several roads from Dickeyville to Platteville were under up to a foot of water. <i>NWS</i>

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- A large chemical processing and shipping plant opened, raising concerns about potential for a fire or large spill.
- Alliant Energy maintains a storage area for woodchips on Oak Road. Often this pile has self-heated and the fire department and mutual aid partners have spent a great deal of time and resources battling these fires.
- A property on West Lane was purchased through the FEMA buy-out program in 2002. Two other frequently flooded properties are in the Town, one on West Lane and one on Airport road. GCEM recently acquired both.
- Residences on Kress Lane may also have flooding issues when the Mississippi River backs up into the Platte River.
- Oak Road floods with every heavy rain event.

- High volumes of truck traffic on Highways 61 and 151 increase the possibility of a hazardous materials spill.

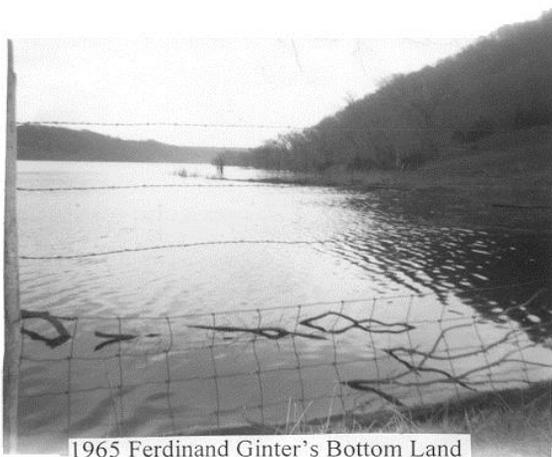
Local Action Recommendations

- Work with the Grant County Highway Department to identify stormwater management issues along roadways and areas prone to embankment failure and make repairs as funds are available.
- In partnership with the Town, the County should prevent additional development in the floodplain and proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- Work with private property owners to improve stormwater management in problem areas.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Work with the local cellular service provider to improve coverage in the area.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s, few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.



1965 Bainfield Bridge West End

The Bainfield bridge was completely covered during the 1965 flood.



1965 Ferdinand Ginter's Bottom Land



1965 Ferdinand Ginter's Bottom Land

The Town of Paris was flooded in 1965. These photos show flooded farmland during this period.

Town of Paris Map

TOWN OF PATCH GROVE

The Town of Patch Grove is located in northwest Grant County. Military Ridge runs through the center of the Town and is a major dividing line between the Millville Creek watershed, which flows directly into the Wisconsin River and two other watersheds, the Mississippi River watershed and the Middle Grant River watershed. Agriculture is the major industry in the Town. Woodlands cover much of Military Ridge in the northern portion of the Town. USH 18 and STH 35 are the two major roadways in the area. The Town’s population was estimated to be 338 in 2011. Patch Grove is expected to experience modest population growth of around 7 percent between 2000 and 2030, representing an additional 27 residents.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding		6/2008	Significant rainfall caused numerous road washouts and embankment failures.
		5/2003	Flooding caused road tubes to washout along with floodgates and fields. Debris washed onto Hicklin Hollow Road, requiring 204 yards of gravel to be replaced.
		7/1993	FEMA monies were used to remove debris, replace gravel on various town roads and make repairs to culverts.
Flash-Flooding		5/22-23/2004	Flash-flooding caused gravel washouts and culvert damage on Hicklin Hollow and Dark Hollow Roads.
Severe Thunderstorms	Main Road and Hwy 35	1950	Hail damaged corn and hay crops.
			Winds estimated as high as 80 mph toppled trees and downed power lines.
Tornado		5/30/1985	An F2 rated tornado destroyed buildings, fences, trees, barns, silos, a hay shed, grain bins and machine sheds. <i>NWS</i>
Winter Storms		2/2/2011	Two days of heavy snow and high winds required extra labor and equipment to clear roads.
		1976	An ice storm caused widespread damage and power outages in areas for four days.
		Date unknown	Roads were blocked for more than a day. Milk from dairy farmers had to be dumped because the roads were impassable for milk trucks and all other traffic.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- There continues to be inadequate cellular coverage in the Town.
- Inappropriate agricultural practices increase damages from flooding.
- High volumes of truck traffic on Highway 18 and 35 increase the possibility of a hazardous materials spill.

Local Action Recommendations

- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- Work with the Grant County Highway Department to identify stormwater management issues along roadways and areas prone to embankment failure and make repairs as funds are available.
- Work with the local cellular service provider to improve coverage in the area.
- In partnership with the Town, the County should proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Consider construction of a community storm shelter, particularly for mobile home park residents. Coordinate with the owners of the mobile home park to identify a temporary storm shelter until one can be built.
- Work with private property owners to improve stormwater management in problem areas.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s, few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

Town of Patch Grove Map

TOWN OF PLATTEVILLE

The Town of Platteville is located in southeast Grant County and surrounds the City of Platteville, which is the County’s largest community. The Town remains primarily agricultural and is entirely within the Little Platte River watershed. Its 2011 estimated population was 1,525 persons, which makes it the second most populous Town in the County. The Town is expected to grow by approximately 21 percent between 2000 and 2030, or about 279 new residents.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flash-Flooding	Southwest Road	2011	Rainwater comes down from Southwest Road from the north and flooded US 151.
		5/22-23 and 6/16/2004	Flash-flooding washed out gravel, deposited debris and damaged culverts on Southwest Road.
		5/31-6/1/2000	Flash-flooding caused washouts on several roads.
		7/1998	Embankment damaged during the heavy rains.
	Southwest Road	Summer, 1998	Flash-flooding caused washouts on several roads.
		6/1993	Heavy rains caused damage to Town roads and culverts. Water 2 feet deep was reported on Southwest Road. FEMA funding helped replace riprap, shot rock and seal coating of black top. These funds did not correct the problem, but repaired the effected location.
		7/15/1950	Flash-flooding washed out and destroyed several bridges in Town, including Stumptown Bridge.
Severe Thunderstorms		1960 (exact date unknown)	Golf-ball sized hail damaged trees, buildings and killed some livestock.
Drought		Summer, 1988	Severe drought conditions resulted in decreased crop yields.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments and Local Action Recommendations

- The culvert at Southwest Road and US 151 needs to be larger or relocated to address flooding issues.
- There is a firing range on Southwest Road. There have not been any incidents, but it should be noted.
- The U.S. Highway 151 four-lane expansion raises concerns about increased stormwater run-off and flooding. The project resulted in 9 more dead-ends and 5.5 more miles of roads.
- The Town currently has 6.5 miles of road that is gravel on portions of 14 different roads.

- Stormwater management issues include:
 - The 4-5 foot drainage tube on Southwest Road needs to be replaced with at least a 6-8 foot tube.
 - Southwest Road 1 mile west of CTH D) has a 6-foot drainage tube, which should be considered for a box culvert replacement. The stream that runs through this valley occasionally overruns its banks causing Southwest Road to flood.
 - Southwest Road 0.5 miles west of CTH D) is gravel and needs to be reditched on the south side. This task will be hard to accomplish, as the bank is steep. According to the Town patrol officer, parts of the road wash away during periods of heavy rain. Paving the road is not an option because construction costs to support the weight of dump trucks that use this road are cost prohibitive. Additionally, farmers in this area should be checked for proper soil conservation practices as topsoil from area fields frequently washes on to the road.
 - Bluff Lane (~2 miles south of US Highway 151 on CTH D) has issues with flooding. The railings of a small bridge about ¼ miles east of CTH D had to be removed to accommodate daily dump truck traffic from a quarry on Bluff Lane. During periods of heavy rain, the bridge is covered with water from a small stream that runs parallel with Bluff Lane and under the bridge. This bridge must be replaced. FEMA funding has been received in the past to replace gravel washed away during flooding. This road and bridge provide access to two residences.



An inlet tube, located near Hwy 151, is unable to effectively handle large volumes of rain water during heavy rains.



This bridge, located on Pleasant Valley Road, floods during periods of heavy rain, restricting access to area homes and businesses.

- Blockhouse Creek (~1.5 miles south of US Highway 80/81) during periods of intense rain, the water leaves the banks of the creek and passes over the road instead of traveling under the bridge on Pleasant Valley Road. Local farming practices and the failure to use proper contour farming techniques, are believed to contribute

to the flooding. Some re-ditching in the area has been done in an attempt to keep water off the road, but it has not been successful. Barns and out buildings of a farm in the valley are often flooded. Some rocks and topsoil has accumulated under the bridge. FEMA funding was used to make some repairs. Work with the Town and property owners to arrive at a long term solution.

- The two mobile home parks in the Town have cinder block, windowless storm shelters that are in varying states of disrepair. GCEM is not positive the shelters could withstand winds in excess of 100 miles per hour. The 150 residents of Oak Park have 24-hour access to their shelter. Most of the mobile homes in Oak Park are in moderate to poor condition. It is doubtful that any of them have tie-downs. The approximately 100 residents at Woodland Terrace must find a key holder to open the shelter; new ownership is considering issuing each unit a shelter key. There is concern that the existing shelter would not be large enough to house 100 residents in an emergency and the shelter is being used improperly as a play house for area children. Mobile homes at Woodland Terrace are in good to moderate condition. Some have tie downs, but the majority do not. Coordinate with the owners of the mobile home parks to (a) identify what repairs or enforcement is necessary to ensure that existing storm shelters are functional, or to get new, accessible shelters built and (b) encourage tie-downs on all mobile homes.
- Residents of Shady Road (Beer Can Alley) requested that the Town relocate the road to an adjacent hill in order to alleviate traffic issues and flooding problems. A 6-foot drainage tube in the valley at the bottom of the hill is inadequate and about every other year, the stormwater runs over the road at this location.
- The low lying areas of North Elm Street receive stormwater run-off from the Platteville Golf and Country Club, a small creek and four tubes that collect stormwater run-off from the City of Platteville housing development. One of the tubes carries a significant volume of water from a natural spring. At certain times of the year, the tubes and retention area are inadequate and floods the road, making access to five houses impossible. The street is owned and maintained by the Town and City of Platteville; however, there is disagreement regarding ownership boundaries and stormwater management responsibilities. Work with the Town and property owners to arrive at a long term solution.
- High volumes of truck traffic on Highways 80, 81 and 151 increase the possibility of a hazardous materials spill.
- Work with the Grant County Highway Department and Wisconsin Department of Transportation to identify stormwater management issues along existing and proposed roadways and make repairs, as funds are available.



An old, weathered Bluff Lane bridge in the Town of Platteville is covered with water during periods of heavy rain.



Shady Lane floods during periods of heavy rain, making emergency access to homes in the area difficult.

- Work with the Grant County Highway Department and Wisconsin Department of Transportation to identify areas prone to embankment failure and make repairs as funds are available.
- In partnership with the Town, the County should prevent additional development in the floodplain and proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- Work with private property owners to improve stormwater management in problem areas.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Work with the local cellular service provider to improve coverage in the area.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s, few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.



The Platteville Industrial Park, located in the background of this photo, experiences stormwater management problems due to ineffective culverts and catch basins.

Town of Platteville Map

TOWN OF POTOSI

At almost 60 square miles, the Town of Potosi is the County’s largest town as measured in land area. It is in south central Grant County and contains the confluence of the Grant and Mississippi Rivers. Water flowing through the area is divided into the Platte, the Lower Grant and the Mississippi River watersheds. The area along the Mississippi River is a low lying area, consisting of broad-leaved deciduous forest. The steep bluffs are also wooded, but along the ridges and in more level areas of the Town, agriculture is the primary land use. The 2011 estimated population is 850 residents. The Department of Administration expects the Town to lose population between 2000 and 2030 at a rate of 23 percent, which equals the loss of 193 residents.

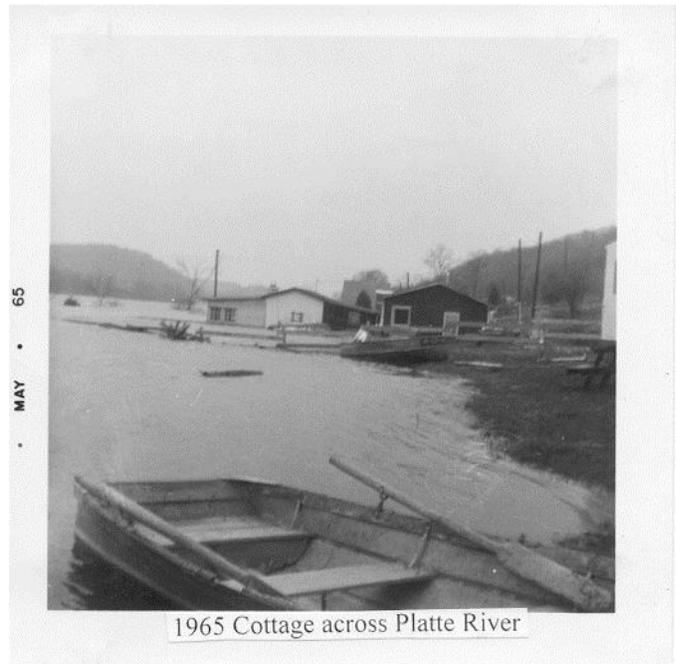
Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding		2000	FEMA funds were used to repair Seymore Ridge, Church Road, Hippy Hollow Road, Rockville Road, Mueller Lane, Bartles 80, Abing Lane, Hogs Hollow Road, River Lane and Pikes Peak Road.
		7/1998	FEMA monies were received for replacement of gravel on Muller Lane, West Lane, Church Lane, Seymore Ridge Road, Camel Back Road, Old Potosi Road, Jannata Lane and Abiuj Road.
		1951 (exact date unknown)	Mississippi River flooding caused the Grant River to back up under the rail road bridge.
Flash-Flooding		5/22-23 and 6/16/2004	Flash-flooding damaged Tobins 80 and the lower end of Hippy Hollow Road. There were significant debris deposits and many plugged tubes. The June 16 th storm caused an additional damage to culverts on Reynolds Ridge Road, standing water on Dutch Hollow Road and plugged many culverts.
Severe Thunderstorms		8/20/2003	Winds estimated as high as 80 mph toppled trees and power lines, tore the roof from schools in Potosi and Patch Grove and damaged the roofs of several homes.
		4/11/2001	55 mph winds caused property damage. The roof was blown off a building 3.5 miles north of Potosi. <i>NWS</i>
		5/31/1998	67 mph winds collapsed a barn near Potosi, killing a horse. <i>NWS</i>

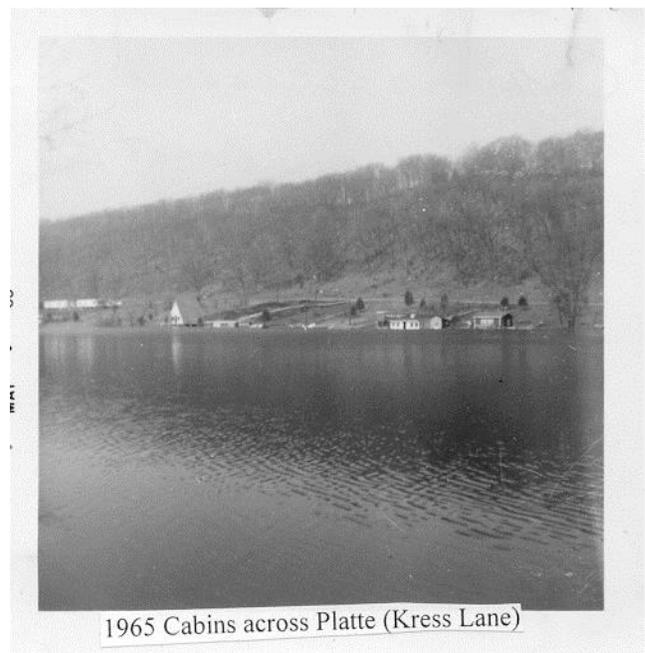
Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments and Local Action Recommendations

- The Army Corps of Engineers Public Area at the end of Park Lane floods when the Mississippi River rises. The park entrance building, campground area and municipal bathhouse are often damaged. There is only one access point to the Public Area, with a locked gate preventing use of a second access. This area is also adjacent to the railroad. If a train stopped in this area it would block access to the park and cabins. Since the Town is responsible for fire and emergency services, there is concern about access issues here. With assistance from GCEM, work with the Army Corps of Engineers to correct flooding issues on Park Lane and to secure an open, second access to the Public Area along the River
- The creek along Slazing Road continues to wash out the road. Work with the Town on a long term solution.
- GCEM recently purchased two repetitive loss properties near Hippy Hollow Road and Highway 61.
- Work with the Town to cut back and re-ditch the bank along River Lane so soil does not wash out onto the road.
- The culvert at Bartles 80, off Muller Lane, needs to be replaced with a larger one. Also, about 1000 feet of the road should be raised. During periods of heavy rain, stormwater run-off flows over the road when the culvert has reached capacity. Financial assistance is needed for repairs.
- Bridge supports on Hippy Hollow Road are washed out during times of high water. The Town is considering extending the wing wells; however, this would require financial assistance.
- Work with the Town, property owners, and emergency responders to address access issues during road flooding along the Platte River.
- Areas along Shannon and Brouillard Hill Roads have several locations where banks could be cut down to stop the drifting of snow; both locations are privately owned. The owner on Shannon Road is receptive to this mitigation strategy, but the Brouillard Hill owner is not. The Town is trying to work with the phone company to agree to replace a telecommunication line in the Shannon Road area after the bank is cut down.
- High volumes of truck traffic on Highway 35, 61 and 133 and train traffic on the Burlington Northern-Santa Fe Railroad increase the possibility of a hazardous materials spill.



