2015

Upper Loup Natural Resource District Multi-Jurisdictional All-Hazard Mitigation Plan Update

JEO CONSULTING GROUP INC

Contents

LIST OF ACRONYMS

BCA – Benefit Cost Analysis
CARC – Nebraska Climate Assessment and Response Committee
CF – Critical Facilities
CFR – Code of Federal Regulations
CIKR – Critical Infrastructure and Key Resources
CRS – Community Rating System
CTP - Cooperating Technical Partners Program
CWS – Chronic Wasting Disease
DHS – Department of Homeland Security
DMA2000 – Disaster Mitigation Act of 2000
DOD – Degree of Damage
EAS – Emergency Alert System
EHD – Epizootic Hemorrhagic Disease
ELAP – Emergency Assistance for Livestock, Honeybees, and Farm-Raised Fish Program
EMS – Emergency Medical Services
EOC – Emergency Operation Center
ERC – Emergency Response Committee
FBI - Federal Bureau of Investigations
FEMA – Federal Emergency Management Agency
FIRM – Flood Insurance Rate Map
FMA – Flood Mitigation Assistance Program
FR –Final Rule
GIS - Geographic Information Systems
GTFDR – Governor's Task Force for Disaster Recovery
HAZU-MH – Hazards United States-Multi Hazard
HMA – Hazard Mitigation Assistance
HMGP – Hazard Mitigation Grant Program
HMP – Hazard Mitigation Plan
HSAS – Homeland Security Advisory System
HUD - Department of Housing and Urban Development
JEO – JEO Consulting Group, Inc.
LFD – Livestock Forage Disaster Assistance Program
LIP – Livestock Indemnity Program
NCDC – National Climactic Data Center
NDA – Nebraska Department of Agriculture
NDEQ – Nebraska Department of Environmental Quality
NDMC – National Drought Mitigation Center
NDNR – Nebraska Department of Natural Resources
NEMA - Nebraska Emergency Management Agency
NFIP – National Flood Insurance Program
NFIRS – National Fire Incident Reporting System
NIPP – National Infrastructure Protection Plan
NTAS – National Terrorism Advisory System
NWS – National Weather Service
PDM – Pre-Disaster Mitigation Program
PDSI - Palmer Drought Severity Index
RAC – Risk Assessment Committee
SBA – Small Business Administration
SFHA – Special Flood Hazard Area
SPIA - Sperry-Piltz Ice Accumulation Index
SSA – Sector Specific Agency

SURE – Supplemental Revenue Assistance Payments
TAP – Tree Assistance Program
TRI – Toxics Release Inventory Program
ULNRD – Upper Loup Natural Resource District
USDA – United States Department of Agriculture
USGS - United States Geological Survey
VS – Vesticular Stomatitis
WAOC – Water Availability and Outlook Committee
WUI – Wildland Urban Interface

Executive Summary

In December of 2012, Upper Loup Natural Resource District (ULNRD) began the process to update their hazard mitigation plan to become compliant with the five year update requirement established by the Disaster Mitigation Act of 2000 (DMA 2000). This updated plan was prepared for the purpose of reducing the participating communities' vulnerability to natural hazards and maintains eligibility for the Federal Emergency Management Agency (FEMA) pre-disaster grant opportunities. This ULNRD Multi-Jurisdictional All-Hazard Mitigation Plan is a multi-jurisdictional plan which covers the following jurisdictions that chose to participate in this update process.

Figure 1: Participating Jurisdictions

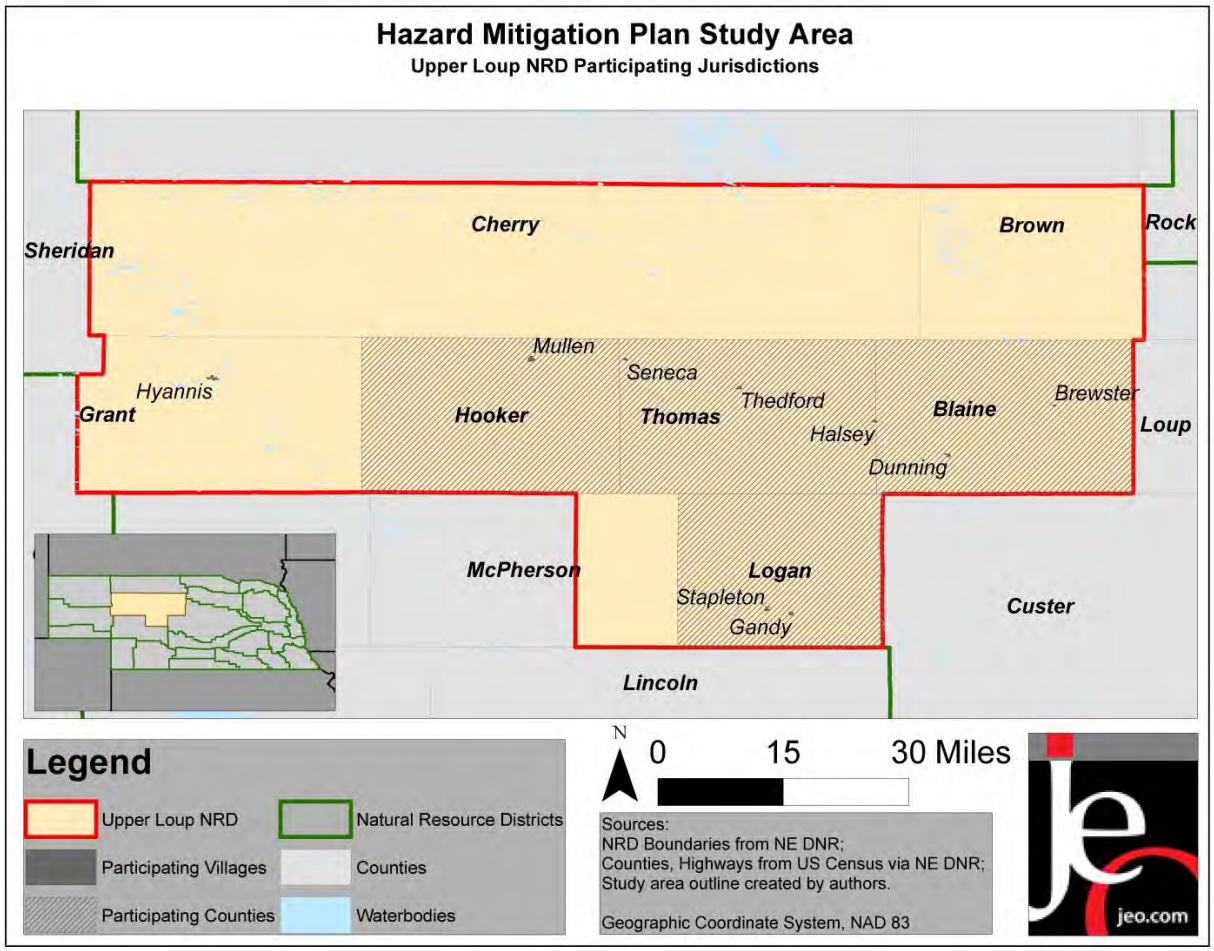


Table 1: Participants

Participating Counties, Cities, & Villages				
Blaine County	Hooker County	Logan County	Thomas County	Village of Hyannis (Grant County)
Village of Brewster	Village of Mullen	Village of Gandy	Village of Thedford	Upper Loup Natural Resource District
Village of Dunning	Mullen Public Schools	Village of Stapleton		
Village of Halsey				

The purpose of this plan update is to identify hazards; assess the vulnerability of each participant to the various hazards; determine potential losses associated with the hazards; examine the capabilities in place and develop sound mitigation alternatives to reduce these vulnerabilities. The potential for substantial damages as a result

of natural or manmade disasters presents a large likelihood for impacts to the health, safety, and welfare of all citizens in the planning area. The risk assessment process led to the development of specific goals and objectives which helped to identify a wide range of mitigation strategies and projects for participating jurisdictions. This update builds upon the prior hazard mitigation plan developed by ULNRD in 2009, some of the most significant changes in this update are: the inclusion of manmade hazards based on the threats addressed in the State of Nebraska's Hazard Mitigation Plan; greater efforts to reach out to and include stakeholder groups; an expanded risk assessment for both the entire planning area as well as for each participating jurisdiction; and the inclusion of both generalized mitigation strategies as well as specific projects that will help build stronger, more resilient communities.

This update also works to unify the various planning mechanisms in place throughout the planning area to ensure that the goals and objectives identified in those planning mechanisms are consistent with what is identified in this plan. This plan identifies specific goals and objectives based on the risk assessment process. These goals are to:

Goal 1: Protect the Health and Safety of Residents

Objective 1.1: Reduce or prevent damage to property or prevent loss of life or serious injury (overall intent of the plan).

Goal 2: Reduce Future Losses from Hazard Events

Objective 2.1: Provide protection for existing structures, future development, critical facilities, services, utilities, and trees to the greatest extent possible.

Objective 2.2: Develop hazard specific plans, conduct studies or assessments, and retrofit jurisdiction to mitigate for hazards and minimize their impact.

Objective 2.3: Minimize and control the impact of hazard events through enacting or updating ordinances, permits, laws, or regulations.

Goal 3: Increase Public Awareness and Educate on the Vulnerability to Hazards

Objective 3.1: Develop and provide information to residents and businesses about the types of hazards they are exposed to, what the effects may be, where they occur, and what they can do to be better prepared.

Goal 4: Improve Emergency Management Capabilities

Objective 4.1: Develop or improve Emergency Response Plan and procedures and abilities.

Objective 4.2: Develop or improve Evacuation Plan and procedures.

Objective 4.3: Improve warning systems and ability to communicate to residents and businesses during and following a disaster or emergency.

Goal 5: Pursue Multi-Objective Opportunities (whenever possible)

Objective 5.1: When possible, use existing resources, agencies, and programs to implement the projects.

Objective 5.2: When possible implement projects that achieve several goals.

Goal 6: Enhance Overall Resilience and Promote Sustainability

Objective 6.1: Incorporate hazard mitigation and adaptation into updating other local planning endeavors (e.g., comprehensive plans, zoning ordinance, subdivision regulation, etc.)

This plan is comprised of seven sections, discussed below:

Section One – Introduction: This section introduces hazard mitigation planning, including an overview of DMA2000, benefits of utilizing the multi-jurisdictional approach, and plan financing and preparation. . No significant changes were made to Section One during the course of the update.

Section Two – Planning Process: This section outlines the hazard mitigation planning process used for development of the plan, including hazard identification; resource organization; risk assessment; structural inventory; mitigation strategy; and plan implementation and maintenance. The Planning Team; public involvement and participation; participating jurisdictions; as well as general plans, documents, and additional information used throughout the planning process are also listed in this section. The changes in Section Two for the plan update include: inviting multiple stakeholder groups to participate in updating the plan, engaging the public through tools such as Survey Monkey, conducting one-on-one meetings with communities unable to attend public meetings, providing status reports on the plan through JEO Consulting Group's Hazard Mitigation Website, and expanding the hazards considered to address all the hazards covered by the 2014 Nebraska Hazard Mitigation Plan.

Section Three – Community Profile & Capability Assessment: This section provides an overall profile of the planning area including geography, climate, demographics, assets, and the identification of regional capabilities that can be utilized in the implementation of projects and strategies. The changes in Section Three for the plan update include: an expanded profile analysis and the completion of Capability Assessment to determine the ability of participating jurisdictions to implement mitigation strategies/projects in their community.

Section Four – Risk Assessment: This section contains the risk assessment for the planning area including hazard identification, hazard background, historical occurrences, vulnerability assessment, potential losses, and future development and vulnerability for all participants. The changes in Section Four for the plan update include: considering all hazards addressed in the 2014 Nebraska Hazard Mitigation Plan, using available data to improve the risk assessment components, refining the Risk/Vulnerability Rank to provide more distinction between options and to increase accuracy, and asking communities for their ranking of hazards as it applies to their jurisdiction.

Section Five – Mitigation Strategy: This section discusses the establishment of goals and objectives for all participants. The goals and objectives provide the framework for identifying mitigation alternatives or 'action items', the on-the-ground activities to reduce the effects of natural hazards. All action items were evaluated by the participants using the FEMA recommended 'STAPLEE' process. Mitigation strategies are included in *Section Seven for each individual participating jurisdiction.* The changes in Section Five for the plan update include: changes in prioritization and needs within participating jurisdictions as they relate to mitigation activities.

Section Six – Plan Implementation and Maintenance: This section contains recommendations for plan implementation and maintenance, including the monitoring of hazards, establishment of a panel for the annual plan review, and an outline of the process for updating the plan in the future. No significant changes were made to Section Six during the plan update.

Section Seven – Participant Sections: Participant sections provide information specific to each individual plan participant, which was not covered in the 'Upfront Section'. The risk assessment includes a participant specific hazard identification summary and description of structural inventory and valuation. Also, maps specific to each participant can be found in their respective section. The changes in Section Seven for the plan update include: more detailed community profiles, greater discussion of hazards affecting the communities, a more in-depth review of mitigation activities selected by each community, and the completion of a Capability Assessment to determine the ability of participating jurisdictions to implement mitigation strategies/projects.

Section 1: Introduction

HAZARD MITIGATION PLANNING

Hazard events are inevitable. It is just a matter of when they happen and how well a community is prepared for such an event. Mitigation reduces risk and is a socially and economically responsible action to prevent long term risks from natural and man-made hazard events.

Natural hazards, such as severe winter storms, tornados and high winds, severe thunderstorms, flooding, extreme heat, drought, agriculture diseases (plant and animal), earthquakes, landslides, and wildfires are a part of the world around us. Their occurrence is natural and inevitable, and there is little we can do to control their force and intensity. Man-made hazards are a product of the society that we live in and can occur with significant impacts to communities. Man-made hazards include levee failure, dam failure, chemical and radiological fixed site hazards, major transportation incidents, terrorism, civil disorder, and urban fire. These hazard events can occur naturally or as a result of human error. All jurisdictions participating in this planning process are vulnerable to a wide range of natural and man-made hazards that threaten the safety of residents, and have the potential to damage or destroy both public and private property, cause environmental degradation, or disrupt the local economy and overall quality of life.

FEMA definition of Hazard Mitigation

"Any sustained action taken to reduce or eliminate the long-term risk to human life and property from [natural] hazards."

Mitigation planning is described as having the potential to produce long-term and recurring benefits by breaking the repetitive cycle of disaster associated loss. A core assumption of hazard mitigation planning is that pre-disaster investments will significantly reduce the demand for post-disaster assistance by lessening the need for emergency response, repair, recovery, and reconstruction. Furthermore, mitigation practices will enable local residents, businesses, and industries to re-establish themselves in the wake of a disaster, getting the local economy back on track sooner and with minimal interruption.

The benefits of mitigation planning go beyond reducing hazard vulnerability. Measures such as the acquisition or regulation of land in known hazard areas can help achieve multiple local goals like preserving open space, improving water quality, maintaining environmental health, and enhancing recreational opportunities. Mitigation planning also offers the following benefits:

- Saving lives and property;
- Saving money;
- Speeding up recovery following disasters;
- Reducing future vulnerability through wise development and post-disaster recovery and reconstruction;
- Enhancing coordination within and across participating jurisdictions;
- Expediting the receipt of pre-disaster and post-disaster grant funding; and,
- Demonstrating a firm commitment to improving local health and safety

As a jurisdiction formulates a comprehensive approach to reduce the impacts of hazards, a key means to accomplish this task is through the development, adoption, and regular update of a hazard mitigation plan. A hazard mitigation plan establishes the vision, guiding principles, and specific actions designed to reduce current and future hazard vulnerabilities. The ULNRD Multi-Jurisdictional Hazard Mitigation Plan is an effective tool to incorporate hazard mitigation principles and practices into the day-to-day activities of county and municipal governments. This plan offers specific actions designed to protect residents, as well as the built environment from those hazards that pose the greatest risk. Identified mitigation actions go beyond recommendations for structural solutions to reduce existing vulnerability, such as elevation, retrofitting, and acquisition projects. Local policies on growth and development; incentives tied to natural resource protection; and public awareness

and outreach activities are examples of other actions intended to reduce future vulnerability to identified hazards.

DISASTER MITIGATION ACT OF 2000

In an effort to reduce the nation's mounting natural disaster losses, the U.S. Congress passed the DMA 2000 to amend the Robert T. Stafford Disaster Relief and Emergency Assistance Act. Section 322 of the DMA 2000 requires that state and local governments develop, adopt, and routinely update a hazard mitigation plan in order to remain eligible for pre- and post-disaster mitigation funding. These funds include the Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation Program (PDM), and the Flood Mitigation Assistance Program (FMA). They are administered by FEMA under the Department of Homeland Security (DHS).

This plan was developed in accordance with current state and federal rules and regulations governing local hazard mitigation plans. The plan shall be monitored and updated on a routine basis to maintain compliance with the legislation – Section 322, Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as enacted by Section 104 of the Disaster Mitigation Act of 2000 (P.L. 106-390) and by FEMA's Final Rule (FR) published in the Federal Register on November 30, 2007, at 44 Code of Federal Regulations (CFR) Part 201.

HAZARD MITIGATION ASSISTANCE & NATIONAL FLOOD INSURANCE PROGRAM

On June 1, 2009, FEMA initiated the Hazard Mitigation Assistance (HMA) program integration, which aligned certain policies and timelines of the various mitigation programs. These HMA programs present a critical opportunity to minimize the risk to individuals and property from hazards while simultaneously reducing the reliance on federal disaster funds.

Mitigation is the cornerstone of emergency management. Mitigation focuses on breaking the cycle of disaster damage, reconstruction, and repeated damage. Mitigation lessens the impact disasters have on people's lives and property through damage prevention, appropriate development standards, and affordable flood insurance. Through measures such as avoiding building in damage-prone areas, stringent building codes, and floodplain management regulations, the impact on lives and communities is lessened.

- FEMA Mitigation Directorate

Each HMA program was authorized by separate legislative action, and as such, each program differs slightly in scope and intent.

- **HMGP:** To qualify for post-disaster mitigation funds, local jurisdictions must have adopted a mitigation plan that is approved by FEMA. HMGP provides funds to states, territories, Indian tribal governments, local governments, and eligible private non-profits following a presidential disaster declaration. The DMA 2000 authorizes up to seven percent of HMGP funds available to a state after a disaster to be used for the development of state, tribal, and local mitigation plans.
- **FMA:** To qualify to receive grant funds to implement projects such as acquisition or elevation of flood-prone homes, local jurisdictions must prepare a mitigation plan. The plan must include specific elements and be prepared in conjunction with the process outlined in the National Flood Insurance Program's (NFIP) Community Rating System. The goal of FMA is to reduce or eliminate claims under the NFIP.
- **PDM:** To qualify for pre-disaster mitigation funds, local jurisdictions must adopt a mitigation plan that is approved by FEMA. PDM assists states, territories, Indian tribal governments, and local governments in implementing a sustained pre-disaster hazard mitigation program.
- **NFIP Community Rating System (CRS):** The CRS offers recognition to local governments that exceed minimum requirements of the NFIP (refer to *Section Four: Risk Assessment* – Flooding). Recognition comes in the form of discounts on flood insurance policies purchased by citizens. The CRS offers credit for mitigation plans that are prepared according to a multi-step process.

MULTI-JURISDICTIONAL APPROACH

According to FEMA, "A multi-jurisdictional hazard mitigation plan is a plan jointly prepared by more than one jurisdiction." The term 'jurisdiction' means 'local government'. Title 44 Part 201, Mitigation Planning in the CFR, defines a 'local government' as "any county, municipality, city, town, township, public authority, school district, special district, intrastate district, council of governments, regional or interstate government entity, or agency or instrumentality of a local government; any Indian tribe or authorized tribal organization, any rural community, unincorporated town or village, or other public entity". For the purposes of this plan, any 'taxing authority' was also included.

FEMA recommends the multi-jurisdictional approach under the DMA 2000 for the following reasons:

- It provides a comprehensive approach to the mitigation of hazards that affect multiple jurisdictions;
- It allows economies of scale by leveraging individual capabilities and sharing cost and resources;
- It avoids duplication of efforts; and
- It imposes an external discipline on the process.

Both FEMA and the Nebraska Emergency Management Agency (NEMA) recommend this multi-jurisdictional approach through a combination of counties and regional emergency management districts. The ULNRD utilized the multi-jurisdiction planning process recommended by FEMA (Local Mitigation Plan Review Guide (October 2011), Local Mitigation Planning Handbook (March 2013), and Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards (January 2013) to develop this plan.

PLAN FINANCING AND PREPARATION

In regards to plan financing and preparation, in general, the local government (ULNRD) is the "sub-applicant" that is the eligible entity that submits a sub-application for FEMA assistance to the "Applicant". The "Applicant," in this case is the State of Nebraska. If HMA funding is awarded, the sub-applicant becomes the "sub-grantee" and is responsible for managing the sub-grant and complying with program requirements and other applicable federal, state, territorial, tribal, and local laws and regulations.

Section 2: Planning Process

SUMMARY OF CHANGES

The planning process followed for this plan update was similar to that followed for the prior hazard mitigation plan. However, some changes were incorporated in order to build upon the lessons learned from the prior planning effort:

- More diverse and inclusive planning team including county emergency management directors, staff from Upper Loup Natural Resource District, Mullen Public Schools, and consultants from JEO Consulting Group, Inc. (JEO) ;
- Multiple stakeholder groups were identified and invited to participate in updating the plan;
- Additional efforts were made to engage the public through the use of online tools including the project website, ULNRD Website, JEO's Mitigation Planning Website, and Survey Monkey; and,
- The hazards considered were expanded to include all hazards addressed by the State hazard mitigation plan.

Requirement §201.6(b): Planning process. An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:

(1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;

(2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and

(3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

Requirement §201.6(c) (1): [The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

HAZARD MITIGATION PLANNING PROCESS

The hazard mitigation planning process has four general steps, which include organization of resources; assessment of risks; development of mitigation strategies; and implementation and annual monitoring of the plan's progress. The mitigation planning process is rarely a linear process. It is not unusual that ideas developed during the assessment of risks may need revision or additional information while updating the mitigation plan or that implementation of the plan may result in new goals or additional risk assessment.

- Organization of Resources
  - Focus on the resources needed for a successful mitigation planning process. Essential steps include:
    - Organizing interested community members
    - Identifying technical expertise needed
- Assessment of Risks
  - Identify the characteristics and potential consequences of the hazard. Identify how much of the jurisdiction can be affected by specific hazards and the impacts they could have on local assets.
- Mitigation Plan Development
  - Determine priorities and identify possible solutions to avoid or minimize the undesired effects. The result is a hazard mitigation plan and strategy for implementation.
- Plan Implementation and Progress Monitoring
  - Bring the plan to life by implementing specific mitigation projects and changing day-to-day operations. It is critical that the plan remains relevant to succeed. Thus, it is important to conduct periodic evaluations and revisions, as needed.

PLAN UPDATE PROCESS

The ULNRD began the process of securing funding for their multi-jurisdictional hazard mitigation plan (HMP) in December of 2012. JEO was contracted in May 16, 2013 to guide and facilitate the planning process and assemble the multi-jurisdictional hazard mitigation plan. For the ULNRD, Anna Baum led the development of the plan at the staff level and served as the primary point-of-contact throughout the project. The project kick-

off meeting with the ULNRD and JEO provided an overview of the work to be completed over the following three months including: the identification of additional potential participants (particularly school districts); identification of and coordination with the Planning Team; determination of number and location of future public meetings (if necessary); assessment of the attendance requirements; and discussion of what types of information would need to be provided to the consultant to successfully complete the plan.

This ULNRD plan is an update in accordance with the mandatory plan update every five years. Hyannis was not a participant in previous mitigation plans, but opted to participate in this plan. The first activity in the update process for the ULNRD HMP was coordination of efforts with local, state, and federal agencies and organizations. Also, the Nebraska Department of Natural Resources (NDNR) and NEMA became involved in the planning process. The ULNRD and JEO then worked together to identify elected officials and key stakeholders to lead the planning effort.

RESOURCE ORGANIZATION

PLANNING TEAM

At the beginning of the planning process, the Planning Team, comprised of local participants and the consultant, was established to guide the planning process, review the plan, and serve as a liaison to plan participants throughout the planning area. A list of Planning Team members can be found in Table 2. Additional technical support was provided to the Planning Team through staff from NEMA and the NDNR.

Table 2: Hazard Mitigation Planning Team

Name	Jurisdiction	Title
Anna Baum	ULNRD	General Manager
Kyle Yrkoski	ULNRD	Technician
Wynn Wiens	Hooker County/ULNRD	Deputy Sherriff & Deputy Emergency Manager (Hooker County)/Director (NRD)
Bryan Criso	Hooker County	County Commissioner
Dan Van Dyke	Mullen Public Schools	Superintendent
Jerry Johnson	Logan County	County Commissioner
Jack Brommet	Stapleton	Appointed Representative
Kenneth Jividen	Gandy	Board Chairperson
Jeff Henson*	JEO Consulting Group	Project Manager
Katie Swanson*	JEO Consulting Group	Project Coordinator

**External Contributors*

The Planning Team meetings were held on:

- December 17, 2013 (Hooker County Planning Team): Outline the HMP planning process, discuss data need for plan development, and outline responsibilities and expectations for the planning team;
- December 18, 2013 (Thomas County): Planning Team representatives were unable to attend this meeting; and
- December 19, 2013 (Blaine & Logan Counties): Outline the HMP planning process, discuss data need for plan development, and outline responsibilities and expectations for the planning team.

PARTICIPANT INVOLVEMENT

Elected officials, key stakeholders, and residents within ULNRD experience the area hazards first hand and play a key role in providing local information necessary to complete the plan. Participants played a key role in the identification of hazards; understanding the community's perception of risk; providing a record of historical disaster occurrences and localized impacts; reviewing and revising existing goals and objectives; approval of

one newly established goal and objective ; identification and prioritization of potential mitigation projects and strategies; and, the development of annual review procedures.

In order to be a participant in the development of this plan update, jurisdictions were required to have at minimum one representative present at the "Hazard Identification" and "Mitigation Alternatives" meeting. Some jurisdictions were able to send multiple representatives to meetings. Sign-in sheets from all public meetings can be found in *Appendix B*. Jurisdictions were encouraged to invite stakeholder groups from within their communities to participate in the public meetings.

Jurisdictions that were unable to attend the scheduled public meetings were able to request a meeting with members of the planning team that would satisfy the meeting attendance requirement. This effort enabled jurisdictions which could not attend a scheduled public meeting to participate in the plan.

The Hazard Identification meetings were held on:

- December 17, 2013 (Mullen, NE): Present a general overview of the HMP planning process, discuss participation requirements, begin the process of risk assessment and impact reporting, and update critical facilities
- December 18, 2013 (Thedford, NE): Present a general overview of the HMP planning process, discuss participation requirements, begin the process of risk assessment and impact reporting, and update critical facilities
- December 19, 2013 (Stapleton, NE): Present a general overview of the HMP planning process, discuss participation requirements, begin the process of risk assessment and impact reporting, and update critical facilities
- December 26, 2013 (Thedford, NE): Present a general overview of the HMP planning process, discuss participation requirements, begin the process of risk assessment and impact reporting, and update critical facilities
- December 30, 2013 (Thedford, NE): Present a general overview of the HMP planning process, discuss participation requirements, begin the process of risk assessment and impact reporting, and update critical facilities

The intent of these meetings was to provide the public and jurisdictional representatives with an overview of the work to be completed over the next several months and discuss what types of information would need to be provided to complete the plan. Information regarding how to complete the meeting worksheets online was provided to each jurisdiction. This information was distributed to provide an opportunity to gather input on the identification of hazards, records of historical occurrences, establishment of goals and objectives, and potential mitigation alternatives from jurisdictional representatives (refer to *Appendix B*).Meeting attendees are identified in Table 3.

Table 3: Hazard Identification Meeting Attendees

Name	Jurisdiction	Title
Anna Baum	ULNRD	General Manager
Kyle Yrkoski	ULNRD	Technician
Craig Thompson	Blaine County	County Commissioner
Jerry Johnson	Logan County	County Commissioner
Wynn Wiens	Hooker County/ULNRD	Deputy Sheriff & Emergency Manager/Director
Alan Atkins	Thomas County	County Commissioner
Lorissa Hartman	Thomas County	Clerk
Kevin Hood	Thomas County	Emergency Manager
Donna Baker	Brewster	Board Chair

Dan Sheets	Dunning	Mayor
Loren Eaton	Halsey	Board Member
Dianna Rodocker	Halsey	Clerk
Cliff Dailey	Hyannis	Board Member/Fire Chief
Mickey Retclaff	Hyannis	Board Member
Cheryl Anderson	Hyannis	Clerk/Treasurer
Dan Daly	Mullen	Fire Chief
Deb Daly	Mullen	Clerk
Melody McDowell	Mullen/Mullen Public Schools	Board Member & EMT/Teacher
Tony Core	Mullen	Utility Superintendent
Dan Van Dyke	Mullen Public Schools	Superintendent
Kim Carr	Sandhills Public Schools	Business Manager
Pat Taylor	Seneca	Board Chair
Tami Taylor	Seneca	Board Member
Jack Brommet	Stapleton	Designated Representative
Terry Higgins	Thedford	Maintenance Chief

Table 4: Public Notification - 'Hazard Identification' Meetings

Action	Intent
Posting of 2009 ULNRD HMP	2009 ULNRD HMP posted for public viewing on ULNRD website and JEO Hazard Planning website
Hazard Identification Letter	Sent to participants to discuss the agenda/dates/times/locations of the first round of public meetings
Planning Team Letter	Informed the Planning Team about their first meeting
Neighboring Jurisdictions Letter	Informed neighboring jurisdictions about the planning effort
Press Release	Sent to local newspapers to describe the purpose of the plan
Project Announcement	Project Announcement Posted on ULNRD's website
Follow-up Phone Call	Potential participants were called to remind them about the upcoming meetings
Follow-up Emails and Phone Calls	Participating jurisdictions were contacted to encourage them to finish the Hazard ID worksheets
Meeting Flyer	Flyers were posted announcing meeting date and locations. Flyers were posted at multiple locations throughout all counties.
Word-of-Mouth	Staff discussed the plan with jurisdictions throughout the planning process

The public was invited to participate in the planning process a number of ways. Flyers (Figure 2) reminding the public of meetings were posted throughout the planning area, public meetings were held in the evenings after normal business hours to allow the public to attend, links to an online public survey, and a QR code to allow residents with smartphones to scan the code and complete the survey, and the plan was posted online for a public review period before the document was submitted to FEMA. Only one person opted to complete the survey. All feedback received from planning team members, jurisdictional representatives, and the public was incorporated into the appropriate participant sections. Sign-in sheets from the public meetings are available in *Appendix B*.

Figure 2: Photograph of Meeting Flyer

Photo: Meeting Flyer posted at Logan County Court House

Opportunity for Neighboring Communities & Stakeholder Involvement

The efforts taken to inform potential participants and allow for public involvement and participation were also extended to 'neighboring communities' and stakeholder groups within the planning area. Table 5 indicates the neighboring jurisdictions invited to participate in the planning process.

Table 5: Neighboring Jurisdictions Contacted

Jurisdiction	Office Contacted	Attendance/Participation
Grant County	Office of Emergency Management	Phone discussion with County Emergency Manager
Brown County	Office of Emergency Management	Individual Meeting with County Emergency Manager
Rock County	Office of Emergency Management	Individual Meeting with County Emergency Manager
Loup County	Office of Emergency Management	None
Custer County	Office of Emergency Management	None
Lincoln County	Office of Emergency Management	None
McPherson County	Office of Emergency Management	None
Arthur County	Office of Emergency Management	None
Broken Bow	City Administrator	None
Ainsworth	City Clerk	None
Valentine	City Administrator	None

At the beginning of the planning process, the planning team worked to identify stakeholder groups that could serve as "hubs of communication" through the completion of the plan. A wide range of stakeholder groups were contacted and encouraged to participate. Survey Monkey and the project website were used to post Stakeholder Surveys and Community Participation Surveys. Community members were also directed to ULNRD's website which included a project announcement and made a copy of the Upper Loup Hazard Mitigation Plan, as well as hosting a draft of the 2014 Upper Loup Multi-Jurisdictional Hazard Mitigation Plan, which was made

available for public review and comment. Table 6 illustrates the stakeholder groups that received notification regarding the hazard mitigation planning process and were invited to attend public meetings.

Table 6: Stakeholder Groups Contacted

Group	Office Contacted	Attendance/Participation
Brown County Hospital	Chief Executive	None
Jennie Melham Medical Facility	Chief Executive	None
Great Plains Regional Medical Center	Chief Executive	None
Sandhills District Health Department	Director	None
Pioneer Memorial Community Hospital Association	Executive Director	None
Loup Basin Resource Conservation & Development	Executive Director	None
Sandhills Area 4H	General	None
Logan County 4h	President	None
Sandhills RC & D	President	None
Dunning chamber of Commerce	Director	None
Stapleton Chamber of Commerce	Director	None
Sexton Enterprises	Owner	None
Glen Coble & Sons, Inc.	President	None
Blaine County Farm Service Agency (FSA)	Director	None
Hooker County FSA	Director	None
Logan County FSA	Director	None
Thomas County FSA	Director	None
American Red Cross(North Platte)	Not specified	None
Thomas County Fair Board	Not specified	Attended Hazard Identification meeting
Thomas County Ag Society	Treasurer	Attended Mitigation Alternatives meeting
Halsey United Church of Christ	Not specified	Attended Hazard Identification meeting

In addition to invitations sent to targeted stakeholders, meeting notifications were posted throughout the planning area. Meeting flyers included meeting times and locations, links to an online public survey, and a QR code to allow residents with smartphones to scan the code and complete the survey.

RISK ASSESSMENT

HAZARD IDENTIFICATION

The Upper Loup Natural Resources District is vulnerable to a wide array of natural and man-made or technological hazards that threaten life and property. At the hazard identification meetings, the planning team reviewed the following hazards consistent with the Nebraska State Hazard Mitigation Plan (2014) to conduct further risk and vulnerability assessment based on these hazards' previous occurrence and the communities' exposure to the hazards:

- Severe Winter Storms
- Tornados
- High Winds
- Severe Thunderstorms
- Hail
- Flooding (Riverine and Flash)
- Extreme Heat
- Drought
- Earthquakes
- Wildfires
- Levee Failure
- Dam Failure
- Ag Diseases
- Fixed Site Hazards (Chemical & Radiological)
- Transportation Incidents (Chemical, Radiological, and Severe Incidents)
- Terrorism
- Civil Disorder
- Urban Fire

All the hazards are further described in *Section Four: Risk Assessment*. The information included in the hazard profiles, as well as the extent of the risk assessment, are dependent upon the information available for analysis.

HAZARD RISK & VULNERABILITY ASSESSMENT

The ULNRD Hazard Mitigation Plan utilizes an enhanced hazard risk assessment methodology to assess the potential risk and vulnerability of the entire planning area and of each participating jurisdiction. The risk assessment methodology utilizes a combination of public input and information provided by elected officials, key stakeholders, and residents throughout the planning area; publically available data on previous occurrences; and, other sources of information where available.

> ***Risk*** *is the potential loss associated with a hazard, defined in terms of probability, rate of recurrence, extent, severity, and end result.*
>
> ***Vulnerability*** *is the identification of what is capable of being affected as the result of a hazard.*

A risk assessment was conducted for the entire planning area, for each hazard identified as having a history of previous occurrence or a likely to occur in future occurrence. More detailed hazard risk and vulnerability assessment information can be found in *Section Four: Risk Assessment*. This includes: the calculation of average annual damages; discussion of significant previous occurrences; and Special Flood Hazard Area (SFHA) data for flooding.

Information specific to each jurisdiction, including the results of their unique risk assessment can be found in their respective sections in *Section Seven: Participant Sections*.

CAPABILITY ASSESSMENT

The purpose of conducting a capability assessment is to evaluate a jurisdiction's ability to implement mitigation actions. The process assists with the determination of which actions are feasible or are likely to be implemented over time given the jurisdiction's planning and regulatory, administrative and technical, fiscal, and educational capability. In addition, it provides the opportunity to assess existing planning endeavors in place, to identify any gaps or weaknesses within existing government activities that might result in increasing community vulnerability, and to highlight positive actions already in place that should be continually supported.

The capability assessment was conducted through a detailed survey (see *Appendix C*) that was sent out to the designated representative of each participating jurisdiction within ULNRD prior to the Mitigation Alternative Meetings in April, 2014. The survey questionnaire requested information on capability indicators such as existing planning endeavors, local policies, programs and ordinances, personnel resources, and budgetary that would strengthen or weaken the localities' ability to implement identified hazard mitigation actions. The survey respondents were also asked questions related to their political will to carry out hazard mitigation planning and to implement mitigation actions. These surveys were discussed in detail at the Mitigation Alternative Meetings with the option of communities meeting with members of JEO to discuss mitigation actions specific to the community that would be the most beneficial to meet the community's concerns and shortcomings in disaster mitigation.

ESTABLISH MITIGATION STRATEGIES

The Mitigation Strategies meetings were held on:

- April 1, 2014: Mullen, NE – review of collected data and introduction of the STAPLEE project prioritization process;
- April 2, 2014: Thedford, NE – review of collected data and introduction of the STAPLEE project prioritization process; and
  April 3, 2014: Stapleton, NE – review of collected data and introduction of the STAPLEE project prioritization process.

Table 7: Mitigation Strategies Meeting Attendees

Name	Jurisdiction	Title
Anna Baum	ULNRD	General Manager
Kyle Yrkoski	ULNRD	Technician
Craig Thompson	Blaine County	County Commissioner
Jerry Johnson	Logan County	County Commissioner
Wynn Wiens	Hooker County/ULNRD	Deputy Sheriff & Emergency Manager/Director
Kevin Hood	Thomas County	Emergency Manager
Donna Baker	Brewster	Board Chair
Don Baker	Brewster	Board Member
Ken Johnston	Brewster	Clerk
Dan Sheets	Dunning	Mayor
Loren Eaton	Halsey	Board Member
Dianna Rodocker	Halsey	Clerk
Cheryl Anderson	Hyannis	Clerk/Treasurer
Kurt Johnson	Hyannis	Maintenance Superintendent
Melody McDowell	Mullen/Mullen Public Schools	Board Member & EMT/Teacher
Kim Carr	Sandhills Public Schools	Business Manager
Pat Taylor	Seneca	Board Chair
Tami Taylor	Seneca	Board Member
Jack Brommet	Stapleton	Designated Representative
Terry Higgins	Thedford	Maintenance Chief

The intent of these meetings was to provide an opportunity for the public to review a draft of the plan and collect any additional information necessary to finish the plan. Meeting worksheets were distributed to provide an opportunity for plan participants to evaluate and prioritize mitigation alternatives, as well as update critical facilities, and highly vulnerable areas and populations (refer to *Appendix C*).

PLAN APPROVAL AND ADOPTION

Based on FEMA requirements, this multi-jurisdictional hazard mitigation plan must be formally adopted by each participant through approval of a resolution. This approval will create 'individual ownership' of the plan by each participant. Formal adoption provides evidence of a participant's full commitment to implement the plan's goals and objectives and action items.