1965 Cottage across Platte River



1965 Cabins across Platte (Kress Lane)

Homes in the Platte River area are often flooded. These photos show some of the homes after the 1965 flood.

- In partnership with the Town, the County should prevent additional development in the floodplain and proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Work with GCEM to identify and seek funding support for floodproofing or acquisition of additional recurring loss structures.
- Work with the Grant County Highway Department to identify stormwater management issues along roadways and areas prone to embankment failure and make repairs as funds are available.
- Work with private property owners to improve stormwater management in problem areas.
- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s, few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

Town of Potosi Map

TOWN OF SMELSER

The Town of Smelser is located in southeast Grant County, directly south of Platteville. It is in the Little Platte River and the Galena River watersheds and is primarily agricultural. The northwest corner of the Town contains some forested areas adjacent to Blockhouse Creek and the Snowden Branch of the Little Platte River. The Town’s population was estimated to be 795 in 2011. The Department of Administration expects the Town to gain approximately 23 residents between 2000 and 2030, a growth rate of 3 percent.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding		1999	5.5 inches of rain caused damages in Sections 20, 22, 16, 17, 32, 28, 8, 9, 21 and 30. The amount of FEMA funds received was not recorded. Klar and St. Rose Roads were damaged. East Quarry, Quarry, Rock and Cemetery Roads were closed.
		7/1998	FEMA monies were received for replacement of gravel to Cemetery, Rock, Hill and Klar Roads.
		6/1993	Heavy rains caused substantial damages to roads in the Town.
		1876	“Centennial Flood” of Campbell’s Branch Creek killed one and threatened to washout the dam and mill. The flood gates had to be watched.
Flash-Flooding		5/22-23 and 6/16/2004	Gravel washed out on Patch Road, debris deposited and culverts plugged.
Severe Thunderstorms		9/11/2000	1.25 inch hail and winds caused property and crop damage north and west of Cuba City. Law enforcement reported wind gusts of 60-65 mph as well as hail up to the size of half dollars. Roads in Sections 2, 3, 4, 8, 9 and 10 were damaged. Two unspecified bridges were blocked for about 4 hours. A backhoe was used to remove debris from bridges and gravel had to be replaced on the roadways. Rock, Patch and Pleasant Valley Roads sustained damage. Rock and Patch Roads were closed.
Winter Storms		2/2011	Heavy snow and wind caused drifting on Lone Road, Model Road and St. Rose Road.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- Inappropriate agricultural practices increase damages from flooding.
- High volumes of truck traffic on Highway 80 and 81 increase the possibility of a hazardous materials spill.

Local Action Recommendations

- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- In partnership with the Town, the County should prevent development in the floodplain and proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Work with the Grant County Highway Department to identify stormwater management issues along roadways and areas prone to embankment failure and make repairs as funds are available.
- Work with private property owners to improve stormwater management in problem areas.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s, few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

Town of Smelser Map

TOWN OF SOUTH LANCASTER

The Town of South Lancaster is located in central Grant County, south of Military Ridge and surrounding the City of Lancaster. Much of the Town’s 34 square miles is used for agricultural production, although small patches of woodlands exist on steep slopes and along some waterways. There are three dominant ridges in the Town that direct water into four different watersheds—the Upper, Middle and Lower Grant River watersheds and the Platte River watershed. The Town’s population was estimated to be 851 in 2011. The Department of Administration expects the Town to gain approximately 114 residents between 2000 and 2030, a growth rate of 14 percent.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding		5/2000	Pigeon Lane was washed out during a period of heavy rain. FEMA funded gravel replacement.
		7/1993	FEMA monies were awarded and used to replace gravel washed away during the storms.
Flash-Flooding		5/22-23/2004	Flooding caused gravel to washout.
Severe Thunderstorms		6/13/2002	55 mph winds caused damage. Straight-line winds estimated at 60-65 mph blew down a barn killing seven cattle. <i>NWS</i>
		7/16-17/1977	Hail damaged crops including oats and corn. Windows were broken in several homes.
Tornado		1959	Tornado near the unincorporated Town of Hurricane, no details available.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- The Town contact identified the following hazards as having affected the Town: floods, flash-floods, tornados, heavy rain, severe snowstorm, severe ice storm, hail and high winds.
- Inappropriate agricultural practices increase damages from flooding.
- High volumes of truck traffic on Highway 35, 81, 61 and 129 increase the possibility of a hazardous materials spill.

Local Action Recommendations

- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- Work with the Grant County Highway Department to identify stormwater management issues along roadways and areas prone to embankment failure and make repairs as funds are available.
- In partnership with the Town, the County should prevent development in the floodplain and proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Consider construction of a community storm shelter, particularly for mobile home park residents. Coordinate with the owners of the mobile home parks to identify a temporary storm shelter until one can be built.
- Work with private property owners to improve stormwater management in problem areas.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.

- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s, few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

Town of South Lancaster Map

TOWN OF WATERLOO

The Town of Waterloo is located in southwest Grant County in the Lower Grant and Mississippi River watersheds. STH 133 runs along the ridge that separates the two watersheds. Although the more level areas are in agricultural production, much of the Town consists of steep wooded hillsides, especially in the Grant River Valley. The Town’s population was estimated to be 558 in 2011. The Town is expected to see population growth at a rate of 20 percent between 2000 and 2030, which equates to an additional 109 residents.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding		6/4/2002	Grant and other Rivers flooded extensive areas of farm fields causing property and crop damage. <i>NWS</i>
		7/1993	FEMA monies were received and used to clear out a channel, which drains water away from residences; create an emergency levee on Lynn Hollow Lane; and to replace gravel on several roads.
Flash-Flooding		5/22-23 and 6/16/2004	Flash-flooding caused gravel washouts, plugged tubes and deposited debris. The June 16 th storm caused embankment failures on West Haas Lane, Sleepy Hollow Lane and Irish Hollow Road.
	Pigeon River Road	5/1975, 6/1978, 6/15/1991, 7/1996, 6/1/2000 6/2001 and 6/4/2002	The Grant River floods during periods of heavy rains, causing flash-flooding. The river flowed into adjacent cornfields and caused heavy crop damage and soil erosion to the Keith Miles property.
	Above Burton Bridge	1991, 1996, 2000, 2001 and 2002	Flash-flooding of the Grant River caused overflow into adjacent cornfields, resulted in heavy crop damage and soil erosion.
	Below Burton Bridge	6/1991, 1996, 2000, 2001, 2002 and 2/1994	Flash-flooding of the Grant River into adjacent cornfields caused heavy crop damage and soil erosion on the Reynolds property. In February of 1994, ice chunks and debris caused additional problems.
	Below Burton Lane	6/1991, 1993 and 6/2002	Flash-flooding of the Grant River into adjacent cornfields caused heavy crop damage, soil erosion and weeks of standing water on the Hauk property.
	CTH U	1976, 6/1991, 1993 and 6/2002	Flash-flooding of the Grant River into adjacent cornfields caused heavy crop damage, soil erosion and weeks of standing water.
	Rattlesnake Road	1976, 6/1999, 2001 and 6/2002	Flash-flooding of the Grant River flooded area cornfields.
	Haas Lane	1976, 1979, 1981, 1984, 1989, 1991, 1993, 1999	Flash-flooding of the Grant River into adjacent cornfields caused heavy crop damage and soil erosion.

Disaster	Location	Date	Descriptions
		and 2002	
	East Park Lane	1976, 1979, 1981, 1984, 1989, 1991, 1993, 1999 and 2002	Flash-flooding of the Grant River into adjacent cornfields caused heavy crop damage and soil erosion on the Yager property. In February of 1994, ice chunks and debris caused additional problems on Camel Ridge Road.
	West Park Lane	1999, 2001 and 6/2002	Flash-flooding of the Grant River into adjacent cornfields caused heavy crop damage and soil erosion.
	Glassmaker Road	1979, 1981, 1984, 1989, 1991, 1993, 1999 and 2002	Flash-flooding of the Grant River combined with water from the Rattlesnake Creek and flowed into adjacent cornfields, causing heavy crop damage and soil erosion.
	Grant River Bottoms	1976, 1979, 1981, 1984, 1989, 1991, 1993 and 2002	Flash-flooding of the Grant River into adjacent cornfields caused heavy crop damage and soil erosion.
	Udelhoven Bridge	1976, 1979, 1981, 1984, 1989, 1991, 1993, 1999 and 2002	Flash-flooding of the Grant River into adjacent cornfields caused heavy crop damage and soil erosion.
	Chaffee Hollow Road	6/8/1951	Flash-flooding on the Grant River took out the bridge on Chaffee Hollow Road.
Severe Thunderstorms	Camel Ridge Road	10/2001	Lightning killed two heifers; one by direct strike and one by a lightning-toppled tree.
	Camel Ridge Road	2001	Lightning burned out the wiring on a grain bin.
	Camel Ridge Road	6/2000	Hail occurred early in the month and then again two weeks later. The first storm stripped the corn and the second restripped the new growth.
Tornado		6/30/1955	A tornado destroyed three barns and two garages. One house and two barns were extensively damaged.
Landslide/ Embankment Failure			Embankment failures are frequent on Kieler Lane, East Park Road, Dugway Road, Blackjack Road and Pigeon River Road.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- The Beetown Branch Creek swept away propane tanks and debris from the Beetown area and lodged it under an old bridge at the north end of Rattlesnake Road just into the Town of Waterloo, causing farm buildings, feed lots and pastureland north of this location to flood.
- Snow fences must be erected on Dutch Hollow, Camel Ridge, Chaffee Hollow, Reynolds Ridge, Elmdale and Adrian Hollow Roads to keep them from drifting shut.
- High volumes of truck traffic on Highway 133 and train traffic on the Burlington Northern-Santa Fe Railroad increase the possibility of a hazardous materials spill.

Local Action Recommendations

- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Work with the Grant County Highway Department and property owners to install snow fences along Dutch Hollow, Camel Ridge, Chaffee Hollow, Reynolds Ridge, Elmdale and Adrian Hollow Roads.
- In partnership with the Town, the County should prevent additional development in the floodplain and proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Work with the Grant County Highway Department to identify stormwater management issues along roadways and areas prone to embankment failure and make repairs as funds are available.
- Work with private property owners to improve stormwater management in problem areas.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s, few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

Town of Waterloo Map

TOWN OF WATERSTOWN

The Town of Watterstown is located in northeast Grant County along the Wisconsin River and is densely wooded with patches of agricultural land. Property along the Wisconsin River is in the Lower Wisconsin River State Wildlife Area, Blue River Unit. A ridge runs north to south through the Town and separates it into two watersheds, the Blue River watershed and the Green River and Crooked Creek watershed, both of which flow into the Wisconsin River. STH 133 runs east to west and is the major transportation facility in Watterstown. The 2011 estimated population was 329 persons and is expected to increase by 6 percent, or 20 residents, between 2000 and 2030.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding	Studenberg Road	5/22-23/2004	Flooding damaged a culvert.
	Bailey Road ~1.5 mi. south of Forest Road	7/2000	Flood water deposited rocks and debris onto the road and washed away three layers of seal coating.
	Flynn Road ~0.5 mi. south of Old C	7/2000	Flood water washed out two layers of seal coating in an area 500 x 20 feet.
	Old C ~0.5 mi. west of Circle Drive	7/2000	Heavy rain caused debris to accumulate in the ditch. The road surface was washed out and the culvert was completely filled with sediment.
		7/1993	FEMA monies were used to remove debris deposited by the rain. It was also used to replace gravel washed away and to repair damage to culverts around the Township.
		7/1990	FEMA monies were used to replace gravel and repair culverts on Circle Drive, Bailey Road and Old Co. C.
Severe Thunderstorms	2 mi. south of Blue River	8/25/2003	0.88 inch hail was reported.
Landslide/ Embankment Failure	Studenberg Road ~1.5 mi. south of Old C	7/2000	Heavy rain caused embankment failure. A slide began at the shoulder of the roadway and extended onto the road.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- High volumes of truck traffic on Highway 133 and train traffic on the Wisconsin Calumet Railroad increase the possibility of a hazardous materials spill.

Local Action Recommendations

- Work with the Grant County Highway Department to identify stormwater management issues along roadways and areas prone to embankment failure and make repairs as funds are available.
- In partnership with the Town, the County should prevent additional development in the floodplain and proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- Work with private property owners to improve stormwater management in problem areas.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s, few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

Town of Watterstown Map

TOWN OF WINGVILLE

The Town of Wingville is located in northeast Grant County. Military Ridge is the most prominent geologic feature and separates the Town into two watersheds—the Blue River and the Platte River watersheds. As in much of Grant County, agriculture is the major industry in Wingville. Forested tracts can be found along steeper slopes and adjacent to certain waterways. USH 18 runs east to west through the Town and is the major transportation facility in the area. The Town’s population was estimated to be 356 in 2011. The Town is expected to grow by 24 percent, or 93 new residents, between 2000 and 2030.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding		2007/2008	Flooding caused embankment failures and road washouts.
	Richard Schambow Farm	1996	Flooding washed out a private drive.
	Haines Lanes	1993	Flooding caused the end of a culvert to washout. FEMA monies were used to remove debris on Cass Hollow Road. It was also used replace culverts in 3 locations and replace gravel on several roads.
	Cass Hollow Road	1990	Flooding caused a culvert to washout.
Flash-Flooding	Snow Bottom and Vavrica Roads	1992	Flash-flooding caused severe road damage. According to the Town, FEMA funding was received, but this could not be confirmed by GCEM.
Severe Thunderstorms		1997	High winds took the roof off of the Town salt shed.
	Southern half of Wingville	1994	Hail caused widespread damage over the southern half of the Town.
Tornado	Doug Jenks Farm	1974	Tornado touched down.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- The culvert on Cass Hollow Road needs to be expanded.
- Inappropriate agricultural practices increase damages from flooding.
- High volumes of truck traffic on Highways 18 and 80 increase the possibility of a hazardous materials spill.