> ***Requirement §201.6(c) (5)****: For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.*

Once adopted, participants are responsible for implementing and updating the plan every five years. In addition, the plan will need to be reviewed and updated annually or when a hazard event occurs that significantly affects

the area or individual participants. Copies of resolutions approved by each participant are located in *Appendix A*.

GENERAL PLANS, DOCUMENTS, AND INFORMATION

General plans, documents, and information used throughout the development and update of the plan are listed in Table 8:

Table 8: General Plans, Documents, and Information

Documents	Source
Disaster Mitigation Act of 2000	http://www.fema.gov/media-library/assets/documents/4596?id=1935
Final Rule	http://www.fema.gov/media-library-data/20130726-1606-20490-9373/lomrad13.pdf
Local Multi-Hazard Mitigation Planning Handbook 2013	http://www.fema.gov
Local Mitigation Planning Handbook	http://www.fema.gov/media-library-data/20130726-1910-25045-9160/fema_local_mitigation_handbook.pdf
Hazard Mitigation Assistance Unified Guidance	http://www.fema.gov/hazard-mitigation-assistance
What is a Benefit: Guidance on Benefit-Cost Analysis on Hazard Mitigation Projects	http://www.fema.gov/benefit-cost-analysis
The Census of Agriculture	http://www.agcensus.usda.gov/
National Flood Insurance Program Community Status Book	http://www.fema.gov/cis/NE.html
Plans/Studies	**Source**
Nebraska Drought Mitigation and Response Plan	http://carc.nebraska.gov/docs/NebraskaDrought.pdf
Flood Insurance Study	http://www.fema.gov/floodplain-management/flood-insurance-study
Nebraska State Hazard Mitigation Plan 2014	http://www.nema.ne.gov/pdf/hazmitplan.pdf
Nebraska Geological Survey Landslide Study	http://snr.unl.edu/csd/surveyareas/geology.asp
Data Sources/Technical Resources	**Source**
Federal Emergency Management Agency	http://www.fema.gov
United States Department of Commerce	http://www.commerce.gov/
National Oceanic Atmospheric Administration	http://www.noaa.gov/
National Environmental Satellite, Data, and Information Service	http://www.nesdis.noaa.gov/
National Climatic Data Center (NCDC)	http://www.ncdc.noaa.gov
Storm Prediction Center Statistics	http://www.spc.noaa.gov
United States Geological Survey (USGS)	http://www.usgs.gov/
United States Department of Agriculture	http://www.usda.gov
United States Department of Agriculture – Risk Assessment Agency	http://www.rma.usda.gov
National Agricultural Statistics Service	http://www.nass.usda.gov/
High Plains Regional Climate Center	http://www.hprcc.unl.edu
United States Census Bureau	http://www.census.gov
National Flood Insurance Program	http://www.fema.gov
National Flood Insurance Program Bureau and Statistical Agent	http://www.fema.gov/national-flood-insurance-program
FEMA Map Service Center	http://www.msc.fema.gov
National Drought Mitigation Center – Drought Monitor	http://drought.unl.edu/dm/monitor.html
National Drought Mitigation Center – Drought Impact Reporter	http://www.droughtreporter.unl.edu
National Historic Registry	http://www.nps.gov/nr
United States Small Business Administration	http://www.sba.gov

Nebraska Emergency Management Agency	http://www.nema.ne.gov
Nebraska Climate Assessment Response Committee	http://carc.agr.ne.gov
Nebraska Department of Natural Resources	http://www.dnr.ne.gov
Nebraska Department of Natural Resource – Geographic Information Systems (GIS)	http://dnrdata.dnr.ne.gov
Nebraska Department of Natural Resources – Dam Inventory	http://dnrdata.dnr.ne.gov/Dams/Search.aspx?mode=county
Nebraska Department of Natural Resources – Soils Data	http://www.dnr.ne.gov/databank/soilsall.html
Natural Resources Conservation Service	www.ne.nrcs.usda.gov
Nebraska Forest Service	http://www.nfs.unl.edu/
Nebraska Forest Service – Wildland Fire Protection Program	http://nfs.unl.edu/program-wildlandfireprotection.asp
Nebraska Association of Resources Districts	http://www.nrdnet.org
Nebraska Public Power District Service	http://sites.nppd.com
Nebraska Department of Revenue – Property Assessment Division	http://www.revenue.ne.gov/PAD
UNL – College of Agricultural Sciences & Natural Resources – Schools of Natural Resources	http://casnr.unl.edu
High Hazard Dam Inundation Area/Information	http://dnr.ne.gov/website

PLAN IMPLEMENTATION AND PROGRESS MONITORING

Hazard mitigation plans need to be a living document. To ensure this, the plan must be monitored, evaluated, and updated on a five-year or less cycle. This includes incorporating the mitigation plan into county and local comprehensive or capital improvement plans as they are developed. *Section Six* describes the system that participating jurisdictions in the ULNRD have established to monitor the plan; provides a description of how, when, and by whom the HMP process and mitigation actions will be evaluated; presents the criteria used to evaluate the plan; and explains how the plan will be maintained and updated.

Section 3: Community Profile & Capability Assessment

SUMMARY OF CHANGES

- Changes to the profile (expanded analysis)
- Hyannis statistics included in the regional totals
- Participating jurisdiction completed a Capability Assessment to determine their ability to implement mitigation strategies/projects in their community.

PLANNING AREA GEOGRAPHIC SUMMARY

The ULNRD covers a total of 6,690 square miles in north central Nebraska. ULNRD includes all of Grant, Hooker, Thomas, Blaine, and Logan counties as well as parts of McPherson, Brown, and Cherry Counties. The ULNRD is located in the Sandhills of Nebraska. The Sandhills region of Nebraska sits atop the Ogallala Aquifer. Dunes in the Sandhills may exceed 330 feet in height. The Sandhills constitute the largest and most intricate wetland ecosystem in the United States and support a vast array of plan and animal life. This region has been proven to be poor for crop agriculture but supports a ranching and cattle operations.

Figure 3: Sandhills Photograph

Logan County

DEMOGRAPHICS AND ASSETS SUMMARY

Demographic and asset information can be used to determine differing levels of vulnerability by analyzing data on population and housing, structural inventories and valuations, critical facilities, and highly vulnerable areas and populations for each participating jurisdiction.

POPULATION AND HOUSING

Tables 9 to 13 summarize various population and housing characteristics such as population trends; population by age; housing occupancy and tenure; and age of structures. Table 12 highlights selected demographic characteristics including housing units lacking complete facilities; mobile home housing units; and population 65 and older with a disability.

Table 9 provides a summary of population changes from 1990 to 2010. The percent of change was then used to project the population for 2020. This is a relatively simple method to predict population change and it does not account for predominant age cohorts in the community, birth and death rates, or in and out migration which will likely impact the rate of growth or decline.

As populations change, either growing or declining, the vulnerability of the community is impacted. If a community grows quickly it may lack resources to provide services for all members of the community in a reasonable timeframe, this could include issues like snow removal, emergency storm shelters, repairs to damaged infrastructure, or even tracking the location of vulnerable populations. Communities experiencing population decline may be more vulnerable to hazards as a result of vacant and/or dilapidated structures, an inability to properly maintain critical facilities and/or infrastructure, and higher levels of unemployment and population living in poverty. It is important for communities to monitor their population changes and ensure that those issues be incorporated into hazard mitigation plans, as well as other planning mechanisms within the community.

Table 9: Population Trends 1990-2020

Jurisdiction	1990 Population	2000 Population	2010 Population	Change 2000-2010	2020 Projected Population
Blaine County	675	583	478	-18%	392
Brewster	22	29	17	-41%	10
Dunning	131	109	103	-6%	97
Halsey	110	59	76	29%	98
Hooker County	793	783	736	-6%	692
Mullen	554	491	509	4%	529
Logan County	878	774	763	-1%	755
Gandy	51	30	32	7%	34
Stapleton	299	301	305	1%	308
Thomas County	851	729	647	-11%	576
Thedford	211	301	188	-38%	117
Hyannis	210	287	182	-37%	114
Total	3,197	2,869	2,806	-8%	2,416

Overall, the planning area's population was 2,869 persons in 2000 and 2,627 persons in 2010. This is a decrease of 242 people, or 8 percent, in ten years. The rural population was 1,211 persons in 2000, which decreased to1, 179 persons in 2010, a decrease of 32 people, or 3 percent. The urban population was 1,658 persons in 2000 and 1,445 persons in 2010, a decrease of 213 people, or 13 percent. Few communities saw an increase in population and no counties as a whole experienced growth between the years of 2000 and 2010. For a further population analysis of each community, refer to *Participant Sections*.

Table 10: Population by Age

Jurisdiction	< 9	10 - 19	20 - 34	35 - 54	55 - 64	65 - 84	> 85	Median	Total
Blaine County	52	74	47	141	69	87	8	46.1	**478**

	10.9%	15.4%	9.9%	29.5%	14.4%	18.1%	1.7%	X	
Brewster	1	2	0	2	5	7	0	61.8	**17**
	5.9%	11.8%	0	11.8%	29.4%	41.2%	0	X	
Dunning	8	22	11	29	16	16	1	40.8	**103**
	7.8%	21.4%	10.7%	28.2%	15.6%	15.6%	1%	X	
Halsey	8	9	3	19	18	15	4	54.8	**76**
	10.5%	11.9%	3.9%	24.9%	23.7%	19.7%	5.3%	X	
Hooker County	74	97	84	171	117	132	61	50.1	**736**
	10.1%	13.2%	11.4%	23.2%	15.9%	17.9%	8.3%	X	
Mullen	46	70	57	118	70	98	50	50.9	**509**
	9%	13.8%	11.2%	23.1%	13.8%	19.2%	9.8%	X	
Logan County	110	90	107	205	112	121	18	43.3	**763**
	14.4%	11.8%	14%	26.9%	14.7%	15.9%	2.4%	X	
Gandy	3	0	2	3	13	8	3	60.5	**32**
	9.4%	0	6.2%	9.4%	40.6%	25.1%	9.4%	X	
Stapleton	53	31	54	72	33	57	5	41.1	**305**
	17.4%	10.1%	17.7%	23.6%	10.8%	18.6%	1.6%	X	
Thomas County	81	75	81	161	114	112	23	46.7	**647**
	12.5%	11.6%	12.6%	25.8%	17.6%	17.4%	3.6%	X	
Thedford	24	20	24	46	31	37	6	44.7	**188**
	12.7%	10.7%	12.7%	24.3%	16.5%	19.7%	3.2%	X	
Hyannis	9	16	20	50	32	53	2	54.2	**182**
	4.9%	8.8%	10.9%	27.4%	17.5%	29%	1.1%	X	
Total	326	352	339	728	444	505	112		**2806**
	11.6%	12.5%	12.1%	25.9%	15.8%	18%	4%		

Source: United States Census Bureau – 2010

The largest age cohort of 35-54 represents 25.9 percent of the total population, or 728 persons. The smallest age cohort of 85 and older represents 4 percent, or 112 persons. Brewster, Gandy, Hyannis, and Mullen are well above the planning area average of 22 percent of the population 65 and older.

The age cohorts that represent the highest levels of vulnerability are generally those people under the age of 19 and over the age of 55. For the planning area, more than 24.1 percent of the population is under the age of 19. This group is vulnerable to a wide range of hazards including: severe winter storms, tornado, and extreme heat. Most individuals under the age of 19 are reliant on others for transportation. Events that require evacuation or relocation (such as moving to a tornado shelter) would require transportation that may or may not be available, as they are dependent on others in the area. This demographic group is more likely to be clustered together especially during daytime hours when they are in school. An event like a tornado that impacts a school building during school hours could result in a much higher injury and/or fatality count than if this group was dispersed throughout the community. According to the American Association of Pediatricians, children of all ages are much more vulnerable to the effect of extreme heat due to a decreased ability to regulate their body temperature.

Individuals over the age of 55 constitute 37.8 percent of the planning area population with over half of those individuals (22 percent of the total population) being over the age of 65. This demographic group also experiences higher risks related to a number of natural hazards which include: severe winter storms, tornados, severe thunder storms, and extreme heat. A 2011 study conducted by the Center for Injury Research and Policy found that on average there are 11,500 injuries and 100 deaths annually related to snow removal. People, especially males, over the age of 55 are 4.25 times more likely to experience cardiac symptoms during snow

removal. Community members over the over the age of 65 have a higher rate of decreased mobility directly impacting their ability to seek shelter during extreme weather events such as severe thunderstorms or tornados. Power outages during severe thunderstorms and severe winter storms may also result in prolonged power outages resulting in negative outcomes for community members dependent on medical equipment.

Table 11: Housing Occupancy and Tenure

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Blaine County	242	71.8%	95	28.2%		158	65.3%	84	34.7%
Brewster	11	57.9%	8	42.1%		11	100%	0	0%
Dunning	67	72.8%	25	27.2%		54	80.6	13	19.4%
Halsey	33	64.7%	18	35.3%		29	87.9%	4	12.1%
Hooker County	320	77.5%	93	22.5%		271	84.7%	49	15.3%
Mullen	226	77.7%	65	22.3%		189	83.6%	37	16.4%
Logan County	320	77.3%	94	22.7%		218	68.1%	102	31.9%
Gandy	24	100%	0	0		24	100%	0	0%
Stapleton	114	85.7%	19	14.3%		90	78.9%	24	21.1%
Thomas County	332	82%	73	18%		256	77.1%	76	22.9%
Thedford	100	91.7	9	8.3%		80	80%	20	20%
Hyannis	109	73.6%	39	26.4%		90	82.6%	19	17.4%
Total	1,323	77.1%	394	22.9%		993	75.1%	330	24.9%

Source: United States Census Bureau, 2010

In the planning area there are 1,323 housing units. Nearly 65 percent of housing units in the planning area were constructed prior to 1970 (making the age of these units more than 40 years old). According to the Department of Housing and Urban Development (HUD), homes of this vintage are at greater risk of poor repair and dilapidation resulting in blighted or substandard properties. This is significant in assessing hazard vulnerability because these housing units may result in living quarters that are prone to higher damages during disaster events which include high winds, tornados, hail, severe thunderstorms, and severe winter storms.

For the planning area, nearly 23 percent of housing units are vacant. Vacant housing units in a community add to vulnerability by creating structures that are poorly maintained and more likely to be derelict. During disaster events like tornados or high winds, these structures may fail and result in debris which can impact other structures as well as humans, resulting in higher damage totals and injuries or fatalities. Vacant housing units can also be a haven for criminal activity. This often results in deteriorating neighborhoods and communities.

Of the occupied housing units, nearly 25 percent are renter occupied. Renter occupied housing units often do not receive many of the updates and retrofits that are need to make them resilient to disaster impacts. Communities may consider enacting landlord outreach programs aimed at educating property owners about the threats in their area and what they can do to help reduce the vulnerability of the tenants living in their housing units.

Table 12: Selected Demographic Characteristics, ULNRD Planning Area

Characteristic	Number of Units	Percent of Total
Occupied housing units	1323	-
Lacking complete plumbing facilities	7	<1%
Lacking complete kitchen facilities	4	<1%

No telephone service available	6	<1%
Mobile Homes	142	10.7%
Housing Unit with No vehicles available	19	1.4%
House Heating: Bottled, Tank, or LP Gas	647	49%
Housing Heat: Electricity	204	15.4%

Sources: United States Census Bureau – 2010 DP-4

The selected housing characteristics include housing units that lack complete plumbing or kitchen facilities, have no telephone service, or are mobile homes. Almost 11percent of housing units in the planning area are mobile homes. Mobile homes are at a higher risk of sustaining damages during high wind events, tornados, severe thunderstorms, and severe winter storms. Mobile homes that are either not anchored or are anchored incorrectly can be overturned by 60 mph winds. A thunderstorm is classified as severe when wind speeds exceed 58mph, placing improperly anchored mobile homes at risk.

NATIONAL HISTORIC REGISTRY

According to the National Register of Historic Places, Table 13 is a summary list of the historic sites located within the plan area. Detailed information on the historic sites is presented in the *Section Seven: Participant Section* by participants.

Table 13: National Historic Registry

County	Buildings	Districts	Site	Structure
Blaine County	0	0	0	0
Hooker County	0	1	2	0
Logan County	0	0	0	0
Thomas County	0	1	0	0
Hyannis (Grant County)	1	0	0	0

Source: Nebraska National Register

These national historic landmarks in the planning area are as follows:

- Bessey Nursery, Thomas County near Halsey, listed 5/24/1978
- Hooker County Courthouse, Mullen, NE, listed 01/10/1990
- Humphrey Archeological Site, Hooker County near Mullen, listed 01/21/1974
- Kelso Site, Hooker County near Mullen, listed 10/21/1974
- Hotel DeFair, Hyannis, listed 10/29/1976

CRITICAL INFRASTRUCTURE/KEY RESOURCES

DHS defines critical infrastructure as "assets, systems, and networks, whether physical or virtual, so vital to the United States that their incapacitation or destruction would have a debilitating effect on security, national economic security, national public health or safety, or any combination thereof".

According to FEMA, "A critical facility is a structure that, if flooded [or damaged], would present an immediate threat to life, public health, and safety." Examples of critical facilities include hospitals, emergency operations centers, schools, wells, and sanitary sewer lift stations, etc.

Each participating jurisdiction identified critical facilities vital for disaster response, providing shelter to the public, and essential for returning the jurisdiction's functions to normal during and after a disaster. Critical facilities were updated at the 'mitigation alternative' public meetings through the meeting worksheets (refer to *Appendix C*). Below is a summary of the critical facilities for the entire planning area.

Table 14 shows the critical facility summary for the whole planning area; for a list and map of critical facilities for participating jurisdictions please refer to *Section Seven: Participant Sections*.

Table 14: ULNRD Critical Facilities Summary

Critical Facility (Infrastructure)	# Identified	Critical Facility (Facility)	# Identified
Municipal Well & Pump Houses	11	Nursing Home	1
Water Tower & Tanks	3	Air Port	1
Lift Station	5	Maintenance Building	10
Phone Switching Centers & Cell Towers	8	Community Hall/Center	4
Water Plant/Lagoon	3	Stores & Vet Clinics	7
Critical Facility (Facility)	**# Identified**	Gathering Places	9
County Courthouse	5	Village Storage	2
Utility Department & Substations	3	Post Office	7
Churches	24	Park	6
Fire Halls	9	Athletic Fields/Stadium	6
Educational Facility	19	Administrative Office	2

STRUCTURAL INVENTORY

A structural inventory was completed for the corporate limits of each incorporated jurisdiction in the planning area. Structural inventories were completed in order to determine the types and numbers of structures within each jurisdiction. This inventory provided valuable information on the vulnerability and potential losses to each plan participant.

Structural inventory data was collected from county assessors who were able to provide a data set which includes location of property, parcel value, and value for improvements (structures). This information was used for assessing risk to structures related to hazards with known geographic locations such as flooding.

Structures are categorized into the following classifications:

- **Residential**, including all residential structures: single-family dwellings, multi-family dwellings (duplexes, townhomes, and apartments), trailer homes, and retirement villages. High-Density Residential buildings, such as apartment buildings, were also identified. In this process, these were treated as residential structures.
- **Commercial/Industrial**, including all structures associated with commercial or industrial uses, such as motels, restaurants, gas stations, storage facilities, hair salons, manufacturing facilities, grain elevators, etc.
- **Public/Quasi Public**, including structures that are a part of any government facility, religious facility, non-profit organization, or community facility, such as post offices, county buildings, courthouses, city halls, fire stations, schools, churches, water treatment facilities, park facilities, etc.
- **Agricultural**, including buildings used solely for agricultural purposes in which the use is exclusively in connection with the production, harvesting, storage, drying, or raising of agricultural commodities, including the raising of livestock.
- **Others**, including those structures which are on the property but cannot be classified as all previous types of structures; these structures may include but are not limit to detached garages, storage sheds, swimming pools, and retaining walls.

STRUCTURAL INVENTORY AND VALUATION SUMMARY

Table 15 displays the structural inventory and evaluation summaries for both the cities and counties in the planning area. The structural inventory was developed from the survey completed for the 2009 hazard mitigation plan updated by the local planning teams during the first round of meetings. Valuations for structures were updated based on the Nebraska State Assessor's office data. This information allowed for an averaged per structure valuation. It was not possible at this time to conduct a structural inventory for the unincorporated areas of the planning area. Efforts were made to utilize county assessor data and GIS information; unfortunately at this time there is not sufficient data to allow for the differentiation between land values and structural values. It was most accurate to omit this data from the plan to ensure there were not inflated valuations for structures in the unincorporated potions of the counties. Future updates should work with assessor's offices to evaluate the available data at that time to increase the quantification of risk and vulnerability.

Table 15: Structural Inventory and Valuation Summary

Jurisdiction	Commercial/ Industrial		Out Buildings		Residential		Other		Total	
	#	Value	#	Value	#	Value	#	Value	#	Value
Blaine County										
Brewster	12	$122,004	18	$63,000	19	$274,360	9	$44,901	59	$504,625
Dunning	13	$525,695	20	$113,950	64	$1,440,090	13	$117,000	110	$2,196,655
Halsey	9	$919,267	39	$195,000	45	$1,351,500	9	$106,705	102	$2,572,472
Hooker County										
Mullen	60	$3,274,500	112	$637,280	272	$8,817,968	23	$288,880	467	$11,441,210
Logan County										
Gandy	1	$9,578	22	$110,000	24	$672,580	2	$10,000	49	$802,158
Stapleton	38	$1,101,973	83	$415,000	149	$6,790,198	13	$124,937	283	$8,432,108
Thomas County										
Thedford	31	$1,701,362	61	$361,730	131	$4,788,705	18	$187,074	241	$7,038,871
Grant County										
Hyannis	28	$1,813,265	85	$431,800	148	$5,555,731	4	$47,424	265	$7,848,220

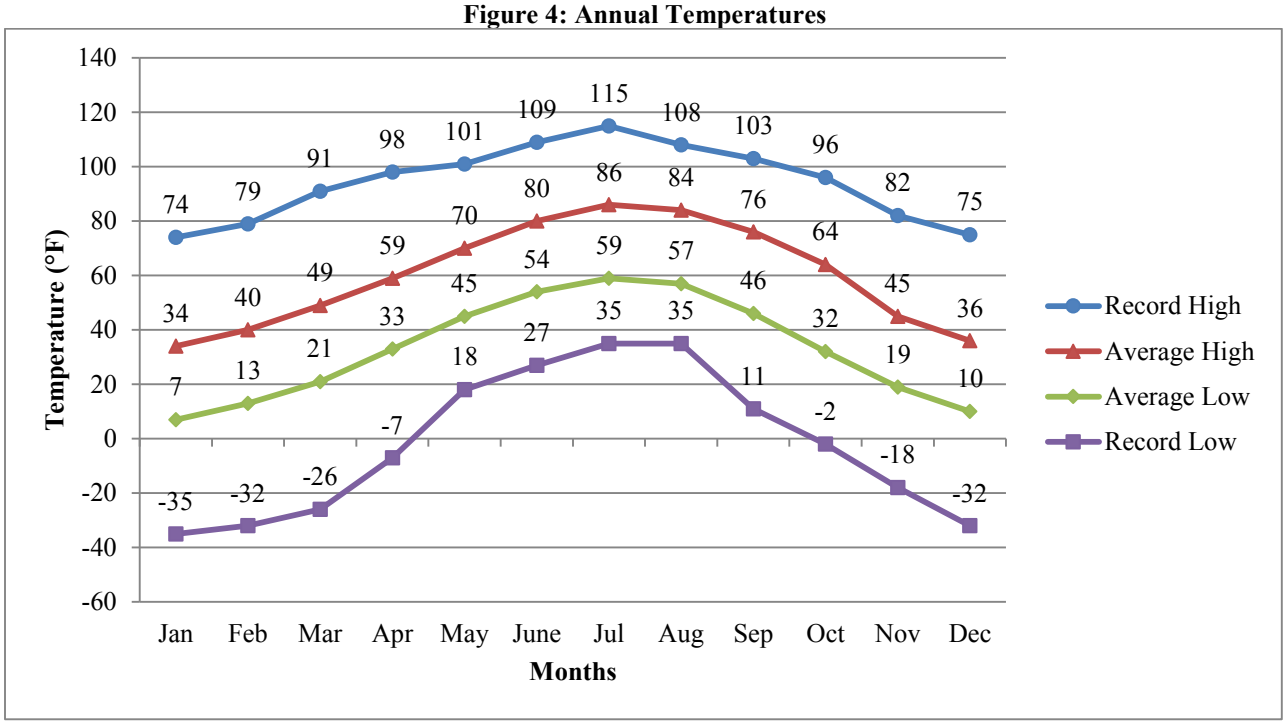
Source: Nebraska State Property Assessment Data

CLIMATE SUMMARY

Located on the Great Plains far from the moderating influence of mountains or large bodies of water, the planning area possesses a highly variable four-season humid continental climate: winters are cold, but relatively dry; summers are hot and humid. With little precipitation falling during winter, precipitation is concentrated in the warmer months, when thunderstorms frequently roll in, often producing tornados. Snow tends to fall in light amounts, though blizzards are possible. Snow cover is not very reliable due to both the low precipitation and the frequent thaws during winter.

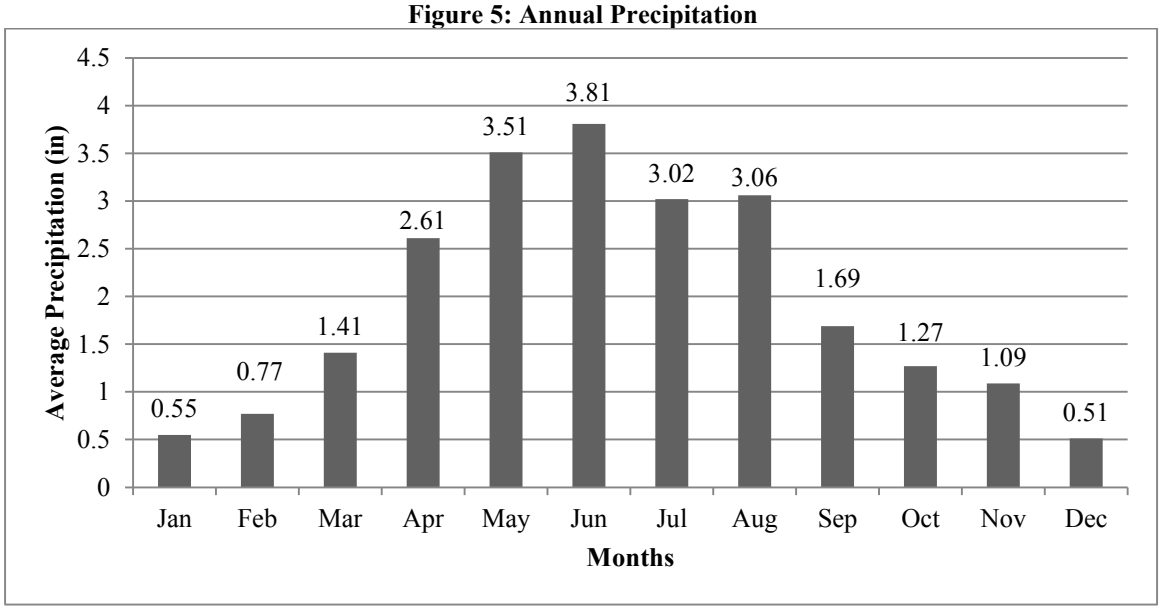
The monthly daily average temperature ranges from a mean minimum of 7 °F in January to a mean max of 86 °F in July. However, the planning area is subject both to episodes of bitter cold in winter and heat waves during summer. The planning area is in USDA Plant Hardiness Zones 4b, indicating an annual minimum temperature of around −25 °F. Temperature extremes have ranged from −35 °F in 1963 up to 115 °F in 1954. The monthly temperature averages and records and precipitation averages are shown in Figures 4 and 5.

Figure 4: Annual Temperatures



Source: Weather.com

Figure 5: Annual Precipitation



Source: High Plains Climate Center

FARM SERVICE AGENCY: SMALL BUSINESS ADMINISTRATION DECLARED DISASTERS

The U.S. Small Business Administration (SBA) was created in 1953 as an independent agency of the federal government to aid, counsel, assist, and protect the interests of small business concerns, to preserve free competitive enterprise, and maintain and strengthen the overall economy of our nation. A program of the SBA includes disaster assistance for those affected by major natural disasters. Table 16 summarizes the SBA Disasters involving the planning area.

Table 16: SBA Declared Disasters

Declared	Disaster Number	Description and Documents	Primary Counties	Contiguous Counties
8/1/2012	NE-00049	Drought	Multiple	Multiple
6/20/2008	NE-00021 (11299)	Severe Storms, Tornadoes, and Flooding	Blaine, Logan, Thomas	--
6/20/2008	NE-00020 (11297/11298)	Severe Storms, Tornadoes, and Flooding	--	Blaine, Logan
7/24/2007	NE-00014 (10956)	Severe Storms and Flooding	Logan	--
6/6/2007	NE-00013 (10893)	Severe Storms, Flooding, and Tornadoes	Thomas	--
1/7/2007	NE-00011 (10783)	Severe Winter Storms	Blaine, Logan	--
7/13/2006	NE-00007 (10556)	High Temperatures, High Winds, Excessive Heat, and Ongoing Drought	Blaine, Hooker, Logan, Thomas	--
7/13/2006	NE-00006 (10541)	High Winds, Excessive Heat, A Late Freeze, and Ongoing Drought	--	Blaine

Source: United States Small Business Administration.

PRESIDENTIAL DISASTER DECLARATIONS

The presidential disaster declarations involving the planning area up until February 2013 are summarized in Table 17. Declarations prior to 1962 available on the FEMA website, do not list designated counties.

Table 17: Presidential Disaster Declarations

Disaster Declaration Number	Declaration Date	Disaster Type	Total Individual Assistance	Public Assistance Counties	Total Public Assistance Grants
DR-4014	Aug 12, 2011	Severe Storms, Tornados, Straight-line Winds and Flooding	$0.00	Logan	$3,448,581
DR-1924	July 15, 2010	Severe Storms, Tornados, and Flooding	$0.00	Multiple	$49,622,825
DR-1770	Jun 20, 2008	Severe Storms, Tornados, and Flooding	$1,560,229	Multiple	$36,258,650
DR- 1714	July 24, 2007	Nebraska Severe Storms and Flooding	$0.00	Logan	$2,306,258
DR-1706	June 6, 2007	Severe Storms, Flooding, and Tornados	$0.00	Blaine and Thomas	$6,109,252
DR- 1674	January 7, 2007	Severe Winter Storms	$0.00	Blaine and Logan	$124,357,843
DR- 1627	January 26, 2006	Severe Winter Storms	$0.00	Logan	$5,444,137
DR-1373	May 16, 2001	Severe Storms	$0.00	Multiple	$2,982,075

Source: Federal Emergency Management Agency

CAPABILITY ASSESSMENT

The capability assessment for the ULNRD plays a significant role in the overall planning process and lays part of the foundation for developing effective and implementable hazard mitigation strategies. This process also assists with the determination of goals, objectives, and actions which are likely to be implemented given the jurisdiction's planning and regulatory capacity, levels of administrative and technical support, available fiscal resources, and current political climate.

This section examines the capabilities at the regional, state, and federal level that significant contribute to mitigating the impacts of natural and man-made hazards. Specific information for each jurisdiction is later demonstrated in *Section Seven: Participant Sections*.

REGIONAL (NATURAL RESOURCES DISTRICTS) CAPABILITY

Nebraska's system of local natural resources management is unique in the United States. Unlike the county-wide districts found in most states, NRDs are based on river basin boundaries, enabling them to approach natural resources management on a watershed basis. Like the other 22 NRDs in Nebraska, ULNRD is autonomous, governed by a locally–elected Board of Directors. While NRDs share a common set of responsibilities, each district sets its own priorities and develops its own programs to serve local needs. In general, NRDs are charged under state law with 12 areas of responsibility:

- Erosion prevention and control
- Prevention of damages from flood water and sediment
- Flood prevention and control
- Soil conservation
- Water supply for any beneficial uses
- Development, management, utilization, and conservation of groundwater and surface water
- Pollution control
- Solid waste disposal and drainage
- Drainage improvement and channel rectification
- Development and management of fish and wildlife habitat
- Development and management of recreational and park facilities
- Forestry and range management

ULNRD takes lead on a variety of projects that fulfill the responsibilities required by the state law. The most recently completed projects include Project WET, Project WILD, Project LT, Corners for Wildlife, as well as tree planting projects.

Project WET, Project WILD, and Project LT

The purpose of Project WET is "to facilitate and promote the awareness, appreciation, knowledge, and stewardship of water resources through the development and dissemination of classroom ready teaching aids and the establishment of state and internationally sponsored Project WET programs."

Project WET was originally developed in 1984 by the North Dakota State Water Commission. Five years later (1989) Montana State University received funding to develop a multi- state program. This new initiative was so successful that the decision was made to develop Project WET U.S.A. Today this program exists in all fifty states and has experienced great success.

Project WILD's mission is to provide wildlife-based conservation and environmental education that fosters responsible actions toward wildlife and related natural resources. The goal of Project WILD is to assist learners of any age in developing awareness, knowledge, skills and commitment to result in informed decisions, responsible behavior and constructive actions concerning wildlife and the environment upon which all life depends. Through interactive projects and lessons students gain an understanding of the importance of water for everyone from farmers and ranchers to energy producers, and even wildlife. They also learn why careful water management is imperative to sustaining future life, and economic stability. Students become aware of, and learn respect for, the water sources around them while taking the first steps toward a responsible attitude where nature is concerned.

This program is designed for students grade K-12 and is easily adaptable to any classroom, outdoor, or home setting. Both formal and non-formal educators can benefit from this program (non-formal educators can be anyone from resource agency educators, zoo educational staff, youth organization leaders, etc.).

Corners for Wildlife
Corners For Wildlife gives landowners the option of enrolling in a program to help establish wildlife habitat by planting trees, shrubs, and or grasses on center pivot corners. The objective of the program is to establish high quality wildlife habitat for upland wildlife and grassland songbirds. Nebraska's Natural Resources Districts and Pheasants Forever cooperate on this cost-share program.

Practices:
Cover Practice #1
Projects will establish nesting habitat from a variety of wildlife habitat mixtures. This practice will be seeded by May 10th of the first year of the contract. Rental payment is a maximum of $60.00 per acre.

Cover Practice #2
Projects will establish a minimum of 2 shrub thickets of 1500 ft. on each corner and receive a rental payment of up to $100.00 per acre. Projects with a minimum of 400 wildlife shrubs and trees planted in rows will receive a maximum rental payment of $75.00 per acre. A 75 percent cost-share rate is available for the cost of shrubs and trees. Landowners can choose from a variety of wildlife shrubs and a limited selection of trees.

Tree Services
Trees provide important benefits such as protecting homes and livestock from wind and snow, helping to reduce heating and cooling costs, preventing soil erosion, and providing wildlife habitat. The ULNRD offers tree program services including: planning, planting, weed barrier installation or weed control, and drip irrigation. Annually ULNRD works with private landowners to install an estimated 20,000 trees across the district. For this program ULNRD participates in sharing the cost of the trees and materials while the landowners are responsible for installing materials and trees.

ULNRD also works with landowners in residential areas. For these cost share projects ULNRD will help fund tree and shrub planning. Residential programs include the Yard Enhancement Program and the Trees for Newborns programs.

Chemigation Inspection
Chemigation is the injection of agricultural chemicals into water flowing through an irrigation distribution system for application to land, crops, or both. This year several irrigators across the planning area will use chemigation to apply fertilizers and pesticides to their crops.

With chemigation the rate of application can be regulated and chemicals may be applied at the exact time needed by the plants to produce maximum results. The actual handling of chemicals is reduced so operator exposure is minimized and the chance for spills is diminished. In addition, the use of chemigation helps to reduce nitrate-leaching and the possibility for nitrate contamination of ground waters.

There are some risks associated with chemigation, such as potential groundwater contamination through backflow into irrigation wells. To help reduce the potential for hazards (such as ground water contamination) irrigators are required to apply for permits issued by the ULNRD. In the ULNRD approximately 300 wells and irrigation systems are inspected and permitted annually.

STATE CAPABILITY
Nebraska Emergency Management Agency
NEMA is a small agency with less than 40 full and part-time employees and is a part of the Military Department in the State of Nebraska. NEMA is responsible for emergency management, which is usually divided into four phases: preparedness, response, recovery, and mitigation.

NEMA's role related to mitigation includes (but is not limited to) developing the state hazard mitigation plan, this plan serves as a comprehensive set of guidelines for hazard mitigation in across the state. The state hazard mitigation plan frames the discussion that will be conducted at the local level related to relevant hazards and

needs across the state. The state hazard mitigation officer and other mitigation staff members play an active role in assisting in the development local hazard mitigation plans. Representatives from the state hazard mitigation program serve as technical guides to local planning teams and regularly participate in local mitigation planning meetings. The state hazard mitigation program also oversees the HMGP, PDM, and FMA; and works with the Governor's taskforce to prioritize projects requesting funding assistance through the HMGP, PDM, and FMA.

The main objective in NEMA's preparedness process is to develop plans and procedures to help facilitate any response that may need to occur during a hazard event. NEMA assists communities in the development of county or city/village planning documents; assists with the development of exercises for existing plans and procedures; conducts trainings for communities officials, assist emergency management related groups (Citizen Emergency Response Teams, Citizen Corps, Medical Reserve Corps, Fire Corps, and other interest groups); and provide technical resources and expertise throughout the state.

NEMA's role during a response is to assist communities in responding to hazard events when the need for assistance exceeds the local capabilities and resources. This includes facilitating and tracking grants, coordinating local needs, providing state and federal level assistance through activation of Emergency Operation Centers (EOC) , Mass Critical Shelters, Emergency Alert Systems (EAS) and providing technical, logistical, and administrative resources and expertise before, during, and after incidents. The main purpose of the recovery phase is to perform actions that allow the return of normal living, or better conditions, which may include vital life saving measures. The secondary role of the recovery phase is grant administration and tracking, project monitoring, damage assessment, collaborating with communities on effective recovery options and opportunities, serving as liaison between federal level entities and local representatives, and serving as a technical resource throughout the recovery process.

For more information regarding the plans and NEMA's responsibilities as well as their ongoing projects, please go to http://www.nema.ne.gov.

Nebraska Department of Natural Resources
The NDNR is committed to providing Nebraska's citizens and leaders with the data and analyses they need to make appropriate natural resource decisions for the benefit of all Nebraskans both now and in the future. The state agency is responsible in the area of surface water, groundwater, floodplain management, dam safety, natural resource planning, integrated water management, storage of natural resources and related data, and administration of state funds.

NDNR plays a significant role in protecting and conserving water resources through the oversight of surface and groundwater status and integrated water management. The NDNR is also responsible for a non-structural program of floodplain management, coordination and assistance with the National Flood Insurance Program as well as the Flood Mitigation Assistance Program, reviewing and approving engineering plans for new dams, rehabilitating old dams, and high hazard dam emergency preparedness plans. NDNR was very active throughout the hazard planning process and provided extensive resources and technical support for hazard risk and vulnerability analysis such as flood and dam failure. NDNR also works with communities in many capacities including assisting in the completion of Benefit Cost Analysis (BCA).

For more information regarding NDNR's responsibilities as well as their ongoing projects, please go to http://dnr.ne.gov/

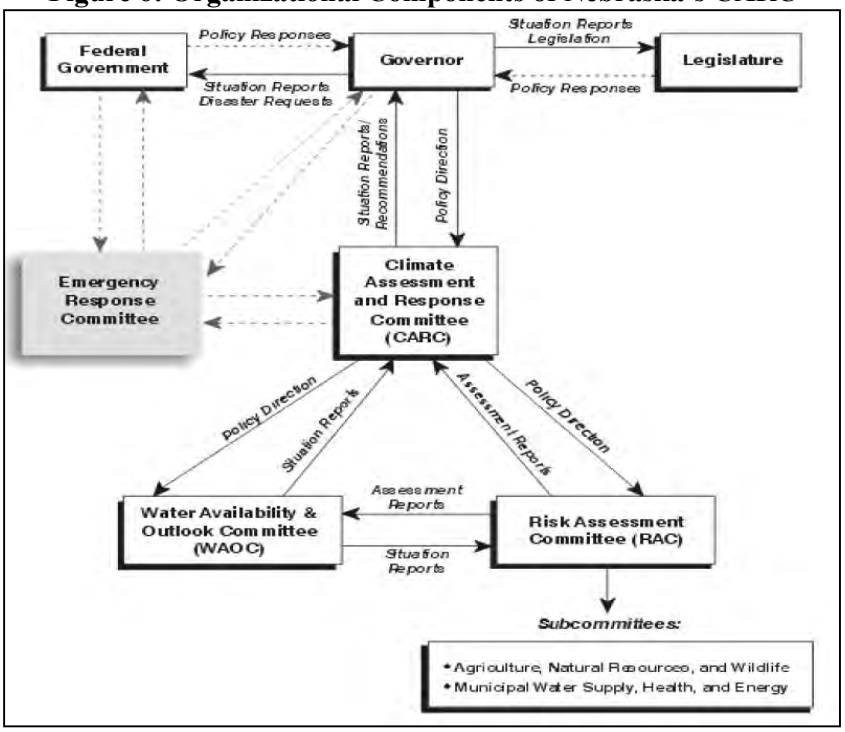
Nebraska's Climate Assessment and Response Committee (CARC)
Nebraska's CARC was established by the Nebraska Legislature in 1991 and serves as the major drought planning and response committee in state. The committee's duties are:

- To provide timely and systematic data collection, analysis, and dissemination of information about drought and other severe climate occurrences to the Governor and to other interested persons.

- To provide the Governor and other interested persons with information and advice relevant to requests for federal disaster declarations and to the use of funds and other types of assistance available to the state because of such declarations.
- To establish criteria for startup and shutdown of various assessment and response activities by state and federal agencies during drought and other climate-related emergencies.
- To provide an organizational structure that assures information flow and defines the duties and responsibilities of all agencies during times of drought and climate-related emergencies.
- To maintain a current inventory of state and federal agency responsibilities in assessing and responding to drought and other climate-related emergencies.
- To provide a mechanism for the improvement of methods of assessing impacts of drought on agriculture and industry.
- To provide such other coordination and communication among federal and state agencies as is deemed appropriate by such committee.
- To perform such other climate-related assessment and response functions as are desired by the Governor.

CARC also coordinated with other state and federal agencies to develop a State Drought Mitigation and Response Plan. The committee serves as a steering role for the state's drought plan and other climate-related activities. As shown in Figure 6, the other principal committees associated with CARC are the Water Availability and Outlook Committee (WAOC) and the Risk Assessment Committee (RAC). To avoid any overlap of duties, originally considered as a formal arm of CARC, Emergency Response Committee (ERC) was revised in June 2000 and its role was folded into the NEMA organization and separated from the official CARC structure.

Figure 6: Organizational Components of Nebraska's CARC



Source: http://carc.nebraska.gov/

Other Key Agencies

Other agencies that play an active role in hazard mitigation planning and contribute to the overall planning process at the state level are shown in the Table 18. Members from these agencies were designated as the Governor's Task Force for Disaster Recover (GTFDR) and served as the Planning Team responsible for coordinating the development of the 2011 State Hazard Mitigation Plan.

Table 18: Other Key Agencies in the State of Nebraska

Agency	Official Website Link
Nebraska Department of Agriculture	http://www.nda.nebraska.gov/
Nebraska State Patrol	https://statepatrol.nebraska.gov/
Nebraska Department of Economic Development	http://www.neded.org/
Nebraska Department of Environmental Quality	http://www.deq.state.ne.us/
Nebraska Game and Parks Commission	http://outdoornebraska.ne.gov/
Nebraska Historical Society	http://www.nebraskahistory.org/
Nebraska Department of Administrative Services	http://das.nebraska.gov/
Nebraska Department of Revenue	http://www.revenue.ne.gov/
Nebraska Department of Health and Human Services	http://dhhs.ne.gov
Nebraska Forest Service	http://nfs.unl.edu/
Nebraska Public Health Laboratory – UNMC	http://www.unmc.edu/pathology/
University of Nebraska – School of Natural Resources	http://snr.unl.edu/

FEDERAL ASSISTANCE

The federal government and its sub-agencies have provided a variety of assistance for state and local governments in hazard mitigation planning and emergency response. Table 19 lists the major federal agencies and summarizes their major types of assistance. For more information regarding funding opportunities, please refer to *Appendix E*.

Table 19: Major Federal Assistant Agencies

Agency	Type of Assistance	Official Website Link
Department of Homeland Security/ Federal Emergency Management Agency	Administrative, Political, Funding, Educational, and Technical	http://www.fema.gov/
National Oceanic and Atmospheric Administration	Educational and Technical	http://www.noaa.gov
U.S. Department of Agriculture	Funding, Educational, and Technical	http://www.usda.gov
U.S. Geological Survey	Educational and Technical	http://www.usgs.gov
U.S. Environmental Protection Agency	Educational and Technical	http://www.epa.gov
U.S. Department of Housing and Urban Development	Administrative, Educational, and Technical	http://portal.hud.gov
U.S. Small Business Administration	Funding	http://www.sba.gov
U.S. Department of Transportation	Funding, Educational, and Technical	http://www.dot.gov/
U.S. Department of Health and Human Services	Funding, Educational, and Technical	http://www.hhs.gov

Section 4: Risk Assessment

SUMMARY OF CHANGES

This plan follows the risk assessment process that was used in the prior hazard mitigation plan. However, some changes were incorporated in order to build upon the lessons learned from the prior planning effort:

- The hazards considered were expanded to include all hazards addressed by the State hazard mitigation plan
- Additional risk assessment components were incorporated as the available data allowed
- The risk assessment methodology was refined to provide more distinction between options and to increase accuracy

Regional Risk Assessment

The methodology utilized for the regional risk assessment varies by hazard, depending upon the information available. It consists of the following components: historical occurrences; estimated probability of future occurrences; the calculation of average annual damages for those hazards (where sufficient data was available); the calculation of assets located within high risk areas such as the floodplain, for those hazards which can be spatially defined; and measures of extent. The specific methodology utilized for each hazard is defined in the specific hazard sections.

The data source utilized for individual hazards varies based on the best and most appropriate source of information. The NCDC was utilized for many of the natural hazards, but it should be noted that the NCDC is not an all-inclusive, or exhaustive, source for historical weather data. Often data records for short-term local hazard events are more detailed and readily accessible than data for long-term regional events.

- *Historical Occurrence*
  - This is reported as the number of events recorded during a defined time period. A variety of sources were utilized for this measure, however, for any one hazard, a single "best" source is identified and used as a basis for analysis.

Requirement §201.6(c) (2): *Risk assessment. The plan shall include a risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.*

Requirement §201.6(c) (2) (i)*: [The risk assessment shall include a] description of the type … of all natural hazards that can affect the jurisdiction.*

Requirement §201.6(c) (2) (i)*: [The risk assessment shall include a] description of the … location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.*

Requirement §201.6(c) (2) (ii)*: [The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c) (2) (i) of this section. This description shall include an overall summary of each hazard and its impact on the community.*

Requirement §201.6(c) (2) (ii)*: [The risk assessment] must also address National Flood Insurance Program (NFIP) insured structures that have been repetitively damaged floods.*

Requirement §201.6(c) (2) (ii) (A)*: The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard area.*

Requirement §201.6(c) (2) (iii)*: For multi-jurisdictional plans, the risk assessment must assess each jurisdiction's risks where they vary from the risks facing the entire planning area.*

- *Probability*
  - For this plan probability is established based on the historic record for each event. The number of reported events divided by the number of years of record yields a probability of annual occurrence. It should be noted that this predictive method is limited in that it does not consider changes in environment, changes in climate, or efforts undertaken to reduce the potential of future occurrence. When changes related to occurrence have the

potential to effect deviations from the historic record, those changes will be discussed as part of the hazard profile.

- *Extent*
  - Extent is a measure of strength or magnitude of the hazard. Extent can be described in a combination of ways depending on the hazard. Standard measures for extent will be utilized when possible.
  - A variety of sources were utilized for this measure. The individual data sources utilized will be identified in the hazard profile.

The following table provides an overview of the data contained in the hazard profiles. This table is intended to be a quick reference for people using the plan and does not contain source information. Source information and full discussion of individual hazards are included later in this section. Hazard list is ranked by historical losses associated with the hazard type; losses reported in table 21.

Table 20: Regional Risk Assessment

Regional Risk Assessment			
Hazard	**Previous Occurrence Events/Years**	**Annual Probability**	**Likely Extent**
Drought	9/29	31%	D3
Hail	259/18	100%	H3-H5
Flooding	7/18	39%	6 inches to 1 foot, localized flooding
Severe Winter Storms	66/18	100%	.25 - .5" ice 40 - 60°F below zero (wind chills) 4 – 8" snow 25 – 40 mph winds
Severe Thunderstorms	66/18	100%	≥1" rainfall
Grass/Wildfires	240/12	100%	<100 acres
Tornados	16/18	89%	EF0
Chemical Transportation	6/23	26%	limited
High Winds	29/18	100%	8-9 BWF
Extreme Heat	42 days/1	100%	>90°
Urban Fire	193/5	100%	Limited (single structure fires)
Ag Animal Disease	2/1.33	100%	Unavailable
Ag Plant Disease	Unknown	unknown	Unavailable
Earthquakes	5/38	13%	<4.0
Landslides	0	<1%	No historic occurrences to establish likely extent
Chemical Fixed Sites	0/23	<1%	No historic occurrences to establish likely extent
Terrorism	0	<1%	No historic occurrences to establish likely extent
Dam Failure	0	<1%	No structures or lives are protected by dams (no high hazard dams in the planning area)
Civil Disorder	0	<1%	No historic occurrences to establish likely extent
Radiological Transportation	0	<1%	No historic occurrences to establish likely extent

Regional Risk Assessment			
Hazard	**Previous Occurrence Events/Years**	**Annual Probability**	**Likely Extent**
Levee Failure	0	-	No federal levees in the planning area
Radiological Fixed Facilities	Not present in the planning area	NA	NA

Community Based Risk Assessment

Participating jurisdictions completed a risk assessment for their community/jurisdiction. The local planning teams were asked to prioritize hazards based on local occurrences and impacts. Participants were encouraged to consider: historic events; probability of future events; specific vulnerable populations; properties that may be at higher levels of risk related to hazards; potential impacts to critical facilities and critical services; and potential economic losses. The information developed during the community based risk assessment is presented in *Section Seven: Participant Sections.*

Average Annual Damages and Frequency

FEMA ***Requirement §201.6(c) (2) (ii) (B)*** suggests that when the appropriate data is available, hazard mitigation plans should also provide an estimate of potential dollar losses for structures in vulnerable areas. This risk assessment methodology includes an overview of assets at risk and provides historic average annual dollar losses for all hazards for which historic event data is available. Additional loss estimates are provided separately for those hazards for which sufficient data is available. These estimates can be found within the relevant hazard profiles.

Average annual losses from historical occurrences can be calculated for those hazards for which there is a robust historic record and for which monetary damages are recorded. There are three main pieces of data that are used throughout this formula.

- **Total Damages in Dollars:** This is the total dollar amount of all property damages and crop damages as recorded in federal, state, and local data sources. The limitation to these data sources is that dollar figures often do not include all damages from every event, but rather only officially recorded damages from reported events.
- **Total Years of Record:** This is the span of years there is data available for recorded events. Vetted and cleaned up NCDC data is available for 1996 to 2013. Although some data is available back to 1950, this plan update utilizes only the more current and more accurate data available. Wildfire data is available from the NFS from 2000 to 2012. Crop loss data from RMA is available from 2000 to 2013.
- **Number of Hazard Events:** This shows how often an event occurs. The frequency of a hazard event will affect how the city responds. A thunderstorm may not cause much damage each time, but multiple storms can have an incremental effort on housing and utilities. In contrast, a rare tornado can have a widespread effect on a city.

An example of the Event Damage Estimate is found below:

$$\textbf{Annual Frequency}\ (\#) = \frac{Total\ \ Hazard\ Events\ Recorded\ (\#)}{Total\ Year\ of\ Record\ (18)}$$

$$\textbf{Average Damage per Event}\ (\$) = \frac{Total\ Damages\ in\ Dollars\ (\$)}{Total\ Year\ Recorded\ (18)}$$

Table 21: Hazard Loss Estimation

Hazard Type	Total Property Loss	Annual Property Loss	Total Crop Loss	Annual Crop Loss
Drought	$4,000,000	$222,222	$3,060,000	$170,000
Hail Events	$1,634,000	$90,778	$2,302,000	$127,889
Flooding	$635,000	$35,278	$15,000	$833
Severe Winter Storms	$472,000	$26,222	-	-
Severe Thunderstorms	$363,000	$20,167	$57,000	$3,167
Grass/Wildfires	$139,288	$11,607	$315,506	$26,292
Tornados	$104,000	$5,778	-	-
Chemical Release (Transportation)	$76,151	$2,929	-	-
High Winds	$6,000	$333	$100,000	$5,555
Extreme Heat	NA	NA	$491,709	$35,122

AGRICULTURAL (ANIMAL & PLANT DISEASE)

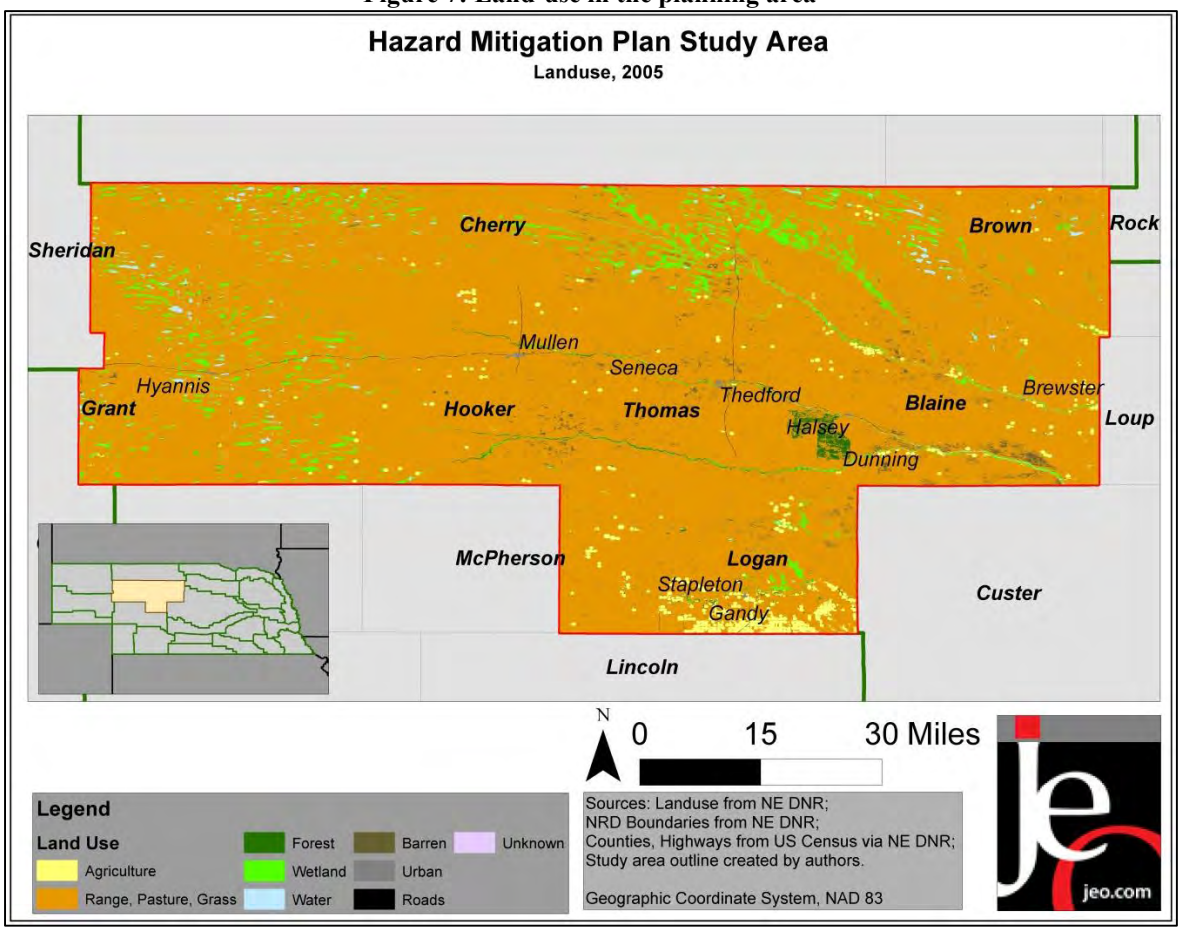
Hazard Profile

Agriculture Disease (Animal and Plant Disease) is any biological disease or infection that can reduce the quality or quantity of either livestock or vegetative crops. This section looks at both animal disease and plant disease as both make up a significant portion of Nebraska's, and the planning area's economy.

The state of Nebraska has one of the country's largest economy's that is vested in both livestock and crop sales. According to the Department of Agriculture (NDA), in 2005, agriculture cash receipts totaled $11.4 billion dollars with $7.5 billion being livestock and $3.9 billion being in vegetative crops. In the state, one in three jobs are in the agriculture industry. Nebraska also totaled $2.8 billion in revenue due to agriculture exports with $498 million in livestock exports and $2.3 billion in vegetative exports.

Figure 7 shows a map of land use data provided by the University of Nebraska at Lincoln.

Figure 7: Land-use in the planning area



Source: NE DNR

As the map illustrates a majority of land in the planning area is devoted to rangeland and ranching. There are areas of forest, wetlands, and crop farming.

Table 22 quantifies the agricultural assets within the planning area by county as reported in the 2012 Agricultural Census.

Table 22: Agricultural Assets

	# of Farms	Acres of Farm Land	Market value of Crops	Market Value of Livestock
Blaine	117	402,530	$5,541,000	$29,015,000
Hooker	82	436,820	$1,879,000	$15,382,000
Logan	149	330,151	$26,232,000	$15,764,000
Thomas	87	367,535	Not Available	Not Available
	Cattle (population)	**Hogs (population)**	**Sheep (population)**	**Chickens (population)**
Blaine	43,542	26,085	7	0
Hooker	21,307	16	0	56
Logan	28,823	0	2	246
Thomas	26,151	0	0	100

	Corn (grain by bushel)	Corn (silage by ton)	Wheat (by bushel)
Blaine	356,582	18,245	0
Hooker	0	0	0
Logan	3,081,790	0	25,213
Thomas	238,557	0	0

Source: 2012 USDA Agricultural Census

Historic Occurrences

According to the State of Nebraska Hazard Mitigation Plan Update (2011) and the NDA the following four diseases were reported as having occurred throughout the 93 counties in Nebraska impacting livestock.

- **Chronic Wasting Disease (CWS)** – This disease was first reported in mule deer, white-tailed deer, black-tailed deer, and elk populations in the state's panhandle region beginning in 1998. Symptoms of the disease include weight loss, as well as incessant drinking and urination. An infected animal often stands listlessly, head down and ears drooping, with saliva dripping from its mouth. Between the years of 1997 and 2006 the Nebraska Game and Parks Commission confirmed 117 positive tests of CWS statewide. The livestock within the state have had no confirmed cases of the disease.

- **Vesicular Stomatitis (VS)** - In 2005 Nebraska had three horses test positive for VS. VS primarily affects cattle, horses, and swine, causing blisters on lips, tongues, and coronary bands. The blisters enlarge and break, leaving raw tissue that is so painful the animals refuse to eat or drink, and they become lame. Severe weight loss usually follows. In a herd affected by VS, nearly 90 percent of the animals may show clinical signs and nearly all develop antibodies.

The disease is spread through direct contact between animals as well as through biting insects. If not properly handled, VS can be spread to humans and cause acute influenza like symptoms for four to seven days. There have been no new confirmed reports of VS in Nebraska since 2005.

- **Epizootic Hemorrhagic Disease (EHD)** - Commonly known as "blue tongue," is an acute, infectious, often fatal viral disease of some wild ruminants. It is characterized by extensive hemorrhaging, has been responsible for significant epizootics in deer in the northern United States and southern Canada. There have been ongoing confirmed reports of periodic outbreaks over the last fifty years in the state's deer population since the disease was first identified in 1955. All documented outbreaks of EHD have occurred during the late summer or early fall. Deer in the

state's panhandle appear to be the most at risk when compared to other areas of the state. There have been no reports of EHD among the state's livestock; only wild game has been affected.

The economic impact from such outbreaks could negatively impact businesses and communities that are reliant upon hunting for the majority of their sales or income.

- **Bovine Tuberculosis** - In the later stages of the disease it is easier to see the clinical symptoms of Bovine Tuberculosis. According to the USDA, symptoms include: emaciation, lethargy, weakness, anorexia, low-grade fever, and pneumonia with a chronic, moist cough. Enlarged lymph nodes may also be present. The disease gets into cattle herds by infected cattle, cervids, swine, and humans. Bovine Tuberculosis can be spread through the respiration of bacteria aerosols, contaminated feed or watering sites, or by drinking milk that is unpasteurized from infected animals. There is a high risk of contamination in enclosed areas such as barns that have poor ventilation. Bovine Tuberculosis primarily affects cattle but can be passed easily to any warm-blooded animal. In certain, but rare, conditions the disease can effect humans. In June of 2009, two beef cows in Rock County tested positive for the disease. In response to the findings, NDA staff coordinated with federal animal disease officials to properly respond. The NDA with the help of federal officials tested 21,764 head of cattle in association with the investigation. As the NDA traced cattle movement into and out of the affected herd, 61 herds of cattle were quarantined in 20 of Nebraska's 93 counties. By April 7, 2010 all but three of those herds were released from quarantine. The herd that was initially affected was also released from quarantine and endured tests that are part of the USDA federal test and remove strategy.

Between 1/1/2009 and 12/31/2009, 582 cases of the above described diseases were reported to the State of Nebraska from various counties.

In regards to diseases involving animals, the NDA provides reports on diseases occurring in ULNRD. Table 23 includes those diseases and numbers of occurrences within the planning area between January 1, 2012 and March 1, 2014.

Table 23: Animal Diseases Reported in the Planning area

	Anaplasmosis	Blue-tongue	Bovine Viral Diarrhea	Caprine Arthritis / Encephalitis	Enzootic Bovine Leukosis	Epizootic Hemorrhagic Disease	Lepto-spirosis	Para-tuberculosis	Porcine Reproductive and Respiratory Disease	Rabies	West Nile Fever
Species Impacted	**Bovine**	**Bovine**	**Bovine**	**Caprine/ Ovine**	**Bovine**	**Cervid**	**Bovine**	**Bovine**	**Porcine**	**Bovine**	**Bovine**
Blaine	0	0	0	0	0	0	0	0	0	1	0
Hooker	0	0	0	0	0	0	0	0	0	0	0
Logan	0	0	0	0	1	0	0	0	0	0	0
Thomas	0	0	0	0	0	0	0	0	0	0	0

Source: NE Dept. of Agriculture

However, the above listed diseases are not the only ones that could impact animals. Diseases and rates of disease among "free range game" is lacking due to lack of laboratory testing, reporting, and field study.

For crops, according to the Nebraska Department of Agriculture, the primary crops grown throughout the state include alfalfa, corn, sorghum, soybeans, and wheat. Table 24 provides the value and acres planed of the top crops in the state.

Table 24: Nebraska Crops

Crop	Acres Planted	Value	U.S. Ranking in Sale
Alfalfa	2,563,515	$388,557,000	8th
Corn	9,192,656	$9,369,600,000	3rd
Sorghum	236,607	$38,690,000	4th
Soybeans	3,834,855	$2,971,658,000	7th
Wheat	1,964,302	$440,438,000	9th

Source: USDA Ag Census 2007

The above list does not account for all crops in the region as there are others such as Sugar Beets, Dry Beans, Sunflowers, and Chickpeas. However, the crops in Table 25 make up the bulk of the crop portion of Nebraska's agricultural product. There are many diseases that can impact crops that vary from year to year. The Department of Agriculture provides information on some of the most common, being:

Table 25: Common Crop Diseases in Nebraska

Crop	Diseases	
Corn	• Anthracnose • Bacterial Stalk Rot • Common Rust • Fusarium Stalk Rot • Fusarium Root Rot • Gray Leaf Spot • Maize Chlorotic Mottle Virus	• Southern Rust • Stewart's Wilt • Common Smut • Goss's Wilt • Head Smut • Physoderma
Soybeans	• Anthracnose • Bacterial Blight • Bean Pod Mottle • Brown Spot • Brown Stem Rot • Charcoal Rot • Frogeye Leaf Spot • Phytophthora Root and Stem Rot • Pod and Stem Blight	• Purple Seed Stain • Rhizoctonia Root Rot • Sclerotinia Stem Rot • Soybean Mosaic Virus • Soybean Rust • Stem Canker • Sudden Death Syndrome
Wheat	• Barley Yellow Dwarf • Black Chaff • Crown and Root Rot • Fusarium Head Blight	• Leaf Rust • Tan Spot • Wheat Soil-borne Mosaic • Wheat Streak Mosaic
Sorghum	• Ergot • Sooty Stripe • Zonate Leaf Spot	

Source: 2011 Nebraska Hazard Mitigation Plan

In addition to the viral and bacterial disease that could impact crops, pests can also result in crop loss or quality of crop. Those pests are:

- Grasshoppers,
- Western Bean Cutworm,
- European Corn Borer,
- Corn Rootworm,
- Corn Nematodes, Bean Weevil,
- Mexican Bean Beatle,
- Soybean Aphids, and
- Rootworm Beatles

With the lack of reporting and data gathering, it's hard to determine an accurate account of disease and pests that occur in livestock and plants each year.

Location
Mostly rural and agricultural areas are at risk related to agricultural diseases. It is possible that developed/incorporated areas could be impacted more seriously if roadways were closed to limit the transportation on potentially tainted livestock.

Extent
According to the Nebraska State Hazard Mitigation Plan, 2014 this data is classified or protected by the USDA. Therefore it is not possible to provide a likely extent for agricultural disease (animal and plant disease).

Probability
Based on the record provided by the Nebraska Department of Agriculture there were two incidents of animal disease in a 16 month period. There were no occurrences of plant disease identified for the planning area. Given the historic record animal disease has a near 100 percent chance of annual occurrence.

Vulnerability

- Agricultural based employment
  People working in the agricultural sector are most vulnerable to impacts from this hazard. This is due to loss of wages and income during events.

- Local economies
  The most common occurrence during this hazard is a loss of economic production from farmers. These diseases have shown that even if they do not cause death they can reduce yields or the ability of animals to produce the same as healthy animals. There could also be additional costs to farmers in veterinarian bills and finding or building space to quarantine affected animals.

- Future development
  Future development is not likely to be impacted from animal or plant disease(s).

Averaged Annual Damages and Frequency
Due to the lack of sufficient data, limited resources, nature of damages, and limited reports of historical occurrences with recorded damages, it is not feasible to utilize the 'event damage estimate formula' to estimate potential losses for the planning area.

Summary
Agricultural diseases (animal and plant) can occur throughout the planning area, mostly in agricultural areas like farms and ranches. Animal and plant diseases are highly likely to occur in the future with a limited extent. The greatest vulnerability related to ag disease is related to local economies whether it be loss of revenue from farmers and ranchers or loss of jobs and wages for employees in the ag sector.

Future Development and Vulnerability
Overall, the planning area is experiencing slight population decline. There are many strategies that can be undertaken to protect both existing and future assets. As development continues in the State of Nebraska and Upper Loup NRD, most development is estimated to be urban development within municipal boundaries and little development in the land designated for agriculture use.

Mitigation Alternatives
Hazard mitigation options for agricultural diseases (animal and plant) focus primarily on education and outreach.

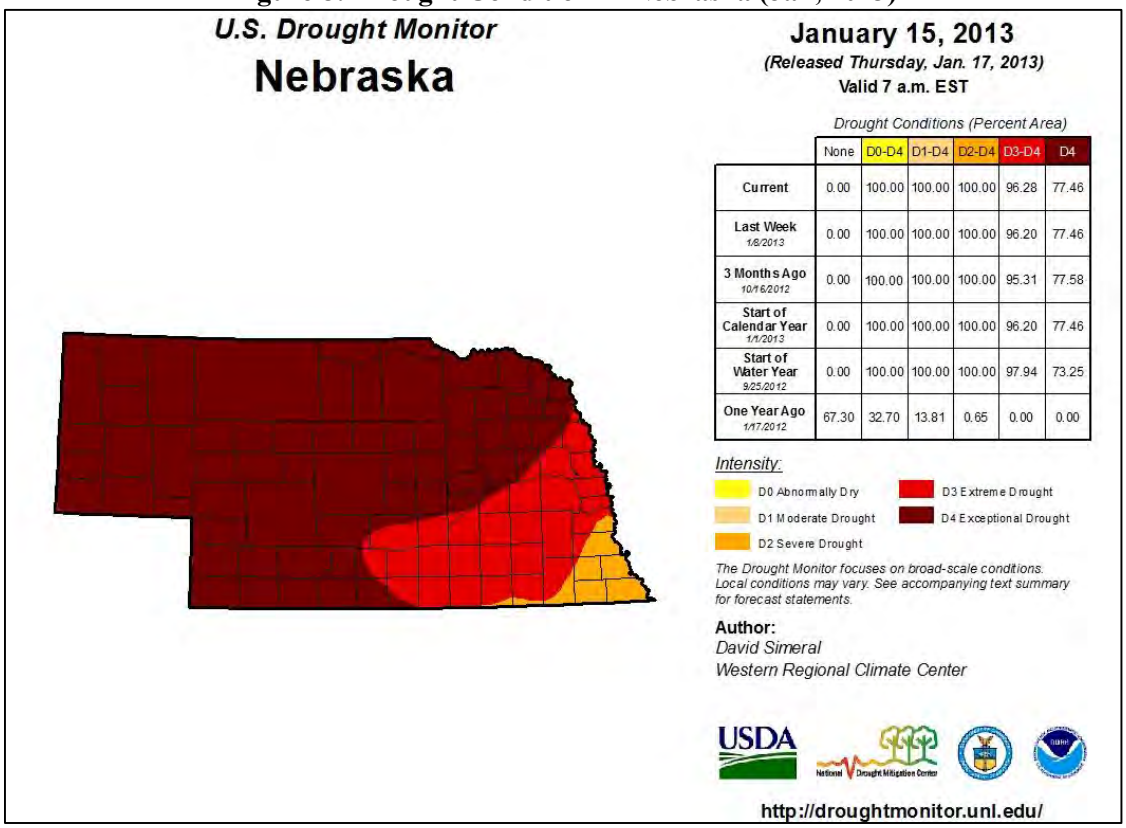
DROUGHT

Hazard Profile

> *According to the National Drought Mitigation Center, "**drought** is a normal, recurrent feature of climate, although many erroneously consider it a rare and random event. It occurs in virtually all climatic zones, but its characteristics vary significantly from one region to another."*

Drought is generally defined as a natural hazard that results from substantial period with lack of precipitation. Although many erroneously consider it a rare and random event, drought is actually a normal, recurrent feature of climate. It occurs in virtually all climatic zones, but its characteristics vary significantly from one region to another. A drought often coexists with periods of extreme heat, which together can cause significant social stress, economic losses, and environmental degradation.

Figure 8: Drought Condition in Nebraska (Jan, 2013)



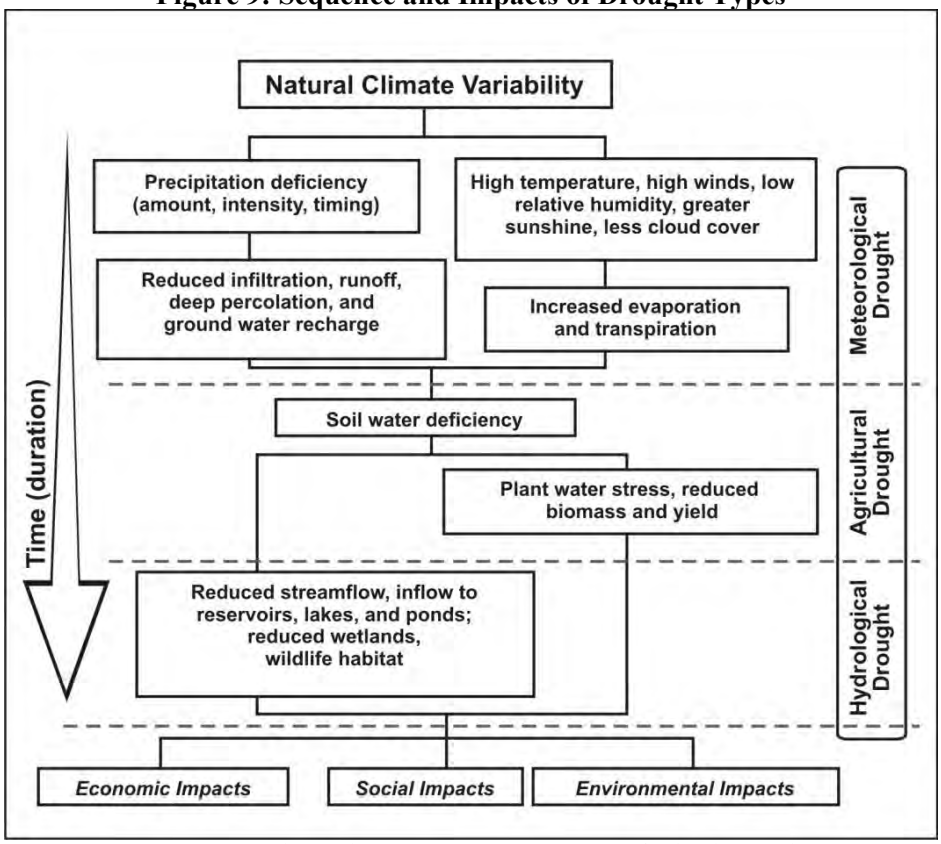
Source: National Drought Mitigation Center, Drought Monitor

Drought is a slow-onset, creeping phenomenon and its impacts are largely non-structural. Drought normally affects more people than other natural hazards, and its impacts are spread over a larger geographical area. As a result, the detection and early warning signs of drought conditions and assessment of impacts is more difficult to identify than that of quick-onset natural hazards (e.g., flood and storm) that results in more visible impacts. In addition, drought has more than 150 definitions and this lack of a universal definition makes it even harder to decide the onset and ending. Generally, according to the National Drought Mitigation Center (NDMC), droughts are classified into four major types:

- **Metrological Drought** – is defined based on the degree of dryness and the duration of the dry period. Metrological drought is often the first type of drought to be identified and should be defined regionally as precipitation rates and frequencies ("norms") vary.

- **Agricultural Drought** – occurs when there is deficient moisture that hinders planting germination, leading to low plant population per hectare and a reduction of final yield. Agricultural drought is closely linked with metrological and hydrological drought, as agricultural water supplies are contingent upon the two sectors.
- **Hydrologic Drought** – occurs when water available in aquifers, lakes, and reservoirs falls below the statistical average. This situation can arise even when the area of interest receives average precipitation. This is due to the reserves diminishing from increased water usage, usually from agricultural use or high levels of evapotranspiration, resulting from prolonged high temperatures. Hydrological drought often is identified later than metrological and agricultural drought. Impacts from hydrological drought may manifest themselves in decreased hydropower production and loss of water based recreation.
- **Socioeconomic Drought**– occurs when the demand for an economic good exceeds supply due to a weather-related shortfall in water supply. The supply of many economic goods include, but are not limited to, water, forage, food grains, fish, and hydroelectric power.

Figure 9: Sequence and Impacts of Drought Types



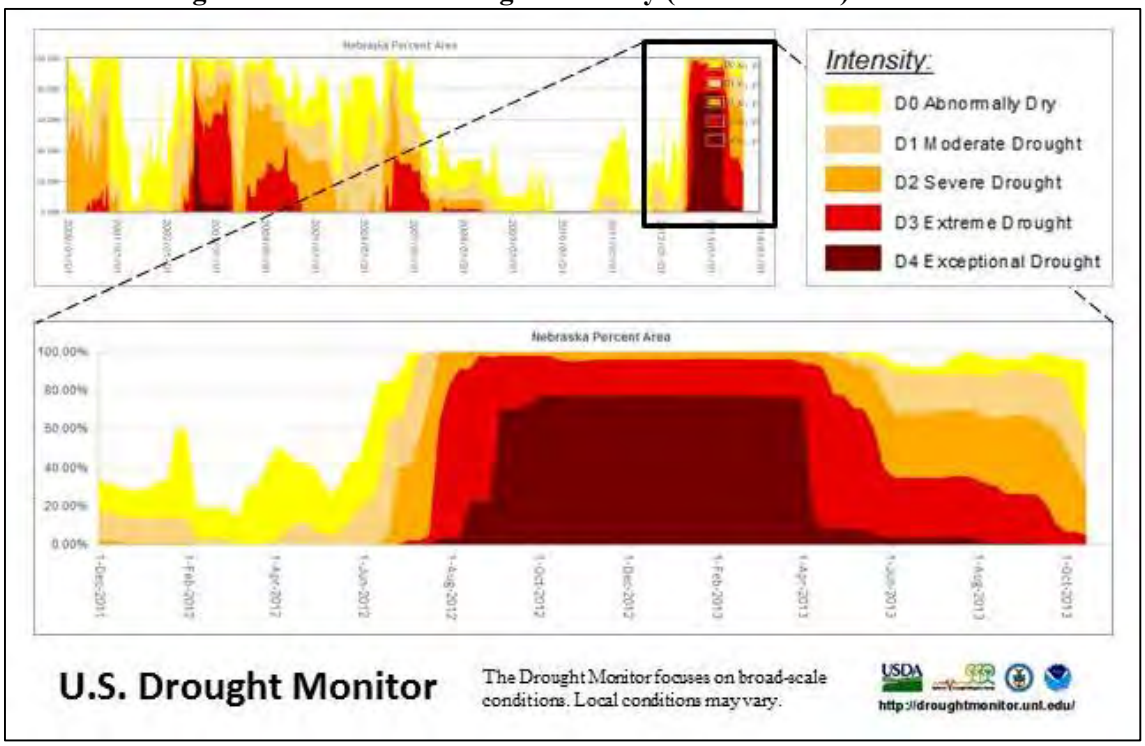
Source: National Drought Mitigation Center, University of Nebraska-Lincoln

Historical Occurrence

The NCDC reported a prolonged drought event (20 continuous months) for the planning area beginning in June of 2012 and extending until January of 2014 for all of the counties in the planning area. This extreme heat and drought event that started in the summer of 2012 was substantial, but did not warrant a presidential disaster declaration within Nebraska. Figure 10 summarizes the historical drought conditions for Nebraska by intensity and percent area since 2000. According to the data acquired from NDMC, the whole state of Nebraska was in severe drought conditions from the middle of July 2012 to the end of May 2013, and over

70 percent of the state was in exceptional drought conditions for over eight months. The full effects of this event are still to be assessed, and any future update should include details about its true extent.