Local Action Recommendations

- In partnership with the Town, the County should prevent additional development in the floodplain and proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- Work with the Grant County Highway Department to identify stormwater management issues along roadways and areas prone to embankment failure and make repairs as funds are available.
- Expand culvert on Cass Hollow Road.
- Work with private property owners to improve stormwater management in problem areas.

- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s, few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

Town of Wingville Map

TOWN OF WOODMAN

The Town of Woodman is in north central Grant County. Although some land is in agricultural production, the majority of the Town’s 27.5 square miles is heavily wooded and the terrain is quite steep. STH 133 runs north to south through the area and follows the Green River Valley. Property along the Wisconsin River is in the Lower Wisconsin River State Wildlife Area, Woodman-Millville Unit. The Mt. Hope Pond State Wildlife Area is located in the southern portion of the Town. The Town’s population was estimated to be 185 in 2011. It is expected to grow by 7 percent, or 14 new residents, between 2000 and 2030.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding	CTH C	4/17/1997	Wisconsin River flooding caused damage to CTH C. <i>Herald Independent</i>
Flash-Flooding	Green River Road, Irish Ridge Road, Lake Road	7/8/2009	3 inches of rain caused road washouts. Roads were repaired and culvert was replaced with larger size.
	Green River Road, Irish Ridge Road, Rail Hollow Road	6/10/2008	2-3 inches of rain caused road washouts. Roads were repaired and regraded.
	Green River Road, Irish Ridge Road, Lake Road	8/10/2007	2-3 inches of rain caused road washouts. Roads were repaired and regraded.
		5/22-23/2004	Flash-flooding caused widespread gravel loss, washouts, debris deposits and culvert damage. Fallen trees made roadways impassible.
		6/1/2000	Flash-flooding washed out a portion of Rocky Dell Road (the washout was caused by a drainage issue on an adjacent property). The Town filled the hole, regraded the road and cleaned the tubes. The flood also washed out an area below the drainage tube on Irish Ridge Road (a new tube since installed). A plugged bridge caused water to wash away a section of Big Green Road. A plugged tube caused water to wash away a portion of Spring Road.
		7/1993	FEMA monies were received and used to replace gravel and road embankments on Shady Hollow, Rosendale and Spring Roads and Batchelor Lane.
	Virgin Lane and Rosendale Road	5/1992	Flash-flooding caused stormwater runoff, creating a hole in the roadway. Rosendale Road had trees plugged under a bridge. (New bridge and tube has since been installed at Rosendale Road).

Disaster	Location	Date	Descriptions
	Rosendale Road	5/1990	Flash-flooding damaged Rosendale Road when trees, washed away by water, dammed up behind the bridge. After the declaration in July, FEMA monies were received and used to remove embankment failures on Rocky Dell, Rosendale and Dutch Hill Roads. Gravel also had to be replaced on these roads.
Severe Thunderstorms		6/25/1998	0.75 inch hail caused crop damage. <i>NWS</i>
Winter Storm		2/2/2011	12-14 inches of snow throughout the Town.
Tornado		1947	A tornado damaged trees and buildings on the south end of Town.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- The Town received FEMA funds in 2000 for several road repairs necessary as a result of flooding..
- Inappropriate agricultural practices increase damages from flooding.
- In this part of the County, DNR requires a burning permit anytime the ground is not snow covered during the months of January, February, March, April and May.
- High volumes of truck traffic on Highway 133 increase the possibility of a hazardous materials spill.

Local Action Recommendations

- In partnership with the Town, the County should prevent additional development in the floodplain and proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- Help prevent forest and wildland fires by:
 - Making residents aware that a burn permit may be required by the DNR between January and May.
 - Ensuring the Fire Department is prepared and equipped to respond to this type of hazard.
 - Encouraging fire safe “clear zones” around all homes that are free of trees and brush.
- Work with the Grant County Highway Department to identify stormwater management issues along roadways and areas prone to embankment failure and make repairs as funds are available.
- Work with private property owners to improve stormwater management in problem areas.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s, few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

Town of Woodman Map

TOWN OF WYALUSING

The Town of Wyalusing is a scenic, densely wooded Town along the Wisconsin River in the northwestern tip of the County. Property along the Wisconsin River is in the Lower Wisconsin River State Wildlife Area and is primarily covered with floodplain forest. Wyalusing State Park is also located in the Town and is situated at the confluence of the Wisconsin and Mississippi Rivers. The Town’s topography is steep in much of its 42.5 square miles. Its estimated 2011 population was 346 people and is expected to see only a modest population increase of 6 percent, or 23 new residents, between 2000 and 2030.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions
Flooding	CTH X	2008 and 2009	Flash-flooding and riverine flooding causes water over CTH X to block the roadway.
		4/20/2001	The Mississippi River reached 23.6 feet in height and washed gravel from Bohringer Lane to Bagley Bottoms.
		4/17/1997	Flooding of the Wisconsin River ran over CTHs C and X <i>Herald Independent</i>
	Mississippi River	6/30/1993	The Mississippi River flooded, 21.8 feet.
	Mississippi River	10/4/1986	The Mississippi River flooded, 20.16 feet.
	Mississippi River	4/10/1986	The Mississippi River flooded, 20.1 feet.
	Mississippi River	3/21/1973	The Mississippi River flooded, 20.2 feet.
	Mississippi River	4/22/1969	The Mississippi River flooded, 21.6 feet.
	Mississippi River	4/10/1967	The Mississippi River flooded, 20.7 feet.
	Mississippi River	4/24/1965	The Mississippi River flooded, 25.4 feet.
	Mississippi River	4/23/1952	The Mississippi River flooded, 21.2 feet.
	Mississippi River	4/20/1951	The Mississippi River flooded, 20.9 feet.
	Mississippi River	4/19/1922	The Mississippi River flooded, 19.4 feet.
	Mississippi River	4/4/1920	The Mississippi River flooded, 19.6 feet.
	Mississippi River	5/13/1888	The Mississippi River flooded, 20.6 feet.
Mississippi River	6/21/1881	The Mississippi River flooded, 21.5 feet.	
Mississippi River	5/1880	The Mississippi River flooded, 22.6 feet.	

Disaster	Location	Date	Descriptions
	River		
Flash-Flooding		5/22-23 and 6/16/2004	Flash-flooding caused washouts on Sand Hollow, Dry Hollow and Gasner Hollow Roads.
Severe Thunderstorms		5/16/1999	1.75 inch hail caused property damage. <i>NWS</i>
		6/18/1998	Most of the township received wind damage. Buildings were blown down and trees were uprooted. FEMA monies were received and used to remove wind-generated debris and replace gravel on Reddy Hollow Road.
Tornado		5/1985	A tornado destroyed buildings and acres of trees.
Winter Storms		February 2011	Three day storm event; keeping roads open was difficult due to blowing and drifting.
		1880-81	This winter was exceptionally long and severe. Travel was almost entirely impeded including mail delivery. <i>C.W. Butterfield's History of Grant County, Wisconsin</i>
		1855-56	This winter exceptionally severe. Heavy snow, warm weather, then heavy snow left a hard crust on the snow cover. Wild animals such as deer were harvested with clubs. Quails were killed nearly to extinction. <i>C.W. Butterfield's History of Grant County, Wisconsin</i>
		1843	This winter exceptionally severe.
		1836	This winter was exceptionally severe. According to Clinton Champion, the roads to Bloomington were impassable due to heavy snows.
		1833	Heavy snow caused drifts of 15-16 feet in the valleys.

Note: Unless otherwise noted, disaster locations are generalized within the jurisdiction.

Comments

- Flood Stage at the boat landing in Wyalusing State Park is 19.5 feet, as shown on a pole on the Glenn Lake shore.
- Wyalusing Town lies along Pool 10 in the Army Corps of Engineers Lock and Dam System.
- The majority of Town roads are gravel.
- In this part of the County, DNR requires a burning permit anytime the ground is not snow covered during the months of January, February, March, April and May.
- Approximately two miles north of CTH X on Ganser Hollow Road, the Town experiences washouts due to undersized culverts and debris channels. Such an incident occurs three to four times in a given ten year period.
- The gravel portion of Park Lane located ½ mile north of Bagley, off CTH X leading to property owned by the Fish and Wildlife Service, washes out with Mississippi River flooding.
- GCEM identified two recurring loss properties in the Town that are candidates for acquisition via the FEMA buyout program.
- High volumes of truck traffic on the Mississippi River, Highway 18 and train traffic on Burlington Northern-Santa Fe Railroad increase the possibility of a hazardous materials spill.

Local Action Recommendations

- County Highway X, north of Bagley near Wyalusing Beach, frequently floods, eliminating emergency vehicle access. A member of the Bagley Fire Department recommended raising portions of the road.
- Pursue seal-coating of gravel roads in the Town as a way to limit future washouts and pursue other approaches in persistent problem areas (e.g., Ganser Hollow Road).
- Help prevent forest and wildland fires by:
 - Making residents aware that a burn permit may be required by the DNR between January and May.
 - Ensuring the Fire Department is prepared and equipped to respond to this type of hazard.
 - Encouraging fire safe “clear zones” around all homes that are free of trees and brush.
- Given current rates of development, there is potential for increased flooding risk to the campers in Jellystone Park and residences in Ganser Hollow. There are similar concerns of flash-flooding with public and private camping areas located in Ready Hollow.
- In partnership with the Town, the County should prevent additional development in the floodplain and proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.
- GCEM should continue to procure funds to support buyout of frequently flooded properties.
- Work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.
- Work with the Grant County Highway Department to identify stormwater management issues along roadways and areas prone to embankment failure and make repairs as funds are available.
- Work with private property owners to improve stormwater management in problem areas.
- Work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.
- Keep local plans up to date and responsive to hazard mitigation concerns. Wisconsin law requires any community that wishes to have zoning or subdivision regulations to also have a comprehensive plan to guide such regulations. A comprehensive plan is a blueprint for how the affected community wishes to grow and change over the following 10 to 20 years. A comprehensive plan must contain multiple elements, including land use, transportation, natural resources, housing, economic development, utilities and community facilities and intergovernmental cooperation. Many of these elements could have a strong relationship to hazard mitigation planning, if local communities and their planners choose to integrate such concerns in the comprehensive plan. While most Grant County communities prepared comprehensive plans in the late 2000s, few considered hazard mitigation. Comprehensive plans must be updated at least once every ten years, which provides an opportunity to better integrate land use and hazard mitigation planning.

Town of Wyalusing Map

Chapter 5: Mitigation Strategies

Chapter 5 discusses Countywide hazard mitigation strategies and identifies parties that could be responsible for and partner on implementation of the strategies. This Chapter does not suggest that the County will implement all of the mitigation strategies. Time and budget limitations, other priorities (including responding to natural hazards), the availability of partnerships, grant funding opportunities or the lack thereof and a host of other factors will affect implementation.

The mitigation strategies prioritization process for this 2013 Plan was completely updated, rather than revising the 2004 Plan. However, many of the strategies that address multiple hazards including community outreach and education, code enforcement and education, and preparing new and amended ordinances were also identified in the 2004 Plan.

OVERALL HAZARD MITIGATION GOALS

Armed with knowledge of the hazards that most affect Grant County, the Committee developed the following seven hazard mitigation goals, with input and review from the public:

- Protect human lives, both today and for future generations
- Protect human and environmental health
- Protect utilities and critical facilities, including police, fire and EMS stations
- Help people to protect themselves
- Protect roads from washouts/landslides
- Prevent future risk of hazards in highly vulnerable areas
- Maximize the use of state and federal funds

These goals were used to prioritize hazard mitigation actions and strategies to address each hazard.

Other factors were also critical in identifying and prioritizing strategies. These included community support, whether the strategy was technically feasible, what groups were available to carry them out and where it would be cost-effective. The general cost estimates for each strategy in the tables, based on the key below, will vary based on contractor availability, whether in-house staff or consultants are necessary, the availability of partnering agencies, volunteer resources and other factors. Also, fees, grants and state and federal aid may be used to offset some of the costs needed to support these efforts.

\$	Less than about \$5,000 per event or effort
\$\$	Approximately \$5,000-\$10,000 per event or effort
\$\$\$	Approximately \$10,000-\$25,000 per event or effort
\$\$\$\$	Approximately \$25,000-\$50,000 per event or effort
\$\$\$\$\$	\$50,000 and above, per event or effort

SUGGESTED STRATEGIES TO ADDRESS ALL HAZARDS

Table 16: Strategies for Addressing All Hazards

Goal: Prepare and protect residents and visitors from personal injury, death, or property loss due to hazards.			
Mitigation Strategy (see detailed descriptions that follow)	Responsible Parties	Potential Partners	Suggested Timeline
1. Pursue Continued Community Outreach and Education (\$)	GCEM, County Zoning and Administration, Cities, Villages, Towns, Grant County Health Department	UWEX, WEM, local lenders, insurance agencies	Ongoing
2. Engage in Continued Code Education and Enforcement (\$)	County Planning and Zoning (unincorporated areas); City and Village zoning administrators (incorporated areas)	Towns, UWEX, SWWRPC	Ongoing
3. Explore New and Amended Ordinances Addressing Mitigation (\$\$) <ul style="list-style-type: none"> - Zoning - Subdivision - Erosion Control and Stormwater Management - Driveway 	County Zoning, Cities, Villages, Towns (for driveway ordinances)	UWEX, SWWRPC, GCEM	Ongoing
4. Explore New Technology for Public Notification (\$)	GCEM	UWEX, WEM	2013-2015
5. Continue to Encourage Use of NOAA Weather Radios (\$)	GCEM	Cities, Villages, Towns, WEM	Ongoing

Descriptions of Potential Mitigation Strategies Listed in Above Table

1. Pursue Continued Community Outreach and Education: State and County governments are usually best equipped to provide communities with information about the effect of disasters, methods for preventing damages and the actions to take when disasters threaten a locality. Ideally, such information would be distributed annually or at the beginning of each hazard season. Municipal and County meetings; building and zoning permitting processes, state and local parks and recreation permits; social media; and school classrooms are effective means to provide information and resources. Web sites, local closed-circuit cable and radio stations, newspaper articles and informational fliers can reach a large audience at little to no cost.
2. Engage in Continued Code Enforcement and Education: Under Wisconsin law and by local decision, Grant County and its cities and villages have the power and often the obligation to enact and enforce regulations to limit development within floodplains, wetlands, shorelands and other areas susceptible to hazards. Enforcement of these regulations—critical in mitigating future hazards—depends both on the will to enforce, the knowledge of enforcement approaches and sometimes even basic understanding that the regulations exist, particularly if adopted many years ago. Educating new local elected officials, plan commissioners and local staff of these types of regulations and the importance of their enforcement to hazard mitigation, is a worthwhile initiative.
3. Explore New and Amended Codes Addressing Mitigation: When enforced, County and municipal zoning, land division and other codes are a powerful mitigation tool. The County and its cities, villages and towns may consider the following new and amended codes.