Figure 10: Historical Drought Intensity (Percent Area) Nebraska



Source: National Drought Mitigation Center, University of Nebraska-Lincoln

No other specific historical occurrences were recorded by residents, city officials, or found in other resources for the Planning Area.

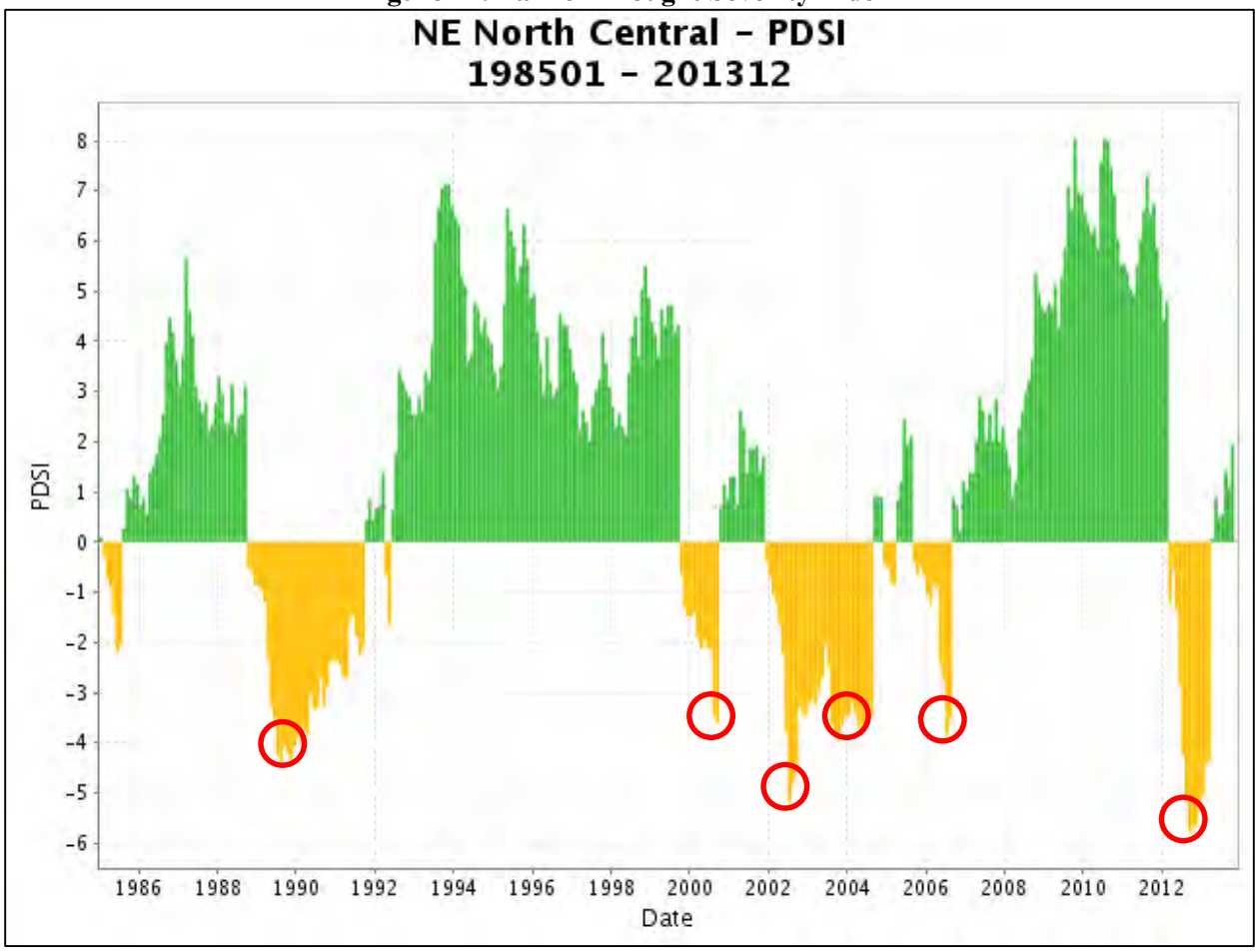
Location

The entire planning area is susceptible to the impacts resulting from drought. Agricultural areas and producers may experience greater impacts than incorporated areas.

Extent

Due to drought's unique nature and characteristics, it has yet to be decided which is the best way to predict and monitor drought. Among the several indices, the Palmer Drought Severity Index (PDSI) has been widely used by various governments in the U.S. including USDA that uses it in determining when to grant emergency drought assistance. Figure 11 is the PDSI, with data from the NCDC. The graph illustrates historical PDSI for Division 7 – North Central Nebraska, which includes the planning area, between the years of 1986 and 2012. The negative Y axis represents a drought, for which '-2' indicates a moderate drought, '-3' a severe drought, and '-4' an extreme drought. Table 26 describes the Palmer Classifications. According to this classification, since 1986, severe and extreme droughts were recorded five times within the last 26 years. In total the planning area suffered drought conditions (moderate, severe, and extreme drought) approximately nine of 26 years.

Figure 11: Palmer Drought Severity Index



Source: National Oceanic Atmospheric Administration, High Plains Regional Climate Center

Table 26: Palmer Classifications

Numerical Value	Description	Numerical Value	Description
4.0 or more	Extremely wet	-0.5 to -0.99	Incipient dry spell
3.0 to 3.99	Very wet	-1.0 to -1.99	Mild drought
2.0 to 2.99	Moderately wet	-2.0 to -2.99	Moderate drought
1.0 to 1.99	Slightly wet	-3.0 to -3.99	Severe drought
0.5 to 0.99	Incipient wet spell	-4.0 or less	Extreme drought
0.49 to -0.49	Near normal	--	--

Source: National Oceanic Atmospheric Administration National Weather Service, Climate Prediction Center

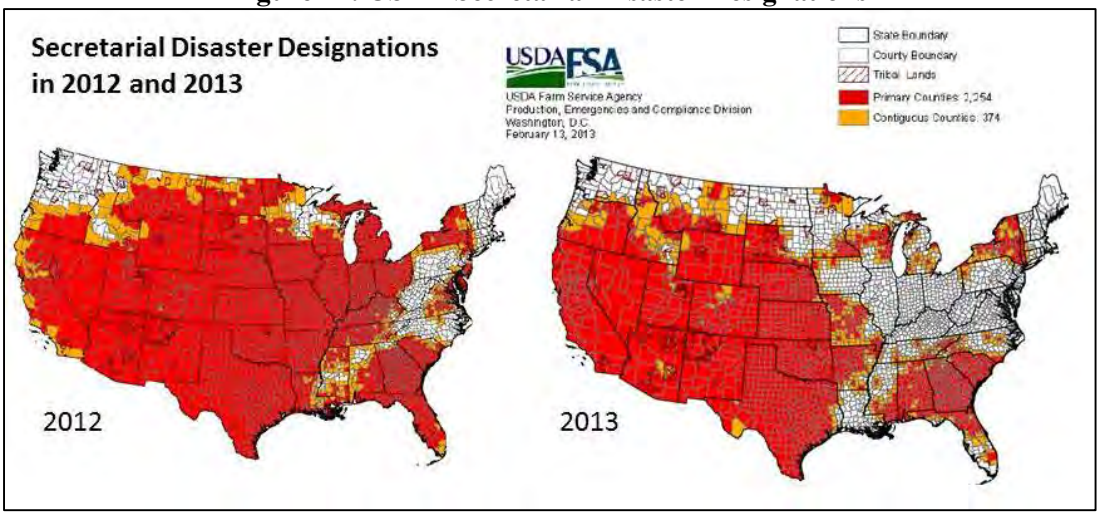
Probability

Based on the historic record drought is likely to occur in the future. The 26 year record provided by the PDSI shows that drought occurred in nine of 26 years within the planning area with an increase in frequency over the last decade. Given that record the planning area can expect to see an increase in drought conditions with more severe events more frequently occurring.

Vulnerability

The severe drought in 2012 significantly affected the agricultural sector of the state. Although the full impacts are yet to be studied, the USDA reported a total of $139,957,809 to Nebraska from 2008 to 2011 for all five disaster programs: Supplemental Revenue Assistance Payments (SURE), Livestock Forage Disaster Assistance Program (LFD), Emergency Assistance for Livestock, Honeybees, and Farm-Raised Fish Program (ELAP), Livestock Indemnity Program (LIP), and Tree Assistance Program (TAP). Figure 12 shows the drought disaster designations by USDA in 2012 and 2013 and the whole state of Nebraska is in the red zone, indicating that Nebraska, including our planning area, has a high probability of a drought disaster in the time period shown.

Figure 12: USDA Secretarial Disaster Designations



Source: U.S. Department of Agriculture

The Drought Impact Reporter also provides insight into the drought impacts in the planning area. Table 27 demonstrates the previous impacts in ULNRD since 2000. The table shows the number of drought impacts reported for the county based on media reports, public reports, NWS Drought Statements, burn bans issued by local governments, or water restrictions that are enforced. The more impacts that are reported the National Drought Mitigation Center believes the more severe the drought.

Table 27: Reported Drought Impacts (January 2000 - February 2014)

County	Agricultural	Business & Industry	Energy	Fire	Plant & Wildlife	Relief, Response, & Restrictions	Society & Public Health	Tourism & Recreation	Water Supply & Quality
Blaine County	152	32	7	10	28	61	33	4	31
Hooker County	152	32	7	9	27	63	33	4	31
Logan County	152	32	7	9	27	65	33	4	31
Thomas County	152	32	7	11	27	64	33	4	31

Source: National Drought Mitigation Center – Drought Impact Reporter

As identified in Nebraska's Drought Mitigation and Response Plan, drought is a common feature of the Nebraska landscape and often causes significant economic, environmental, and social impacts. Although agriculture is the major sector affected, impacts on rural and municipal water supplies, fish and wildlife,

tourism, recreation, water quality, soil erosion, the incidence of wildfires, electricity demand, and other sectors are also significant. Also, the indirect impacts of drought on personal and business incomes, tax revenues, unemployment, and other areas are also important. In general, drought produces a complex web of impacts that ripple through many sectors of the economy. This is largely due to the dependence of so many sectors on water for producing goods and providing services. It is impossible to predict all the potential impacts, but the common impacts of drought have been compiled by the NDMC and are illustrated in Table 28.

Table 28: Classification of Drought-Related Impacts

Problem Sectors	Impacts

Economic	• Loss from crop production
	  ▪ Annual and perennial crop losses; damage to crop quality
	  ▪ Reduced productivity of cropland (wind erosion, etc.)
	  ▪ Insect infestation
	  ▪ Plant disease
	  ▪ Wildlife damage to crops
	• Loss from dairy and livestock production
	  ▪ Reduced productivity of range land
	  ▪ Forced reduction of foundation stock
	  ▪ Closure/limitation of public lands to grazing
	  ▪ High cost/unavailability of water for livestock
	  ▪ High cost/unavailability of feed for livestock
	  ▪ High livestock mortality rates
	  ▪ Increased predation
	  ▪ Range fires
	• Loss from timber production
	  ▪ Forest fires
	  ▪ Tree disease
	  ▪ Insect infestation
	  ▪ Impaired productivity of forest land
	• Loss from fishery production
	  ▪ Damage to fish habitat
	  ▪ Loss of young fish due to decreased flows
	• Loss of national economic growth, retardation of economic development
	• Income loss for farmers and others directly affected
	• Loss of farmers through bankruptcy
	• Loss to recreational and tourism industry
	• Loss to manufacturers and sellers of recreational equipment
	• Increased energy demand and reduced supply because of drought-related power curtailments
	• Costs to energy industry and consumers associated with substituting more expensive fuels (oil) for Hydroelectric power
	• Loss to industries directly dependent on agricultural production (e.g., machinery and
	• Decline in food production/disrupted food supply
	  ▪ Increase in food prices
	  ▪ Increased importation of food (higher costs)
	• Disruption of water supplies
	• Unemployment from drought-related production declines
	• Strain on financial institutions (foreclosures, greater credit risk s, capital shortfalls, etc.)
	• Revenue losses to federal, state, and local governments (from reduced tax base)
	• Deterred capital investment, expansion
	• Dislocation of businesses
	• Revenues to water supply firms
	• Loss from impaired navigability of streams, rivers, and canals
	• Cost of water transport or transfer

	• Cost of new or supplemental water resource development
Environmental	• Damage to animal species ▪ Reduction and degradation of fish and wildlife habitat ▪ Lack of feed and drinking water ▪ Disease ▪ Increased vulnerability to predation (e.g., from species concentration n ear water) • Loss of biodiversity • Wind and water erosion of soils • Reservoir and lake drawdown • Damage to plant species • Water quality effects (e.g., salt concentration, increased water temperatures, pH, dissolved oxygen) • Air quality effects (dust, pollutants) • Visual landscape quality (dust, vegetative cover, etc.) • Increased fire hazard • Estuarine impacts; changes in salinity levels, reduced flushing
Social	• Increased groundwater depletion (mining), land subsidence • Loss of wetlands • Loss of cultural sites • Insect infestation • Food shortages (decreased nutritional level, malnutrition, famine) • Loss of human life (e.g., food shortages, heat) • Public safety from forest and range fires • Conflicts between water users, public policy conflicts • Increased anxiety • Loss of aesthetic values • Health-related low flow problems (e.g., diminished sewage flows, increased pollutant concentrations, etc.) • Recognition of institutional constraints on water use • Inequity in the distribution of drought impacts/relief • Decreased quality of life in rural areas • Increased poverty • reduced quality of life, changes in lifestyle • social unrest, civil strife • population migration (rural to urban areas) • reevaluation of social values • increased data/information needs, coordination of dissemination activities • loss of confidence in government officials • recreational impacts

Average Annual Damages and Frequency

While the PDSI is a better tool for measuring drought occurrence and severity it provides little in way of recorded impacts. For recorded impact this plan will utilize the average damages based upon NCDC Storm Events Database since 1996. This does not include losses from displacement, functional downtime, economic loss, injury, or loss of life. The following table shows historic losses attributed to drought. It should be noted that the NCDC records drought as a regional event, as such the loss totals reported are potentially high for the individual counties. As this is the best data available it will be used to provide an estimate of economic impacts.

Table 29: Drought Loss Estimation

Hazard Type	Total Property Loss	Annual Property Loss	Total Crop Loss	Annual Crop Loss
Droughts	$4,000,000	$222,222	$3,060,000	$170,000

Risk Assessment Summary
Droughts are likely to occur in the future for the planning area. It is estimated that there is a 30 percent chance of drought occurrence in a given year. The likely extent of drought during this time period, as defined by the National Drought Monitor, is between a D2 and D3 designation. It is difficult to quantify direct and in-direct impacts of drought. Given the reliance upon agriculture as an economic sector within the planning area it is possible that drought could have a dramatic impact on the area. Due to the regional natural of this event the entire planning area is at risk.

Future Development and Vulnerability
There is a wide range of growth and decline among the participating jurisdictions. There are many strategies that can be undertaken to protect both existing and future assets. According to the Climate Prediction Center at the National Weather Service, drought in the near future is going to persist or intensify in Central and Western Nebraska. Besides climate variability that results in drought conditions, communities can be vulnerable and increase their drought risks with unwise land use decisions, urban development, and population growth etc.

Mitigation Alternatives
The following bullet points identify some general mitigation strategies that can be used to reduce a community's vulnerability to the threat of drought. Some of these strategies are already in place in the planning area. Many of these strategies are identified and discussed in greater detail in the FEMA document, *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards*. Additional information regarding drought mitigation and drought planning can be found in the *National Drought Mitigation Center's Drought-Ready Communities: A Guide to Community Drought Preparedness*. Once the full extent of damages from the Drought of 2012 is known, this information should be incorporated into the update to this plan in 5 years.

- Assess Drought Vulnerability (identify factors that affect drought severity for local jurisdictions)
- Establish a Drought Monitoring Board and drought reporting procedures
    - This has not occur in the planning area nor is it identified as a need/strategy
- Establish monitoring procedures for municipal water supply and distribution systems
    - Participating jurisdictions reported monitoring of impacts rather than a proactive monitoring procedure
- Develop drought specific plans (this may include water conservation plans, drought preparedness plans, and wellhead protection plans)
    - At this time this is not identified as a need within the planning area
- Establish municipal water conservation programs
    - Many communities reported water conservation as an ongoing project/strategy
- Establish agricultural policies (agricultural irrigation standards, grazing policies, etc.)
    - While not formalized many areas/land owners within the planning area utilize grazing procedures aimed at minimizing impacts on the land
- Enhanced residential landscape standards (xeriscaping, irrigation systems requirements, etc.)
    - This is not currently enacted within the planning area
- Enhanced building codes to require low-flow fixtures in new construction
    - This is not likely to occur within the planning area
- Incentives to retrofit structures with low-flow fixtures
    - This may happen on a case-by-case basis
- Incorporate permeable surfaces into municipal designs
    - Many communities utilize gravel roadways and parking area within both rural and developed areas
- Investigate alternative water supply options

    - Water supplies within the planning area are sufficient to meet current and future needs
- Participate in the Tree City USA program
    - Communities in this area are not currently interested in participating in this program
- Encourage agricultural businesses to purchase crop insurance as appropriate
    - Crop insurance is common in this planning area
- Drought education programs (residential and agricultural)

FIRE

GRASS/WILDFIRES

Hazard Profile

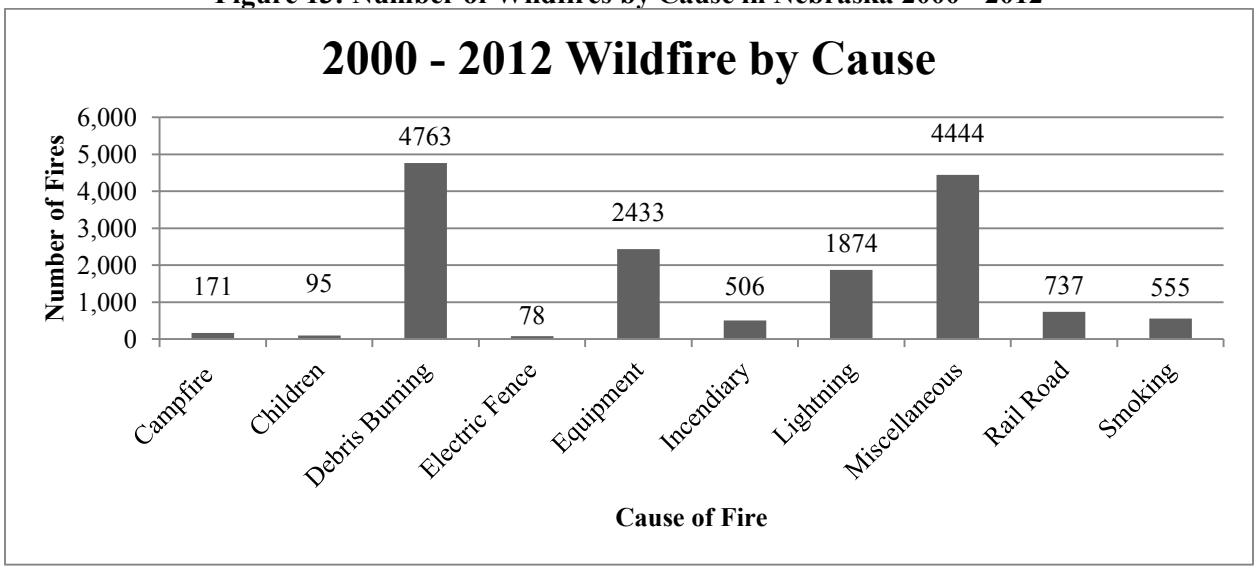
Wildfires, also known as brushfires, forest fires, or wildland fires, are any uncontrolled fire that occurs in the countryside or wildland. Wildland areas may include, but are not limited to, grasslands, forests, woodlands, agricultural fields, and other vegetated areas. Wildfires differs from other fires by their extensive size, the speed at which they can spread out from the original source, their ability to change direction unexpectedly, and to jump gaps, such as roads, rivers, and fire breaks. While some wildfires burn in remote forested regions, others can cause extensive destruction of homes and other property located in the wildland-urban interface, the zone of transition between developed areas and undeveloped wilderness.

Lightning starts approximately 10,000 ***forest fires*** *each year, yet four out of every five forest fires are started by humans.*

Wildfires are a growing hazard in most regions of the United States, posing a threat to life and property, particularly where native ecosystems meet urban developed areas. Although fire is a natural and often beneficial process, fire suppression can lead to more severe fires due to the buildup of vegetation, which creates more fuel and increases the intensity and devastation of future fires.

Wildfires are characterized in terms of their physical properties including topography, weather, and fuels. Wildfire behavior is often complex and variably dependent on factors such as fuel type, moisture content in the fuel, humidity, wind speed, topography, geographic location, ambient temperature, the effect of weather on the fire, and the cause of ignition. Fuel is the only physical property humans can control and is the target of most mitigation efforts. The National Weather Service (NWS) monitors the risk factors including high temperature, high wind speed, fuel moisture (greenness of vegetation), low humidity, small cloud cover in the state on a daily basis.

Figure 13: Number of Wildfires by Cause in Nebraska 2000 - 2012

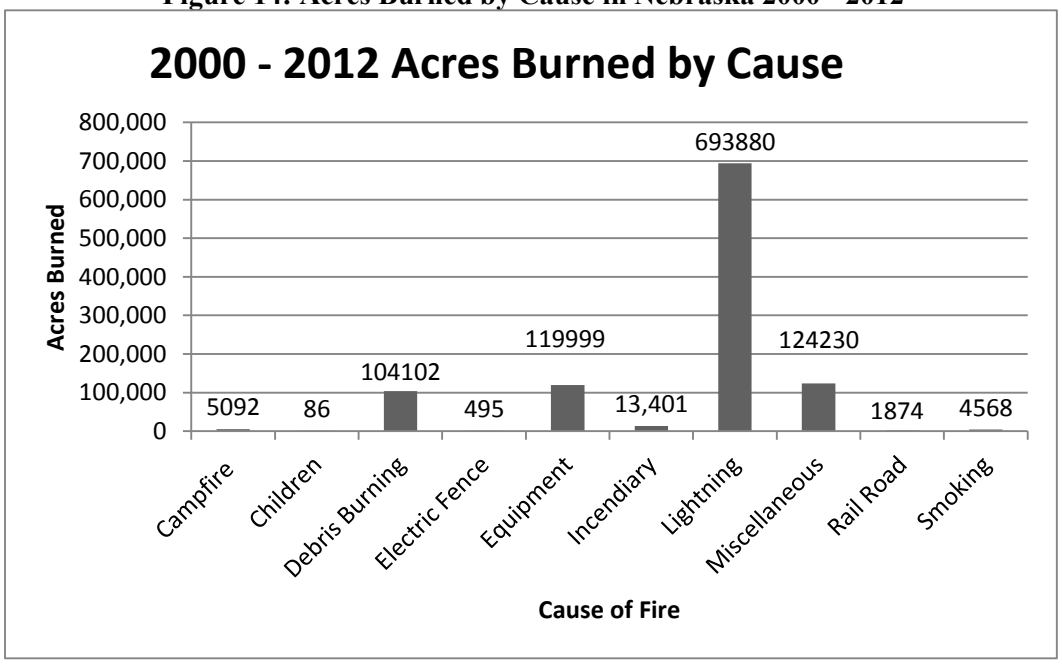


Source: Nebraska Forest Service

In recent decades, as the population of the United States has decentralized and residents have moved farther away from the center of villages and cities, the area known as the wildland urban interface (WUI) has developed significantly, in both terms of population and building stock. The WUI is defined as the zone of transition between developed areas and undeveloped wilderness, where structures and other human development meet wildland. The expansion of the WUI increases the likelihood that wildfires will threaten people and homes, making it the focus of the majority of wildfire mitigation efforts.

Annually throughout the United States wildfires on average consume 4.3 million acres, with the federal government spending approximately $1 billion per year on fire suppression. Based on the Nebraska Forest Service's 'Wildfire by Cause' report, the most common causes of wildfires include lightning, debris burning, equipment use, and arson. Figure 14 illustrates the number of wildfires and acres burned by cause in Nebraska from 2000 to 2012.

Figure 14: Acres Burned by Cause in Nebraska 2000 - 2012

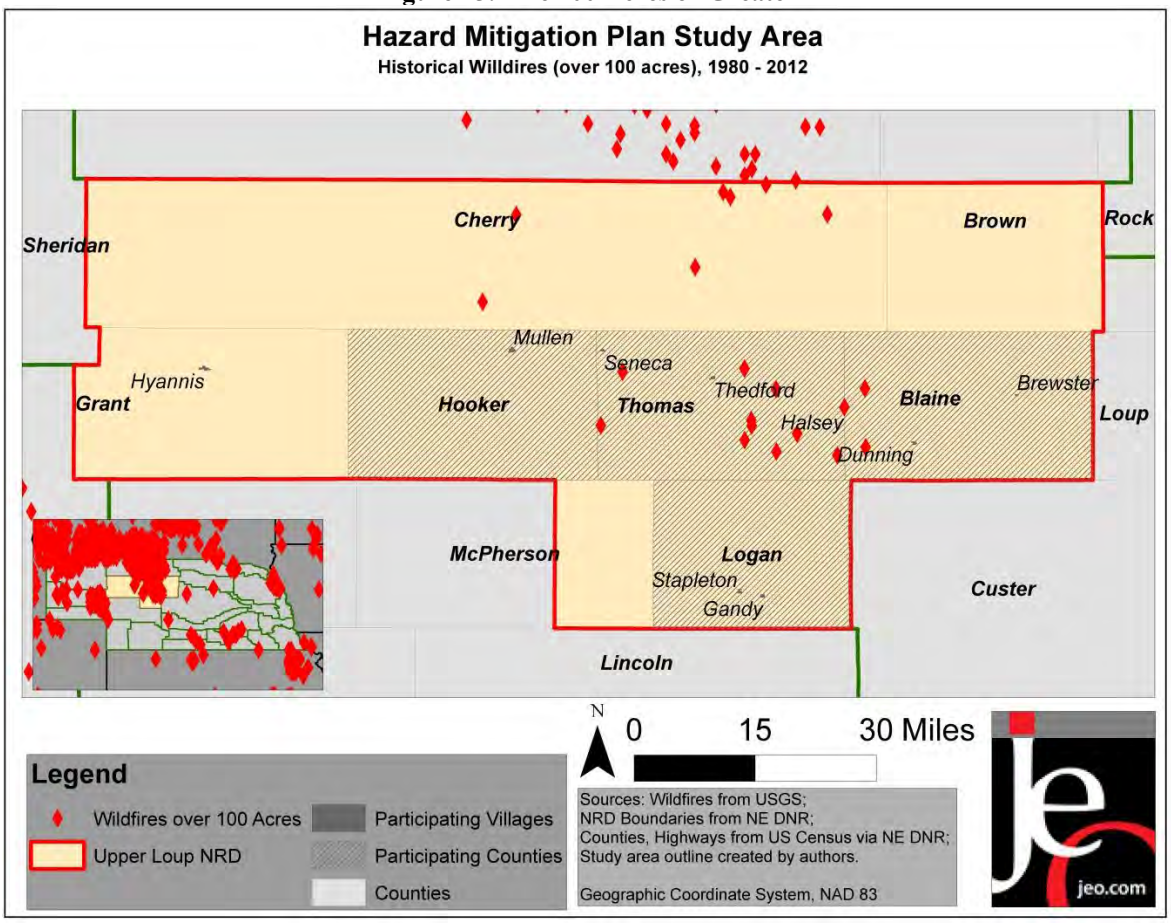


Source: Nebraska Forest Service

Historical Occurrences

The state of Nebraska is vulnerable to wildfires, but primarily in the western portions of the state. In 2006, ten homes were consumed during the 'Big Rock Fire' in Valentine, NE, which was Nebraska's first documented loss of homes due to wildfire. The same year, Nebraska received three presidential declarations of disaster for wildfire. Figure 15 displays wildfires greater than 100 acres in Nebraska from 1980 to 2007.

Figure 15: Fire 100 Acres or Greater



Source: USGS

Local fire departments report fire events annually to the Nebraska Forest Service. According to this data set there were three grass/wildfires reported in the planning area between 2000 and 2012. These events were reported by the Brewster, Mullen, and Thedford fire departments in 2011 and 2012. There were no reported deaths or injuries associated with these fires. Two of the events reported five acres burned each (total of 10 acres) while the third event, reported by the Thedford Fire Department, consumed approximately 1,000 acres and caused an estimated $10,000 in damages to crops. All three fires were reportedly the result of campfires.

Location

The entire planning area is at risk related to wildfire. The area in and around Halsey National Forest is at a higher risk of fires developing due to increased fuel loads in the forest. In areas like the Halsey National Forest lightning can cause fires which could then move into other range land areas. The Nebraska Forestry Service dues conduct fuel load management programs in forest areas.

Figure 16: Photograph of Halsey

Photo: Halsey National Forest (taken from observation tower)

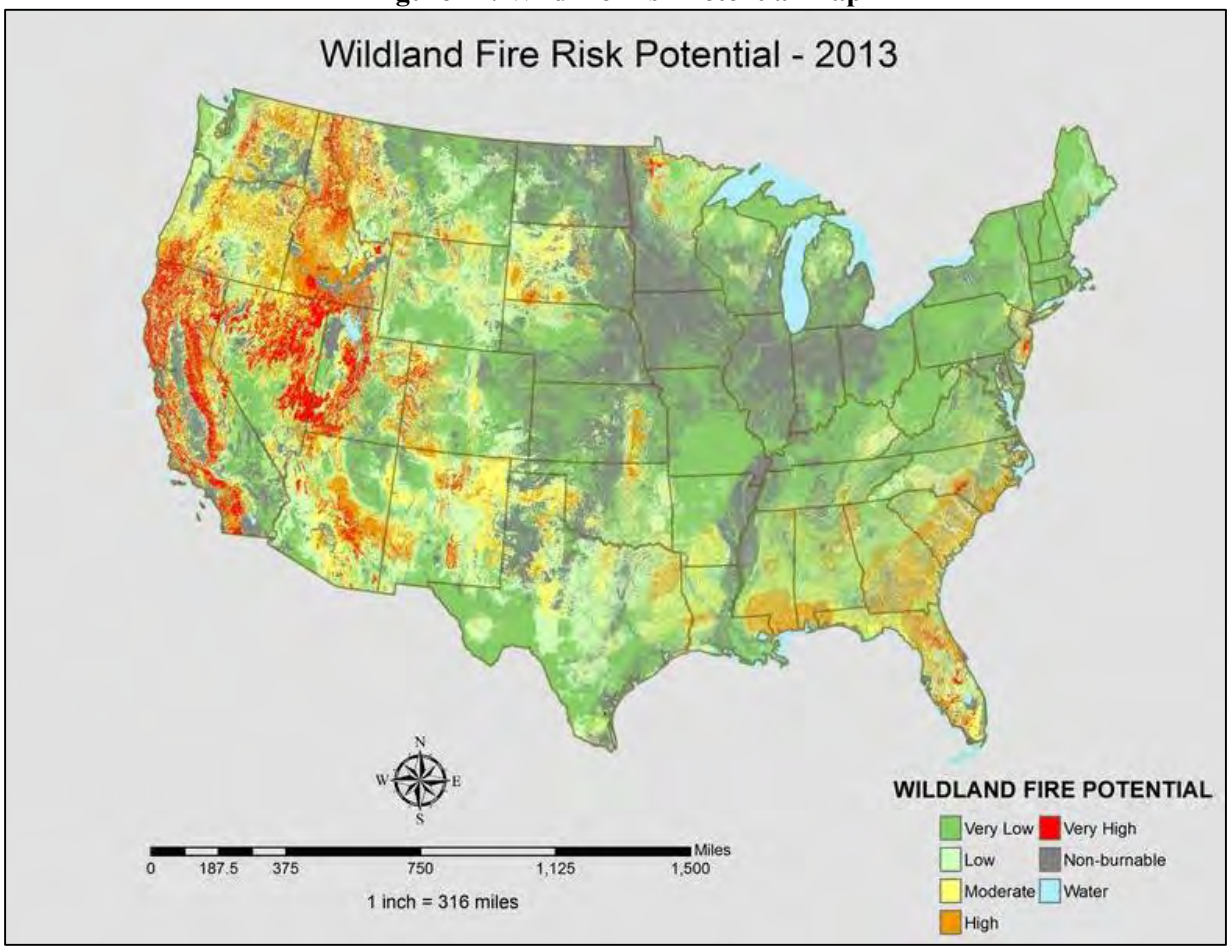
Extent

Given the small number of reported events and the range of area impacted it is difficult to provide a likely event extent. Based on the limited record it is reasonable to expect smaller grass/wildfires (less the one hundred acres) to occur multiple times in a decade. Also based on the reported events it is possible that large fires (more than 100 acres consumed) will occur. The occurrence of larger events will likely occur in coordination with other climatic extremes (i.e. drought, strong winds, extreme heat, etc.). Most events will occur in uninhabited, rural areas.

Probability

Probability of grass/wildfire occurrence is based on the historic record provided the Nebraska Forestry Service and reported potential by participating jurisdictions. With 240 wildfire events having been reported in the planning area there is a near 100 percent chance annually that wildfires will occur. It is not likely that developed areas will be impacted but it is possible. For large fire events (100 acres or greater) there were 52 fires reported that burned 100 acres or more during the 12 years of data, given this occurrence rate it is a high probability that large fires will occur, according to the record however these large fires are more likely to occur in years experiencing.

Figure 17: Wildfire Risk Potential Map



Source: USDA Forest Service, 2013

Vulnerability

- Young Children
  Children are dependent on others for transportation. The main concern related to this issue surrounds the potential need for evacuation. During evacuation orders children require assistance from parents, guardians, or others to ensure their evacuation from dangerous areas.

- Elderly and people with limited mobility
  The elderly and people with limited mobility are at greater risk when evacuation is required. Additionally, this segment of the population may require assistance in implementing basic mitigation related activities such as maintaining landscapes, installing defensible areas around structures, and removing combustible debris from fire prone areas.

- Low Income Populations
  Low income populations may be dependent upon the community within the planning area to assist them during evacuation. In addition, low income residents may lack required resources and finances to implement mitigation strategies (such as: fire resistant building materials, well maintained landscapes, and defensible space around structures.

- People with chronic medical condition
  People with chronic medical conditions are at risk from the smoke. The smoke can cause or worsen breathing problems for these people. The heat from these fires may also lead to heat illness problems in this population.

- Firefighter
  Firefighters are on the front lines of these wildfires working to control them and protecting property. This puts them in danger of getting trapped by the fire. The fire fighters experience extreme heat when fighting these fires so heat-related illness must also be a concern of this group.

Averaged Annual Damages and Frequency
The average damage per event estimate was determined based upon Nebraska Forest Service Events Database from 2000 to 2012 and number of historical occurrences. This does not include losses from displacement, functional downtime, economic loss, injury, or loss of life. According to Table 30, wildfires have a high probability of future occurrences in the planning area with an annual frequency of 19+. Based on the event history it is reasonable to expect $26,292 in property losses and $11,607 in crop losses resulting from wildfire.

Table 30: Grass/Wildfires Loss Estimation

Hazard Type	Number of Events	Annual Frequency	Total Property Loss	Annual Property Loss	Total Crop Loss	Annual Crop Loss
Grass/Wildfires	240	20	$139,288	$11,607	$315,506	$26,292

Summary
Based on historic records grass/wildfires have a high probability of occurrence in the future (near 100 percent annually). It is likely that future events will have a limited scope, consuming fewer than 100 acres; it is likely that large, 100 acre plus fire will occur in the future especially during periods of drought. Areas around the Halsey National Forest are at a higher risk of wildfires than other locations within the planning area.

Future Development and Vulnerability
Overall, the planning area is experiencing slight population decline. There are many strategies that can be undertaken to protect both existing and future assets. Any future development will be as vulnerable to losses from wildfires as is existing development, in particular development into the WUI. Much of the future development within the planning area will occur within the existing corporate limits of communities; this will allow for growth without placing additional housing units in the WUI areas. Within corporate limits it is important that vacant structures be monitored to guard against becoming an increased liability in the case of a fire.

Mitigation Alternatives
The following bullet points identify some general mitigation strategies that can be used to reduce a community's vulnerability to the threat of wildfire. Some of these strategies, such as the use of warning systems, are already in place in the planning area. Many of these strategies are identified and discussed in greater detail in the *FEMA document Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards*. As community varies in their risk and vulnerability to the hazard, community-related mitigation strategies can be found in *Section Seven: Participant Sections*.

- Map and Assess Vulnerability to Wildfire
- Incorporate Wildfire Mitigation in Comprehensive Planning (i.e., identify areas of risk per assessment of vulnerability)

  - This is not standard practice;
- Reduce Risk Through Land Use Planning (i.e., implement landscaping ordinances)
  - Given the historic record codes within participating jurisdictions are sufficient.
- Develop a Wildland-Urban interface Code
  - This is not likely to occur within the planning area
- Require or Encourage Fire-Resistant Construction (i.e., encourage the use of non-combustible materials)
  - The use of metal roofing materials is common within the planning area especially on agricultural structures
- Retrofit At-Risk Structures with Ignition-Resistant Materials (i.e., installing wall components that conform to ignition-resistant construction standards)
  - This is not common in the planning area; masonry structures were and continue to be common within the planning area
- Create Defensible Space Around Structures and Infrastructure
  - This is standard practice within the planning area
- Conduct Maintenance to Reduce Risk (i.e., perform arson prevention cleanup activities)
  - Most participating jurisdictions reported tree care and public landscape maintenance programs
- Implement a Fuels Management Program (i.e., Nebraska Forest Service – Forest Fuels Reduction Program)
  - This is not a need within the planning area given the small amount of forest area
- Participate in Firewise Program
  - There are no Firewise Communities within the planning area and only one in the state of Nebraska
- Increase Wildfire Risk Awareness (i.e., informing the public about proper evacuation procedures)
  - Nebraska Forestry Service, USDA, and County and Regional Emergency Management Agencies have educational materials and programs related to wildland fire
- Educate Property Owners about Wildfire Mitigation Techniques
  - Nebraska Forestry Service, USDA, and County and Regional Emergency Management Agencies have educational materials and programs related to wildland fire
- Wildland Fire Fighting Training for Fire Departments
  - Participating jurisdictions reported highly trained and competent fire departments; there were some communities that reported additional training for fire departments as a mitigation strategy

URBAN FIRES

Hazard Profile

Urban fires are classified as "uncontrolled burning in a residence or building from natural, human or technical causes." These fires have a potential to spread to adjoining structures. Local city and county fire departments are tasked with the response and control of urban fires.

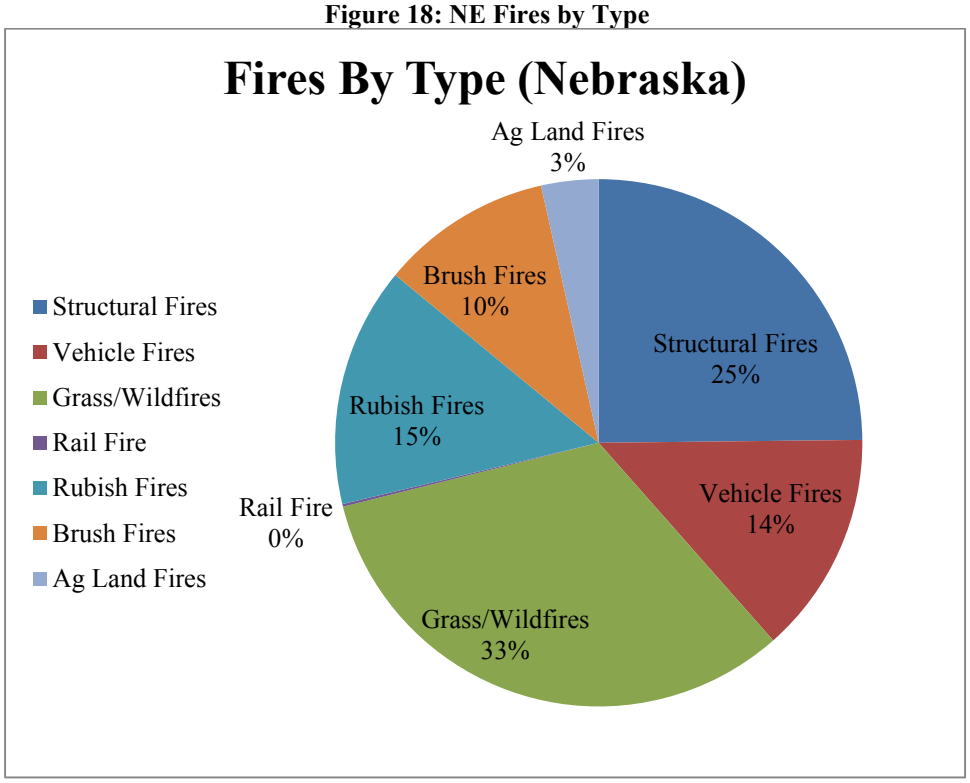
According to the United States Fire Administration, fire risk "varies from region to region in the United States. This often is a result of climate, poverty, education, demographics, and other causal factors. Often times, all that is needed to cause an uncontrolled urban fire is a heat source to spark a fire, flammable materials that act as a fuel source, and oxygen.

Historic Occurrences

There were fires reported by local planning teams (which included the fire chiefs of Sandhills Volunteer Fire Department and Mullen Volunteer Fire Department), none of the fires resulted in significant damages or any death or injuries. Of the fire reported to the Nebraska Fire Marshal's Office grass/wildfires have the greatest occurrence rate. Structural fire have the second greatest rate of occurrence. For the years of 2008

through 2012 fire departments in Hooker County reported responding to more fires than any other county, Sandhills Volunteer Fire Department reported the second highest total.

Figure 18: NE Fires by Type



Source: NE State Fire Marshal's Office

Location
Urban fires are most likely to occur in developed incorporated areas. The probability of fire occurrence has a direct correlation to density and age of structure. Older wood-built structures are at greater risk of fire. Densely urbanized areas also have increased vulnerability to urban fire.

Extent
It was reported by participating jurisdiction that most urban fires occurring in the planning area are contained to a single structure.

Probability
It is highly probable (near 100 percent probability annually) that urban fires will occur within in the planning area in the future. In the planning area from 2008 – 2012 there were 193 total fires reported to the Nebraska State Fire Marshal's office.

Vulnerability
Fire death rates are based on all deaths in which exposure to fire, fire products, or explosion was the underlying cause of death or was a contributing factor in the chain of events leading to death." Table 31 was provided by the U.S. Fire Administration to depict death rates for the State of Nebraska.

Table 31: Fire Death Rates for the State of Nebraska

State	2005 Death Rate/Million Population	2006 Death Rate/Million Population	2007 Death Rate/Million Population	2008 Death Rate/Million Population	2009 Death Rate/Million Population	2010 Death Rate/Million Population
Nebraska	17.1	17.0	12.4	12.9	7.8	9.8

- Elderly, children, minorities
  According to the U.S. Fire Administration, "older adults (age 65 or older) were at higher risk from dying in a fire than the rest of the population. The very young (age 4 or younger) were also at higher risk of fire death and injury when compared to older children. Males, African-Americans, and American Indians/Alaska Natives also had a considerably higher risk of death from fire than did the population as a whole."

- Built Environment
  Due to the nature of urban fires, any structure identified in the planning are could possibly be damaged or destroyed by a fire for one of any number of reasons ranging from faulty or outdated electrical infrastructure, lightning strikes to accidents such as stoves being left on. As already stated, the threat of urban fires in populated areas is not only confined to the structure that initially caught on fire but to those surrounding the burning structure.

Averaged Annual Damages and Frequency

Due to lack of data potential losses are not being calculated for this threat. For frequency local fire departments are encouraged to report annual calls to the Nebraska Fire Marshal's Office. While this is encouraged it is not required by the state. This dataset may be incomplete because it is a voluntary reporting system, but it is the best source of urban fire data in Nebraska. Table 32 shows the number and nature of calls responded to by county. All calls reported in Grant County were reported by the Sandhills Fire Department located in Hyannis.

Table 32: Reported Fires in ULNRD 2008 - 2012

	Fires	Ruptures	Rescue/ EMS	Haz. Mat.	Service Calls	Good Intent Calls	False Alarms	Severe Weather	Special Incidents
Blaine	24	-	1	-	-	-	-	-	-
Hooker	82	-	12	3	4	1	11	2	-
Logan	13	1	1	-	-	-	-	-	-
Thomas	5	-	-	-	-	-	-	-	-
Grant	69	1	11	-	1	3	4	1	-
TOTAL	193	2	25	3	5	4	15	3	0

Source: NE Fire Marshal's Office

Summary

Based on historic records urban/structural fires have a high probability of occurrence in the future (near 100 percent probability annually). It is likely that future events will have a limited scope. It is not possible to establish potential losses.

Future Development and Vulnerability
Overall, the planning area is experiencing slight decline. There are many strategies that can be undertaken to protect both existing and future assets. The impact to people and property in urbanized areas from urban fire can be significant.

Mitigation Measures
The use of building codes, community education, and Fire Wise building practices will reduce some of the damages that could occur or reduce the risk that neighboring structures catch fire as easily.

FIXED SITE HAZARDS (CHEMICAL & RADIOLOGICAL)

Hazard Profile
The following description for hazardous materials is provided by the FEMA:

Chemicals are found everywhere. They purify drinking water, are used in agriculture and industrial production, fuel our vehicles and machines, and simplify household chores. But chemicals also can be hazardous to humans or the environment if used or released improperly. Hazards can occur during production, storage, transportation, use, or disposal. The community is at risk if a chemical is used unsafely or released in harmful amounts.

Hazardous materials in various forms can cause fatalities, serious injury, long-lasting health effects, and damage to buildings, homes, and other property. Many products containing hazardous chemicals are used and stored in homes routinely. These products are also shipped daily on the nation's highways, railroads, waterways, and pipelines.

Chemical manufacturers are one source of hazardous materials, but there are many others, including service stations, hospitals, and hazardous materials waste sites.

Varying quantities of hazardous materials are manufactured, used, or stored at an estimated 4.5 million facilities in the United States--from major industrial plants to local dry cleaning establishments or gardening supply stores.

Hazardous materials come in the form of explosives, flammable and combustible substances, poisons, and radioactive materials. These substances are most often released as a result of transportation accidents or because of chemical accidents in plants.

Hazardous material incidents are technological (meaning non-natural hazards created or influenced by humans) events that involve large-scale releases of chemical, biological or radiological materials. Hazardous materials incidents general involve releases at fixed-site facilities that manufacture, store, process or otherwise handle hazardous materials or along transportation routes such as major highways, railways, navigable waterways and pipelines.

The U.S. Environmental Protection Agency requires industry to report information on toxic chemical releases and water management activities, through the Toxics Release Inventory (TRI) Program. In the previous decade TRI reporting requirements were lessened; thereby limiting available data on chemical releases and disposal. The federal government in recent years reinstated stricter reporting requirements for industrial and federal facilities that release toxic substances with potential to threaten human health and the environment. Those requirements went into effect in April of 2009 and data from these reports is now available.

Classification
Fixed-site events are those that involve chemical manufacturing sites and stationary storage facilities. Table 33 demonstrates the nine classes of hazardous material according to the 2012 Emergency Response Guidebook.

Table 33: Classes of Hazardous Material

Class	Type of Material	Divisions
1	Explosives	Division 1.1 – Explosives with a mass explosion hazard Division 1.2 – Explosives with a projection hazard Division 1.3 – Explosives predominantly a fire hazard Division 1.4 – Explosives with no significant blast hazard Division 1.5 – Very insensitive explosives with a mass explosion hazard Division 1.6 – Extremely insensitive articles
2	Gases	Division 2.1 – Flammable gases Division 2.2 – Non-flammable, non-toxic gases Division 2.3 – Toxic gases
3	Flammable Liquids (and Combustible Liquids)	
4	Flammable solids; Spontaneously combustible materials	Division 4.1 – Flammable solids Division 4.2 – Spontaneously combustible materials Division 4.3 – Water-reactive substances/Dangerous when wet materials
5	Oxidizing substances and Organic peroxides	Division 5.1 – Oxidizing substances Division 5.2 – Organic peroxides
6	Toxic substances and infections substances	Division 6.1 – Toxic Substances Division 6.2 – Infectious substances
7	Radioactive Materials	
8	Corrosive Materials	
9	Miscellaneous hazardous materials/Products, Substances, or Organisms	

Source: Emergency Response Guidebook, 2012

Historic Occurrence
There are no records reporting chemical or radiological materials release at fixed storage sites within the planning area, nor did participating jurisdictions report any chemical release events within the planning area.

Location
Table 34 shows the location of facilities which submitted Tier II reports to the Nebraska Department of Environmental Quality (NDEQ) in 2013.

Table 34: Chemical Storage Locations

County	City/Village	Location	Material	Hazardous
Hooker	Mullen	Farmers/Ranchers Co-Op Assn.	Fuels, Polar Windshield Washer, Oils & Lubricants, Propane	No
Hooker	Mullen	Farmers/Ranchers Co-Op Assn.	Light fuel oils, gasoline	No
Hooker	Mullen	Farmers/Ranchers Co-Op Assn.	Propane	No
Hooker	Mullen	Roads Dept.	Light fuels, Heavy fuels, Road salt & deicer	No
Grant	Hyannis	Roads Dept.	Light fuels	No
Logan	Stapleton	Cooperative Producers	Harness Xtra, Ammonia, UAN-32, Atrazine 4L, Ethylene Glycol, KTS 0-0-25-17, 11-51-0	Yes

			Monoammonium phosphate, K-Mag-0-0-22, Pel-Lime, 12-0-0-26 Ammonium Thiosulfate, Light Fuels, Gasoline, 10-34-0 Phos-plus, Potash 0-0-60, Propane, Halex GT, Urea 46-0-0	
Logan	Stapleton	Eastside Service	Light fuels, Motor oil	No
Logan	Stapleton	Frey Propane	Liquefied Petroleum Gas	No
Logan	Stapleton	Roads Dept.	Diesel fuel, Light Fuels, Propane, Road Salt	No
Thomas	Halsey	Bessey Ranger District	Diamond Phosphate, Triple Super Phosphate, Milorganite, Tri-Broom 67 Preplant Soil Fumigant	Yes
Thomas	Thedford	Roads Dept.	Light Fuels, Road Salt	No

Source: SARA Tier II Reports, NDEQ

Extent
While it is possible that chemicals could be released at fixed storage sites there are few records available to provide a probable extent for these events. Future updates can identify data to establish extent. If possible owners/operators of chemical fixed sites can participate in the planning process.

Probability
Chemical releases at fixed site storage areas are possible in the future. Given the lack of supporting data it is not possible to establish an accurate probability for these events. Future updates can identify data to establish extent. If possible owners/operators of chemical fixed sites can participate in the planning process.

Vulnerability
Individuals in close proximity to an incident could see minor to moderate health impacts depending upon the extent of the incident. Most chemical fixed site incidents occur on a weekday during times when day care centers and schools are likely to be in session. Other vulnerable facilities and groups include hospitals, nursing homes, and housing units with low mobility individuals and families. Vulnerable populations will live near chemical/radiological fixed site locations.

The most common injury that would occur would be chemical burns from coming into contact with the substance that spilled. Breathing in the chemicals may lead to injuries or deaths if the spilled chemical is toxic. Fires or explosions are also possible with these spills and that could cause injuries as well.

Averaged Annual Damages and Frequency
Given the lack of historic records it is not possible to provide loss estimates.

Summary
There is a lot of agricultural based traffic through the planning area. It is possible that a chemical release will occur in the future. To there have been no reported releases within the planning area.

Future Development and Vulnerability
There are many strategies that can be undertaken to protect both existing and future assets. The impacts to people and property from chemical/radiological transportation incidents are potentially severe. Most chemical/radiological transportation incidents occur on a weekday during times when day care centers and schools are likely to be in session. Other vulnerable facilities and groups include hospitals, nursing homes, and housing units with low mobility individuals and families. Vulnerable populations will live along major transportation routes or near chemical/radiological fixed site locations.

Mitigation Measures
Mitigation alternatives for this hazard include training; outreach and education; and planning to ensure that critical facilities are placed in lower risk areas when possible.

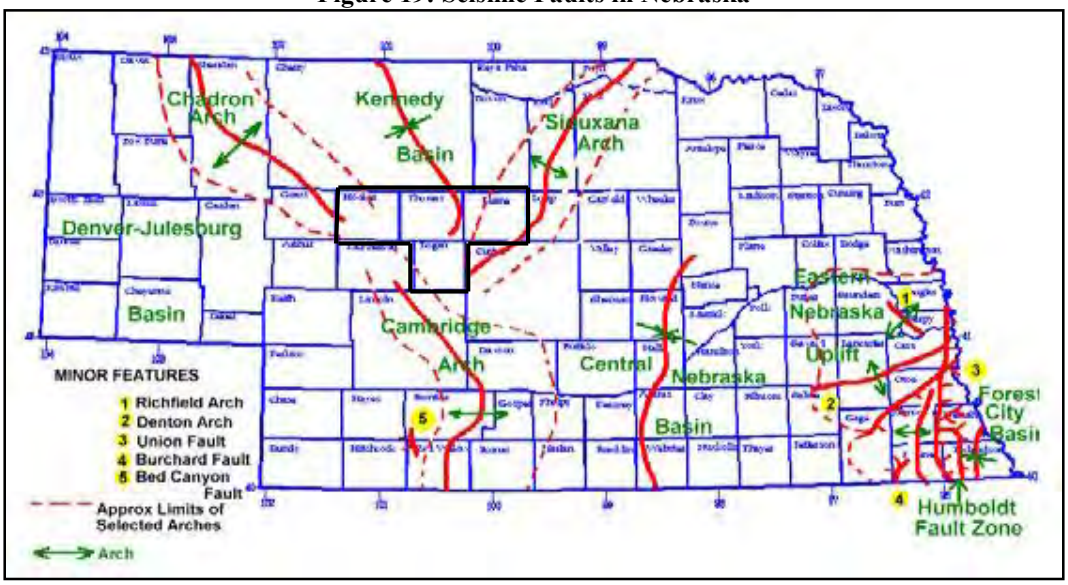
Geological

EARTHQUAKES

Hazard Profile

An earthquake is the result of a sudden release of energy in the Earth's tectonic plates that creates seismic waves. The seismic activity of an area refers to the frequency, type, and size of earthquakes experienced over a period of time. Magnitude is measured by the Richter Scale, a base-10 logarithmic scale, which uses seismographs around the world to measure the amount of energy released by an earthquake. Intensity is measured by the Modified Mercalli Intensity Scale, which determines the intensity of an earthquake by comparing actual damage against damage patterns of earthquakes with known intensities. Figure 19 shows the fault lines in Nebraska the planning area is outlined in black.

Figure 19: Seismic Faults in Nebraska



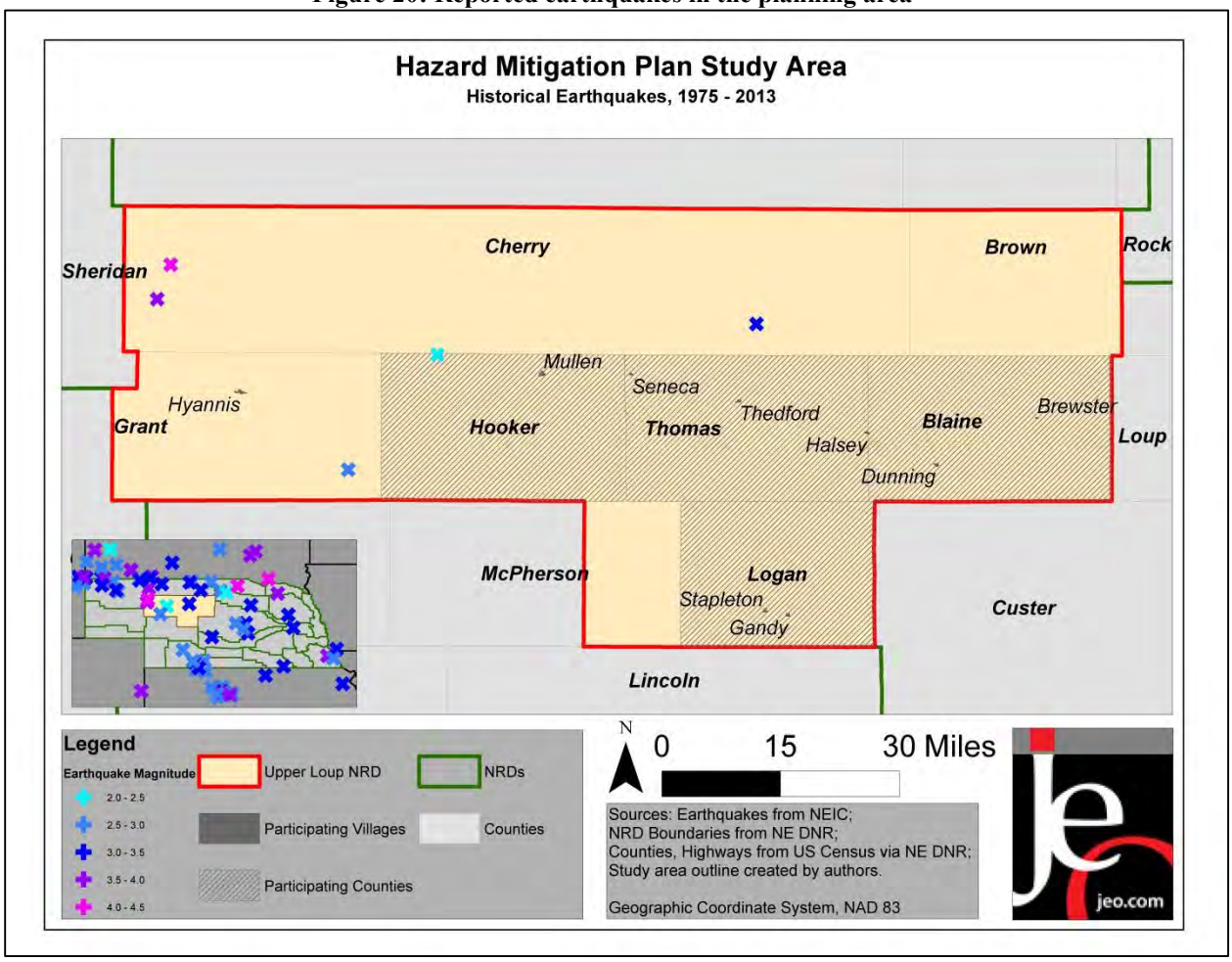
Source: Nebraska Department of Natural Resources

According to the Occupational Safety and Health Administration the most common causes of injuries and deaths result from collapsing walls, flying glass and falling objects as a result of the ground shaking, or from people trying to move more than a few feet during the shaking.

Historical Occurrences

Participant in the planning process reported minor earthquakes as having occurred during the past five years.

Figure 20: Reported earthquakes in the planning area



Source: NEIC

Location

Earthquakes are not more or less likely to affect certain areas more than others within ULNRD. This leaves the entire population of the NRD at risk during these events.

Extent

Tables 35 and 36 summarize the Richter Scale and Modified Mercalli Scale.

Table 35: Richter Scale

Richter Magnitudes	Earthquake Effects
Less than 3.5	Generally not felt, but recorded.
3.5 – 5.4	Often felt, but rarely causes damage.
Under 6.0	At most slight damage to well-designed buildings. Can cause major damage to poorly constructed buildings over small regions.
6.1 – 6.9	Can be destructive in areas up to about 100 kilometers across where people live.
7.0 – 7.9	Major earthquake. Can cause serious damage over larger areas.
8 or greater	Great earthquake. Can cause serious damage in areas several hundred kilometers across.

Source: Federal Emergency Management Agency

Table 36: Modified Mercalli Scale

Scale	Intensity	Description of Effects	Richter Scale Magnitude
I	Instrumental	Detected only on seismographs	
II	Feeble	Some people feel it	< 4.2
III	Slight	Felt by people resting, like a truck rumbling by	
IV	Moderate	Felt by people walking	
V	Slightly Strong	Sleepers awake; church bells ring	< 4.8
VI	Strong	Trees sway; suspended objects swing, objects fall off shelves	< 5.4
VII	Very Strong	Mild Alarm; walls crack; plaster falls	< 6.1
VIII	Destructive	Moving cars uncontrollable; masonry fractures, poorly constructed buildings damaged	
IX	Ruinous	Some houses collapse; ground cracks; pipes break open	< 6.9
X	Disastrous	Ground cracks profusely; many buildings destroyed; liquefaction and landslides widespread	< 7.3
XI	Very Disastrous	Most buildings and bridges collapse; roads, railways, pipes and cables destroyed; general triggering of other hazards	< 8.1
XII	Catastrophic	Total destruction; trees fall; ground rises and falls in waves	> 8.1

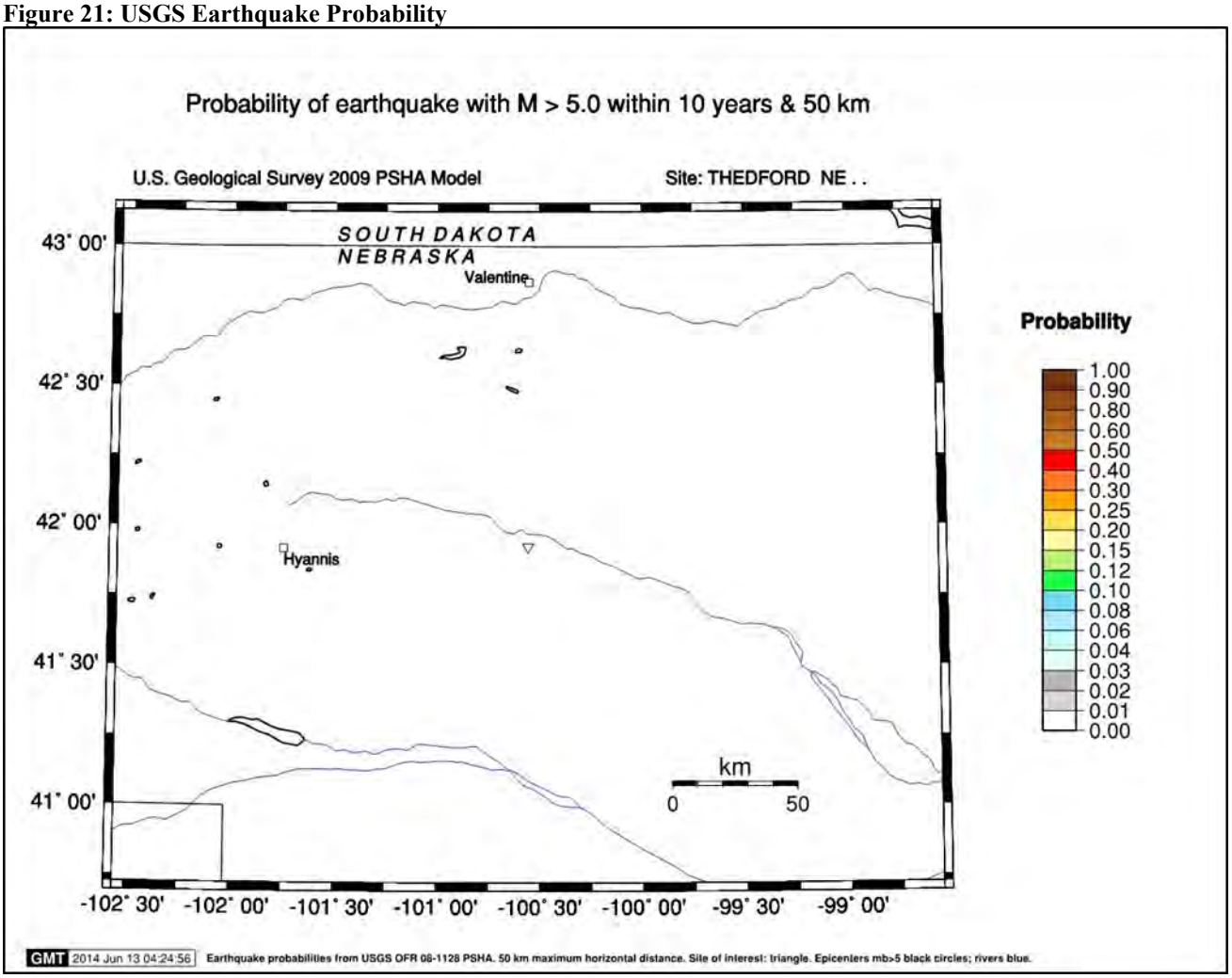
Source: Federal Emergency Management Agency

Although rather uncommon, earthquakes do occur in Nebraska, and are usually small, generally not felt, and cause little to no damage. Earthquakes are measured by magnitude and intensity. Based on historic occurrences it is likely that the extent of future earthquakes within the planning area would equate to a 4 or less on the Richter Scale.

Probability

The historic record recorded five earthquakes in the ULNRD area over a 38 year period making the annually probability of earthquake occurrence approximately 10 percent. The probability of a 5.0 or greater earthquake occurring in the planning area is quite low. Refer to the figure below for the USGS earthquake probability for a 5.0 or greater event occurring in the next decade.

Figure 21: USGS Earthquake Probability



Vulnerability

- Low Income Populations
  Low income individuals and families are among the most vulnerable groups to earthquakes. According to the USGS this is mostly because the location of their housing is on poor and marginal lands and the building quality of those structures is poor as well.

- Hospitals/Nursing Homes
  Residents of hospitals, nursing homes, and other facilities with concentrations of vulnerable populations are at high risk during earthquakes. These people depend on their caretakers to survive and if their caretakers are unable to provide their services due to poor road conditions or being trapped by rubble, these vulnerable populations will not have their needs met and may suffer more harsh consequences.

- Elderly and people with limited mobility
  Elderly citizens are at higher risk of being isolated during earthquakes as a result of decreased mobility. Closed and impassable roadways increases the vulnerability among segments of the population that already have decreased mobility, making it important that they have a social network that can check on them and ensure that they have access to food and lodging.

- Older houses (Pre-WWII)
  These homes are not constructed to the same building codes as today. Typical damages to these structures include the wood frame coming off its foundation, racking of the cripple walls, the foundation cracking, or the chimney breaking at the roof line.

- Mobile Homes
  A mobile home is a factory-built dwelling built entirely of light-weight metal construction or a combination of a wood and steel frame structure. When combining wood and steel, the wood frame structure is erected on a steel frame chassis. In either case, the exterior is typically protected with siding of wood, aluminum or fiberglass. Mobile homes installed before 1995 are often not well tied to their foundations and are prone to shifting off their supports during earthquakes.

- Unreinforced masonry buildings
  Unreinforced masonry buildings are typically structures in which there is no steel reinforcing within a masonry wall. Earthquake damage to unreinforced masonry structures can be severe and hazardous. The lack of reinforcement coupled with poor mortar and inadequate roof-to-wall ties can result in substantial damage to the building as a whole as well as to specific sections of it. Severely cracked or leaning walls are some of the most common earthquake damage. Also hazardous, but slightly less noticeable, is the damage that may occur between the walls, and roof and floor diaphragms. Separation between the framing and the walls can jeopardize the vertical support of roof and floor systems which could lead to the collapse of the structure.

Averaged Annual Damages and Frequency
Due to the lack of sufficient earthquake data, limited resources, low earthquake risk for the area, and limited reports of historical occurrences with recorded damages, it is not feasible to utilize the 'event damage estimate formula' to estimate potential losses for the planning area. For frequency, there is a 10 percent chance of earthquakes occurring in a given year.

Summary
Earthquakes have an annual probability of approximately 10 percent. Earthquakes that do occur are likely to be limited in extent to a 4.0 or less on the Richter Scale. It is possible that critical facilities and services could be interrupted but it is not likely.

Future Development and Vulnerability
There are many strategies that can be undertaken to protect both existing and future assets. It is possible to reduce earthquake vulnerability through the use of building codes and retrofitting of existing construction. However, losses are likely to remain negligible due to the low risk within the planning area.

Mitigation Measures
The following bullet points identify some general mitigation strategies that can be used to reduce a community's vulnerability to the threat of earthquakes. Some of these strategies, such as the use of warning systems, are already in place in the planning area. Many of these strategies are identified and discussed in greater detail in the FEMA document *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards*. As community varies in their risk and vulnerability to the hazard, community-related mitigation strategies can be found in *Section Seven: Participant Sections*.

- Adopt and enforce seismic building codes
  - Given the threat posed by seismic hazards local buildings codes are sufficient
- Incorporate Seismic Safety into all Local Plans (i.e., create a Seismic Safety Committee)
  - This is not likely to happen beyond updating and adoption of local building codes (not specific to seismic threats)

- Conduct Inspections of Building Safety (i.e., identify seismic risk)
- Protect Critical Facilities and Infrastructure (i.e., installing shut off valves; bracing equipment; and reviewing all bridge construction plans)
    - Shut-off valves and bracing are standard building practices within the planning area; communities should review bridges to ensure structural integrity
- Implement Structural Mitigation Techniques (i.e. membranes on windows to prevent glass shattering, steel bracing on chimneys; etc.)
    - This has not occurred in the planning area
- Increase Earthquake Risk Awareness (i.e. outreach to businesses, schools, and individuals)
    - Local hazard education programs contain some resources addressing seismic threats but focus primarily on high probability hazards
- Conduct outreach to building inspectors, engineers and architects.
    - Local outreach programs focus on other construction related issues

LANDSLIDES

Hazard Profile

According to the USGS, landslides are widespread, occur in all 50 states and U.S. territories, and cause $1-2 billion in damages and more than 25 fatalities on average each year. The threat of landslides to human life and property has increased with expansion of urban and recreational developments into hillside areas. Landslides commonly occur in connection with other major natural disasters such as earthquakes, wildfires, and floods as well as alternate freezing or thawing, steepening of slopes by erosion (or human modification), and other natural phenomena that causes ground failure.

A landslide is defined in general terms by FEMA as masses of rock, earth, or debris that moves down a slope. The debris and mud flows that occur are essentially rivers of rock, earth, and other debris saturated with water, which can move slowly or rapidly. Landslides are often associated with heavy rainfall or rapid snowmelt when the additional moisture over saturates and increases the pore-water pressure within the underlying rock or soil. This additional moisture adds weight and decreases the shearing strength of the soil, causing a sudden, structural failure of the grounds. Landslide act like avalanches because they can strike with little or no warning, travel several miles from their source, and grow in size as they pick up debris in the form of trees, boulders, cars, and other materials.

Landslides in Nebraska generally occur along road cuts which disturb the slope and cause drainage issues. Lands that lie along river bluffs are also susceptible to landslides which could cause damage to, or completely destroy, any structure built on the land. Any area where man-made or constructed slopes are too steep or do not provide proper drainage, are susceptible to landslides. The Nebraska Geologic Survey (NGS) has identified Pierre Shale formations, which are fairly common in the northeastern and northwestern portions of the state, and areas where loess overlays glacial material to be highly susceptible to landslides. According to the NGS, total estimated costs related to landslides in Nebraska from 1981 to 2002 were nearly $4.7 million dollars.

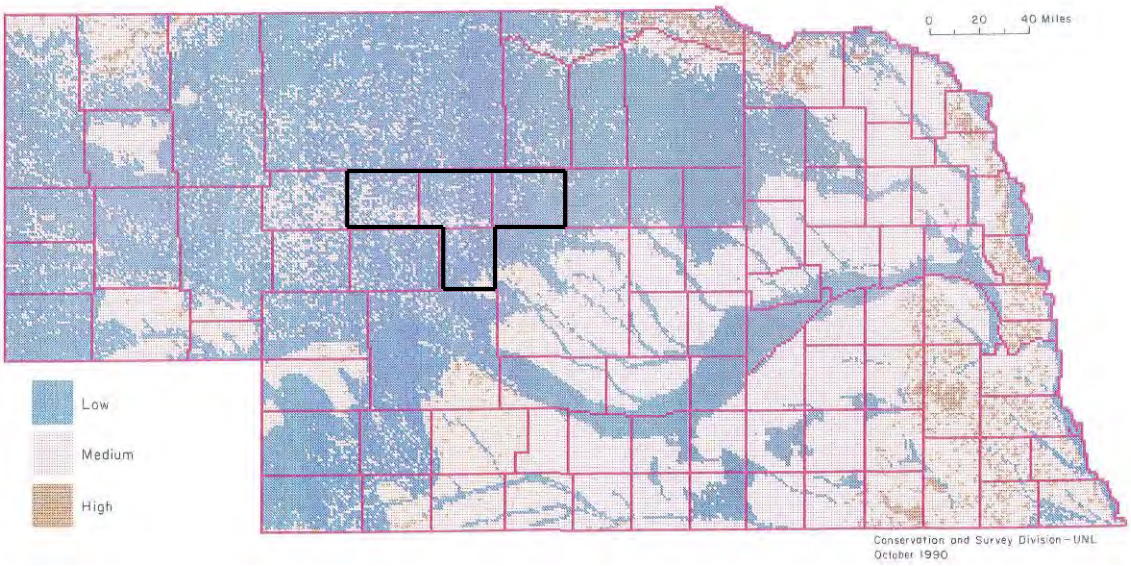
Historical Occurrence

There are no recorded landslides in the ULNRD based on the data from the School of Natural Resources at the University of Nebraska-Lincoln or in the Nebraska State Hazard Mitigation Plan (2014).

Location

Figure 22 below displays the landslide hazard area map of Nebraska. There is a low risk of landslides across the ULNRD based on the map.

Figure 22: Landslide Hazard Map of Nebraska



Source: Nebraska Geologic Survey Landslide Study

Extent

Landslides are classified based on the Varnes Classification of Slope Movements.

Table 37: Varnes Classification of Slope Movements, 1976

Type of Movement			Type of Material		
			Bed Rock	Engineering Soils	
Falls				Predominantly coarse	Predominantly fine
Topples			Rock fall	Debris fall	Earth fall
Slides	Rotational	few units	Rock topple	Debris topple	Earth topple
			Rock slump	Debris slump	Earth slump
	Translational	many units	Rock block slide	Debris block slide	Earth block slide
Lateral Spreads			Rock slide	Debris slide	Earth slide
			Rock spread	Debris spread	Earth spread
Flows			Rock flow (deep creep)	Debris flow (slow creep)	Earth flow
Complex	Combination of two or more principal types				

Source: School of Natural Resources, University of Nebraska-Lincoln

There is no history of landslides in the ULNRD.

Probability

Based on the historic record, there is a low probability of landslides occurring within the planning area in the next decade. The historic record recorded zero landslides in the ULNRD area over a 38 year period.

Vulnerability

Damages that could occur and the extent of landslides can vary depending on location, geological slope of the vulnerable area, and amount of precipitation.

Average Annual Damages and Frequency
Due to the no reports of historical occurrences with recorded damages, it is not feasible to utilize the 'event damage estimate formula' to estimate potential losses for the planning area.

Summary
Landslides have a low probability of future occurrence. If there were to be a landslide any impacts from it would be minimal and likely not cause any damage.

Future Development and Vulnerability
Although the physical cause of many landslides cannot be removed, geologic investigations, good engineering practices, and effective enforcement of land-use management regulations can reduce landslide hazards.

USGS scientists continue to produce landslide susceptibility maps for many areas in the United States. In every state, USGS scientists monitor stream flow, noting changes in sediment load carried by rivers and streams that may result from landslides.

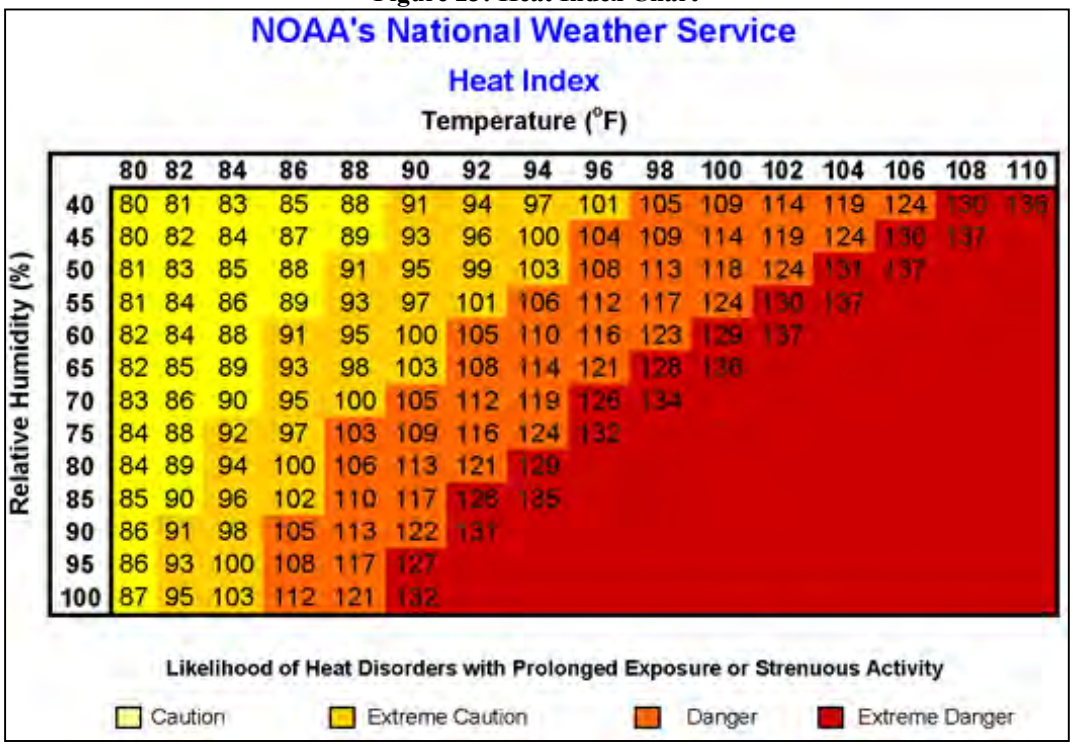
Mitigation Alternatives
The following bullet points identify some general mitigation strategies that can be used to reduce a community's vulnerability to the threat of landslides.