- a) **Zoning:** A zoning ordinance is the set of rules that a local or County government adopts to regulate the future use of land, particularly when new development is proposed. The County's zoning ordinance (updated in 1995) applies in 19 of the 33 towns in Grant County; the remaining towns are unzoned. Cities and villages are responsible for enforcing their own zoning ordinances. County and local zoning ordinances could be amended in ways to enhance hazard mitigation. They could, as just one example, require developers of mobile home and industrial parks to provide a storm shelter and for mobile homes to have anchored tie downs.
 - b) **Subdivision:** A subdivision (or land division) ordinance is the set of rules that a County or local government adopts to regulate the division of larger parcels of land into smaller lots for sale and development. A subdivision ordinance typically defines requirements that the subdivider must meet before lots may be sold. These requirements may include requirements for lot sizes, roads, utilities and grading. The County, cities, villages and towns may each adopt their own land division ordinances. County and local subdivision ordinances could be amended in a variety of ways to assist with hazard mitigation. These may include requiring an inventory of hazard-prone areas in advance of division, including flood-prone areas outside of mapped floodplains. County and local land division ordinances could also require that new subdivisions properly manage stormwater, through basins and other approaches.
 - c) **Erosion Control and Stormwater Management:** These types of ordinances attempt to reduce stormwater runoff from construction sites and new development projects to prevent flooding and protect water quality. New development is subject to technical standards included in the ordinances. Stormwater management and erosion control ordinances can either be either stand-alone regulations, or could be integrated into subdivision and zoning ordinances.
 - d) **Driveway:** A driveway ordinance ensures suitable dimensions and design for emergency vehicles, guides driveway placement to avoid steep slopes, promotes access control to adjacent roads and protects rural character. Towns have the power to adopt driveway ordinances. The County should consider developing a model driveway ordinance that can be adapted and adopted by interested towns and then educate towns on its value.
4. **Explore New Technology for Public Notification:** Digital communications such as the Internet, email and cell phone/smart phone technology are revolutionizing the way we communicate with one another. The County will continue to monitor such new technologies as a means to warn residents and visitors of pending natural or human-made hazards. Critical to making these technologies viable are steps to increase high-speed Internet and cell phone coverage in the County, identified as a common problem among participants in this process. Contacts with major cell providers may be a first step to learning what can be done to increase coverage.
 5. **Continue to Encourage Use of NOAA Weather Radios:** The County will continue efforts to encourage residents to have a National Oceanic and Atmospheric Administration (NOAA) weather radio. NOAA weather radio continuously broadcasts National Weather Service (NWS) forecasts, warnings and other crucial weather information as well as provides direct warnings to the public for natural, man-made, or technological hazards.

SUGGESTED STRATEGIES TO ADDRESS FLOODING

Table 17: Strategies for Addressing Flooding

Goal: Decrease the impact of flood events on people, property, the economy and the environment.			
Mitigation Strategy (see detailed descriptions that follow)	Responsible Parties	Potential Partners	Suggested Timeline
1. Update County Shoreland Ordinance (\$)	County Planning and Zoning (for unincorporated areas)	SWWRPC, UWEX, DNR	2013-2015
2. Encourage Local Mapping of Other Flood-Prone Areas (\$)	GCEM, Cities, Villages	FEMA	2013-2017
3. Continue Acquisition of Repetitive Loss Structures (\$\$\$\$-\$\$\$\$\$)	GCEM	Property owners	Ongoing
4. Pursue Earthen Dam Maintenance Effort (\$\$\$\$)	GCEM	Army Corps, local governments, DNR, property owners, UW-Platteville	2013-2015
5. Maintain and Encourage Participation in the National Flood Insurance Program (NFIP) (\$\$\$)	GCEM, County Planning and Zoning (for unincorporated areas), Cities, Villages	FEMA	Ongoing

Descriptions of Potential Mitigation Strategies Listed in Above Table

1. Update County Shoreland Ordinance: The County has a basic shoreland ordinance based on the State's model. However, the State recently updated shoreland development rules and county governments have until February 1, 2014 to update their shoreland zoning rules to be consistent with or exceed these minimum standards. A new standard caps hard or "impervious" surfaces such as roofs, pavement and decks allowed on shoreland property, requiring mitigation at certain percentage thresholds below the cap. New homes must still be set back 75 feet from the water, but rules associated with expansions and repairs of existing homes closer than 75 feet have become more flexible. Counties may set specific mitigation requirements associated with these types of projects. Grant County should consider flood mitigation as a particular set of requirement when updating its shoreland zoning rules.
2. Encourage Local Mapping of Other Flood-Prone Areas: This hazard mitigation planning process and local experience during flood events, revealed that not all areas that get flooded are in the FEMA-mapped floodplain. The maps included in Chapter 4 identify other known flood-prone areas, which too are not all-inclusive. The County and local units of government should make these areas known to property owners and potential homeowners before subdivisions and home construction occurs, so that informed decisions can be made. This may include steps such as requiring that flood-prone areas identified in this Hazard Mitigation Plan be identified on all new subdivisions and posting such maps in city/village/town halls and sharing them with local realtors.
3. Continue Acquisition of Repetitive Loss Structures: Flood prone land with structures that experience repetitive damages may be purchased by a state, County, or local governing body that can remove structures and place permanent restrictions on development. Additionally, public ownership of damage-prone properties allows for easier construction of structural mitigation measures if needed. Since 2002, GCEM has acquired 14 repetitive flood loss properties with funding support from FEMA, Community Development Block Grants and the State. GCEM intends to continue with its efforts to acquire repetitive loss properties identified in this Plan and through experience. In addition to the FEMA program, land acquisition by non-profit organizations that are interested in conservation, such as the DNR or Ducks Unlimited, is another option to assist with the expense of acquisition. Additionally, voluntary relocation can eliminate risk by removing the structure from the hazardous area.

4. Pursue Earthen Dam Maintenance Effort: While there are approximately 123 dams in Grant County, only six of the dams are considered “large” by the DNR Dam Safety Program. Many more of the dams are earthen berms in valley areas that were constructed from 1960 onward to reduce downstream flooding. Unfortunately, no program was developed or funded for ongoing maintenance of the dams. Since construction, soil and debris have backed up behind the dams, in some cases filling the retention area and significantly reducing their effectiveness. Working with local governments and property owners, GCEM may pursue an initiative to identify and fund solutions to these maintenance problems. Potosi and the Town of Muscoda may serve as pilot areas where solutions could be identify and implemented, with technical assistance. A partnership with private consultants and/or the UW-Platteville civil engineering program should be investigated to provide such assistance. An outreach program with the owners of land on which these earthen dams are built is essential.
5. Maintain and Encourage Participation in the National Flood Insurance Program (NFIP): County, city, and village participation in the NFIP is critical to assuring that residents in the affected communities have access to flood insurance. For NFIP-participating communities, it will be important educate elected officials, staff, and community members on the opportunities and constraints associated with NFIP participation; to consistently administer and enforce floodplain regulations; and to keep floodplain regulations up to minimum federal and state standards as they may change over time. For communities that do not currently participate in the NFIP, but have flood risk, GCEM will continue to encourage their participation in the NFIP.

SUGGESTED STRATEGIES TO ADDRESS LANDSLIDES/EMBANKMENT FAILURES

Table 18: Strategies for Addressing Landslides/Embankment Failures

Goal: Minimize damages and public and private repair costs due to landslides and embankment failures.			
Mitigation Strategy (see detailed descriptions that follow)	Responsible Parties	Potential Partners	Suggested Timeline
1. Enhance Coordination between County Highway and GCEM Departments (\$)	GCEM and GC Hwy. Dept.	WisDOT and WEM	Ongoing
2. Include Vegetation Placement and Management in Highway Plans (\$\$\$\$)	GC Hwy. Dept., State DOT, Local Governments	GCEM	As funds are available
3. Continue Septic System Permitting (\$)	County Sanitarian	GCEM	Ongoing

Descriptions of Potential Mitigation Strategies Listed in Above Table

1. Enhance Coordination between County Highway and GCEM Departments: As this Plan has revealed, many of the significant hazard issues intersect on the County’s roadway network. Continued and enhanced coordination between associated departments and the committees that guide them will help mitigate hazards, reduce future highway maintenance costs and possibly devise a program to assist local units of governments with similar needs on town and village roads. GCEM and the County Highway Department may lead an effort to secure grant funding for a program to mitigate against landslides and washouts of County and town roads, as one potential example.
2. Include Vegetation Placement and Management in Highway Plans and Budgets: Keeping slopes along roadways vegetated and installing new plantings where not, can help prevent landslides. Vegetation increases soil stability through root length and strength and by absorbing precipitation. Management plans are aimed at ensuring long-term maintenance of vegetation appropriate for slide prone areas.

3. Continue Septic System Permitting: Each sanitation permit application requires that the County Sanitarian conduct a percolation test on the soil of the property, which reduces the potential of poor drainage issues and directs the location and type of sanitary systems. According to GCEM, sanitary system requirements are the most consistently enforced code in the County. Enforcement of this code should be used as an example for enforcement of other land use regulations.

SUGGESTED STRATEGIES TO ADDRESS SEVERE WEATHER INCIDENTS

Table 19: Strategies to Address Severe Weather

Goal: Decrease the impact of severe weather events on people, public and private property and the economy.			
Mitigation Strategy (see detailed descriptions that follow)	Responsible Parties	Potential Partners	Suggested Timeline
1. Assist Efforts for Tree Management Near Power Lines (\$\$)	GC Hwy. Dept., Utilities and Property Owners	GCEM	Ongoing
2. Continue Preparedness Education (\$)	GCEM, Cities, Villages, Towns and County and Local Public Works Departments	GCEM, NWS, Local Newspapers, Radio	Ongoing
3. Pursue Construction of Storm Shelters for Vulnerable Populations (\$\$\$-\$\$\$\$\$)	GCEM	Cities, Villages, Towns, DNR, Mobile home parks	Ongoing
4. Continue Use of Snow Fences (\$\$)	GC Hwy. Dept., WisDOT, Towns	GCEM and Property Owners	Ongoing

Descriptions of Potential Mitigation Strategies Listed in Above Table

1. Assist Efforts for Tree Management Near Power Lines: Tree pruning can reduce the potential for trees falling on and breaking power lines or damaging buildings. According to GCEM, utilities often limit tree trimming due to opposition from property owners and environmentalist. Grant County could work with local utilities to educate property owners on the benefits of tree management and to coordinate a general tree trimming approach that is acceptable to property owners and environmentalists. Annually, local utilities could distribute educational information regarding the benefits of tree management with customer bills, or when establishing a new account.
2. Continue Preparedness Education: Communities should annually prepare for severe winter weather by ensuring that plowing and sanding equipment is operational and prepared to handle potential emergencies. Additional personnel and funding may also be necessary to cover overtime hours. Families and traveler preparedness information relating to severe winter weather hazards is available from the Wisconsin Department of Transportation; such information should be included in driver education classes and materials. Farmers and other animal custodians should plan for addressing livestock or other animal needs. GCEM, the Health Department and Highway Department could team with local utilities and insurance agencies to provide household and traveling preparedness information annually or with new accounts.
3. Pursue Construction of Storm Shelters for Vulnerable Populations: GCEM works with the public and private sectors on an ongoing basis to identify safest areas in schools, businesses, public facilities and homes. Risk to lives can be reduced through construction and use of concrete safe rooms in mobile home parks, industrial parks and public recreation areas. Access to storm shelters or safe rooms for residents of, or employees, in prefabricated or

slab-on-grade constructed buildings is critical. Based on GCEM assessment, less than 1 percent of mobile home parks and no industrial parks have storm shelters or safe rooms.

4. **Continue Use of Snow Fences:** Using snow fences or "living snow fences" (rows of trees or other vegetation) can limit blowing and drifting snow over critical segments of roads. Such fences are longer lasting than standard snow fences and are permanent so they do not require the time of municipal staff to seasonally install and dismantle them. The Highway Department should continue to expand snow fences where needed along State roads (particularly STH 80 and 81), County roads, work with towns as time allows for fences along town roads and continue to educate property owners where the use of private property is required.

SUGGESTED STRATEGIES TO ADDRESS HAZARDOUS MATERIALS INCIDENTS

Table 20: Strategies to Address Hazardous Materials Incidents

Goal: Minimize the potential number and severity of hazardous material incidents.			
Mitigation Strategy (see detailed descriptions that follow)	Responsible Parties	Potential Partners	Suggested Timeline
1. Transition to Regional Level 3 HazMat Team (\$\$)	GCEM and WEM	Area emergency management departments, Grant County Health Department	2013
2. Encourage Railroad Transportation Safety (\$\$)	Department of Energy, DOT, Burlington Northern-Santa Fe Railroad, Calumet and Southern Railroad	Local jurisdictions, WEM	2013-2015
3. Help Raise Public Awareness (\$)	GCEM and WEM	Grant County Health Department	Ongoing

Descriptions of Potential Mitigation Strategies Listed in Above Table

1. **Transition to Regional Level 3 HazMat Team:** At the time of Plan adoption, GCEM was working with WEM to form a regional hazardous material response team based on Grant County that would serve Grant, Iowa and Lafayette Counties (and Jo Daviess County in Illinois).
2. **Encourage Railroad Transportation Safety:** Local law enforcement and other emergency personnel should be well versed in compliance with and enforcement of federal and state regulations regarding hazardous material and hazardous waste transportation throughout the County. Spent nuclear waste is currently transported from the Genoa Power Plant along the Burlington Northern-Santa Fe Railroad. Well before transport, all responsible parties should ensure that tracks, beds and bridges are in good condition. Local and regional coordination and education will be necessary to ensure safe transport of these materials. Coordination with local jurisdictions will be necessary to ensure that railroad access roads are clear. Wisconsin Emergency Management has a training program in place to prepare emergency managers and responders for the transport and the Nuclear Regulatory Commission coordinates transport.
3. **Help Raise Public Awareness:** Regulations require training in and compliance with all safety procedures and systems related to the manufacture, storage, transport, use and disposal of hazardous materials. The Emergency Planning and Community Right-to-Know Act (EPCRA), also known as SARA Title III, provides an infrastructure at the state and local levels to plan for chemical emergencies. Reported information on chemical storage facilities is publicly available so that interested parties may become informed about potentially dangerous chemicals in their community. EPCRA also requires that employers communicate the hazards of workplace chemicals and ensure that workers receive education and training. GCEM should continue annual outreach to organizations that house hazardous materials to keep records current and to insure the organization is aware of

storage requirements. Utilities could provide informational materials to consumers on how to identify and react to fuel leaks and how locate fuel pipelines and underground wires when landscaping or undertaking earthwork annually or with new customers and businesses that use hazardous materials should maintain current and ongoing worker education.

SUGGESTED STRATEGIES TO ADDRESS WILDLANDS AND FOREST FIRES

Table 21: Wildlands and Forest Fires

Goal: Minimize the potential and impact of wild and forest fires on public safety, public and private property and the economy.			
Mitigation Strategy (see detailed descriptions below)	Responsible Parties	Potential Partners	Suggested Timeline
1. Encourage Self-Initiated Mitigation Strategies Education (\$)	GCEM, DNR, Cities, Villages and Towns	Local Insurance Agencies	Ongoing
2. Review Development Proposals for Fire Safety (\$)	County Planning and Zoning and Local Fire Departments	GCEM	Ongoing
3. Support Forest Management and Fire Suppression(\$)	DNR, GCEM, Fire Departments	Property Owners, UWEX and WEM	Ongoing

Descriptions of Potential Mitigation Strategies Listed in Above Table

1. Encourage Self-Initiated Mitigation Strategies Education: The DNR provides information on preventative measures and strategies to mitigate wildfire damage in residential areas within, or adjacent to, forestland. Strategies to prevent or minimize any major wildfire damage include efforts to protect private homes through thoughtful home siting and grounds maintenance. GCEM, County Administration and local governments could work with insurance agencies to educate private developers and property owners on the risk of wildfires and take measures to ensure that emergency responders can safely and adequately fight fires. In addition, municipalities can support efforts such as the “Firewise Community.” This model involves appointing a board of area residents interested in fire issues, conducting a wildlife hazard assessment, removing trees to promote access along roads and driveways and scheduling a spring cleaning day to remove flammable woody debris.
2. Review Development Proposals for Fire Safety: Local fire agencies should be provided the opportunity to review and comment on major subdivisions or large-scale non-residential development projects. The location of individual home sites, parks, open recreational lands, roads, trees and landscaping should also be reviewed with fire protection in mind. With coordination assistance from GCEM and appropriate code amendments, the Grant County Planning and Zoning Department could initiate such an effort.
3. Support Forest Management and Fire Suppression: Healthy forests are less susceptible to fire. Municipalities should encourage private landowners to participate in the State’s Managed Forest Land (MFL) Program. Adhering to a forest management plan—prepared for each piece of MFL-enrolled property—is a requirement of the program. The following towns in Grant County are included in the State’s extensive forest fire control area: Wyalusing, Millville, Woodman, Marion, Boscobel, Hickory Grove, Watterstown, Castle Rock and Muscodia. In addition to the currently held cooperative aid programs among fire departments, ongoing training in fire control and fire-fighting tactics are necessary for any response unit. Given that nearly all local fire personnel are volunteers, the importance of training sessions and drills is increased.