- Monitoring Soils for signs of landslides
    - Landslides were last examined in the 1980s and determined to be inactive
- Land use planning to ensure that buildings and critical facilities are away from areas of greater risk
    - This is not standard in the planning area
- Education and outreach
    - This is not standard in the planning area

SEVERE WEATHER
EXTREME HEAT
Hazard Profile

Extreme heat is often associated with periods of drought, but can also be characterized by long periods of high temperatures in combination with high humidity. During these conditions, the human body has difficulties cooling through the normal method of the evaporation of perspiration. Another factor to consider in extreme heat situations is the humidity level relative to the temperature. As is indicated in Figure 23, as the Relative Humidity increases, the temperature needed to cause a dangerous situation decreases. For example, for 100 percent Relative Humidity, dangerous levels of heat begin at 86°F where as a Relative Humidity of 50 percent require 94°F. The combination of Relative Humidity and Temperature result in a Heat Index: 100 percent Relative Humidity + 86°F = 112° Heat Index.

Figure 23: Heat Index Chart



Source: NOAA

For the planning area, the months with the highest temperatures are May, June, July, August, and September. Health risks arise when a person is overexposed to heat. Extreme heat can also cause people to overuse air conditioners, which can lead to power failures. The National Weather Service is responsible for issuing excessive heat outlooks, excessive heat watches, and excessive heat warnings. Excessive heat outlooks are issued when potential exists for an excessive heat event in the next 3 to 7 days. Excessive heat outlooks can be utilized by public utility staffs, emergency managers, and public health officials to plan for extreme heat events. Excessive heat watches are issued when conditions are favorable for an excessive heat event in the next 24 to 72 hours. An excessive heat watch should provide local officials and residents in the area enough time to take appropriate actions to mitigate the effects of extreme heat. Finally, excessive heat warnings are issued when an excessive heat event is expected in the next 36 hours. Excessive heat warnings are issued when an extreme heat event is occurring, is imminent, or has a very high probability of occurring.

Historical Occurrence
It is understood that extreme heat are a regular part of the climate for the planning area. According to the High Plains Climate Center there are more than 42 days greater than 90°F annually across the planning area, these temperatures combined with high levels of humidity can create dangerous situations for residents. The discussion at public meeting did not identify specific events that have occurred but rather focused on the annual occurrence of heat events.

Location
The entire planning area is likely to experience extreme heat events due to the regional nature of this hazard.

Extent
For this planning process and the planning area extreme heat is defined as temperatures greater than 90°F. It is reasonable that for the month of May the planning area will experience two days with temperatures greater than 90°F; for the month of June the planning area will experience seven days of temperatures greater than 90°F; for the month of July the planning area will experience 16 days of temperatures greater than 90°F; for August the planning area will experience 12 days of temperatures greater than 90°F; and in September the planning area will experience 5 days of temperatures greater than 90°F.

Table 38: Days Greater than 90 degrees

Month	Record High	Days with Temperatures Greater than 90°F
January	77°F	0
February	77°F	0
March	87°F	0
April	100°F	.3
May	104°F	1.4
June	108°F	7.1
July	111°F	15.9
August	110°F	12.9
September	102°F	4.2
October	94°F	.3
November	81°F	0
December	74°F	0

Source: High Plains Climate Center

Probability
It is understood that extreme heat will occur annually within the planning area.

Vulnerability
According to the CDC extreme heat events are the most common cause of weather-related deaths in the United States. Most of the deaths occur because of heat stress. Heat stress is heat-related illness caused by the body's inability to cool down properly. The body normally cools itself by sweating but under some conditions, sweating just isn't enough. In such cases, a person's body temperature rises rapidly. Very high body temperatures may damage the brain or other vital organs. Heat stress ranges from milder conditions like heat rash and heat cramps, to the most common type, heat exhaustion. The most serious heat-related illness is heat stroke. Heat stroke can cause death or permanent disability if emergency treatment is not provided.

Highly vulnerable populations, which are defined as the people who are at the most risk in regards to this hazard, young children, the elderly and people with chronic medical conditions, low income populations, and outdoor workers and athletes.

- Young children
  Young children often play outside during periods of extreme heat and may be more susceptible due to poor knowledge of when to cool down inside, or drink more water. Children overheat faster than adults and the younger the child, the easier it is for the child to overheat.

- Elderly and people with chronic medical conditions
  The elderly and people with chronic medical conditions are less likely to sense and respond to changes in temperature. This makes them more vulnerable to experiencing the symptoms of heat stress.

- Low income populations
  Individuals and families below the poverty line may lack resources or access to resources that could mitigate the impacts of extreme heat. They might not have sufficient cooling sources or alternative cooling sources during prolonged power outages.

- Outdoor workers and athletes
  People who work outdoors or exercise in extreme heat are more likely become dehydrated and are more likely to get heat-related illness.

- Power Outages
  Due to increased demand during extreme heat events it is not uncommon that power service is interrupted.

Averaged Annual Damages and Frequency
The average damage per event estimate was determined based upon NCDC Storm Events Database since 1996 and number of historical occurrences. This does not include losses from displacement, functional downtime, economic loss, injury, or loss of life. According to Table 39, extreme heat events have a medium probability of future occurrences in the planning area with an annual frequency of .17. It could cause $35,122 per year and $3,512 per event due to extreme heat events for the whole ULNRD.

Table 39: Extreme Heat Loss Estimator

Hazard Type	Total Property Loss[1]	Annual Property Loss[1]	Total Crop Loss[2]	Annual Crop Loss[2]
Extreme Heat	$0	$0	$491,709	$35,122

1 indicates the data is from NCDC (January, 1996 to January, 2014); 2 indicates the data is from RMA USDA (2000 to 2013).

Summary
From the data collected from the NCDC, extreme heat events have a 100 percent probability of occurring annually. The population, property, and critical facility and infrastructure are not likely to sustain significant damages. The months of June, July, August, and September are the mostly likely times to see dangerously high temperatures which can cause injury or death.

Future Development and Vulnerability
Communities will always have some level of vulnerability related to extreme heat events. Any future development and future residents in the planning area will be vulnerable to the affects and losses sustained from extreme heat, especially the agricultural economy. The total losses that could occur in the future would increase as the population of the town increases. Education of the population is the best way to mitigate for

extreme heat. There are few large scale "hard" projects that can be undertaken, but explaining policies and best practices can go a long way in dealing with this hazard. It is especially advisable to educate the most vulnerable populations such as the elderly and children.

Communities can incorporate some strategies to reduce the impacts of extreme heat including: cool roofing materials, planting trees and vegetation, incorporating green roofs into urban design, and using cool pavements. Cool roof products are made of highly reflective and emissive materials that can remain approximately 50 - 60°f cooler than traditional roofing materials during peak summer heat. Trees, shrubs, grass, and ground covers help cool urban environments by providing shade as well as increasing evapotranspiration resulting in cooler temperatures. A green roof is a vegetative layer grown on a rooftop which helps to remove heat from the air through evapotranspiration. Cool pavements are designed to reduce solar energy absorption as well as reduce thermal emittance.

Mitigation Measures
The following bullet points identify some general mitigation strategies that can be used to reduce a community's vulnerability to the threat of extreme heat. Some of these strategies, such as the use of warning systems, are already in place in the planning area. Many of these strategies are identified and discussed in greater detail in the FEMA document, *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards*. As community varies in their risk and vulnerability to the hazard, community-related mitigation strategies can be found in *Section Seven: Participant Sections*.

- Reduce Urban Heat Island Effect (i.e., using cool roofing products that reflect sunlight and heat away from buildings)
- Increase Awareness of Extreme Heat Risk and Safety (i.e., educating citizens regarding the dangers of extreme heat and the steps they can take to protect themselves)
    - County and regional emergency management agencies offer informational and educational materials to local governments
- Assist Vulnerable Populations (i.e., creating a database to track those individuals at high risk such as the elderly)
    - Currently there are informal list especially within small communities and more formal list in larger communities
- Identify Existing Community Shelters/Centers
    - Local Emergency Operations Plans currently identify shelters

FLOODING

Hazard Profile

Flood events are the most damaging and costly hazard in the United States and account for 90 percent of all presidential declarations of disaster. Flooding can occur on a local level, sometimes affecting only a few streets, and also on a regional level, affecting entire drainage basins and several states. A flood occurs when water, usually from rain or snow, overflows a waterway beyond its capacity. In some cases a flood could be defined as areas that do not have any defined waterway that become covered in water. Flooding is most commonly caused by excessive rainfall and excessive snowmelt but can also be caused by ice jams. Flooding from excessive rainfall in Nebraska usually occurs in during late-spring into the early-fall.

Ice jams can cause flooding when a warm snap breaks up river ice and piles up against bridges or other waterway obstructions which causes a temporary dam with water backing up behind it. Also, when the ice jam breaks, it can release all the backed up water, causing a rush of water downstream which can cause severe flooding. Ice jams are common throughout Nebraska during the transition between winter and spring.

North and Middle Loup Rivers and the Dismal River, all three which flow primarily from the northwest to the southeast through the planning area. All three rivers are fed mostly by groundwater and natural springs originating in the Sandhills. Due to the highly sandy composition of soils in the area major flooding threats are generally limited.

Riverine Floods

Riverine floods, slower in nature, occur when water from sustained rainfall or rapid snow melt overflows a waterway once the volume of water exceeds the capacity of the waterway. Flash floods, faster in nature, result from convective precipitation usually due to intense thunderstorms or sudden release from an upstream impoundment created behind a dam, landslide, or levee. Flash floods are distinguished from a regular flood by a timescale less than six hours. Flooding from excessive rainfall in Nebraska usually occurs between late spring and early fall.

Flash Floods

Flooding is most commonly caused by excessive rainfall or snowmelt, but unexpected drainage obstructions such as landslides, ice, or debris can cause slow flooding upstream of the obstruction. Ice jams can cause flooding when a warm snap breaks up river ice, which flows downstream, and piles up against bridges or other waterway obstructions, causing a temporary dam in the waterway with water backing up behind it. When an ice jam breaks, all of the backed-up water is suddenly released, causing a rush of water downstream which can rapidly exceed the capacity of waterways and cause severe flash flooding. Ice jams are common throughout Nebraska during the transition between winter and spring.

Historical Occurrence

The NCDC reports seven flooding events from 1996 to 2014. Of these seven events six are flash flooding and one is riverine flooding. According to the NCDC flash flooding resulted in $535,000 in property damages while riverine flooding caused $100,000 in property damages and $15,000 in crop losses.

The planning team for the Village of Brewster reported flash flooding in 2010. During this event roadways were closed, the village was flooded, and the operation of critical facilities and services were interrupted. The planning reported repairs to stormwater management systems to address the problem. Recovery actions include: increasing depth of ditches, replacing and upsizing (as needed) of culverts, removal of overgrowth and debris. This storm event also impacted rural roads and bridges as well as to agricultural lands in Thomas and Blaine Counties.

Figure 24: Flooding in Thomas and Blaine Counties

Photo: Flooding Brewster (source Region 26 Emergency Management)

Photo: Flooding Thomas County (source Region 26 Emergency Management)

Photo: Flooding Blaine County (source Region 26 Emergency Management)

Location
According to the FEMA Map Service Center website (www.msc.fema.gov), the only communities in the Upper Loup NRD that currently has a Flood Insurance Rate Map (FIRM) panel is the Village of Thedford in Thomas County and the village of Dunning in Blaine County. Thedford is included on FIRM panel number 310326 (effective July 11th, 1975) and Dunning is included on FIRM panel number 310007 (effective July 1, 1987). This information can be seen in the participant sections for these two communities.

The NCDC did report multiple flash flood events within the planning area. The villages of Brewster, Mullen, Hyannis, Stapleton, Halsey, and Gandy all are reported as having been impacted by localized flash flooding events. There were repeated events located near the village of Stapleton which impacted HWY 92. In addition there were multiple events reported which impacted HWY 2 near Thedford.

National Flood Insurance Program
The NFIP was established in 1968 to reduce flood losses and disaster relief costs by guiding future development away from flood hazard areas where feasible by requiring flood resistant design and construction practices and by transferring the costs of flood losses to the residents of floodplains through flood insurance premiums.

In return for availability of federally backed flood insurance, jurisdictions applying to join the NFIP must agree to adopt and enforce minimum flood loss reduction standards to regulate proposed development in special flood hazard areas as defined by FEMA's flood maps. One of the strengths of the program has been keeping people away from flooding rather than keeping the flooding away from people - through historically expensive flood control projects.

The NFIP has approximately 4.4 million policies in force, representing over $370 billion worth of coverage, in 19,884 participating jurisdictions nationwide. Ninety-five percent of flood insurance policies are written by private companies and sold by more than 110,000 insurance agents and brokers participating in the NFIP's Write Your Own program. Since 1969, over $12.1 billion in claims have been paid.

Currently, Nebraska has 13,300 policies in force representing $1.3 billion worth of coverage.

Another innovative program is FEMA's Cooperating Technical Partners Program (CTP). The main objective of CTP is to increase local involvement in the flood mapping process. With over 20,000 jurisdictions in the NFIP, the CTP encourages collaboration with NFIP jurisdictions and regional and state agencies who wish to become more active participants in the FEMA flood hazard mapping program.

In order to qualify for Hazard Mitigation Assistance, plan participants must have a good standing in NFIP if the project is located in a Flood Hazard Risk Area. At this time there are two communities participating in the NFIP within the planning area.

Table 40: NFIP Participating Communities

Community Name	NFIP Status	CRS Status	Number of Policies
Mullen	Active	Not participating	1 policy
Dunning	Active	Not participating	2 policies

Repetitive Loss Properties
There are no repetitive loss properties in the planning area according to the NDNR.

Extent
The potential extent of flooding in the Upper Loup NRD is difficult to quantify. Flash flooding events are likely to be localized in their extent. Of the reported flooding events depths between six inches and one foot have occurred. Given the low occurrence rate for flooding it is possible that when floods occur this will be a likely extent.

Probability
Based on the historic record and reported incidents by participating communities flooding has an approximate annual probability of 40 percent.

Vulnerability
Vulnerable populations related to severe thunderstorms include the elderly, those living in mobile homes, and those caught outside during storm events.

- Low-income and minority populations
  A 2008 study examining social vulnerability as it relates to flood events found that low-income and minority populations are disproportionately vulnerable to flood events. These groups may lack resources that are needed to mitigate potential flood events as well as resources that are necessary for evacuation and response. In addition, low income residents are more likely to live in areas vulnerable to the threat of flooding, but lack the resources necessary to purchase flood insurance. The study did find that flash floods are more often responsible for injuries and fatalities than prolonged flood events.

- Elderly
  Elderly residents may suffer from a decrease or complete lack of mobility and as a result, be caught in flood-prone areas.

- Groups/Individuals Outdoors
  Residents in campgrounds or public parks may be more vulnerable to flooding events as many of these areas exist in natural floodplains and can experience rapid rise in water levels resulting in injury or death.

Averaged Annual Damages and Frequency
The average damage per event estimate was determined based upon NCDC Storm Events Database since 1996 and number of historical occurrences. This does not include losses from displacement, functional downtime, economic loss, injury, or loss of life. According to Table 41, flooding events have a high probability of future occurrences in the planning area with an annual frequency of .39. It could cause $67,944 per year and $6,989 per event due to flooding events for the whole ULNRD.

Table 41: Flooding Loss Estimation

Hazard Type	Total Property Loss	Annual Property Loss	Total Crop Loss	Annual Crop Loss
Flooding	$635,000	$35,278	$15,000	$833

Source: NCDC (January, 1996 to January, 2014).

Summary
There were seven recorded flood events (six flash floods, one riverine flood) reported during an 18 year period (approximate annual probability of 40 percent). Given the soil composition and topographic characteristics of the planning area flood events will result primarily in agricultural impacts and disruption to transportation routes in rural areas. Two community have mapped 1 percent annual flood risk area

(Dunning and Thedford) and two communities (Mullen and Dunning) participate in the NFIP. In total 14 properties are located in the 1 percent annual flood risk area.

Future Development
Given the limited area within the 1 percent annual flood risk zone it is not likely that additional structures will be developed within this area. Local residents and planning and zoning bodies are aware of where localized flood events area likely to occur and encourage development in other areas.

Mitigation Actions
The following bullet points identify other general mitigation strategies that can be used to reduce a community's vulnerability to the threat of flooding. Many of these strategies are identified and discussed in greater detail in the FEMA document, *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards*.

- Limit or restrict development in flood-prone areas
    - The only floodplain in the planning area is fully developed ensuring no new structures will be constructed in this area.
- Preserve natural open spaces in floodplains
    - Preservation of open space is a common practice within the planning area.
- Incorporate permeable surfaces and other "green infrastructure" components into municipal designs; establish a "green infrastructure" program
    - Green infrastructure in common within the planning area including but not limited to: crushed gravel roadways, native plantings, etc.
- Enhanced building codes (i.e. require tie-downs for propane tanks and other gas and chemical storage containers; require water detention swales and retention ponds for new construction)
    - This is not standard within the planning area
- Revise and update floodplain maps
    - The village of Thedford identified this as a need/strategy
- Manage the Floodplain Beyond Minimum Requirements
    - The entire state of Nebraska requires a one foot freeboard which exceeds that minimum national standards
- Participate in the National Flood Insurance Program (NFIP)
    - Two communities are currently participating in the NFIP
- Encourage property owners in areas protected by dams and levees to purchase flood insurance
    - This is not applicable for the planning area
- Participate in the NFIP's Community Rating System
    - No communities in this area are currently participating in the CRS
- Develop incentives for structural floodproofing
    - This is not standard within the planning area
- Consider erosion control and bank stabilization programs for critical facilities
    - This is not needed in the planning area
- Retain natural vegetative beds in stormwater channels
- Incorporate flood mitigation programs into comprehensive plans
    - There are few updated comprehensive plans in this area and very little floodplain area.
- Construct flood control measures
    - This is not applicable for communities in the planning area.
- Evaluate and update municipal storm water systems
    - This is not needed in the planning area
- Develop flood response plans for the community (incorporating information about pet and agricultural animal considerations)

    - County LEOPS address this area
- Establish education programs to educate the public about the risks of flooding and ways to protect their families and property
    - County EMA offer materials related to regional hazards

SEVERE WEATHER

HAIL

Hazard Profile

Hail is usually associated with severe thunderstorms. This association makes hail just as unpredictable as a severe thunderstorm. Hail events in thunderstorms differ from many other hazards in that they are generally large in magnitude, have a long duration, and travel large areas and through multiple jurisdictions within a single region. Additionally, hail events in thunderstorms often occur in series, with one area having the potential to be hit multiple times in one day.

Severe thunderstorms in the planning area usually occur in the evening during the spring and summer months. These often massive storms can include heavy rain, hail, lightning, high wind, and can produce tornados with little or no advanced warning. Furthermore, hail can destroy property and crops with their shear force as some hail stones can fall at 100 mph.

While the moisture from the thunderstorms that are associated with hail events can be beneficial. When thunderstorms do produce hail the potential for crop losses, property losses due to building and automobile damages, and personal injury from people not seeking shelter during these events. The potential for damages increases as the size of the hail increases.

Historical Occurrence

The NCDC reports events as they occur in *each* community. A single hail event can affect multiple communities and counties at a time; the NCDC reports these large scale, multi-county events as separate events. The result is a single hail event covering a large portion of the planning area could be reported by the NCDC as several events. For the purpose of clarity, if a severe thunderstorm event is recorded in multiple communities/counties on the same day, it is counted as a single storm event for this planning process. The NCDC reports a total of 618 hail events in the planning area; these 618 isolated events are more accurately represented by the number of total hail events. The 618 events occurred in 259 large-scale regional hail storms. These events were responsible for $1,634,000 in property damages and $2,302,000 in crop damages. These events resulted in zero injuries and fatalities.

Location

The entire planning area is at risk hail due to the regional nature of this type of event.

Extent

The TORRO scale is used throughout the United Kingdom to classify hailstones and provides some detail related to the potential impacts from hail. Table 42 outlines the TORRO Hailstone Scale.

Table 42: TORRO Hailstone Scale

TORRO Classification / Intensity	Typical Hail Diameter	Typical Damage Impacts
H0: Hard Hail	5 mm; Pea size	No damage
H1: Potentially Damaging	5 -15 mm (marble)	Slight general damage to plants and crops
H2: Significant	10 -20 mm (grape)	Significant damage to fruit, crops, and vegetation
H3: Severe	20 -30 mm (Walnut)	Severe damage to fruit and crops, damage to glass and plastic structures
H4: Severe	30 -40 mm (Squash Ball)	Widespread damage to glass, vehicle bodywork damaged
H5: Destructive	40 – 50 mm (Golf ball)	Wholesale destruction of glass, damage to tiled roofs; significant risk or injury
H6: Destructive	50 – 60 mm (chicken egg)	Grounded aircrafts damaged, brick walls pitted; significant risk of injury

H7: Destructive	60 – 75 mm (Tennis ball)	Severe roof damage; risk of serious injuries
H8: Destructive	75 – 90 mm (Large orange)	Severe damage to structures, vehicles, airplanes; risk of serious injuries
H9: Super Hail	90 – 100 mm (Grapefruit)	Extensive structural damage; risk of severe or even fatal injuries to persons outdoors
H10: Super Hail	>100 mm (Melon)	Extensive structural damage; risk or severe or even fatal injuries to persons outdoors

From 1996 to 2014 there were 259 reported hail events in the planning area. Of the 259 hail events reported for the planning area the average hailstone size is less than one inch. Events of this magnitude correlate to an H2 and H3 classifications. It is reasonable to expect H3 classified events to occur more than one time per year in the planning area. In addition it is reasonable, based on the number of occurrence, to expect larger hailstones to occur in the planning area annually. For this event it is realist to expect an H5 event to occur approximately one time per year in the planning area.

Probability
Based on historic records and reported events severe thunderstorms and hail are likely to occur on an annual basis. The NCDC reported 259 hail events between 1996 and 2014 this results in approximately 14 hail event annually.

Vulnerability
Vulnerable populations related to severe thunderstorms include the elderly, those living in mobile homes, and those caught outside during storm events. Vulnerable areas to consider include public parks, campgrounds, swimming pools, and schools with playgrounds.

- Elderly
  The elderly are generally less mobile than many other members or the community, making them more vulnerable to a wide range of threats.

- Mobile Home Residents
  Hail can seriously impact residents of mobile homes. Nebraska is one of the three states that receive the highest number of hail events annually.

- Property Vulnerability
  The damage can range from a few downed tree limbs to wide spread tree loss, hail damage, and significant property damage. All building stock and infrastructure including critical facilities, vehicles, power lines, trees, and utilities are at risk of being damaged or affected by severe thunderstorms.

- Vacant Structures
  The planning area is losing population which making the area more vulnerable to severe thunderstorms. The increase in vulnerability relative to a declining population is related to an increased number of vacant properties. Structures in poor condition can result in added debris in the event of various different hazards. It can create additional debris following thunderstorms winds and tornados.

Averaged Annual Damages and Frequency
The average damage per event estimate was determined based upon NCDC Storm Events Database since 1996 and number of historical occurrences. This does not include losses from displacement, functional downtime, economic loss, injury, or loss of life. According to the table below, flooding events have a high

probability of future occurrences in the planning area with an annual frequency of 14.39. It could cause $90,778 per year and $6,308 per event due to hail events for the whole ULNRD.

Table 43: Hail Loss Estimator

Hazard Type	Number of Events	Annual Frequency	Total Property Loss	Annual Property Loss	Total Crop Loss	Annual Crop Loss
Hail	259	14.39	$1,634,000	$90,778	$2,302,000	$ 127,889

Source: NCDC (January, 1996 to January, 2014).

Summary
Hail events are high probability events within the planning area. There were 259 hail events (618 isolated reports via NCDC) in an 18 year period. Hail was among the most costly hazard events in the planning area during that time period. Thunderstorms and hail typically do not result in injuries to people but can result in significant economic impacts to both the built environment and the agricultural sector.

Future Development and Vulnerability
Given the scope and regional aspect related to severe thunderstorms future developments and critical facilities will be exposed to this threat. There are actions that that developers, builders, and community officials can implement to reduce vulnerability. *Section Seven* will identify specific strategies that have been identified by participating jurisdictions to reduce vulnerabilities in existing and future development areas.

Mitigation Actions
The following bullet points identify some general mitigation strategies that can be used to reduce a community's population vulnerability to the threat of severe thunderstorms. Many of these strategies are identified and discussed in greater detail in the FEMA document *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards*.

- Establish community severe weather warning protocols
    - Emergency management agencies in the planning area have warning protocols
- Incorporate text messaging into severe weather messaging programs
    - Emergency management offices covering all of the participating counties offer text messaging regarding hazards via the Code Red system.
- Incorporate cable TV interruption warning systems
    - Local televisions stations can be interrupted but not cable networks. It should also be noted that the village of Hyannis identified increase communications as a need (for more information refer to Section Seven).
- Purchase and issue weather radios to critical facilities and vulnerable populations
    - Multiple communities identified this as a mitigation project
- Establish mutual aide agreements with neighboring communities and privately owned businesses
    - Communities in the planning area maintain mutual aide agreements with other nearby communities. Participating communities also identified the use of private businesses as valuable partners in recover efforts especially in past events.
- Establish public education programs to increase awareness of the dangers posed by severe thunderstorms and ways the public can mitigate the potential impacts
    - There are public education programs sponsored by the emergency management agencies in the planning area.

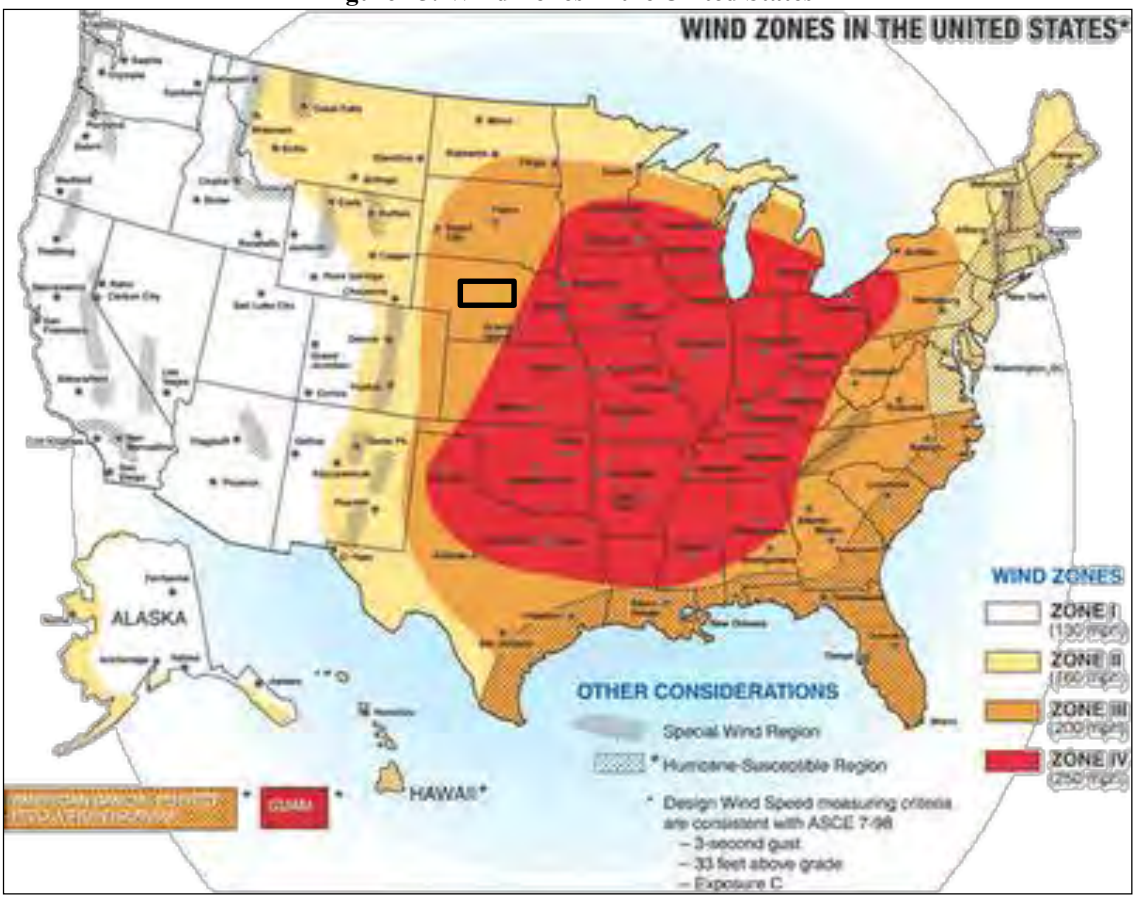
- Install and maintain surge protection for critical facilities
    - Most participating jurisdictions reported the use of surge protectors in critical facilities; other communities identified this as a need/project.
- Incentive programs to encourage the use of hail resistant roofing materials for new and existing structures
    - This has not occurred within the planning area.
- Develop business continuity plans for critical community services (public and private)
    - This was identified as a project/need for some participating jurisdictions; other, smaller communities with few businesses did not report this as having occurred nor did they indicate it was something they anticipated doing in the future.

HIGH WINDS

Profile

High winds typically accompany severe thunderstorms and severe winter storms and can cause significant property and crop damage, downed power lines, loss of electricity, obstruction to traffic flow, and significant damage to trees and center-pivot irrigation systems. All building stock and above ground infrastructure, including critical facilities, are at risk of being damaged or affected by high winds. High wind speeds and flying debris can pose a significant threat to human life. Figure 25 shows the wind zones in the United States the planning area is outlined in black.

Figure 25: Wind Zones in the United States



Source: Federal Emergency Management Agency

Historical Occurrences

The NCDC reported a total of 29 high wind events for the planning area from 1996 to 2014. It was reported to result in $6,000 in total property damages and no deaths, injuries, and $100,000 crop damages. There were no major events in the planning area causing deaths or injuries.

Location

High winds commonly occur throughout the planning area. Developed areas are at greater risk of damages than the rural, less densely populated portions of the planning area.

Extent
The National Weather Service (NWS) defines High Winds as sustained wind speeds of 40 mph or greater lasting for 1 hour or longer, or winds of 58 mph or greater for any duration. The NWS issues High Wind Advisories when there are sustained winds of 25 – 39 miles per hour and/or gusts to 57 mph. The Beaufort Wind Scale can be used to classify wind strength. Table 44 outlines the scale, providing wind speed ranking, range of wind speeds per ranking, and a brief description of conditions for each ranking.

Table 44: Beaufort Wind Force Rankings

Beaufort Wind Force Ranking	Range of Wind Speeds	Conditions
0	<1 mph	Smoke rises vertically
1	1 – 3 mph	Direction shown by smoke but not wind vanes
2	4 – 7 mph	Wind felt on face; leaves rustle; wind vanes move
3	8 – 12 mph	Leaves and small twigs in constant motion
4	13 – 18 mph	Raises dust and loose paper; small branches move
5	19 – 24 mph	Small trees in leaf begin to move
6	25 – 31 mph	Large branches in motion; umbrellas used with difficulty
7	32 – 38 mph	Whole trees in motion; inconvenience felt when walking against the wind
8	39 – 46 mph	Breaks twigs off tree; generally impedes progress
9	47 – 54 mph	Slight structural damage; chimneypots and slates removed
10	55 – 63 mph	Trees uprooted; considerable structural damages; improperly or mobiles homes with no anchors turned over
11	64 – 72 mph	Widespread damages; very rarely experienced
12 – 17	72 - >200 mph	Hurricane; devastation

Source: National Weather Service

Using the NCDC reported events the most common high wind event is a Level 8/9 event. The reported high wind events produced an average event with 47 mph winds with gusts over 60 mph.

Probability
Based on historical records it is likely that high winds will occur within the planning area annually. For the 18 years examined there were 29 reported high winds events reported. Given the historical record it is reasonable to expect one to two high wind events annually for the planning area.

Vulnerability
High winds are a zonal event and can equally affect the entire planning area. All building stock and above ground infrastructure, including critical facilities, are at risk of being damaged or affected by high winds. High winds can cause structure loss, downed power lines, loss of electricity, obstruction to traffic flow, and significant damage to trees.

- Economic Vulnerability

The planning area is losing population which making the area more vulnerable to tornados and high winds. The majority of the increase in vulnerability relative to a declining population has to do with the vacant properties which can result. Vacant housing is often more likely to be in disrepair, and eventually add to blight. Housing in poor condition can result in added debris in the event of various different hazards. It can create additional debris following thunderstorms winds and tornadoes. It can also provide housing for pests, such as pigeons and rats which can have other detrimental effects on neighboring houses as well as on some kinds of crops (as well as a connection back to the spread of pandemic disease).

Often, a declining population is also an aging population – as it tends to be the younger families who move on/out. There is some vulnerability associated with that as well. Vacant housing can lead to economic impacts, if there is a lack of tenants for rental properties and/or lack of a local base to shop in local establishments.

Averaged Annual Damages and Frequency
The average damage per event estimate was determined based upon NCDC Storm Events Database since 1996 and number of historical occurrences. This does not include losses from displacement, functional downtime, economic loss, injury, or loss of life. According to the table below, high winds have a high probability of future occurrences in the planning area with an annual frequency of 45. It would cause $333 per year and $207 per event due to high wind events for the whole ULNRD.

Table 45: High Wind Loss Estimation

Hazard Type	Number of Events[1]	Annual Frequency	Total Property Loss	Annual Property Loss	Total Crop Loss	Annual Crop Loss
High Wind	29	1.61	$6,000	$333	$100,000	$5,555

Source: NCDC (January, 1996 to January, 2014)

Summary
From the data collected from the NCDC, high winds have a high probability of occurring in the planning area (near 100 percent probability annually). Based on historic events impacts are likely to be minor but it is possible that population, property, and critical facility and infrastructure could sustain significant damages in a localized area. The most likely extent for high winds is a level 8/9 event as ranked by the Beaufort Wind Scale. There are a number of strategies that can be employed to reduce vulnerability to tornados and high winds, some of the strategies were identified by participating jurisdictions as desired project while others were already implemented.

Future Development and Vulnerability
Overall, the planning area is experiencing decline. However, there are communities that are growing in the planning area. There are many strategies that can be undertaken to protect both existing and future assets. Building codes for new structures can be strengthened, requiring increased rebar in foundations, enhanced nailing patterns for wall sheathing, and the use of Simpson Strong Ties and Straps. Building codes can also be strengthened to require the use of anchors and tie-downs of mobile homes. Additionally, individuals can choose to build to an optional Code Plus Standard, such as Fortified for Safer Living. Saferooms can be installed in new structures as well as made to adapt to existing structures. In-ground saferooms can be installed in existing structures for as little as $4,000. The installation of public saferooms in areas around vulnerable populations, such as mobile home parks, can increase safety of residents in those areas.

Potential Mitigation Actions
The following bullet points identify some general mitigation strategies that can be used to reduce a community's population vulnerability to the threat of tornado events. Some of these strategies, such as the use of warning systems, are already in place in the planning area. Many of these strategies are identified and discussed in greater detail in the FEMA document *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards*.

- Ensure schools are equipped with sufficient safe space for their maximum student capacity
    - Mullen Public School District plans on pursuing a tornado safe room following this planning process
- Develop maps of "vulnerable populations" and saferooms located near those groups

    - While there are not formal lists of vulnerable populations one of the strengths of the jurisdictions within the ULNRD is the sense of community. In nearly every community within the ULNRD residents are aware of residents with special needs and have an informal procedure to check on community members with higher level of needs.
- Ensure outdoor warning sirens are functional and located adequately to warn the public of potential tornado events
    - Communities within the ULNRD report having sufficient coverage from their warning sirens.
- Incorporate text messaging into severe weather messaging programs
    - Emergency management offices covering all of the participating counties offer text messaging regarding hazards via the Code Red system.
- Incorporate cable TV interruption warning systems
    - Local televisions stations can be interrupted but not cable networks. It should also be noted that the village of Hyannis identified increase communications as a need (for more information refer to *Section Seven*).
- Enhance building codes to incorporate wind –resistant building techniques
    - At this time there are few building codes enacted throughout the planning area.
- Bury overhead power lines
    - There are a small number of power lines that have buried in the planning area thus far. With the high water table this strategy is not always the best option for the entire planning area.
- Establish redundancies for necessary municipal services (i.e. water, gas, electric, transportation)
    - Many of the communities reported needing generators to support critical functions.
- Establish data recovery program and backup program for municipal employees
    - Many of the participating counties reported having data backup programs; some communities identified this as a need/project.
- Establish a Tree Board to assist in the development of a tree management program
    - While participating jurisdictions did not report having or wanting tree boards there are programs and procedures in place to facilitate tree care within communities. The ULNRD is very active in tree planting and care programs throughout the planning area.
- Participate in Tree City USA; establish a tree maintenance ordinance
    - There are no Tree City USA communities in the planning area.
- Encourage the construction of safe rooms
    - Most communities in the planning area reported basements and cellars as being common throughout the planning area. In addition, many communities identified storm shelters as desired projects.
- Require tornado saferooms in newly constructed municipal buildings
    - This is not likely to occur in the planning area.

SEVERE THUNDERSTORMS

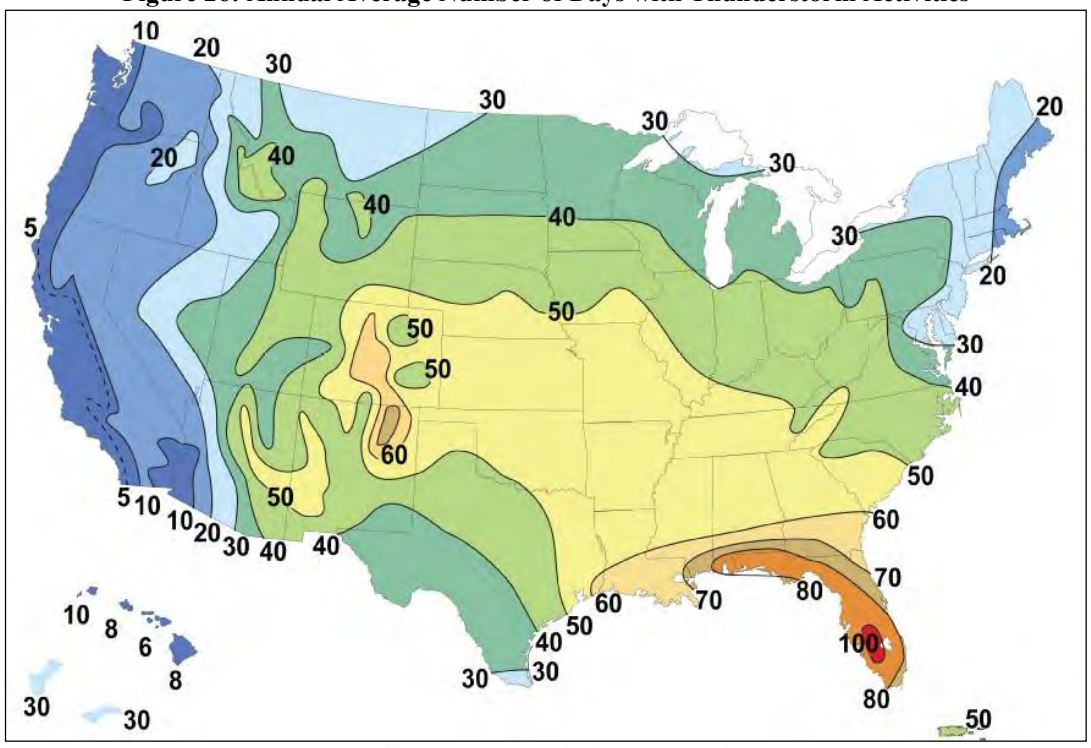
Hazard Profile

Severe thunderstorms are common and unpredictable annual events throughout the central and southern United States. Thunderstorms differ from many other hazards in that they are generally large in magnitude, have a long duration, and travel across large areas and through multiple jurisdictions within a single region. Additionally, thunderstorms often occur in series, with one area having the potential to be hit multiple times in one day.