SUGGESTED STRATEGIES TO ADDRESS DROUGHT

Table 22: Strategies to Address Drought

Goal: Lessen the economic impact of drought on the rural economy and environment.			
Mitigation Strategy (see detailed descriptions below)	Responsible Parties	Potential Partners	Suggested Timeline
1. Encourage Contingency Planning (\$)	County, Cities and Villages	GCEM	2013-2015
2. Encourage Crop Insurance (\$)	Farm Service Agency, USDA, UWEX	Farmers	Ongoing

Descriptions of Potential Mitigation Strategies Listed in Above Table

1. Encourage Contingency Planning: Drought contingency planning can help anticipate needs and actions to take during a drought. Areas that are identified as having potentially problematic groundwater levels should be monitored for decreasing levels. The UW Extension and/or the Department of Consolidated Farm Services provide additional drought information for farmers. In times of potential drought, these agencies should coordinate monitoring of groundwater levels.
2. Encourage Crop Insurance: Crop insurance can help preserve economic stability for farmers during a drought. The Farm Service Agency and UW Extension, with assistance from local insurance agents and the Department of Agriculture, could develop an educational outreach program regarding the benefits and coverage limitations of crop insurance policies.

SUGGESTED STRATEGIES TO ADDRESS INSECT INFESTATION

Table 23: Strategies to Address Insect Infestation

Goal: Minimize the potential impacts of insect infestation on public safety and public and private property.			
Mitigation Strategy (see detailed descriptions below)	Responsible Parties	Potential Partners	Suggested Timeline
1. Encourage Healthy Forests (\$)	DNR, UWEX	Property Owners	Ongoing
2. Prepare Insect Infestation Mitigation Plan (\$\$\$)	County Land Conservation Dept., Grant County Health Department	UWEX, Local communities, land owners	2013-2015

Descriptions of Potential Mitigation Strategies Listed in Above Table

1. Encourage Healthy Forests: During periods of insect infestation, healthy woodlots will sustain less damage than unhealthy ones and the prevalence of overstocked woodlands in the County increases the risk of additional damage. Accepted, tested forest management practices and monitoring the woodland for signs of mortality or defoliation are recommended for all sites. Rapid response to the symptoms can be helpful to slow the spread of infestation. Response may include harvesting of trees in the affected area as well as trees within a buffer surrounding the infestation. It could also require fast, total removal and destruction of trunk, limb wood, twigs and leafy ground cover. Currently, cost-sharing programs will help fund this work on qualifying private forestland. UW Extension and DNR could initiate an educational outreach effort to inform property owners of infestation risk, response and available funding assistance.
2. Prepare Insect Infestation Mitigation Plan: The Emerald Ash Borer (EAB) is an exotic pest from Asia that is responsible for the death of over 30 million ash trees in the United States and Canada. The State of Wisconsin Department of Agriculture, Trade and Consumer Protection Agency has been conducting EAB surveys as well as

placing EAB traps in one-mile increments searching for this insect across the State. No EAB has been detected in Grant County, but Crawford County is under federal quarantine for an EAB infestation. This pest is a significant threat since ash trees are widespread throughout the County. The County should consider preparing an insect infestation plan to address EAB and other insects. This plan could include proactive approaches to contain infestations, remove infected trees, replant with other species and mitigate possible financial and environmental impacts.

SUGGESTED STRATEGIES TO ADDRESS SUBSIDENCE

Table 24: Strategies to Address Subsidence

Goal: Decrease damage to public and private property due to subsidence.				
	Mitigation Strategy (see detailed descriptions below)	Responsible Parties	Potential Partners	Suggested Timeline
1.	Digitize and Map Susceptible Areas on Public Documents (\$\$)	County Land Information office, GCEM	Rollo Jamison Mining Museum, SWWRPC	2013-2015
2.	Enhance Rescue Capabilities (\$\$)	GCEM	Local Fire Depts.	

Descriptions of Potential Mitigation Strategies Listed in Above Table

1. Digitize and Map Susceptible Areas on Public Documents: In 1959, the United States Geological Survey prepared a map indicating historic locations of mining in the region. That map is reproduced in Chapter 3 as Figure 7. To maximize its effectiveness in this modern era, the map should be digitized and brought into County, local, regional and state data layers. This way, that information can be used in local planning efforts and to best inform the public of potentially hazardous locations.
2. Enhance Rescue Capabilities: GCEM could undertake training exercises with local fire department personnel to train for rescues in confined spaces and subterranean locations.

SUGGESTED STRATEGIES TO ADDRESS EARTHQUAKES

Table 25: Strategies to Address Earthquakes

Goal: Decrease potential for damage and death by increasing awareness of earthquake potential and recommended response.				
	Mitigation Strategy (see detailed descriptions below)	Responsible Parties	Potential Partners	Suggested Timeline
1.	Include Earthquake Awareness in Emergency Operations Plan (\$)	GCEM	WEM	Ongoing
2.	Prepare Critical Facility Survey Procedures (\$)	County, Cities and Villages	GCEM	2013-2015

Descriptions of Potential Mitigation Strategies Listed in Above Table

1. Include Earthquake Preparedness in Emergency Operations Plan: Because earthquakes are so infrequent in the Midwest, the population tends to neither be aware of, nor prepared for, the potential impacts. Currently, earthquakes are not addressed in GCEM’s Emergency Operations Plan; however, organization of an emergency response team that is trained specifically for rescue in situations of collapsed buildings has been accomplished. The public is more likely to acknowledge the risk of earthquakes if municipalities acknowledge the need for

preparedness. GCEM should address earthquake response strategies when next updating the County Emergency Operations Plan and use that opportunity to educate local communities about earthquake risk.

2. Prepare Critical Facility Survey Procedures: Public buildings, such as schools and community halls, are critical facilities not only because of the large and often vulnerable population they accommodate, but also because they are often identified as shelter sites for a community. Therefore, it is essential that these buildings are safe and can function after a seismic event. GCEM could work with communities to develop a survey procedure and guidance document to inventory structural and non-structural hazards in and near designated shelter sites. Survey results can be used to determine mitigation priorities that can be incorporated into capital improvement plans. Such surveys should take into account that existing shelter sites are often constructed of brick and mortar, which is intolerant of earth shaking movements.

SUGGESTED STRATEGIES FOR DISEASE AND ILLNESS PREVENTION AND CONTROL

Table 26: Strategies for Disease and Illness Prevention and Control

Goal: To prepare for and to protect residents from disease and illness, death, economic harm, or property loss due to the spread disease or illness.			
Mitigation Strategy (see detailed descriptions below)	Responsible Parties	Potential Partners	Suggested Timeline
1. Engage in Community Outreach and Education \$\$	GCHD (Human), UWEX and WDATCP (for animal disease control)	WDHS, CDC, Clinics, Hospitals, GCEM, EMS, Media	Ongoing
2. Enforce Current Regulations \$\$\$\$\$\$	GCHD, Laboratories, Schools, Day Care, Health Providers, Vets (animals only)	WDHS, CDC, Clinics, Hospitals	Ongoing
3. Develop Modern Policies \$\$-\$\$\$	Grant County Board, WI/Federal Legislature	WPHA, WALHDAB, NACCHO, APHA, WMA, WDHS,	Ongoing
4. Engage in Mass Clinic Planning \$\$\$	GCHD	WDHS, CDC, GCEM, WEM, Hospitals, Clinics, Schools/Universities, Local Businesses	Updated as needed
5. Advance Local Emergency Planning and Response \$\$\$\$	GCHD, GCEM, WDHS, CDC,	Clinics, Hospitals, EMS, Coroner (UWEX and WDATCP animal only)	Ongoing
6. Provide Immunizations for Vaccine Preventable Illnesses \$\$\$\$\$	GCHD, Clinics, Hospitals, Veterinarians	SWIC	Ongoing
7. Protect Food Quality \$\$\$\$\$	WDHS and WDATCP	GCHD, Restaurants, Retail Food Establishments, WRA, WI Tavern League	Ongoing
8. Ensure Code Compliance for Hotels, Motels, Pools, & Recreation Facilities \$\$\$\$	WDHS	GCHD	Ongoing
9. Protect Air and Water Quality \$\$\$\$\$	DNR, GCLWC, GC Zoning and Sanitation, WDATCP, Local Utilities (water and sewer) and GCHD	UWEX	Ongoing

Abbreviations:

APHA =	American Public Health Association
CDC =	Centers for Disease Control and Prevention
EMS =	Emergency Medical System
GCHD =	Grant County Health Department
GCLWC =	Grant County Land and Water Conservation
NACCHO =	National Association of County and City Health Officials
SWIC =	Southwest Wisconsin Immunization Coalition
WALHDAB =	Wisconsin Association of Local Health Departments and Boards
WDATCP =	Wisconsin Department of Agriculture and Consumer Protection
WDHS =	Wisconsin Department of Health Services
WMA =	Wisconsin Medical Association
WPHA =	Wisconsin Public Health Association
WRA =	Wisconsin Restaurant Association

Descriptions of Potential Mitigation Strategies Listed in Above Table

1. **Engage in Community Outreach and Education:** State and local governments are equipped to provide communities information about the effects of disease and illness, methods for preventing disease and illness and the actions to take when disease and illness threaten a locality. Ideally, such information would be distributed prior to a significant outbreak. Press releases, brochures, community events and school classrooms are effective means to provide information and resources. Web sites, local closed-circuit cable and radio stations, newspaper articles and informational fliers can reach a large audience at little to no cost. Education about the public and private costs of disease and illness and the methods and benefits of mitigation will help the communities understand their role in mitigating hazards. Such education should focus on the simple changes in behavior that can minimize risks. Self-instigated mitigation strategies can be accomplished at the household level, without direct government interference; for example, getting proper immunizations, washing your hands and staying home when ill can help. CDC, hospitals and clinics can help disseminate information on mitigation strategies as well. Since widespread illness similar to what is seen in epidemics or pandemics can disrupt all businesses and services, businesses, non-profits and governmental agencies have a vested interest in educating.
2. **Enforce Current Regulations:** Existing rules and regulations are designed to limit the possibility of disease or illness and to assist in the response to control disease or illness should it occur in the community. However, enforcement of these regulations requires a joint effort including health departments, laboratories, schools, day care and health care providers. Failure to report or follow up on diseases illnesses in a timely manner generally leads to increased spread of illness. Additionally, failure to ensure that proper immunizations are given or that imposed isolation or quarantine orders are followed can lead to wide-spread disease and illness as well.
3. **Develop Modern Policies:** As more information is learned about the spread of disease, rules and regulations can be modified to improve the ability to prevent or control illness. This can include changes to required immunizations as new vaccines are developed, broadening of public health powers, or passing local ordinances to prevent illness or improve the ability to control it (such as regulations requiring sick leave).
4. **Engage in Mass Clinic Planning:** Mass clinic planning is essential for rapidly distributing vaccines or prophylaxis to large numbers of residents to help prevent or control illness. Proper planning facilitates the acceptance of State or Federal assets and ensures that adequate and redundant resources are available to distribute said assets.
5. **Advance Local Emergency Planning and Response:** Generalized planning and response includes provisions for plans and strategies besides vaccinations and immunizations that can help prevent or control illness. These strategies can include isolation and quarantine, predetermined messaging, developing emergency rules or policies and finding and working with partners to identify solutions that are not reliant on any one entity.
6. **Provide Immunizations for Vaccine Preventable Illnesses:** Providing immunizations can prevent a variety of illnesses. Encouraging all health care providers to offer appropriate immunizations to both clients and staff can help ensure immunity that can slow, prevent, or even eradicate illness. Therefore, a robust immunization program can assist with preventing disease and illness within the County.

7. Protect Food Quality: Food contaminated with biological, viral, microorganisms, prions, chemicals or otherwise adulterated, can cause or spread illness. Food borne illnesses outbreaks have overwhelmed hospitals, clinics and drugstores. Therefore, enforcement of regulations regarding food safety including the timely and consistent inspection of food establishments plays an important role in preventing the spread of illness in a community.
8. Ensure Code Compliance for Hotels/Motels, Pools, Recreational Facilities, etc.: Establishments such as hotels/motels and pools have regulations designed to prevent disease, illness and injury. Failure to enforce codes has resulted in outbreaks of illness such as legionosis and other communicable diseases as well as injury and death. A robust enforcement program including consistent and regular inspections of these establishments can help prevent illness, injury and death.
9. Protect Air and Water Quality: Air and water contamination can cause widespread illness or aggravate existing disease. For example, the introduction of the microorganism cryptosporidium to the drinking water supply killed many people, sickened thousands and caused many secondary infections in Milwaukee in the 1990's. Additionally, long-term exposure to particulates or chemicals can lead to chronic illness or disease. Therefore, protecting water and air quality is critical to the overall health of the community and can prevent disastrous events.

SUMMARY OF POTENTIAL FUNDING SOURCES AND IMPLEMENTATION TOOLS

There are a number of potential funding sources available to help finance mitigation efforts, including but not limited to those listed below. It should be noted that funds from many of these programs are subject to change due to fluctuations in federal, state, and local budgets. GCEM and local governments should also pursue partnerships with organizations on planning, development, and funding new facilities.

- Municipal Flood Control Grant Program (WisDNR)
- Forest Fire Protection Grant Program (WisDNR)
- River Protection Planning & River Protection Management Grants (WisDNR)
- Knowles-Nelson Stewardship Program – Stream Bank Protection (WisDNR)
- Community Development Block Grant (Wisconsin Economic Development Corporation)
- Community Economic Recovery Guidebook for Local Disaster Resilience (Wisconsin Economic Development Corporation)
- Upper Mississippi River Watershed Fund (USDA Forest Service and NFWF)
- Preparedness (Non-Disaster) Grants (FEMA)
- Assistance to Firefighters Grants (FEMA)
- Hazard Mitigation Assistance Grants (FEMA)
- Disaster Grants (FEMA)
- United States Fire Administration Grants (FEMA)

Other tools available to Grant County communities including taxing authority, planning, regulation, and enforcement are listed in Table 27.

Table 27: Implementation Tools

	Taxing Authority	Comp. Plan	General Zoning	Land Division	Floodplain Zoning	Shoreland-Wetland Zoning	Code Enforcement Staff
Grant County	Yes	Yes	Yes	No	Yes	Yes	Yes
City of Boscobel	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City of Cuba City	Yes	Yes	Yes	Yes	No	No	Yes
City of Fennimore	Yes	Yes	Yes	Yes	No	No	Yes
City of Lancaster	Yes	Yes	Yes	Yes	No	No	Yes
City of Platteville	Yes	Yes	Yes	Yes	Yes	No	Yes
Village of Bagley	Yes	Yes	Yes	Yes	No	Yes	Yes
Village of Bloomington	Yes	Yes	Yes	Yes	No	Yes	Yes
Village of Blue River	Yes	Yes	Yes	Yes	Yes	No	Yes
Village of Cassville	Yes	Yes	Yes	No	Yes	No	Yes
Village of Dickeyville	Yes	Yes	Yes	Yes	No	No	No
Village of Hazel Green	Yes	Yes	Yes	Yes	No	No	Yes
Village of Livingston	Yes	Yes	Yes	Yes	No	No	Yes
Village of Montfort	Yes	Yes	Yes	Yes	No	No	Yes
Village of Mount Hope	Yes	Yes	Yes	No	No	No	No
Village of Muscodia	Yes	Yes	Yes	Yes	Yes	No	Yes
Village of Patch Grove	Yes	Yes	Yes	Yes	No	No	No
Village of Potosi	Yes	Yes	Yes	No	Yes	No	Yes
Village of Tennyson	Yes	Yes	Yes	Yes	No	No	No
Village of Woodman	Yes	Yes	Yes	Yes	Yes	No	Yes
Town of Beetown	Yes	No	No	No	County	County	County
Town of Bloomington	Yes	Yes	No	No	County	County	County
Town of Boscobel	Yes	Yes	County	No	County	County	County
Town of Cassville	Yes	Yes	No	No	County	County	County
Town of Castle Rock	Yes	Yes	No	No	County	County	County
Town of Clifton	Yes	Yes	County	No	County	County	County
Town of Ellenboro	Yes	Yes	County	No	County	County	County
Town of Fennimore	Yes	Yes	County	No	County	County	County
Town of Glen Haven	Yes	No	No	No	County	County	County
Town of Harrison	Yes	Yes	County	No	County	County	County
Town of Hazel Green	Yes	Yes	No	No	County	County	County
Town of Hickory Grove	Yes	Yes	County	No	County	County	County
Town of Jamestown	Yes	Yes	County	Yes	County	County	County
Town of Liberty	Yes	Yes	County	No	County	County	County
Town of Lima	Yes	Yes	County	No	County	County	County
Town of Little Grant	Yes	Yes	No	No	County	County	County
Town of Marion	Yes	No	No	No	County	County	County

	Taxing Authority	Comp. Plan	General Zoning	Land Division	Floodplain Zoning	Shoreland-Wetland Zoning	Code Enforcement Staff
Town of Millville	Yes	Yes	County	No	County	County	County
Town of Mount Hope	Yes	Yes	County	No	County	County	County
Town of Mount Ida	Yes	No	County	No	County	County	County
Town of Muscoda	Yes	No	County	No	County	County	County
Town of North Lancaster	Yes	Yes	No	No	County	County	County
Town of Paris	Yes	Yes	County	No	County	County	County
Town of Patch Grove	Yes	No	No	No	County	County	County
Town of Platteville	Yes	Yes	County	No	County	County	County
Town of Potosi	Yes	Yes	County	No	County	County	County
Town of Smelser	Yes	Yes	No	No	County	County	County
Town of South Lancaster	Yes	Yes	County	No	County	County	County
Town of Waterloo	Yes	Yes	No	No	County	County	County
Town of Watterstown	Yes	Yes	County	No	County	County	County
Town of Wingville	Yes	Yes	County	No	County	County	County
Town of Woodman	Yes	Yes	No	No	County	County	County
Town of Wyalusing	Yes	Yes	No	No	County	County	County

Chapter 6: Plan Adoption and Implementation

PLAN ADOPTION

This Plan should be adopted by the County Board and by the governing bodies of cities and villages. Cities and villages must adopt a hazard mitigation plan to receive mitigation grant funds. According to FEMA, towns do not have to formally adopt the Plan.

Adoption of the Grant County Multi-Hazard Mitigation Plan accomplishes the following:

- Confirms the commitment of community leaders and citizens to mitigate the effects of disasters.
- Provides a definitive guide for community leaders and officials of the County and local jurisdictions to initiate changes that will decrease damages incurred from disasters.
- Provides legal authority to implement mitigation strategies and to enact ordinances, policies and programs with the goal of reducing disaster related losses.
- Ensures the long-term continuity of mitigation policies and programs through changes in political leadership, County and municipal staff and community decision makers.
- Provides confirmation to Wisconsin Emergency Management (WEM) and FEMA that the Plan's recommendations were assessed and approved by the governing authority of Grant County.

Before the County, cities and villages adopt the Plan, it must first be reviewed by WEM to insure compliance with the Disaster Mitigation Act of 2000 and any additional State requirements. Upon approval from WEM, following adoption by the County, WEM submits the plan to FEMA Region V for FEMA review and approval.

PLAN IMPLEMENTATION

GCEM Role

Upon approval of the Plan, the County should inform all participating jurisdictions and stakeholders and the Director of County Emergency Management should distribute copies of the Plan to these parties. Additionally, the County should make the Plan available to the public by placing it on the County Emergency Management web site.

GCEM should take the lead on Plan implementation, which would include making sure that the plan is referenced by future planning efforts and is used to provide guidance on political decisions, public expenditures and policy directives. With assistance from the Emergency Management/Disaster Services Committee, GCEM should monitor implementation progress and effects of mitigation strategies. Monitoring the Plan will help implement its recommendations.

In addition to overseeing implementation and Plan monitoring, GCEM and the Emergency Management/Disaster Services Committee should prioritize mitigation projects and spearhead fund procurement to finance mitigation projects. Such efforts could include preparation of grant proposals as well as provision of assistance to local jurisdictions in preparation of grant proposals to state, federal and non-profit funding opportunities.

As discussed in Chapter 5, education about self-initiated mitigation strategies that can be employed to reduce potential disaster-related damages can be a cost effective method of building local support for mitigation. GCEM intends to undertake creative outreach programs to community members, business owners and non-profit personnel to encourage involvement, in and understanding of, local mitigation efforts.

County and local jurisdiction staff and elected officials should ensure that the recommended mitigation strategies in Chapters 4 and 5 are considered in budgets. In addition to the grant opportunities discussed in this Plan, as political will dictates, administrators and elected officials can use volunteer efforts, bonds, loans, fees and taxes to finance high priority mitigation projects.

Promote Project Success Stories

As successful mitigation projects come to fruition, GCEM and participating local jurisdictions and agencies should continue promote their accomplishments so that the community is aware that the Plan is being implemented and involvement of multiple organizations, jurisdictions and agencies continues. Opportunities to showcase successful projects include posting descriptions on the Web sites, through newspaper articles and through subsequent updates to this Plan.

PLAN MONITORING, EVALUATION AND UPDATE

GCEM intends to work with the Emergency Management/Disaster Services Committee to monitor and evaluate this Plan annually. Planning is an ongoing process and for this Multi-Hazard Mitigation Plan to remain current and applicable, periodic updates will be necessary. The Disaster Mitigation Act of 2000 requires that local mitigation plans are evaluated and updated at least every five years. To expedite this process, GCEM should maintain a record of disaster related damages that will help to further hone the vulnerability and risk assessments and should track mitigation projects to determine implementation progress and results. Additionally, vulnerability, risk and mitigation recommendations should be reviewed following a disaster to determine if any changes are warranted based on degrees of damage and patterns of the event. The Emergency Management/Disaster Services Committee will guide all additions and updates to the Plan and all updates should include public involvement and stakeholder outreach.

Appendices

Appendix A: Grant County Hazard Mitigation Plan FAQ

Appendix B: Planning Process

Appendix C: Local Government Involvement Packet

Appendix D: Stakeholder Meeting Attendees

Appendix E: Results of Public Participation Goals Exercise

Appendix F: Emergency Management/Disaster Service Committee Agendas

Appendix G: Dams

APPENDIX A: GRANT COUNTY HAZARD MITIGATION PLAN FAQ

In winter 2012, Grant County began updating its 2006 Multi-Hazard Mitigation Plan with assistance from planners at Vandewalle & Associates through a grant from the Wisconsin Emergency Management Agency awarded in 2011.

What is Hazard Mitigation?

Any action taken to reduce or eliminate the long-term risk to human life and property from natural hazards. Like many counties in Wisconsin, the main hazard in Grant County is flooding.

What are some Natural Hazards the County is Subject to?

- Flooding
- Severe storms
- Winter storms
- Drought
- Tornados/straight-line winds
- Extreme temperatures
- Earthquakes

Why plan for natural hazards?

- Become eligible to apply for grants from FEMA of up to 75 percent of mitigation project costs. Grants are available for both pre-disaster and post-disaster mitigation projects.
- Reduce the cost of recovering from natural hazards by decreasing damage.
- Prevent injury and death to people exposed to hazards.
- Speed emergency response to and recovery from disasters.

What are some strategies to prevent Hazards?

- Prevention (floodplain ordinance, land use planning)
- Property Protection (acquisition, elevation, relocation)
- Public Education and Awareness (education materials, programs, resource centers)
- Natural Resource Protection (wetland regulations)
- Emergency Services (warning system)
- Structural Projects (channel maintenance)

What is the process to update the Plan?

- January-March: Collect updated data and gather input from residents and local governments.
- April-May: Prepare and review Plan.
- June: Submit draft Plan to state and federal agencies.
- Summer: Following FEMA approval, County and local governments adopt Plan.

APPENDIX B: PLANNING PROCESS

Vandewalle & Associates, a planning firm, was hired by the County to work with the County government and the towns, villages and cities to update the 2006 countywide hazard mitigation plan.

Organize Resources

First, the project team organized the resources available through local, state, and federal organizations, and identify and meet with members of the community that have a special interest in natural hazards and disasters and may have knowledge of past disaster events.

Identify Risk

Next, the project team worked with volunteers from each participating community to confirm the kinds of natural hazards that affect Grant County and gather information on events that have occurred since 2005 including type, location, and funding awarded.

Update the Mitigation Plan

Armed with an understanding of the risks posed by natural hazards, the project team worked with each community to determine the most important areas to protect and then look at possible ways to avoid or minimize the damage to these areas. The result is this Hazard Mitigation Plan and a strategy for getting the community's desired results.

Implement the Plan and Monitor Progress

The project team updated ways that the County and all participating communities can bring the hazard mitigation plan to life. Examples include executing specific mitigation projects, such as floodplain management. To ensure a successful long-term plan, a method to review the plan in the future is identified in the plan.

APPENDIX C: LOCAL GOVERNMENT INVOLVEMENT PACKET

- Cover Letter
- Summary of Disaster Histories
- Disaster Events Example
- Recent Local Disasters Worksheet
- Local Mitigation Strategies Worksheet



Grant County Emergency Management

Steve Braun, Director

steve@grantcountyem.com

MEMO: Local Community Input Packet Grant County Multi-Hazard Mitigation Plan Update

Grant County is updating its 2006 Multi-Hazard Mitigation Plan, which provides a framework for reducing the effects of storms, flooding and other natural hazards and bringing more federal dollars into the County. The County secured grant funds for the update through the Wisconsin Emergency Management Agency and has retained consultants for assistance.

The 2006 Plan includes a section for each community in Grant County, including an overview, list of historic disaster events, map and action recommendations. A major part of the 2012 Plan process is updating these sections. The consultants have started collecting data on hazard events from the National Oceanic and Atmospheric Administration (NOAA). Since NOAA does not always reflect the severity or number of actual events, we need local government input to ensure accuracy.

This Local Community Input Packet includes the documents listed below:

- Hazard mitigation planning FAQ
- 2006 local summary map (**please mark up and return black and white map**)
- 2006 local summary of historical disaster events
- 2006 local action recommendations
- Disaster events examples
- **Recent local disaster worksheet (please complete and return)**
- **Local hazard mitigation strategies worksheet (please complete and return)**

Please mail, email, or fax your completed worksheets and map by **March 31st** to Jessica Schmiedicke, our consultant project manager, at the addresses below.

Jessica Schmiedicke
Vandewalle & Associates, Inc.
120 East Lakeside Street
PO Box 259036
Madison, WI 53725-9036
jschmiedicke@vandewalle.com
Phone: (608) 255-3988
Fax: (608) 255-0814

Thank you for your participation in this important process.

Sincerely,

Steve Braun, Director
Grant County Emergency Management

PO Box 506 • 1000 North Adams Street • Lancaster, WI 53813 • (608) 723-7171 • Fax: (608) 723-5159

www.grantcountyem.com



TOWN OF BEETOWN

The Town of Beetown, founded in 1827, is situated south Military Ridge in west central Grant County. Comprising over 48 square miles, the Town is the second largest jurisdiction in the County as measured in terms of land area. With an estimated 2003 population of 757 people, the Town is primarily agricultural and has no incorporated communities. Population growth is expected to grow a modest 3.8 percent, adding about 28 people by 2025. The Town is characterized by the Grant River and at least six of its tributaries, including the Hackett Branch, Blake Fork, the Little Grant, Pigeon Creek, Beetown Branch and Muskellunge Creek. Floodplain forests dominate the land adjacent to these waterways and a rolling topography is typical in the rest of the Town. Lead ore was an important commodity in Beetown’s early history.

Summary of Historical Disaster Events

Disaster	Location	Date	Descriptions	Funding Awarded
Flash-Flooding		5/22-23 & 6/16/2004	Flash-flooding destroyed one road and significantly damaged others. Major embankment failure was reported on Stumptown Road. The Grant River bottoms sustained significant damage. The June 16 th storm left ruts 3 feet deep on Bee Lane. \$238,408 of estimated damages.	\$17,980 thus far
		7/6/2002	Rainfall of 3-6 inches caused localized flooding, resulting in \$1,500 in property damage and \$3,500 in crop damage. Law enforcement reported a propane tank* floating in 2-3 feet of water near Beetown. <i>NWS</i> <i>*NWS data Corrected by GCEM</i>	
		6/4/2002	Run-off from flash-flooding caused the Grant River to flood farm fields. <i>NWS</i>	
		7/1998	Flash-flooding resulted in gravel and rip rap being swept away along Grant River.	\$19,829
	Porter Hill and Porter Bridge Road	1993	Flash-flooding resulted in the loss of gravel from roads.	\$11,287
	Blake Fork, Schildgen Lane	1991	Over 6 inches of rain caused significant flash-flooding and tore out the bridge on Schildgen Lane just a few hundred feet from where it joined the Grant River. The new bridge was built higher with a bigger outlet to prevent future washouts.	
	Slabtown and Schildgen Roads	1991	Flash-flooding resulted in a bridge washout.	
			1851	Flash-flood nearly wiped out the town. Every building in the village had water knee-deep. Several businesses, including a warehouse, livery stable and harness shop were swept away. Many opted to move rather than rebuild. The community has essentially stopped growing since this event.

Disaster	Location	Date	Descriptions	Funding Awarded
	University and Slabtown Roads	unknown	Flash-flooding caused a bridge to washout. A full description can be found in the narrative from Town Clerk John F. Patterson in the appendix.	
Severe Thunderstorms		5/18/2000	1 inch hail caused \$15,000 in crop damage. <i>NWS</i>	
		5/17/2000	1 inch hail caused \$5,000 in crop damage. <i>NWS</i>	
		1974 & 1993	Almost every year there is localized damage from hail. There is no record of large-scale damage.	
Tornado		1957 & 1993	F1 tornados occurred in 1957 and 1993, neither of which followed a defined path. Damages were minimal. (Community members think the 1957 event could have been in 1953.)	
		1940	No documented record.	
Winter Storms		3/1959	There were three heavy snows storms in March 1959. New equipment has been able to handle most subsequent storms.	
		1940, 1948, 1973, & 1982	No documented record.	
Drought		Periodically from 1938 – 1988, & 2003	The Town received moderate damage from droughts. 1983 & 1995 were the worst.	
		1983 & 1988	Nearly 50 percent of crops were lost because of drought.	
Extreme Temperatures		1974	The Town experienced frost damage in every month through July.	
Disease		1850	Cholera outbreak	

Note: Unless otherwise noted, funding awards are from Federal Emergency Management Agency (FEMA) and disaster locations are generalized within the jurisdiction.