Severe thunderstorms in planning area usually occur in the evening during the spring and summer months. These often massive storms can include heavy rain, hail, lightning, high wind, and can produce tornados with little or no advanced warning. Furthermore, heavy rains can cause flooding, lightning can cause wildfires, and high winds can down trees, cause power outages, and destroy property with their shear force.

Economically, thunderstorms are generally beneficial in that they provide moisture necessary to support Nebraska's largest industry, agriculture. The majority of thunderstorms do not cause damage, but when they escalate to the point of becoming severe, the potential for damages include crop losses from wind and hail, property losses due to building and automobile damages due to hail, wind, or flash flooding, and death or injury to humans and animals from lightning, drowning, or getting struck by falling or flying debris. Figure 26 displays the average number of days with thunder across the country each year, with Nebraska experiencing between 45 to 55 days from north to south across the state.

Figure 26: Annual Average Number of Days with Thunderstorm Activities



Source: http://www.nws.noaa.gov/om/severeweather/index.shtml

Thunderstorms can develop in less than 30 minutes, and can grow to an elevation of eight miles into the atmosphere. There are an estimated 100,000 thunderstorms in the United States each year, of which 10 percent are severe. Lightning, by definition, is present in all thunderstorms and can be harmful to humans and animals, cause fires to buildings and agricultural lands, and cause electrical outages in municipal electrical systems. Between 1977 and 2006, an average of 62 people were killed each year by lightning in

the United States. In Nebraska eight fatalities were attributed to lightning between 1990 and 2003. Lightning can strike up to 10 miles from the portion of the storm depositing precipitation. There are three primary types of lightning: intra-cloud, inter-cloud, and cloud to ground. While intra and inter-cloud lightning are more common, it is when lightning comes in contact with the ground that society is potentially impacted. Lightning generally occurs when warm air is mixed with colder air masses resulting in atmospheric disturbances necessary for polarizing the atmosphere. There is no scale for measuring lightning.

Historical Occurrence
The NCDC reports events as they occur in *each* community. A single severe thunderstorm event can affect multiple communities and counties at a time; the NCDC reports these large scale, multi-county events as separate events. The result is a single thunderstorm event covering the entire region could be reported by the NCDC as several events. For the purpose of clarity, if a severe thunderstorm event is recorded in multiple communities/counties on the same day, it is counted as a single storm event for this planning process. The NCDC reports a total of 117 thunderstorm (wind), heavy rain, and lightening events in the planning area; these 117 isolated events are more accurately represented by the number of total storm events. The 117 events occurred in 66 large-scale regional thunderstorm events. These events were responsible for $363,000 in total property damages, no deaths or injuries, and $57,000 crop damages.

Location
The entire planning area is at risk of severe thunderstorms due to the regional nature of this type of storm.

Extent
A major component of severe thunderstorms is rainfall accumulations. For the planning area it is reasonable to expect spring (March, April and May) and summer (June, July and August) to have the highest rainfall totals. Using data provided by the High Plains Regional Climate Center the spring months should have an average of 20 days with at least trace amounts of precipitation. 13 days will receive precipitation totals greater than one tenth of an inch; approximately 4 days will have more than one half an inch of precipitation; and approximately 1 day will report rainfall totals equal to or greater than one inch. During the summer months the planning area can expect to receive at least trace amounts of precipitation on 23 days. More than 16 days will report totals greater than or equal to one tenth of an inch; 5 days will report rainfall totals of at least one half an inch; and 2 days will report precipitation totals of at least one inch.

Probability
Based on historic records and reported events severe thunderstorms are likely to occur on an annual basis. The NCDC reported 66 severe thunderstorms between 1996 and 2014.

Vulnerability
Vulnerable populations related to severe thunderstorms include the elderly, those living in mobile homes, and those caught outside during storm events. Vulnerable areas to consider include public parks, campgrounds, swimming pools, and schools with playgrounds.

- Elderly
  The elderly are generally less mobile than many other members or the community, making them more vulnerable to a wide range of threats.

- Mobile Home Residents
  Mobile homes that are not anchored or are improperly anchored are also at high risk during thunderstorms because they can be turned over by a wind of 60 to 70 mph.

- Prolonged Power Outages
  Severe thunderstorms can cause property damage or loss, downed power lines, loss of electricity, obstruction to traffic flow, significant damage to trees, and pose a threat to human life. The electrical infrastructure is highly vulnerable to damages from lightning strikes and downed tree branches, roadways are vulnerable to wash outs and surface damages from flash floods, and building stock and personal property are vulnerable to damages from large hail stones.

- Property Vulnerability
  The damage can range from a few downed tree limbs to wide spread tree loss, hail damage, and significant property damage. All building stock and infrastructure including critical facilities, vehicles, power lines, trees, and utilities are at risk of being damaged or affected by severe thunderstorms.

- Vacant Structures
  The planning area is losing population which making the area more vulnerable to severe thunderstorms. The increase in vulnerability relative to a declining population is related to an increased number of vacant properties. Structures in poor condition can result in added debris in the event of various different hazards. It can create additional debris following thunderstorms winds and tornados.

Averaged Annual Damages and Frequency
The average damage per event estimate was determined based upon NCDC Storm Events Database since 1996 and number of historical occurrences. This does not include losses from displacement, functional downtime, economic loss, injury, or loss of life. According to Table 46, severe thunderstorm events have a high probability of future occurrences in the planning area with an approximate annual frequency of three to four significant events a year.

Table 46: Severe Thunderstorm Loss Estimator

Hazard Type	Number of Events	Annual Frequency	Total Property Loss	Annual Property Loss	Total Crop Loss	Annual Crop Loss
Severe Thunderstorms	66	3.67	$363,000	$20,167	$57,000	$3,167

Source: NCDC (January, 1996 to January, 2014).

Summary
Severe thunderstorms and hail are high probability events within the planning area. There were 66 total thunderstorm events in an 18 year period. Thunderstorms and hail typically do not result in injuries to people but can result in significant economic impacts to both the built environment and the agricultural sector.

Future Development and Vulnerability
Given the scope and regional aspect related to severe thunderstorms future developments and critical facilities will be exposed to this threat. There are actions that that developers, builders, and community officials can implement to reduce vulnerability. *Section Seven* will identify specific strategies that have been identified by participating jurisdictions to reduce vulnerabilities in existing and future development areas.

Mitigation Actions
The following bullet points identify some general mitigation strategies that can be used to reduce a community's population vulnerability to the threat of severe thunderstorms. Many of these strategies are

identified and discussed in greater detail in the FEMA document *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards*.

- Establish community severe weather warning protocols
    - Emergency management agencies in the planning area have warning protocols
- Incorporate text messaging into severe weather messaging programs
    - Emergency management offices covering all of the participating counties offer text messaging regarding hazards via the Code Red system.
- Incorporate cable TV interruption warning systems
    - Local televisions stations can be interrupted but not cable networks. It should also be noted that the village of Hyannis identified increase communications as a need (for more information refer to Section Seven).
- Purchase and issue weather radios to critical facilities and vulnerable populations
    - Multiple communities identified this as a mitigation project
- Establish mutual aide agreements with neighboring communities and privately owned businesses
    - Communities in the planning area maintain mutual aide agreements with other nearby communities. Participating communities also identified the use of private businesses as valuable partners in recover efforts especially in past events.
- Establish public education programs to increase awareness of the dangers posed by severe thunderstorms and ways the public can mitigate the potential impacts
    - There are public education programs sponsored by the emergency management agencies in the planning area.
- Install and maintain surge protection for critical facilities
    - Most participating jurisdictions reported the use of surge protectors in critical facilities; other communities identified this as a need/project.
- Bury overhead power lines
    - There are a small number of power lines that have buried in the planning area thus far. With the high water table this strategy is not always the best option for the entire planning area.
- Establish a Tree Board to assist in the development of a tree management program
    - While participating jurisdictions did not report having or wanting tree boards there are programs and procedures in place to facilitate tree care within communities. The ULNRD is very active in tree planting and care programs throughout the planning area.
- Participate, or become a participant, in Tree City USA; establish a tree maintenance ordinance
    - There are no Tree City USA communities in the planning area.
- Establish redundancies for necessary municipal services (i.e. water, gas, electric, transportation)
    - Many of the communities reported needing generators to support critical functions.
- Establish data recovery program and backup program for municipal employees
    - Many of the participating counties reported having data backup programs; some communities identified this as a need/project.
- Develop business continuity plans for critical community services (public and private)
    - This was identified as a project/need for some participating jurisdictions; other, smaller communities with few businesses did not report this as having occurred nor did they indicate it was something they anticipated doing in the future.

SEVERE WINTER STORMS

Hazard Profile

Winter storms can bring extreme cold, freezing rain, and heavy or drifting snow creating blizzards. These storms are capable of extending over large areas, potentially impacting a broad range of populations, properties, critical facilities, and infrastructures. Although these storm events can reach large distances, there is generally significant warning time before a severe winter storm occurs.

- Extreme Cold

During severe winter storm events, extreme cold can be dangerous to the well-being of people and animals. What constitutes extreme cold varies from region to region, but is generally accepted as being temperatures that are significantly lower than the average low temperature. Figure 26 shows the monthly average low temperatures of the planning area.

- Freezing Rain

Along with snow, winter storms also have the potential to deposit significant amounts of ice. Ice buildup on tree limbs and power lines can cause them to collapse. This is most likely to occur when ice falls in the form of rain that freezes upon contact, which is most likely to occur in the presence of wind. Ice can also lead to many problems on the roads, as it makes them slick, causing automobile accidents, and making vehicle travel difficult.

- Blizzards

Blizzards are particularly dangerous during severe winter storms due to drifting snow and the potential for rapidly occurring whiteout conditions, which greatly inhibits vehicular traffic. Heavy snow is usually the most defining element of a winter storm. Large snow events can cripple an entire jurisdiction by hindering transportation, knocking down tree limbs and utility lines, and causing structural damage to buildings.

Historical Occurrences

Based on data from the NCDC, a total of 66 severe winter storm events were reported for the planning area from 1996 to 2014. It was reported to result in $472,000 in total property damages and no losses in crop damages. An ice storm event occurred on February 3, 1998, resulting in two deaths, one injury and $16,000 worth of damages.

Location

Severe winter storms occur on a regional scale, and can equally affect the entire planning area. All building stock and infrastructure, including critical facilities, are at risk of being damaged or affected by a single severe winter storm event.

Extent

The Sperry-Piltz Ice Accumulation Index (SPIA) was developed by the National Weather Service to predict the accumulation of ice and resulting damages. The SPIA looks at total precipitation, wind, and temperatures to predict the intensity of ice storms. Figure 27, shows the SPIA index.

Figure 27: SPIA Index

The Sperry-Piltz Ice Accumulation Index, or "SPIA Index" – Copyright, February, 2009

ICE DAMAGE INDEX	* AVERAGE NWS ICE AMOUNT (in inches) *Revised-October, 2011	WIND (mph)	DAMAGE AND IMPACT DESCRIPTIONS
0	< 0.25	< 15	Minimal risk of damage to exposed utility systems; no alerts or advisories needed for crews, few outages.
1	0.10 – 0.25	15 - 25	Some isolated or localized utility interruptions are possible, typically lasting only a few hours. Roads and bridges may become slick and hazardous.
	0.25 – 0.50	> 15	
2	0.10 – 0.25	25 - 35	Scattered utility interruptions expected, typically lasting 12 to 24 hours. Roads and travel conditions may be extremely hazardous due to ice accumulation.
	0.25 – 0.50	15 - 25	
	0.50 – 0.75	< 15	
3	0.10 – 0.25	> = 35	Numerous utility interruptions with some damage to main feeder lines and equipment expected. Tree limb damage is excessive. Outages lasting 1 – 5 days.
	0.25 – 0.50	25 - 35	
	0.50 – 0.75	15 - 25	
	0.75 – 1.00	< 15	
4	0.25 – 0.50	> = 35	Prolonged & widespread utility interruptions with extensive damage to main distribution feeder lines & some high voltage transmission lines/structures. Outages lasting 5 – 10 days.
	0.50 – 0.75	25 - 35	
	0.75 – 1.00	15 - 25	
	1.00 – 1.50	< 15	
5	0.50 – 0.75	> = 35	Catastrophic damage to entire exposed utility systems, including both distribution and transmission networks. Outages could last several weeks in some areas. Shelters needed.
	0.75 – 1.00	> = 25	
	1.00 – 1.50	> = 15	
	> 1.50	Any	

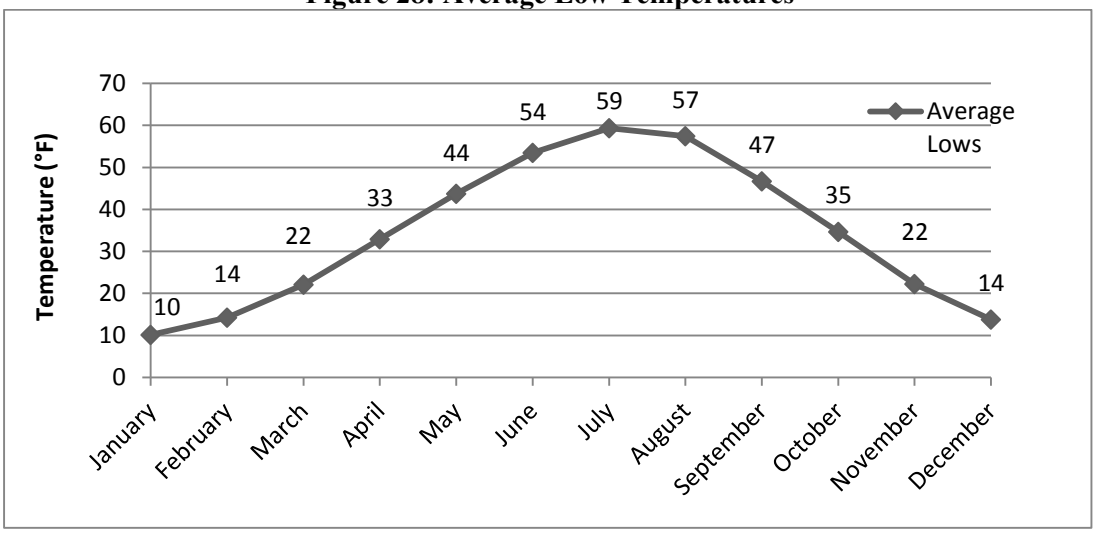
(Categories of damage are based upon combinations of precipitation totals, temperatures and wind speeds/directions.)

Source: http://www.spia-index.com/index.php

Reviews of historical severe winter storms across the planning area show that there is a range of events that can occur. Common components of winter storms in the planning area include extreme cold, ice, snow, and high winds. Typical ice events correlate with Level 2 occurrences according to the SPIA Index. Ice accumulations range from a quarter of an inch to three quarters of an inch. The most common accumulation was one quarter of an inch to half an inch occurring in both ice events.

The coldest months in the year are January, February, March, November, and December and average lows for these months are generally around 17 degrees (refer to Figure 28 for regional low temperatures) .

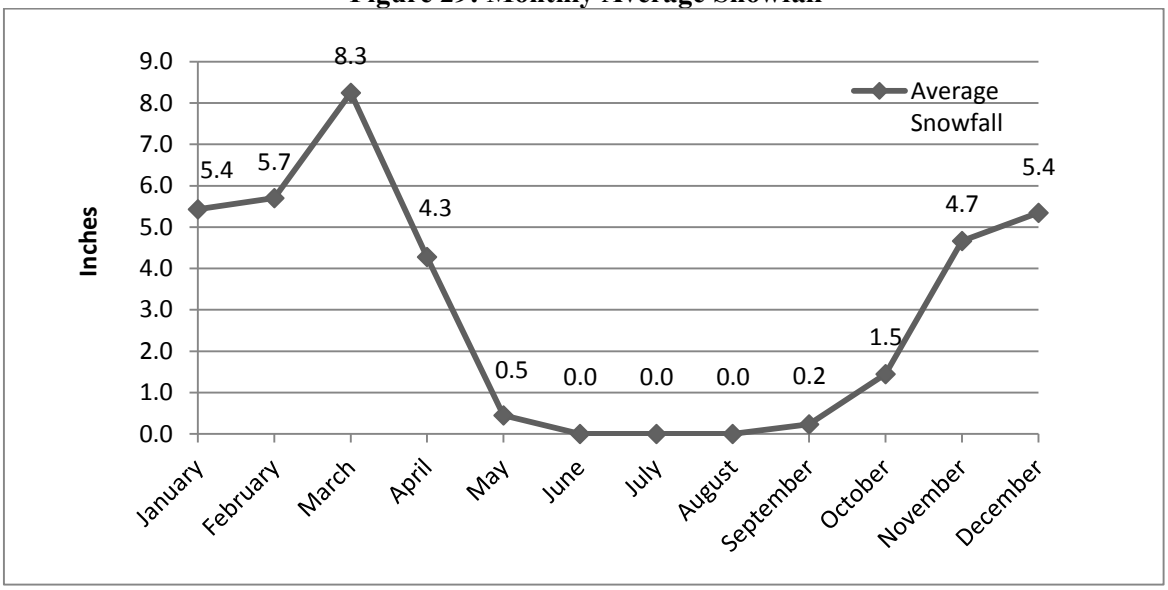
Figure 28: Average Low Temperatures



Source: High Plains Regional Climate Center

Historic snow events report accumulations between two inches and 14 inches during a twelve hour period [refer to Figure 29 for regional snow accumulation statistics as reported by the weather stations located in Brewster (251130), Purdum (256970), Halsey (253540), Mullen (255700, 255702), and Hyannis (254100)]. A common snow event (likely to occur annually) will result in accumulation totals between four and eight inches. Often these snow events are accompanied by high winds. It is reasonable to expect wind speeds of 25 to 40 mph with gusts reaching 60 mph or higher. Strong winds and low temperatures can combine to produce extreme wind chills of 45°F to 60°F below zero.

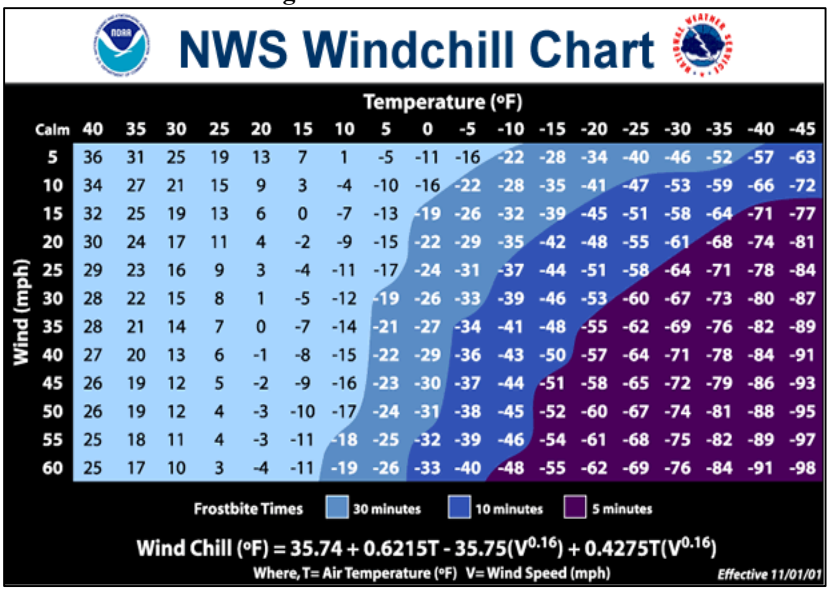
Figure 29: Monthly Average Snowfall



Source: High Plains Regional Climate Center

As indicated on the NWS windchill chart (Figure 30) extreme low temperatures like those in the planning area can result in injuries or death in a very short period of time.

Figure 30: Windchill Chart



Source: NWS

Probability

Based on historical records, it is likely that severe winter storms will occur within the planning area annually.

Vulnerability

Severe winter storms create a higher potential for decreased message dissemination due to the increased likelihood of damages to power and telephone lines as well as infrastructure related to threat communication (i.e. radio and television antennas). This decrease in message dissemination combined with potential power outages results in higher levels of vulnerability for a number of groups within the community. These power outages, which occur almost on an annual basis with severe winter storms in Nebraska, in combination with cold temperatures and below zero wind-chill, can pose a significant threat to human life. Snow and ice accumulations on transportation routes can lead to obstruction of traffic flow and hinder emergency response. The most common injuries and deaths during extreme cold events are hypothermia and frostbite. According to the NCDC, hypothermia occurs when your body loses heat faster than it can be produced. Prolonged exposure to cold will use up the body's stored energy. Hypothermia affects a person's brain making the victim unable to think clearly. Frostbite is an injury caused by freezing. Frostbite can permanently damage body tissues, and severe cases can lead to amputation. The most common areas on the body for frostbite include the nose, ears, cheeks, chin, fingers, or toes.

Highly vulnerable populations, which are defined as the people who are at the most risk in regards to this hazard, include residents of facilities that require continuity of service, young children, the elderly and people with limited mobility, those living in poor conditions, residents new to the area, and people isolated from social interaction.

- Hospital and nursing homes

People who require medical attention or that rely on medical devices, such as residents of hospitals, nursing homes, and other facilities are at high risk during severe winter storm events. This elevated risk results from dependence upon care givers that may not be able to navigate snowy or ice covered roadways. Additionally a larger segment of this population require medical devices which might not be available during power outages resulting from power lines damaged during winter storms from ice or broken or damaged trees.

- Young children

Young children are more vulnerable to impacts resulting from severe winter storms. Young children can lose body heat quickly if in cold or poorly heated areas resulting from an inability to regulate body temperature. Children under the age of 1 year are particularly vulnerable.

- Elderly and people with limited mobility

Elderly citizens are at higher risk of being isolated during severe winter storms as a result of decreased mobility, as well as a diminished ability to remove accumulations of snow and ice from vehicles and driveways. A 2011 study conducted by the Center for Injury Research and Policy found that on average, there are 11,500 injuries and 100 deaths annually related to snow removal. People, especially males over the age of 55, are 4.25 times more likely to experience cardiac symptoms during snow removal. Closed and impassable roadways increases the vulnerability among segments of the population that already have decreased mobility, making it important that they have a social network that can check on them and ensure that they have access to heat and food.

- Individuals and families below the poverty line

Individuals and families below the poverty line may lack resources or access to resources that could mitigate the impacts of severe winter storms. They might not have sufficient food supplies when snowed in, sufficient heat sources or alternative heating sources during prolonged power outages.

- New and isolated residents

People who are new to the area may not know what to expect from a severe winter storm and what actions are appropriate in preparing for the event. Communication may also be difficult for people new to the area

as well as isolated populations, as they may not be aware of the systems in place to inform the public of threats. Threat communication is imperative for informing and educating this portion of the population, and the best way to communicate is to educate all populations before a hazard event occurs.

- Economic Vulnerability

The planning area is losing population which making the area more vulnerable to severe winter weather. The decline in population can make it hard for the counties to be able to provide essential services that are needed during severe winter weather.

Averaged Annual Damages and Frequency

The average damage per event estimate was determined based upon NCDC Storm Events Database since 1996 and number of historical occurrences. This does not include losses from displacement, functional downtime, economic loss, injury, or loss of life. According to the table below, severe winter storms have a high probability of future occurrences in the planning area with an annual frequency of 3.67.

Table 47: Winter Storm Loss Estimation

Hazard Type	Number of Events	Annual Frequency	Total Property Loss	Annual Property Loss	Total Crop Loss	Annual Crop Loss
Severe Winter Storms	66	3.67	$472,000	$26,222	-	-

Source: NCDC (January, 1996 to January, 2014);

Summary

Based on historical occurrences and reports from the participating communities it is highly likely that severe winter storms will occur annually for the planning area. While there are a range of possible events it is highly likely that winter storms include extreme low temperatures (seasonal average of 17°F November – March) from 40°F - 60°F below zero for wind chill, strong winds (sustained winds of 25 – 40 mph and gust of 60 mph or greater) and snow accumulations (4 – 8 inches multiple times per year). Population, properties, critical facilities, and the economy are all vulnerable to the impacts resulting from severe winter storms and the population decline within the planning area could exacerbate these vulnerabilities.

Future Development and Vulnerability

There are many strategies that can be undertaken to protect both existing and future assets. ULNRD works with land owners to install "living snow fences" in areas that struggle with blowing and drifting snows. "Living snow fences" are strategically placed trees and shrubs that act as a wind and snow block, reducing snow drifts and decreasing amounts of snow that would otherwise blow across flat areas. This practice can be applied to existing and future development areas to help protect transportation routes and critical facilities.

Mitigation Alternatives

The following bullet points identify some general mitigation strategies that can be used to reduce a community's property vulnerability to the threat of severe winter storm events. Some of these strategies, such as the use of warning systems, are already in place in the planning area. Many of these strategies are identified and discussed in greater detail in the FEMA document, *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards*.

- Incorporate text messaging into severe weather messaging programs
    - The planning area has access to Code Red
- Incorporate cable TV interruption warning systems
    - Network channels only

- Establish road closure policies and procedures necessary to protect the public
    - There are informal road closure procedures within corporate limits and formal closure procedures in rural portions of the county
- Develop a database of "vulnerable populations"
    - This was identified by multiple communities. Other communities reported informal lists and protocols
- Work with community groups serving "vulnerable populations" such as Meals on Wheels programs to help monitor vulnerable groups
    - This is not necessary for communities in the planning area
- Establish public education programs to increase awareness of the dangers posed by severe winter storms and ways the public can mitigation the potential impacts
    - Regional emergency management agencies and the NRD offer educational materials
- Improve buildings codes to eliminate flat roofs in areas that expect heavy snow loads
    - This is not needed in the planning area
- Retrofit buildings and infrastructure to withstand snow loads
    - Current building practices are sufficient for regional snow loads
- Develop continuity plans for critical community services (public and private)
    - This was identified by multiple communities as a mitigation strategy
- Establish redundancies for necessary municipal services (i.e. water, gas, electric, transportation
    - This varies from community to community

TORNADOS

Profile

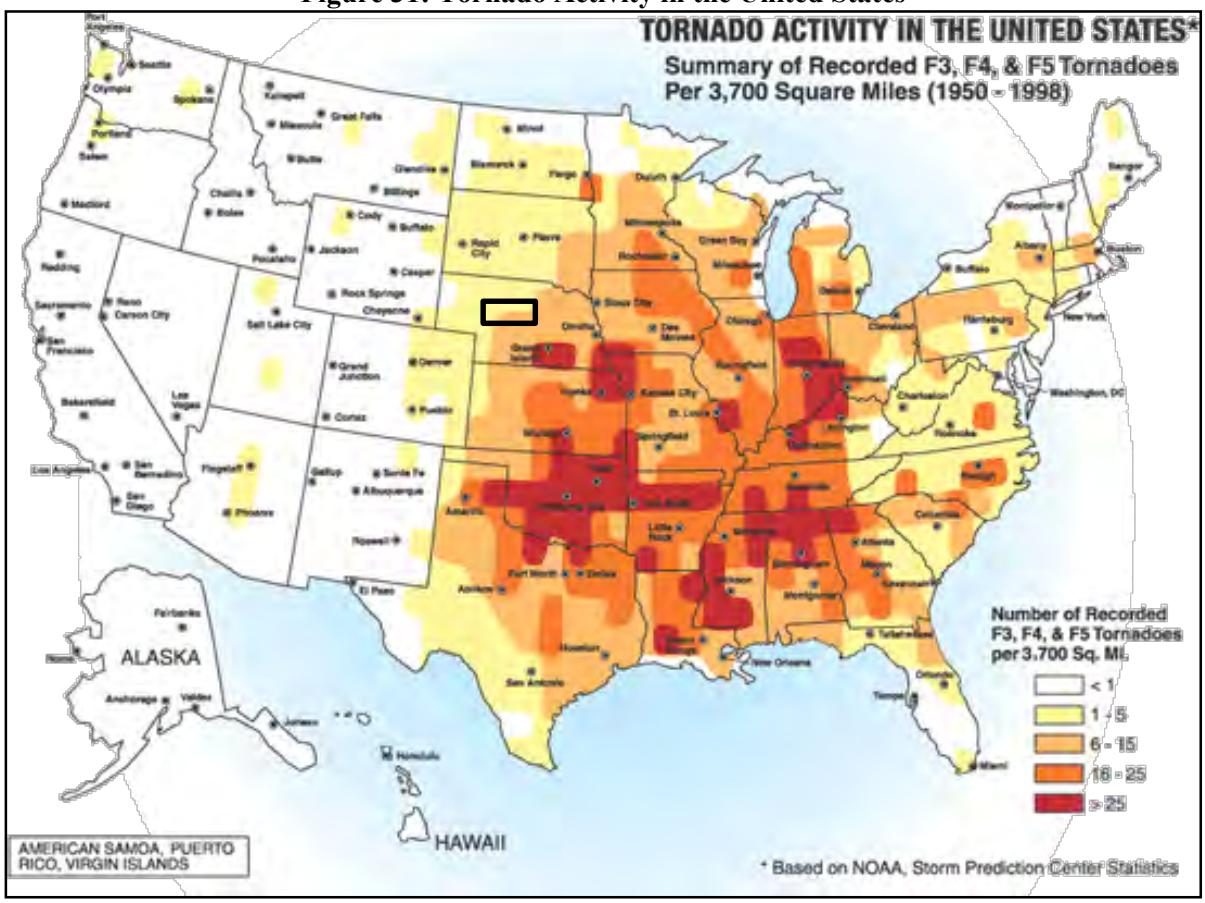
A tornado is typically associated with a supercell thunderstorm. In order for rotations to be classified as tornados, three characteristics must be met:

- There must be a microscale rotating area of wind, ranging in size from a few feet to a few miles wide;
- The rotating wind, or vortex, must be attached to a convective cloud base and must be in contact with the ground; and
- The spinning vortex of air must have caused enough damage to be classified by the Fujita Scale as a tornado.

Once tornados are formed, they can be extremely violent and destructive. They have been recorded all over the world, but are most prevalent in the American Midwest and South, in an area known as "Tornado Alley." Approximately 1,000 tornados are reported annually in the contiguous United States (NOAA 2012). Tornados can travel distances over 100 miles and reach over 11 miles above ground. Tornados usually stay on the ground no more than 20 minutes.

Nebraska is ranked fifth in the nation for tornado frequency with an annual average of 45 tornados between 1953 and 2004 (NOAA 2011). The annual average number of tornados for Nebraska from 1991 to 2011 has increased slightly to 57 (NOAA 2013). Figure 31 shows the tornado activity in the United States as a summary of recorded F3, F4, and F5 tornados per 3,700 square miles form 1950-1998; the planning area is outlined in black.

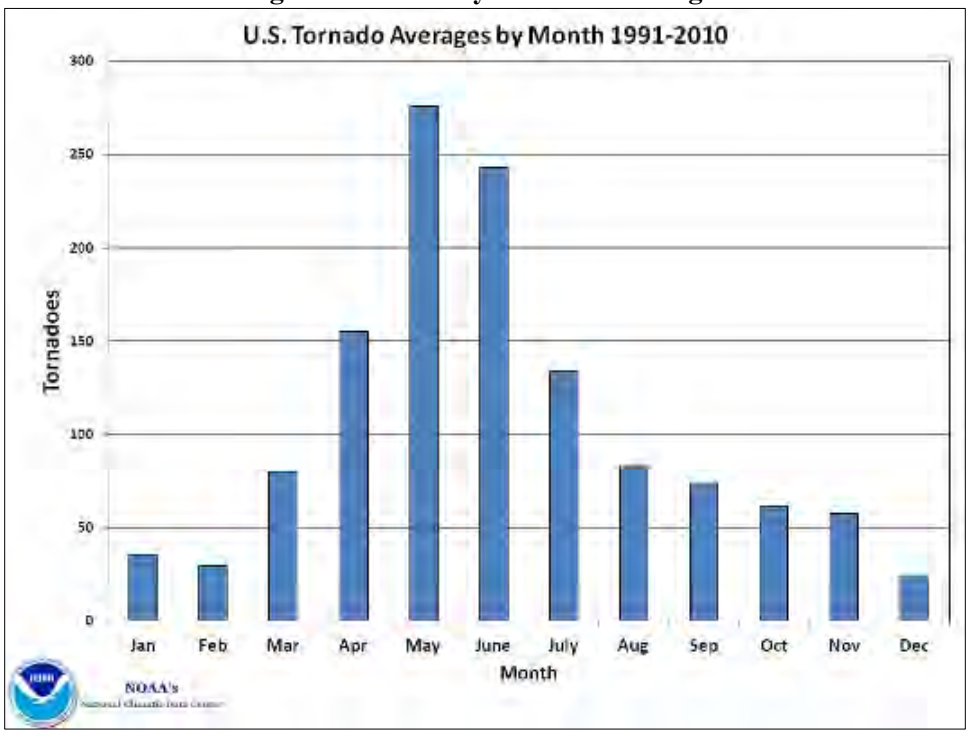
Figure 31: Tornado Activity in the United States



Source: United States Department of Commerce, National Oceanic Atmospheric Administration, Storm Prediction Center Statistics

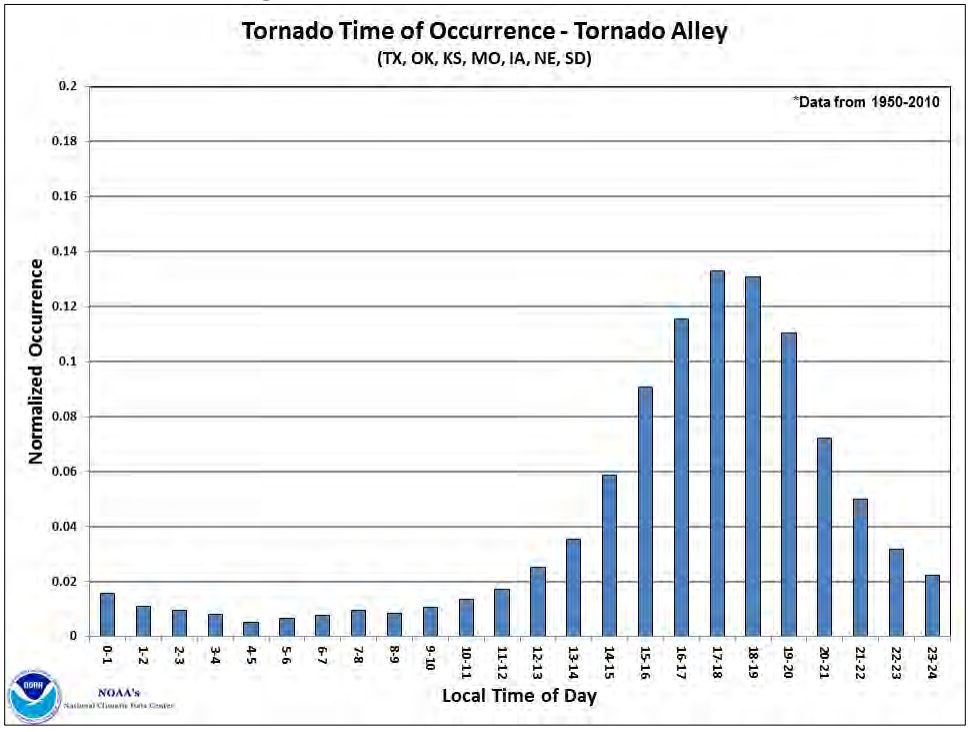
Nationally, the tornado season typically occurs between March and April. On average, 80 percent of tornados occur between noon and midnight. In Nebraska, 77 percent of all tornados occur in the months of May, June, and July.