Comments:

- Beetown is most vulnerable to flash-flooding. There are reports of flooding-related problems as far back as 1851. Before the 1930s, when soil conservation practices were introduced, floods were much worse as most of the surrounding cropland did not hold storm run-off. The four ravines, Pigeon Creek, Rattlesnake Creek, Marlow Branch and Hackett Branch of the Grant River, feed through an unincorporated settlement. The valley is less than 300 feet wide in places and rains of 5-10 inches cause flooding. County highways that run down each ravine and lack of curbs and gutters in developed areas exacerbate the flooding problem. An eight mile section of the Grant River is notorious for flash-flooding.
- Although over half of Town roads are now hard surfaced, which has reduced road damage, flash-floods continue to strip gravel from unpaved roads. The five major bridges over the Grant River have by-pass outlets for stormwater to prevent the bridges from breaking loose in a flood. Of these bridges, four are on Town roads and one is on CTH 35-81.
- According to GCEM, 98 percent of the settled area in the Town is in the FEMA FIRM floodplain, which limits the types and locations of new developments and land uses. The Town believes a zoning ordinance that increases floodplain restrictions and additional floodplain management efforts developed through the Smart Growth Planning effort should greatly reduce property loss.
- The Town is concerned that problems could become worse in the future as many soil conservation practices are being ignored and stormwater run-off is leaving surrounding cropland faster. Additionally, the introduction of soybeans as the primary crop may exacerbate flooding, as this crop does not absorb water quickly and roots are too shallow to hold top soil in the event of a severe rainfall. "We have done as many things as we can to mitigate problems and yet a 15-inch rainfall or a 150 mph wind could negate all our precautions." John Patterson, Town Clerk.
- High volumes of truck traffic on Highway 81 increase the possibility of a hazardous materials spill.

Unabridged disaster history worksheets can be found in Appendix H.

Local Action Recommendation:

- *In partnership with the Town, the County should prevent additional development in the floodplain and proactively undertake mitigation efforts to decrease the vulnerability of flood prone properties.*
- *The Town could work with the County Planning and Zoning Department and the Southwest Wisconsin Regional Planning Commission to develop and implement a flood hazard mitigation overlay zoning district that will identify building practices and land use patterns that will better withstand flood events.*
- *The Town could coordinate with the owners of the mobile home parks to identify a temporary storm shelter until one can be built.*
- *The Town could work with UW Extension and area farmers to identify and correct agricultural practices that contribute to flooding and embankment failure.*
- *The Town could work with the Grant County Highway Department to identify stormwater management issues along roadways and make repairs as funds are available.*
- *The Town could work with the Grant County Highway Department to identify areas prone to embankment failure and make repairs as funds are available.*
- *The Town could work with private property owners to improve stormwater management in problem areas.*
- *The Town could work with UW Extension to coordinate potential assistance with forest debris cleanup by volunteer environmental groups.*
- *The Town could work with the local cellular service provider to establish additional cell towers in the area.*

In addition to the community specific recommendations identified above, the Town should refer to the County-wide strategies for additional hazard mitigation options. Further, pending the approval of a grant from the Wisconsin Department of Administration for a County-wide, multi-jurisdictional comprehensive planning effort, the Town should work with SWWRPC to incorporate the physical locations of hazard-prone areas and mitigation recommendations into the community's comprehensive plan. Specific opportunities for integration of this information within the requisite elements of the comprehensive plan include the following:

- *Issues and Opportunities: Discuss the impacts disasters have had on the municipality and summarize recommendations for planning-based mitigation strategies.*
- *Housing: Include an inventory of the properties that are located in the floodplain, locations of mobile homes, recommended changes to building codes, recommended locations for storm shelters, a listing of homeowners that may be interested in FEMA's voluntary buyout and relocation program and a discussion of the impacts of vacation home development.*
- *Transportation: Include vulnerable portions of the municipality's transportation network, including roads and bridges that incur frequent damages due to flooding and stormwater runoff, areas of frequent embankment failures, stretches of road that are susceptible to blowing and drifting snow and hazardous materials transport routes.*
- *Agriculture, Natural Resources and Cultural Resources: Identify floodplains, other flood-prone areas, agricultural lands that are subject to or contribute to damages from flooding and hydric soils and inclusion of recommendations to mitigate damages to farmlands.*
- *Land Use: Plan future development in areas that are not prone to hazards, particularly flooding. Also, not planning for uses that are prone to hazards (e.g. heavy industry close to hazard prone or hazard susceptible lands).*
- *Economic Development: Identify the impact of disaster related damages to municipal budgets and continuity of local businesses.*
- *Intergovernmental Cooperation: Include a summary of existing formal and informal cooperative aid agreements between area fire and emergency management departments and recommendations of potential partnerships that could encourage a more broad application of mitigation strategies, such as watershed management.*
- *Implementation: Incorporate the highest priority hazard mitigation strategies from this plan into the comprehensive plan.*

Disaster Events Examples

GRANT COUNTY MULTI-HAZARD MITIGATION PLAN UPDATE

You may use these examples to help guide you in the completion of the **Recent Local Disasters Worksheet** for your community and the associated **black and white copy** of your 2006 map to identify location-specific events.

Disaster Type	Location	Date	Description	Funding Awarded
<p>List one of the following types of disasters:</p> <ul style="list-style-type: none"> • Flooding • Flash-Flooding • Severe Thunderstorm • Tornado • Severe Winter Storm • Landslide • Subsidence/Road Washout • Extreme Temperature • Drought • Hazardous Material Incident • Infestation • Wildfire • Wind 	<p>Briefly describe the location, being as specific as possible. See examples below.</p> <ul style="list-style-type: none"> • Community-wide. • Southwest area of the town. • Sections 6 and 7. • Wisconsin River near CTH T. • Maple Rd between CTH B and STH 133. • Intersection of Main Street and First Avenue. • See #1 on map. 	<p>List date(s).</p>	<p>Briefly describe the event. Include damage estimates, clean up efforts and other details if available.</p>	<p>List amount and source of funding awarded, if any.</p>



Recent Local Disasters Worksheet

GRANT COUNTY MULTI-HAZARD MITIGATION PLAN UPDATE

Please document local disasters that have occurred since 2005. See the separate Disaster Events Examples sheet for guidance and use the black and white copy of your 2006 map to help pinpoint location-specific events. Feel free to include all natural hazard events that affected your community, regardless of whether you would consider them “disasters” or not.

Please return this worksheet and the map by **March 31st** to Jessica Schmiedicke at 120 E. Lakeside St. PO Box 259036 Madison WI 53725-9036, jschmiedicke@vandewalle.com, or (608)255-0814 (fax).

Summary of 2005 and later Disaster Events for the

City/Village/Town (circle one) of _____ (fill in community name)

Person/Body submitting response: _____ Phone number: _____

Disaster Type	Location (mark up b&w map as appropriate)	Date	Description	Funding Awarded

Disaster Type	Location (mark up b&w map as appropriate)	Date	Description	Funding Awarded

Local Hazard Mitigation Strategies Worksheet

GRANT COUNTY MULTI-HAZARD MITIGATION PLAN UPDATE

Please circle the **Potential Hazard Mitigation Strategies** that are appropriate for your community. Then identify where each preferred strategy should be applied, what type of hazard(s) it would address and other available information. Please return by **March 31st** to Jessica Schmiedicke at 120 E. Lakeside St. PO Box 259036 Madison WI 53725-9036, j schmiedicke@vandewalle.com, or (608)255-0814.

City/Village/Town (circle one) of _____ (fill in community name)

Person/Body submitting response: _____ Phone #: _____

Please circle the Potential Hazard Mitigation Strategies below that are appropriate for implementation in your community.	If you circled the strategy, where in your community should this strategy be applied?	What type of hazard(s) would this strategy address (e.g., flooding, landslides, storms)?	Any other information about the strategy or the hazard it would help resolve (e.g., How to carry it out? By whom? Components of success)?
1. Increase community outreach and education			
2. Enhance hazard warning system (e.g., weather radios)			
3. Improve protection of critical facilities (e.g., hospital)			
4. Improve coordination and communication among governments and emergency responders			
5. Provide emergency water and power sources			
6. Promote crop insurance			
7. Update and step-up enforcement of building codes			
8. Monitor the locations of vulnerable populations			
9. Improve land use planning and zoning			
10. Enhance stormwater management and erosion control regulations for new development			
11. Enhance regulations for road construction projects			

<p>Please circle the Potential Hazard Mitigation Strategies below that are appropriate for implementation in your community.</p>	<p>If you circled the strategy, where in your community should this strategy be applied?</p>	<p>What type of hazard(s) would this strategy address (e.g., flooding, landslides, storms)?</p>	<p>Any other information about the strategy or the hazard it would help resolve (e.g., How to carry it out? By whom? Components of success)?</p>
12. Update floodplain maps			
13. Open up access to flood insurance			
14. Promote floodproofing of buildings in their current locations in flood-prone areas			
15. Support voluntary relocation of buildings in flood-prone areas to new locations			
16. Support voluntary acquisition of flood-prone sites/ buildings and help relocate people who live in them			
17. Clear and improve obstructed water and drainage ways (e.g., remove fallen trees, debris, sediment)			
18. “Flood-proof” roads and bridges for emergency and business access			
19. Decrease or vegetate grades near existing highways			
20. Increase groundwater monitoring			
21. Promote water saving, storage and use restrictions			
22. Support the installation of drought-proof wells			
23. Promote “best management practices” for lawns and agriculture to reduce water consumption			
24. Recruit additional storm spotters and train them			
25. Support active tree management (e.g. near lines)			

<p>Please circle the Potential Hazard Mitigation Strategies below that are appropriate for implementation in your community.</p>	<p>If you circled the strategy, where in your community should this strategy be applied?</p>	<p>What type of hazard(s) would this strategy address (e.g., flooding, landslides, storms)?</p>	<p>Any other information about the strategy or the hazard it would help resolve (e.g., How to carry it out? By whom? Components of success)?</p>
<p>26. Promote underground utility installation/relocation</p>			
<p>27. Install snowmelt cables on roofs and gutters</p>			
<p>28. Retrofit roofs to better handle snow and ice loads</p>			
<p>29. Install and maintain snow fences along key roads</p>			
<p>30. Promote construction of “saferooms” in buildings</p>			
<p>31. Promote whole-house fans, air conditioners, etc.</p>			
<p>32. Provide, staff and advertise “cooling centers”</p>			

APPENDIX D: STAKEHOLDER MEETING ATTENDEES

- Intergovernmental and Interagency Meeting: January 23, 2012
- Department Heads Meeting: January 23, 2012
- Kick Off Meetings
 - 1:00pm February 29, 2012
 - 7:00pm February 29, 2012
 - 7:00pm March 1, 2012
 - 7:00pm March 15, 2012

Grant County Multi Hazard
Mitigation Plan Update

Intergovernmental/Interagency Meeting
January 23, 2012

-- Attendance Record, Please Print Clearly --

Name	Agency
KEVIN TURNER	JO DAVIESS CO. SHERIFFS OFC
Scott Marquardt	UW-Platteville AD
TODD JANSON	UW EXTENSION
Tom Lunge cmful1967@sandprairie.net	Jo Daviess EMA COORDINATOR ORS T Lunge @ Sandprairie
COLIN FULRATH	JO DAVIESS CO. LEPC/HAZMAT
Row DATA	JO DAVIESS CO. LEPC
Julie hoeffelholz	GCEM
Steve BROWN	GCEM
LUKE YAHN	WSP
Wayne Weber	UW-Platteville College of BLSA

-- Attendance Record, Please Print Clearly --

Grant County Multi Hazard
Mitigation Plan Update

County Department Heads Meeting
January 23, 2012

-- Attendance Record, Please Print Clearly --

Name	Agency
Lynda Schweikert	LUCCO
JOHN ANDERSON	TAX LISTERS OFFICE
Jeff Kindra	Grant Co. Health Dept.
Layne L Musm	ADRC <small>ADULT & DISABILITY RESOURCE CENTER</small>
DAVE LAMBERT	HWY.
Terry Hoeffelholz	Zoning
Keith GOWER	GRANT SHERIFF
Julie Hoeffelholz	GCEM
Steve Brown	GCEM

-- Attendance Record, Please Print Clearly --

Grant County Multi Hazard
Mitigation Plan Update

Kick-off Meeting
Cuba City Fire Station
February 29, 2012

-- Attendance Record, Please Print Clearly --

Name	Community	Email
Faber Bewde	TOWN OF Jamestown	
John DALRING	TOWN OF JAMES TOWN	
Donald Splinter	Town of Hazel Green	
Ken Wiedersholt	Town of Hazel Green	
Bill Wiegman	Village Hazel Green	
Gary Grossler	City of Cuba City	
Frank Cypsel	Village of Hazel Green	
Dale Leitker	Village of Hazel Green	
Mary Kramer	Village of Dickville	
David McClain	Town of Paris	
Troy Leffelluz	City of CC	
Lamy Buehl	City of Plattville	
John Kreier	TOWN OF Snelson	
Steve Tranel	City of Cuba City	
Jim Long	Town of Plattville	
Bob Duesler	TOWN OF SNELSON	

-- Attendance Record, Please Print Clearly --

Grant County Multi Hazard
Mitigation Plan Update

Kick-off Meeting
Lancaster Fire Station
February 29, 2012

-- Attendance Record, Please Print Clearly --

Name	Community	Email
<i>Antonia A. Zeff</i>	Town of Potomac	
<i>Jay Ann</i>	"	
Dale Neis	Village of Dickville	ddpw@tds.net
<i>Jacky (Kotegast)</i>	Town Ellenton	kh312_99@yahoo.com
<i>Gary Schneider</i>	So. Lancaster	
Erica TRAVEN	Village of Tennyson	villageofTennyson@hotmail.com
Elaine Mumm	Town of Little Grant	
Christina Christanson	Village of Lynnton	viloflv@yousg.net
Jerry Wehrle	Lancaster	jjwehrle @chorus.net
Grant Loy	CLIFTON TWP	

-- Attendance Record, Please Print Clearly --

Grant County Multi Hazard
Mitigation Plan Update

Kick-off Meeting
Boscobel Fire Station
March 15, 2012

-- Attendance Record, Please Print Clearly --

Name	Community	Email
Charles Baumeister	Wattenstown	
Robert Reynolds	Town of Fennimore	rreynolds@tds.net
Gary Raunum	Town of Musoda	psychodesign@COUNTRY SPEED.COM
Al Fields	Town of Boscobel	(None)
Robert Mertz	Town of Hickory Grove	
Steve Wetter	Boscobel	SteveWetter@hotmail.com
John Weigel	Town of Wingville	
BRIANT RUSSELL	TOWN OF HICKORY GROVE	BRIMAR24@GMAIL.COM

-- Attendance Record, Please Print Clearly --

APPENDIX E: RESULTS OF PUBLIC PARTICIPATION GOALS EXERCISE

During the four public kick-off meetings for the Grant County Multi-Hazard Mitigation Plan Update – attendees were asked to prioritize their goals for mitigation outcomes. The following table represents their goals ranked in priority order based on votes received.

Goals	Total
Protect people's lives	39
Protect public health	23
Protect utilities	19
Protect public services (fire, police, etc.)	17
Help people to protect themselves	17
Protect roads from washouts/landslides	13
Prevent future risk of hazards in highly vulnerable areas	10
Maximize use of state and federal funds	10
Protect agricultural areas	9
Prevent environmental contamination caused/exacerbated by hazards	8
Prevent road closures/accessibility issues due to hazards	8
Protect sensitive populations (elderly, children, low-income families)	7
Protect housing	7
Protect schools	6
Protect future generations	5
Restrict development in hazardous areas	4
Protect hospitals / health care centers	4
Prevent future development from increasing hazard vulnerability	3
Protect businesses (including, but not exclusively major employers)	3
Clearly communicate mitigation program/measures to the community	3
Minimize property owners' expenditures	3
Minimize public expenditures	3
Protect park and recreation areas	2
Promote intergovernmental coordination when implementing mitigation measures	2
Protect personal property and facilities (13-19)	2
Protect wetlands/environmentally sensitive areas	1
Protect historic/cultural resources	1
Protect a particular area: (23-26)	1
Other: Maximize access to Federal Recovery Aid	1
Other: Clean out our flood control dams	1
Protect a particular area: Valley of Blue River and Branches (roads/bridges)	1
Protect centers of employment	0
Protect new/future buildings	0
Protect cars and other vehicles (e.g. areas of concentrated parking)	0
Promote public/private partnerships	0

APPENDIX F: EMERGENCY MANAGEMENT/DISASTER SERVICE COMMITTEE AGENDAS



EMERGENCY MANAGEMENT / DISASTER SERVICES COMMITTEE AGENDA

The Grant County Emergency Management/Disaster Services Committee will meet on **Monday, January 23, 2011 at 10:00am** in the lower level of the County Law Enforcement Center, 1000 North Adams Street, in Lancaster.

Consideration will be given and/or action taken on any or all of the following items:

Call to Order

Certification of Compliance with Open Meeting Law

Approval of Agenda

Approval of Minutes of Previous Meeting

Public Comments/Open Forum

Director's Monthly Report

Old Business

FEMA AFG Grants

New Business

All Hazards Mitigation Plan Update Presentation

Mark Roffers & Jessica Schmiedicke - Vandewalle & Associates

Wisconsin Hazardous Materials Response System Realignment

Grants

Monthly Bills

Adjournment



EMERGENCY MANAGEMENT / DISASTER SERVICES COMMITTEE AGENDA

The Grant County Emergency Management/Disaster Services Committee will meet on **Monday, August 13, 2012 at 10:00am** in the lower level of the County Law Enforcement Center, 1000 North Adams Street, in Lancaster.

Consideration will be given and/or action taken on any or all of the following items:

Call to Order

Certification of Compliance with Open Meeting Law

Approval of Agenda

Approval of Minutes of Previous Meeting

Public Comments/Open Forum

Old Business

Hazard Mitigation Plan Revisions (Jessica Schmiedicke, Vandewalle & Associates)
Assistance to Firefighter's Grants

New Business

Director's Monthly Report
Drought Disaster Declaration / Small Business Administration Emergency Loans
2013 Public Property & Computer Request

Monthly Bills

Adjournment

APPENDIX G: DAMS

Official Name	Size	Latitude	Longitude	Stream Name	Structure Type
KIRCHBAUM,JIM	SMALL	42.7782927	-90.8450928	TR-GRANT RIVER	
KAHOUT,JOHN JR	SMALL	43.0407029	-90.5249134	UN. TR FENNIMORE CR.	
CULL, MICHAEL	SMALL	42.8857452	-90.8785354	GULLY, TR BLAKES FORK	
KIELER, LAWRENCE	SMALL	42.6751962	-90.5798598	GULLY	
FRITZ, DELBERT	SMALL	42.6965016	-90.652209	GULLY TO PLATTE RIVER	
WIEST, ALPHONSE	SMALL	42.7152531	-90.8907055	GULLY	
DRESSLER, RON	SMALL	42.7308037	-90.7629298	BOICE CR. WATERSHED	
FRITZ, DELBERT	SMALL	42.6781477	-90.6416026	PLATTE RIVER WATERSHED	
LEDBURY, DOUGLAS	SMALL	42.7714016	-90.9443377	FLATROCK CR WATERSHED	
NOHNS, HERBERT	SMALL	42.7550571	-90.5816868	LEE BRCH WATERSHED	
DE WAYNE G. BIERMAN	SMALL	42.6901594	-90.7353015	TR-RIGSBY HOLLOW	
FINCEL, FRANK	SMALL	42.6433396	-90.6393685	TRIB TO PLATTE RIVER	
SECHER, JAMES		43.0168002	-90.7338119	GULLY TO BIG GREEN RIVER	
Lindquist Pond	SMALL	43.1217471	-90.4706405	U/N Trib. to Blue River	
PLUEMER	LARGE	42.8769839	-90.7525626	TR GRANT	EARTH
KOELLER AND KLEIN	LARGE	42.7012887	-90.7453878	TR BOICE CR	EARTH
KLEIN	LARGE	42.8299735	-90.464757	TR-LITTLE PLATTE	EARTH
BLOOMINGTON	SMALL	42.8906535	-90.9337795	TRIB. TO BLAKE FORK	EARTH
HASKINS, DARREL #2	SMALL	42.8357643	-90.714271	TR-PIGEON CR	EARTH
BARNES, WILLIAM L.	SMALL	42.9670141	-90.6531329	TR-GREGORY BRCH	EARTH
BENSON,CHARLES	SMALL	42.6648314	-90.4263629	TR-GALENA RIVER	EARTH
BESTON, GLEN	SMALL	42.6984786	-90.5325685	TR LITTLE PLATTE RIVER	EARTH
BOYER, ARTHUR	SMALL	42.698854	-90.8609298	MC CARTNEY BRCH	EARTH
BRINKMAN, JOHN P.	SMALL	42.7625035	-91.0080333	TR MISSISSIPPI RIVER	EARTH
CLARE, E.R.	SMALL	42.7419551	-90.4989734	TR LITTLE PLATTE RIVER	EARTH
CLAUER, GARY	SMALL	42.6874559	-90.7644451	TR-GRANT RIVER	EARTH
CRUBEL, JERRY	SMALL	42.9077299	-90.9496869	TR-BLAKE FORK CR	EARTH
FINN, BRUCE	SMALL	42.9568765	-90.9795961	TR-PATCH GROVE	EARTH
HARVILLE, KEITH	SMALL	42.9373762	-90.998396	TR-SANDY CR	EARTH
HENRY, STANLEY	SMALL	42.7720401	-90.6587787	TR-PLATTE RIVER	EARTH
IHM, FRANK	SMALL	42.8814632	-90.6815776	TR-ROGERS BRCH CR	EARTH
KARTMAN, CARTER	SMALL	42.6991705	-90.8334451	GULLY TRIB MCCARTNEY BRCH	EARTH

Official Name	Size	Latitude	Longitude	Stream Name	Structure Type
KLAAS, EARL J.	SMALL	42.8615181	-90.6244944	TR-PLATTE RIVER	EARTH
KOBELT, LEONARD	SMALL	43.0409051	-90.8719992	TR-LITTLE GREEN RIVER	EARTH
KUNKEL, JOHN	SMALL	42.5870015	-90.6174541	GULLY	EARTH
MERWIN, JOHN	SMALL	42.9012236	-90.4967204	TR-CROW BRCH CR	EARTH
MUENCH,GARY	SMALL	42.8106392	-90.7422296	TR-PIGEON CR	EARTH
NOVINSKI, TERRILL	SMALL	42.8554775	-90.5876761	GULLY TRIB TO PLATTE RIVER	EARTH
RICHARDSON, RONALD	SMALL	42.6901019	-90.5521483	TR-LITTLE PLATTE RIVER	EARTH
ROESCH, GERALD	SMALL	42.7386606	-90.7187751	GULLY TRIB TO ARROW BRCH	EARTH
SCANLAN, PAUL	SMALL	42.935406	-90.6530289	TR-GREGORY BRCH	EARTH
SCHINDLER, JOHN	SMALL	42.8913558	-90.7324591	TR-BORAH CR	EARTH
SCHMITZ,JAMES	SMALL	42.9800228	-90.8121867	TR-BIG GREEN RIVER	EARTH
STEFFEN, ANDREW N.	SMALL	42.6074112	-90.6239002	TR-INDIAN CR	EARTH
PINK,WILLIAM	SMALL	42.9003251	-90.7724498	TR-MARTENS BRCH	EARTH
HARMS, HERMAN	SMALL	42.7583324	-90.5327774	TR-ROUNDTREE BRCH	EARTH
WACHTER, KENNETH C.	SMALL	43.024598	-90.583458	TR-FENNIMORE CR	EARTH
BELLMAYER,LESTER NO.1	SMALL	42.82137	-90.6772426	INTERMITTENT TR AUSTIN BRCH	EARTH
BELLMAYER, LESTER NO.2	SMALL	42.8235311	-90.6726747	INTERMITTENT TR AUSTIN BRCH	EARTH
HELMS,ERWIN	SMALL	42.9394581	-90.7223167	NO WATERWAY	EARTH
JONES, WILLIAM	SMALL	42.9496112	-90.8052987	TR-GRANT RIVER	EARTH
MACKE, WILLIAM	SMALL	42.8726528	-90.8637694	UNNAMED	EARTH
WOOD,MAX	SMALL	42.928486	-91.0646907	TR-DRY HOLLOW CR	EARTH
BENDER, CHARLES	SMALL	43.0886888	-90.768839	UNNAMED	EARTH
MERTZ-BAUMEISTER	SMALL	43.0892778	-90.6991416	TR CROOKED CR	EARTH
FISH TRAP	SMALL	43.2026207	-90.5439481	JONES SLOUGH	EARTH
MORIS, JAMES	SMALL	42.7958134	-90.9919759	TR KUENSTER CR	EARTH
HASKINS, DARREL #1	SMALL	42.8357016	-90.7143164	TR-PIGEON CR	EARTH
BRINKMAN, NOAH	SMALL	42.7592156	-91.0112849	TR-SINSINAWA RIVER	EARTH
KUHL, MERLIN	SMALL	42.5264049	-90.4892882	GULLY TO MUDDY CR	EARTH
WALLENHORST, M. & RUNDE,C.	SMALL	42.574566	-90.5055627	GULLY TO SINSINAWA CR	EARTH
FREYMILLER, LOU	SMALL	43.0581221	-90.7710243	GULLY TO DRY HOLLOW CR	EARTH
SWENSON, ROBERT	SMALL	43.0388522	-90.5605927	GULLY, TR-FENNIMORE FORK	EARTH
CRUBEL, DENNIS	SMALL	42.9181259	-90.9113651	GULLY, TR BLAKE FORK	EARTH
KIRSCHBAUM, LOREN	SMALL	42.771442	-90.9761879	TR-FLAT ROCK CR	EARTH
SHANLEY,DON	SMALL	42.6712049	-90.6887354	TR-MISSISSIPPI	EARTH

Official Name	Size	Latitude	Longitude	Stream Name	Structure Type
FARREL, M AND KUSSMAUL, A.	SMALL	42.9948212	-90.8964159	TR-MILLVILLE CR	EARTH
STONE, MARSHALL	SMALL	42.7305694	-90.4272355	GULLY	EARTH
MULLER, IRWIN	SMALL	42.609204	-90.6425061	GULLY	EARTH
MULLER, IRWIN	SMALL	42.6093209	-90.6425683	GULLY	EARTH
KUNKEL, DONALD	SMALL	42.5714263	-90.6323638	GULLY	EARTH
JANSEN, GERALD	SMALL	42.5633585	-90.58705	GULLY	EARTH
BRANDT, WILLIAM	SMALL	42.6712718	-90.6967821	GULLY	EARTH
MULLER, IRWIN	SMALL	42.6031666	-90.6443103	GULLY	EARTH
FRITZ, DELBERT	SMALL	42.6697092	-90.6197917	GULLY	EARTH
MULROONEY, LEONARD	SMALL	42.9681338	-90.8187704	TRIBUTARY TO MARTIN BRCH	EARTH
SALOUTOS, CHARLES	SMALL	42.7749445	-90.4595517	TRIBUTARY TO MOUNDS BRCH	EARTH
SCHMITT, ANTON J.	SMALL	42.6332415	-90.5797485	TRIBUTARY TO MCADAM BRCH	EARTH
AMES, JERRY	SMALL	42.7396486	-90.8223096	GRANT RIVER	EARTH
HESS, TIM AND ART	SMALL	42.8108174	-90.9903037	HEILER CR	EARTH
KIRSCHBAUM, DOUGLAS	SMALL	42.7417507	-91.0112771	DEWEY CR	EARTH
PINK, CLEMENT L.	SMALL	42.9120231	-90.8396488	LITTLE GRANT RIVER	EARTH
VOGT, MARCUS	SMALL	42.8103137	-90.9891368	GULLY TO HEILER CR	EARTH
YOOSE, STEVE	SMALL	42.8084846	-90.7690911	PIGEON RIVER	EARTH
MARKUS, RICHARD	SMALL	42.6861104	-90.737329	TRIB. TO RIGSBY HOLLOW CR	EARTH
MEIER, LAVERN L.	SMALL	42.8052113	-90.9200234	TRIBUTARY TO GLEN HAVEN	EARTH
FRITZ, DELBERT	SMALL	42.7024831	-90.6490725	TRIB. TO YANKEE HOLLOW	EARTH
BRINKMAN AND KIRSCHBAUM	SMALL	42.7550588	-91.0323582	TRIB TO MUDDY CR	EARTH
TATGE, DALE	SMALL	43.1691064	-90.4304684	TR BLUE RIVER	EARTH
COX, PAUL	SMALL	42.7301031	-90.7449972	TRIB TO BOICE CR	EARTH
DAVIS, JEFF	SMALL	42.8797516	-90.9267663	GULLY	EARTH
HUGHES, RUTH & ALBERT WHITE	SMALL	42.6702696	-90.5953242	GULLY	EARTH
BODENBINDER, BURNELL	SMALL	43.0810027	-90.7428414	GULLY TR TO BULLHEAD SLOUGH	EARTH
GROSSER, JOE	SMALL	42.6913827	-90.8228861	TRIB TO MCCARTNEY BRCH	EARTH
WAMSLEY, MAURICE	SMALL	42.7452105	-90.8424416	GULLY TRIB TO GRANT RIVER	EARTH
SCHUTT, EVELYN H.	SMALL	42.8276245	-90.6256685	ELLENBORO 16-6	EARTH
SCHIFFMAN, HAROLD	SMALL	42.6532687	-90.6740707	GULLY	EARTH

Official Name	Size	Latitude	Longitude	Stream Name	Structure Type
FARRELL, MIKE	SMALL	43.000409	-90.8976761	TR MILLVILLE CR	EARTH
REYNOLDS, DONALD	SMALL	42.640826	-90.625061	TR GRANT RIVER	EARTH
CULL & MARTIN	SMALL	42.8825406	-90.8811304	GULLY	EARTH
B AND B FARMS	SMALL	42.6803075	-90.6950576	GULLY	EARTH
BETRAM, MELVIN	SMALL	42.7241389	-90.578631	GULLY	EARTH
LANGE, ROBERT	SMALL	42.6081698	-90.6350372	GULLY	EARTH
LOY, GRANT	SMALL	42.8199318	-90.4925902	GULLY	EARTH
SCHAEFER, DON	SMALL	42.7084167	-90.5996231	GULLY	EARTH
HAMILTON, MYRON	SMALL	42.7039983	-90.5720032	GULLY	EARTH
BERNING, DANIEL	SMALL	42.5129203	-90.5991331	GULLY	EARTH
JOHNSON, IVAN	SMALL	42.8867945	-90.5579635	TR- PLATTE RIVER	EARTH
MUMM DAM	SMALL	42.91233	-90.5422	UNNAMED TRIB - PLATTE RIVER	EARTH
KOLAR DETENTION FACILITY	SMALL	42.85221	-90.70545	E. BR PIGEON CR	EARTH
NIHLES	LARGE	42.86175	-90.50561	U/N TRIBUTARY TO BACON BRCH	EARTH
STREICH, JOEL	SMALL	0	0	U/N TRIBUTARY TO YOUNG BRCH	EARTH
LOCK & DAM NO 10	LARGE	42.7889249	-91.0737791	MISSISSIPPI	GRAVITY
LOCK & DAM NO 11	LARGE	42.540547	-90.6429918	MISSISSIPPI	GRAVITY
JORDAHL, HAROLD	SMALL	42.8779269	-90.5840364	TR-PLATTE RIVER	GRAVITY
NELSON DEWEY POWER PLANT	SMALL	42.7251411	-91.013434	ADJACENT TO MISSISSIPPI	GRAVITY
BRANDEMUEHL, JAMES	SMALL	42.8624908	-90.6567951	PLATTE RIVER WATERSHED	GRAVITY
LOEFFELHOLZ, RUD	SMALL	42.6520732	-90.5531666	BLOCKHOUSE CR. WATERSHED	GRAVITY
BRINKMAN, NOAH	SMALL	42.7661086	-91.0195514	TRIB. MUDDY CR	ROCKFILL