Figure 32: Monthly Tornado Averages



Source: National Oceanic and Atmospheric Administration

Figure 33: Tornado Time of Occurrence

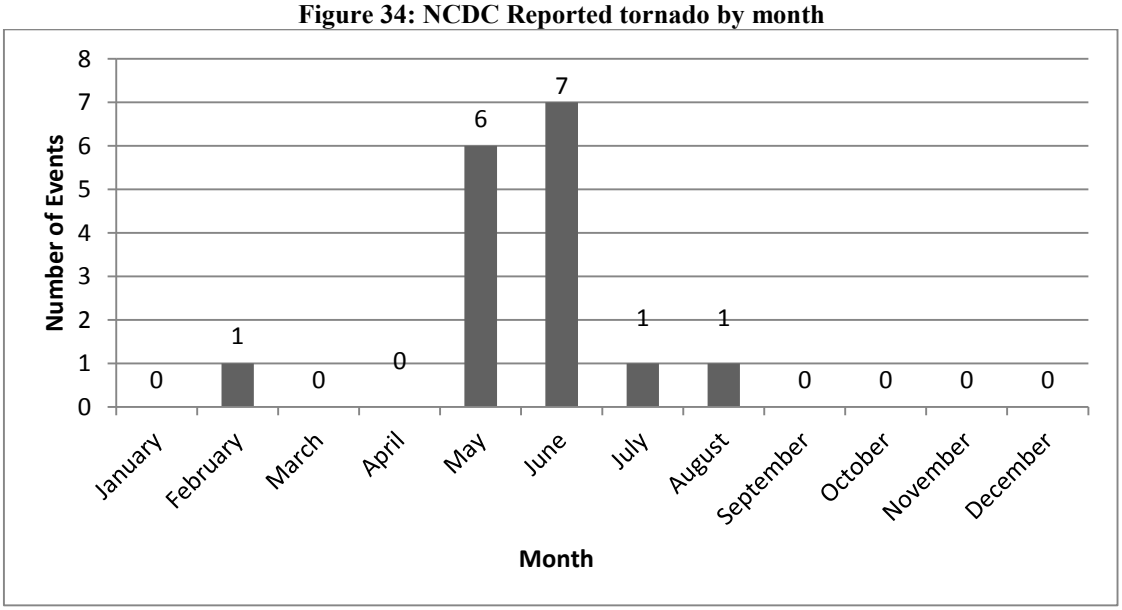


Source: National Oceanic and Atmospheric Administration

Historical Occurrences

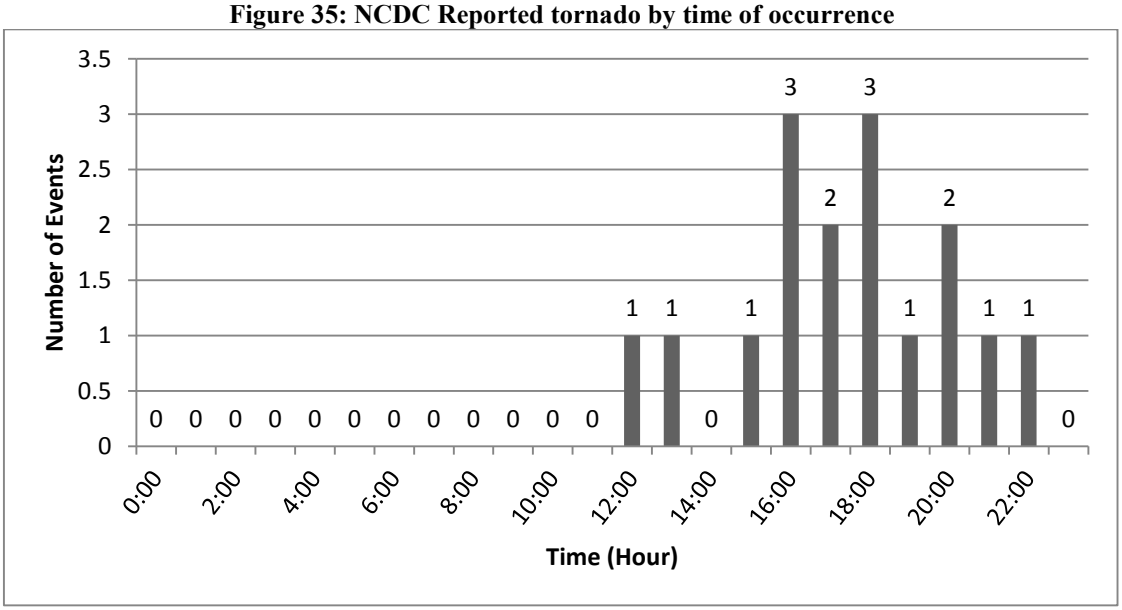
The NCDC reported a total of 16 tornado events for the planning area from 1996 to 2014. It was reported to result in $104,000 in total property damages and no deaths, injuries, or crop damages. There were no major events in the area causing death or injury.

Figure 34: NCDC Reported tornado by month



Source: NCDC

Figure 35: NCDC Reported tornado by time of occurrence



Source: NCDC

Location

Tornados have occurred in all of the counties participating in this plan. Developed, more densely populated areas are more vulnerable to impacts resulting from tornados. Logan and Blaine Counties have had the highest number of tornados reported and Hooker County the fewest.

Extent

After a tornado passes through an area, an official rating category is determined, which provides a common benchmark that allows comparisons to be made between different tornados. The magnitudes of tornados are measured by wind speeds on the Enhanced Fujita Scale. The Enhanced Fujita Scale does not measure tornados by their size or width, but rather the speed of winds and amount of damage caused to human-built structures and trees. The Enhanced Fujita Scale replaced the Fujita Scale in 2007. The enhanced scale classifies EF0-EF5 tornados based on damages as determined by engineers and meteorologists across 28 different types of building and tree damage indicators. In order to establish a rating, engineers and meteorologists examine the degree of damage (DOD) to a variety of damage indicators (buildings and trees) and use the predicted wind speeds based on DOD to damage indicators to determine an EF rating. Table 48 summarizes the final rating given to a tornado based on the wind speeds noted. Table 49 shows the damage indicators as well as the DOD measurements. According to a recent report from the National Institute of Science and Technology on the Joplin Tornado, tornados rated EF3 or lower account for around 96 percent of all tornado damages.

Table 48: Enhanced Fujita Scale

Storm Category	3 Second Gust (mph)	Damage Level
EF0	65-85 mph	Weak
EF1	86-110 mph	Weak
EF2	111-135 mph	Strong
EF3	136-165 mph	Severe
EF4	166-200 mph	Devastating
EF5	200+ mph	Incredible
EF No rating	--	Inconceivable

Source: National Oceanic and Atmospheric Administration; Federal Emergency Management Agency

Table 49: Enhanced F Scale Damage Indicators

Number	Damage Indicator
1	Small barns, farm outbuildings
2	One- or two-family residences
3	Single-wide mobile home (MHSW)
4	Double-wide mobile home
5	Apt, condo, townhouse (3 stories or less)
6	Motel
7	Masonry apt. or motel
8	Small retail bldg. (fast food)
9	Small professional (doctor office, branch bank)
10	Strip mall
11	Large shopping mall
12	Large, isolated ("big box") retail bldg.
13	Automobile showroom
14	Automotive service building
15	School - 1-story elementary (interior or exterior halls)
16	School - jr. or sr. high school
17	Low-rise (1-4 story) bldg.

18	Mid-rise (5-20 story) bldg.
19	High-rise (over 20 stories)
20	Institutional bldg. (hospital, govt. or university)
21	Metal building system
22	Service station canopy
23	Warehouse (tilt-up walls or heavy timber)
24	Transmission line tower
25	Free-standing tower
26	Free standing pole (light, flag, luminary)
27	Tree - hardwood
28	Tree - softwood

Source: National Oceanic and Atmospheric Administration; Federal Emergency Management Agency

Based on the historic record it is mostly likely that tornados that do occur within the planning area will be of EF0 strength. Of the 17 reported events one event was an F2 tornado in 1999 and one event was an EF1 tornado in 2007, other events were EF0.

Probability
Based on historical records there is approximately a 90 percent chance tornados will occur annually within the planning area. For the 18 years examined there were 16 reported tornados.

Vulnerability
Tornados can impact a wide range of people and properties. People living in mobile homes are specifically susceptible to the effects of tornados. Other factors that may increase vulnerability to the threat posed by tornados include age, poverty levels, and home rentals.

The most common injuries from tornados are from flying or falling debris. The second most common injuries come from being picked up or blown by the tornado. Other injuries that occur include being hit by objects, building collapsing, or broken glass. The most common injuries are soft tissue injuries and fractures.

- Individuals and families below the poverty line

Lower income populations often live in housing that is the most vulnerable. The homes that are available to this group are not always up to code and it is hard for the residents to make improvements because of the income bracket they are in.

- Mobile Home Residents

Mobile homes that are not anchored or are not anchored properly can be blown over by winds at speeds of 60 to 70 mph. A 2007 study conducted by Dr. W. Ashley at Northern Illinois University found that between 1985 and 2005, 44 percent of all tornado related fatalities occurred in mobile homes. Tornado related deaths in mobile homes have increased over the timeframe investigated from 37 percent of all fatalities from 1986 to 1990 to nearly 57 percent of all fatalities from 2001 to 2005.

The timing of tornados also impacts the vulnerability of people living in mobile homes. The 2007 study found that while only 25.8 percent of tornados occur between sunset and sunrise they account for 42.5 percent of tornado fatalities. This is a result of a number of factors including: decreased ability to identify tornados in the dark, decreased ability to communicate tornado threats due to a high rate of people sleeping during the night, and a higher number of people in the housing units (i.e. mobile home) during the nighttime.

Only 10 percent of housing units are mobile homes. Most of the mobile homes look to be spread out throughout the county with the exception of Hyannis due to the fact that it is the only participant in Grant County. However, even in Hyannis the mobile homes are spread throughout the village.

- Middle Aged and Elderly

The 2007 study found that middle age (those over 40 years of age) and the elderly are more vulnerable to tornados. This may be a result of decreased mobility, higher rate of auditory complications, or lack of resources needed to mitigate potential tornado related impacts.

- Property Vulnerability

Tornados occur with irregularity, and can equally affect the entire planning area. All building stock and above ground infrastructure, including critical facilities, are at risk of being damaged or affected by tornados. Tornados can cause structure loss, downed power lines, loss of electricity, obstruction to traffic flow, and significant damage to trees and center-pivot irrigation systems.

Averaged Annual Damages and Frequency

The average damage per event estimate was determined based upon NCDC Storm Events Database since 1996 and number of historical occurrences. This does not include losses from displacement, functional downtime, economic loss, injury, or loss of life. According to the table below, tornados have a high probability of future occurrences in the planning area with an annual frequency of .94. It would cause $5,778 per year and $6,118 per event due to tornados for the whole ULNRD area

Table 50: Tornado Loss Estimation

Hazard Type	Number of Events	Annual Frequency	Total Property Loss	Annual Property Loss[1]	Total Crop Loss	Annual Crop Loss
Tornados	16	.88	$104,000	$ 5,778	$0	$0

Source: NCDC (January, 1996 to January, 2014).

Summary

From the data collected from the NCDC, tornados have a high probability of occurring more than four times in the next ten years. Based on historic events impacts are likely to be minor but it is possible that population, property, and critical facility and infrastructure could sustain significant damages in a localized area. The most likely extent of tornadic events for the planning area is an EF0 event; the most likely extent for high winds is a level 8/9 event as ranked by the Beaufort Wind Scale. There are a number of strategies that can be employed to reduce vulnerability to tornados and high winds, some of the strategies were identified by participating jurisdictions as desired project while others were already implemented.

Future Development and Vulnerability

There are many strategies that can be undertaken to protect both existing and future assets. Building codes for new structures can be strengthened, requiring increased rebar in foundations, enhanced nailing patterns for wall sheathing, and the use of Simpson Strong Ties and Straps. Building codes can also be strengthened to require the use of anchors and tie-downs of mobile homes. Additionally, individuals can choose to build to an optional Code Plus Standard, such as Fortified for Safer Living. Saferooms can be installed in new structures as well as made to adapt to existing structures. In-ground saferooms can be installed in existing structures for as little as $4,000. The installation of public saferooms in areas around vulnerable populations, such as mobile home parks, can increase safety of residents in those areas.

Mitigation Actions

The following bullet points identify some general mitigation strategies that can be used to reduce a community's population vulnerability to the threat of tornado events. Some of these strategies, such as the use of warning systems, are already in place in the planning area. Many of these strategies are identified and discussed in greater detail in the FEMA document *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards*.

- Ensure schools are equipped with sufficient safe space for their maximum student capacity
    - Mullen Public School District plans on pursuing a tornado safe room following this planning process
- Develop maps of "vulnerable populations" and saferooms located near those groups
    - While there are not formal lists of vulnerable populations one of the strengths of the jurisdictions within the ULNRD is the sense of community. In nearly every community within the ULNRD residents are aware of residents with special needs and have an informal procedure to check on community members with higher level of needs.
- Ensure outdoor warning sirens are functional and located adequately to warn the public of potential tornado events
    - Communities within the ULNRD report having sufficient coverage from their warning sirens.
- Incorporate text messaging into severe weather messaging programs
    - Emergency management offices covering all of the participating counties offer text messaging regarding hazards via the Code Red system.
- Incorporate cable TV interruption warning systems
    - Local televisions stations can be interrupted but not cable networks. It should also be noted that the village of Hyannis identified increase communications as a need (for more information refer to *Section Seven*).
- Enhance building codes to incorporate wind –resistant building techniques
    - At this time there are few building codes enacted throughout the planning area.
- Bury overhead power lines
    - There are a small number of power lines that have buried in the planning area thus far. With the high water table this strategy is not always the best option for the entire planning area.
- Establish redundancies for necessary municipal services (i.e. water, gas, electric, transportation)
    - Many of the communities reported needing generators to support critical functions.
- Establish data recovery program and backup program for municipal employees
    - Many of the participating counties reported having data backup programs; some communities identified this as a need/project.
- Establish a Tree Board to assist in the development of a tree management program
    - While participating jurisdictions did not report having or wanting tree boards there are programs and procedures in place to facilitate tree care within communities. The ULNRD is very active in tree planting and care programs throughout the planning area.
- Participate in Tree City USA; establish a tree maintenance ordinance
    - There are no Tree City USA communities in the planning area.
- Encourage the construction of safe rooms
    - Most communities in the planning area reported basements and cellars as being common throughout the planning area. In addition, many communities identified storm shelters as desired projects.
- Require tornado saferooms in newly constructed municipal buildings
    - This is not likely to occur in the planning area.

STRUCTURAL FAILURE

DAM FAILURE

Hazard Profile

According to the Nebraska Administrative Code, Title 458, Chapter 1, Part 001.09, dams are " any artificial barrier, including appurtenant works, with the ability to impound water, wastewater, or liquid-borne materials and which is:

(a) is twenty-five feet or more in height from the natural bed of the stream or watercourse measured at the downstream toe of the barrier, or from the lowest elevation of the outside limit of the barrier if it is not across a stream channel or watercourse, to the maximum storage elevation or
(b) has an impounding capacity at maximum storage elevation of fifty acre- feet or more, except that any barrier described in this subsection which is not in excess of six feet in height or which has an impounding capacity at maximum storage elevation of not greater than fifteen acre-feet shall be exempt, unless such barrier, due to its location or other physical characteristics, is classified as a high hazard potential dam. Dam does not include:
    (1) an obstruction in a canal used to raise or lower water;
    (2) a fill or structure for highway or railroad use, but if such structure serves, either primarily or secondarily, additional purposes commonly associated with dams it shall be subject to review by the department;
    (3) canals, including the diversion structure, and levees; or
    (4) water storage or evaporation ponds regulated by the United States Nuclear Regulatory Commission."

The Department of Natural Resources uses a classification system for dams throughout the State including those areas participating this this plan. The classification system includes three classes such as Small, Intermediate, and Large, which are defined as:

Table 51: Dam Failure Classification System

Size	Effective Height (feet) x Effective Storage (acre-feet)	Effective Height
Small	≤ 3,000 acre-feet2	and ≤ 35 feet
Intermediate	> 3,000 acre-feet2 to < 30,000 acre-feet2	or > 35 feet
Large	≥ 30,000 acre-feet2	Regardless of Height

The effective height of a dam is defined as the difference in elevation in feet between the natural bed of the stream or watercourse measured at the downstream toe (or from the lowest elevation of the outside limit of the barrier if it is not across stream) to the auxiliary spillway crest. The effective storage is defined as the total storage volume in acre-feet in the reservoir below the elevation of the crest of the auxiliary spillway. If the dam does not have an auxiliary spillway, the effective height and effective storage should be measured at the top of dam elevation.

Dam failure, as a hazard, is described as a structural failure of a water impounding structure. Structural failure can occur during extreme conditions, which include but are not limited to:

- Reservoir inflows in excess of design flows
- Flood pools higher than previously attained
- Unexpected drop in pool level
- Pool near maximum level and rising
- Excessive rainfall or snowmelt

- Large discharge through spillway
- Erosion, landslide, seepage, settlement, and cracks in the dam or area
- Earthquakes

NDNR regulates dam safety and has classified dams by the potential hazard each poses to human life and economic loss. The following are classifications and descriptions for each hazard class:

Table 52: NE NRD Dam Hazard Classification (NDNR)

Minimal Hazard Potential	Failure of the dam would likely result in no economic loss beyond the cost of the structure itself and losses principally limited to the owner's property.
Low Hazard Potential	Failure of the dam would result in no probable loss of human life and in low economic loss. Failure may damage storage buildings, agricultural land, and county roads.
Significant Hazard Potential	Failure or misoperation of the dam would result in no probable loss of human life but could result in major economic loss, environmental damage, or disruption of lifeline facilities. Failure may result in shallow flooding of homes and commercial buildings or damage to main highways, minor railroads, or important public utilities.
High Hazard Potential	Failure or misoperation of the dam resulting in loss of human life is probable. Failure may cause serious damage to homes, industrial or commercial buildings, four-lane highways, or major railroads. Failure may cause shallow flooding of hospitals, nursing homes, or schools.

Historic Occurrences

While there is no record of dam failure within the planning area the 2014 Nebraska State Hazard Mitigation Plan does report the failure of multiple low hazard dams in 2010. This is relevant to the planning area due to the location of low and moderate hazard dams locate in Blaine and Thomas Counties. The experience of low hazard dams failing in 2010 identified a need for reevaluation of dams related to the potential of failure in the future.

Location

According to the NDNR database, no high hazard dam is located in ULNRD. There are four dams total reported in the planning area. The NDNR database also shows no high hazard dams upstream of the planning area that would affect the planning area if they were to be breached.

Table 53: Existing Dams in the Planning Area

Name	Location	Classification	Status	Emergency Action Plan
Tonawanda Llc. Hp.	Blaine County	Low Hazard	Existing	Not Required
Tonawanda Llc. Hp.	Blaine County	Low Hazard	Existing	Not Required
Jack Rabbit Site Lagoon	Thomas County	Moderate Hazard	Existing	Not Required
Wild Horse Lwcf.	Thomas County	Low Hazard	Approved	Not Required

Extent

Impacts from dam failure in the planning area will be to agricultural lands in the planning.

Probability

Dam failure has a low probability of occurring in the future based on the lack of historical events; however as stated in the 2014 Nebraska State Hazard Mitigation Plan the owners of the existing dams in the planning area should conduct site visits and evaluations to substantiate the potential for failure in the future. The findings from these reevaluations should be included in future updates of this document.

Vulnerability
With no high hazard dams in the planning area this hazard creates little vulnerability within the planning area.

Averaged Annual Damages and Frequency
With no high hazard dams in the planning area this there is no expected annual impacts.

Summary
There are no high hazard dams located in the planning area according to the NDNR. The existing and approved dams in the planning area would only impact rangelands and have minimal impact if they did fail.

Future Development
With the existing dams being in agricultural areas it will be important to monitor where new structures are built in rural portions of the counties. It is not likely that new structures will be built in inundation areas.

Mitigation Measures
This is not relevant for this planning area.

LEVEE FAILURE

Hazard Profile
According to FEMA's website:

> "The United States has thousands of miles of levee systems. These manmade structures are most commonly earthen embankments designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water to provide some level of protection from flooding. Some levee systems date back as far as 150 years. Some levee systems were built for agricultural purposes. Those levee systems designed to protect urban areas have typically been built to higher standards. Levee systems are designed to provide a specific level of flood protection. No levee system provides full protection from all flooding events to the people and structures located behind it. Thus, some level of flood risk exists in these levee-impacted areas."

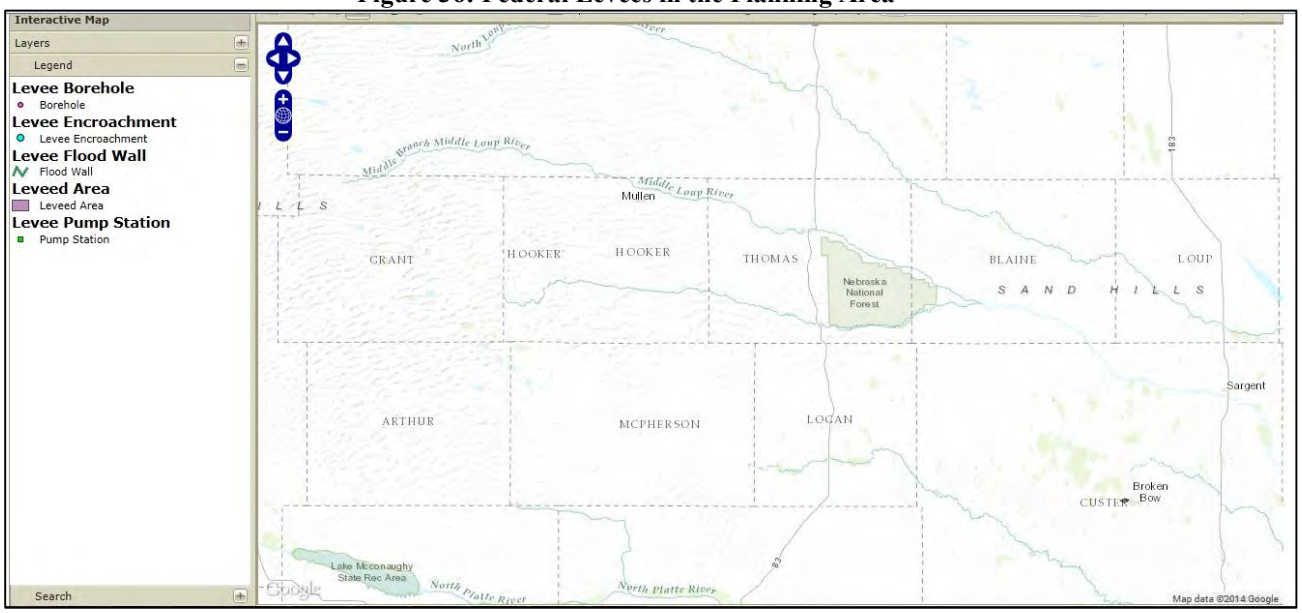
Levee failure can occur several ways. A breach of a levee is when part of the levee breaks away, leaving a large opening for floodwaters to flow through. A levee breach can be gradual by surface or subsurface erosion, or it can be sudden. A sudden breach of a levee often occurs when there are soil pores in the levee that allow water to flow through causing an upward pressure greater than the downward pressure from the weight of the soil of the levee. This under seepage can then resurface on the backside of the levee and can quickly erode a hole to cause a breach. Sometimes the levee actually sinks into a liquefied subsurface below.

Another way a levee failure can often occur is when the levee overtops the crest of the levee. This happens when the flood waters simply exceed the lowest crest elevation of the levee. An overtopping can lead to significant erosion of the backside of the levee and can result to a breach and thus a levee failure.

Historic Occurrences
None have been reported.

Location
There are no federal levees shown in the National Levee Database in the planning area.

Figure 36: Federal Levees in the Planning Area



Source: USACE

Extent
There are no federal levees in the planning area.

Probability
There is a low probability of levee failure occurring within the planning area or the surrounding counties which would result in impacts.

Vulnerability
With no federal levees in the planning area this hazard creates little vulnerability within the planning area.

Averaged Annual Damages and Frequency
With no federal levees in the planning area this there are no expected annual impacts.

Summary
There are no federal levees located in or near the planning area according to the USACE.

Future Development
This is not applicable for this hazard.

Mitigation Measures
This is not relevant for this planning area.

TERRORISM AND CIVIL DISORDER

TERRORISM

Hazard Profile

According to the Federal Bureau of Investigations (FBI), there is no single, universally accepted, definition of terrorism. Terrorism is defined in the Code of Federal Regulations as "the unlawful use of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives" (28 C.F.R. Section 0.85).

The FBI further describes terrorism as either domestic or international, depending on the origin, base, and objectives of the terrorist organization. For the purpose of this report, the FBI will use the following definitions:

- Domestic terrorism is the unlawful use, or threatened use, of force or violence by a group or individual based and operating entirely within the United States or Puerto Rico without foreign direction committed against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof in furtherance of political or social objectives.

- International terrorism involves violent acts or acts dangerous to human life that are a violation of the criminal laws of the United States or any state, or that would be a criminal violation if committed within the jurisdiction of the United States or any state. These acts appear to be intended to intimidate or coerce a civilian population, influence the policy of a government by intimidation or coercion, or affect the conduct of a government by assassination or kidnapping. International terrorist acts occur outside the United States or transcend national boundaries in terms of the means by which they are accomplished, the persons they appear intended to coerce or intimidate, or the locale in which their perpetrators operate or seek asylum.

There are different types of terrorism depending on the target of attack, which are:

- Agro-Terrorism
- Political Terrorism
- Bio-Terrorism
- Cyber-Terrorism
- Eco-Terrorism
- Nuclear-Terrorism
- Narco-terrorism

Terrorist activities are also classified based on motivation behind the event such as ideology (i.e. religious fundamentalism, national separatist movements, and social revolutionary movements). Terrorism can also be random with no ties to ideological reasoning. The FBI also provides clear definitions of a terrorist incident and prevention:

- A terrorist *incident* is a violent act or an act dangerous to human life, in violation of the criminal laws of the United States, or of any state, to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives.

- Terrorism *prevention* is a documented instance in which a violent act by a known or suspected terrorist group or individual with the means and a proven propensity for violence is successfully interdicted through investigative activity.

Note: *The FBI investigates terrorism-related matters without regard to race, religion, national origin, or gender. Reference to individual members of any political, ethnic, or religious group in this report is not meant to imply that all members of that group are terrorists. Terrorists represent a small criminal minority in any larger social context.*

Primarily, threat assessment, mitigation and response to terrorism are federal and state directives and work primarily with local law enforcement. The Office of Infrastructure Protection within the Federal Department of Homeland Security is a component within the National Programs and Protection Directorate.

The Office of Infrastructure Protection leads the coordinated national program to reduce and mitigate risk within 18 national critical infrastructure and key resources (CIKR) sectors from acts of terrorism and natural disasters and to strengthen sectors' ability to respond and quickly recover from an attack or other emergency. This is done through the National Infrastructure Protection Plan (NIPP).

Under the NIPP, a Sector-Specific Agency (SSA) is the federal agency assigned to lead a collaborative process for infrastructure protection for each of the 18 sectors. The NIPP's comprehensive framework allows the Office of Infrastructure Protection to provide the cross-sector coordination and collaboration needed to set national priorities, goals, and requirements for effective allocation of resources. More importantly, the NIPP framework integrates a broad range of public and private CIKR protection activities.

The Sector-Specific Agencies provide guidance about the NIPP framework to state, tribal, territorial and local homeland security agencies and personnel. They coordinate NIPP implementation within the sector, which involves developing and sustaining partnerships and information-sharing processes, as well as assisting with contingency planning and incident management.

The Office of Infrastructure Protection has Sector-Specific Agency responsibility for six of the 18 CIKR sectors. Those six are:

- Chemical
- Commercial Facilities
- Critical Manufacturing
- Dams
- Emergency Services
- Nuclear Reactors, Materials and Waste

Sector-Specific Agency responsibility for the other 12 CIKR sectors is held by other Department of Homeland Security components and other federal agencies. Those 12 are:

- Agriculture and Food – Department of Agriculture; Food and Drug Administration
- Banking and Finance – Department of the Treasury
- Communications – Department of Homeland Security
- Defense Industrial Base – Department of Defense
- Energy – Department of Energy
- Government Facilities – Department of Homeland Security
- Information Technology – Department of Homeland Security
- National Monuments and Icons – Department of the Interior
- Postal and Shipping – Transportation Security Administration
- Healthcare and Public Health – Department of Health and Human Services
- Transportation Systems – Transportation Security Administration; U.S. Coast Guard
- Water – Environmental Protection Agency

The NIPP requires that each Sector-Specific Agency prepare a Sector-Specific Plan, review it annually, and update it as appropriate.

The Department of Homeland Security and its affiliated agencies are responsible for disseminating any information regarding terrorist activities in the country. The system in place is the National Terrorism Advisory System (NTAS). NTAS replaced the Homeland Security Advisory System (HSAS) which was the color coded system put in place after the September 11th attacks by Presidential Directive 5 and 8 in March of 2002. NTAS replaced HSAS in 2011.

NTAS is based on a system of analyzing threat levels and providing either an imminent threat alert or an elevated threat alert.

An ***Imminent Threat Alert*** warns of a credible, specific and impending terrorist threat against the United States. An ***Elevated Threat Alert*** warns of a credible terrorist threat against the United States.

The Department of Homeland Security, in conjunction with other federal agencies, will decide whether a threat alert of one kind or the other should be issued should credible information be available. Each alert provides a statement summarizing the potential threat and what, if anything should be done to ensure public safety.

The NTAS Alerts will be based on the nature of the threat: in some cases, alerts will be sent directly to law enforcement or affected areas of the private sector, while in others, alerts will be issued more broadly to the American people through both official and media channels.

An individual threat alert is issued for a specific time period and then automatically expires. It may be extended if new information becomes available or the threat evolves. The ***sunset provision*** contains a specific date when the alert expires as there will not be a constant NTAS Alert or blanket warning that there is an overarching threat. If threat information changes for an alert, the Secretary of Homeland Security may announce an updated NTAS Alert. All changes, including the announcement that cancels an NTAS Alert, will be distributed the same way as the original alert.

Historical Occurrence
There is no record of terrorist events within the planning area.

Location
Terrorist activity within the planning area is possible throughout the region. Participating communities expressed concerns related tampering with crops and livestock as well as municipal water supplies.

Extent
It is not likely that terrorist activities will occur within the planning area.

Probability
There were no reports of terrorism reported within the planning area therefore it is assumed there is a low probability that terrorist events will occur in the future.

Vulnerability
The unpredictable nature of terrorism is such that impacts can range from very isolated occurrences of property damage with limited injuries to large scale events with catastrophic impacts to lives and property. The population in the planning area is declining which makes the planning are less likely to occur since the goal of terrorist attacks is to cause as much damage as possible.

The primary concern related to terrorism within the planning area was related to the threat of Agro-Terrorism. The FBI defines agro-terrorism as "the deliberate introduction of an animal or plant disease for the purpose of generating fear, causing economic losses or undermining social stability." This tactic would be used to attack the economic stability of the United States. Agro-terrorism is not new. It was used by the Assyrians in the 6th century B.C. when they poisoned enemy wells with rye ergot. During World War I German agents in the United States infected horses and cattle in transit across the Atlantic. The threat today is largely from transnational groups, like al Qaeda. Although other groups that pose a threat include economic opportunists trying to manipulate the market, domestic terrorist trying to hit the U.S. where they do not expect it, or militant animal rights or environmental activists pose a threat because they consider immoral the use of animals for food.

Averaged Annual Damages and Frequency
Due to lack of data, and the very wide range of potential impacts, potential losses are not being calculated for this threat. Terroristic acts are not expected to occur in the planning area.

Summary
Planning participants reported concerns related to agro-terrorism and tampering with local water supplies. There were no reported terrorism incidents for the ULNRD.

Future Development
There are many strategies that can be undertaken to protect both existing and future assets. The impacts to people and property from terrorist incidents are potentially severe. Most terrorist incidents occur on a weekday when governmental, business, and other critical facilities are staffed to inflict the most damage, injuries, and fatalities possible.

Mitigation Alternatives
Mitigation alternatives for terrorism include: training and exercises; education and outreach; vehicular barrier and other building protection measures; and, general awareness raising programs such as "See Something, Say Something."

CIVIL DISORDER

Hazard Profile

Civil disorder, also known as civil unrest or civil strife, is a broad term that is typically used by law enforcement to describe one or more forms of unrest caused by a group of people. Civil disturbance is typically a symptom of, and a form of protest against, major socio-political problems; the severity of the action coincides with public expression(s) of displeasure. Examples of civil disorder include, but are not necessarily limited to: illegal parades; sit-ins and other forms of obstructions; riots; sabotage; and other forms of crime. It is intended to be a demonstration to the public and the government, but can escalate into general chaos.

Historic Occurrence

There are no reported occurrences of civil disorder within the planning area.

Location

Civil disorder typically occurs in urbanized areas. Within the planning area the county seats are the most likely location for civil disorder.

Extent

Civil disorder is not likely to occur within the planning area.

Probability

Civil disorder has a low probability of occurring within the planning area.

Vulnerability

Civil disorder can lead to injuries and property damages. However, police are trained to prevent escalation and most instances of civil disorder remain minor with minimal impacts.

The declining population in the planning area makes any civil disorder event unlikely. While there may be instances of unpopular government decisions within the planning area it is unlikely the aging population will cause any civil disorder as a protest.

Averaged Annual Damages and Frequency

Due to the lack of data, potential losses are not being calculated for this threat. Civil disorder is not expected to occur in the planning area in the near future.

Summary

Overall, the risk and vulnerability assessment shows that civil disturbance is a low probability hazard with limited impacts.

Future Development

There are many strategies that can be undertaken to protect both existing and future assets. The impact to people and property from civil disorder is low as most protests are peaceful and generally dissipated by police without event. However, increases in population can proportionally increase the risk of major conflicts between police and protestors during instances of civil disorder.

Mitigation Alternatives

Mitigation alternatives include training and education, as well as the use of vehicular barriers and other mechanisms to protect critical facilities

TRANSPORTATION
CHEMICAL & RADIOLOGICAL RELEASE
Hazard Profile

The following description for hazardous materials is provided by FEMA:

Chemicals are found everywhere. They purify drinking water, are used in agriculture and industrial production, fuel our vehicles and machines, and simplify household chores. But chemicals also can be hazardous to humans or the environment if used or released improperly. Hazards can occur during production, storage, transportation, use, or disposal. The community is at risk if a chemical is used unsafely or released in harmful amounts.

Hazardous materials in various forms can cause fatalities, serious injury, long-lasting health effects, and damage to buildings, homes, and other property. Many products containing hazardous chemicals are used and stored in homes routinely. These products are also shipped daily on the nation's highways, railroads, waterways, and pipelines.

Chemical manufacturers are one source of hazardous materials, but there are many others, including service stations, hospitals, and hazardous materials waste sites.

Varying quantities of hazardous materials are manufactured, used, or stored at an estimated 4.5 million facilities in the United States--from major industrial plants to local dry cleaning establishments or gardening supply stores.

Hazardous materials come in the form of explosives, flammable and combustible substances, poisons, and radioactive materials. These substances are most often released as a result of transportation accidents or because of chemical accidents in plants.

Hazardous material incidents are technological (meaning non-natural hazards created or influenced by humans) events that involve large-scale releases of chemical, biological or radiological materials. Hazardous materials incidents general involve releases at fixed-site facilities that manufacture, store, process or otherwise handle hazardous materials or along transportation routes such as major highways, railways, navigable waterways and pipelines.

The U.S. Environmental Protection Agency requires industry to report information on toxic chemical releases and water management activities, through the TRI Program. In the previous decade TRI reporting requirements were lessened; thereby limiting available data on chemical releases and disposal. The federal government in recent years reinstated stricter reporting requirements for industrial and federal facilities that release toxic substances with potential to threaten human health and the environment. Those requirements went into effect in April of 2009 and data from these reports is now available.

Historical Occurrences

In the State of Nebraska, according to the Pipeline and Hazardous Materials Safety Administration, there have been 1,782 incidents involving hazardous materials being transported by air, highway, railway and water. These incidents involved at least 276 various forms of toxic materials across the classifications described by the Emergency Response Guidebook.

Of these 1,782 incidents, 6 occurred within in the planning area starting with the first reported on June 22, 1981. During these events, there have been no fatalities or injuries. The six releases did however result in $76,151 in damages.

Table 54 provides a list of those events that have caused some of the most significant damages due to transportation incidents involving hazardous materials.

Table 54: Transportation Incidents Involving Chemicals

Date of Event	Location of Release	Quantity Released	Material Involved	Method of Transportation	Total Damage
6/22/1981	Mullen	300 LGA	FUEL OIL NO. 1 2 4 5 OR 6	Highway	0
4/2/1990	Thedford	8,800 LGA	GASOLINE INCLUDES GASOLINE MIXED WITH ETHYL ALCOHOL WITH NOT MORE THAN 10% ALCOHOL	Highway	$53,824
6/18/1996	Mullen	100 LGA	GASOLINE INCLUDES GASOLINE MIXED WITH ETHYL ALCOHOL WITH NOT MORE THAN 10% ALCOHOL	Highway	$2,150
1/16/2001	Hyannis	50 LGA	FUEL OIL (NO. 1 2 4 5 OR 6)	Rail	$4,550
4/12/2006	Thedford	0.5 SLB	AMMONIUM NITRATE FERTILIZERS WITH NOT MORE THAN 0.2 PERCENT CARBON	Rail	$3,202
9/17/2006	Dunning	9 LGA	PHOSPHORIC ACID SOLUTION	Highway	$12,425

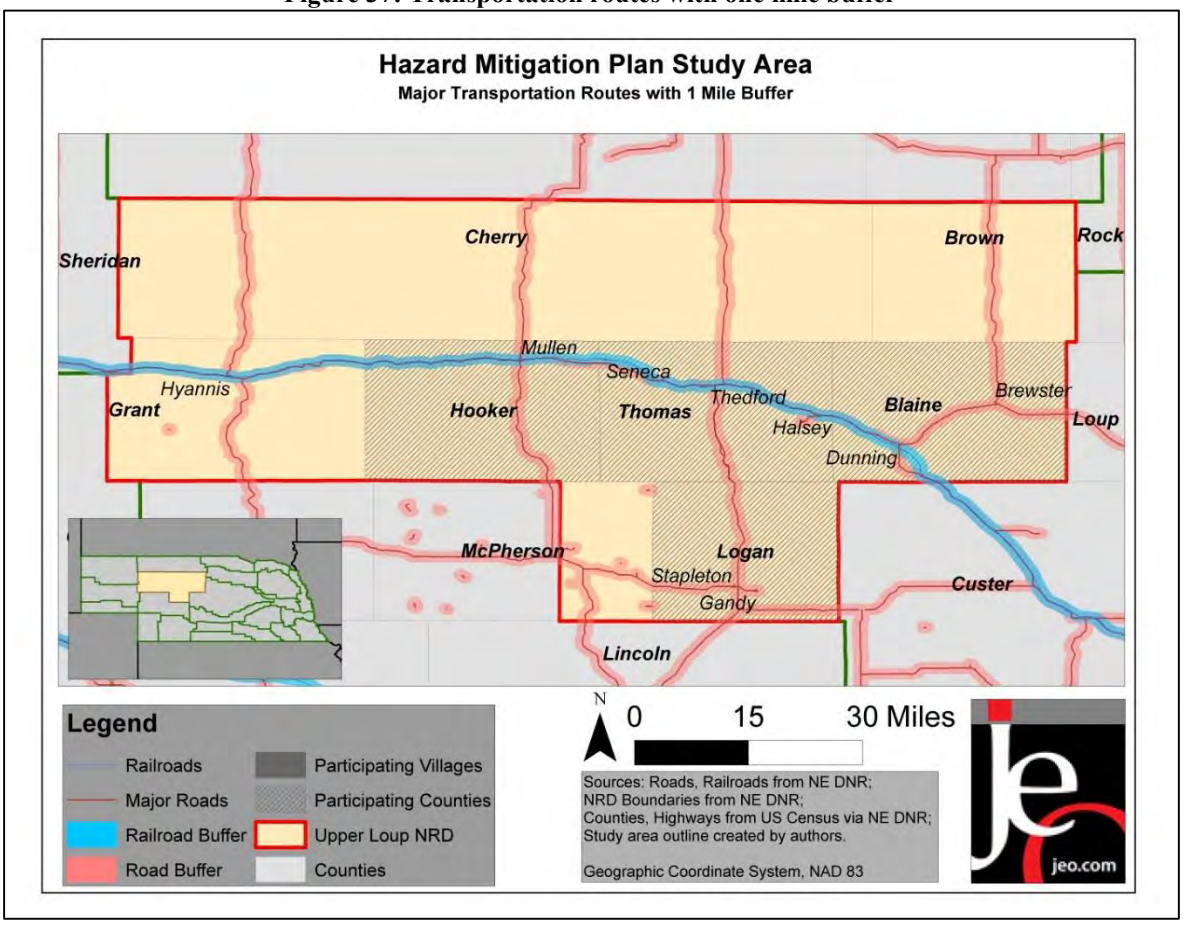
Source: Pipeline and Hazardous Materials Safety Administration

There is no record of radiological releases having occurred within the planning area.

Location

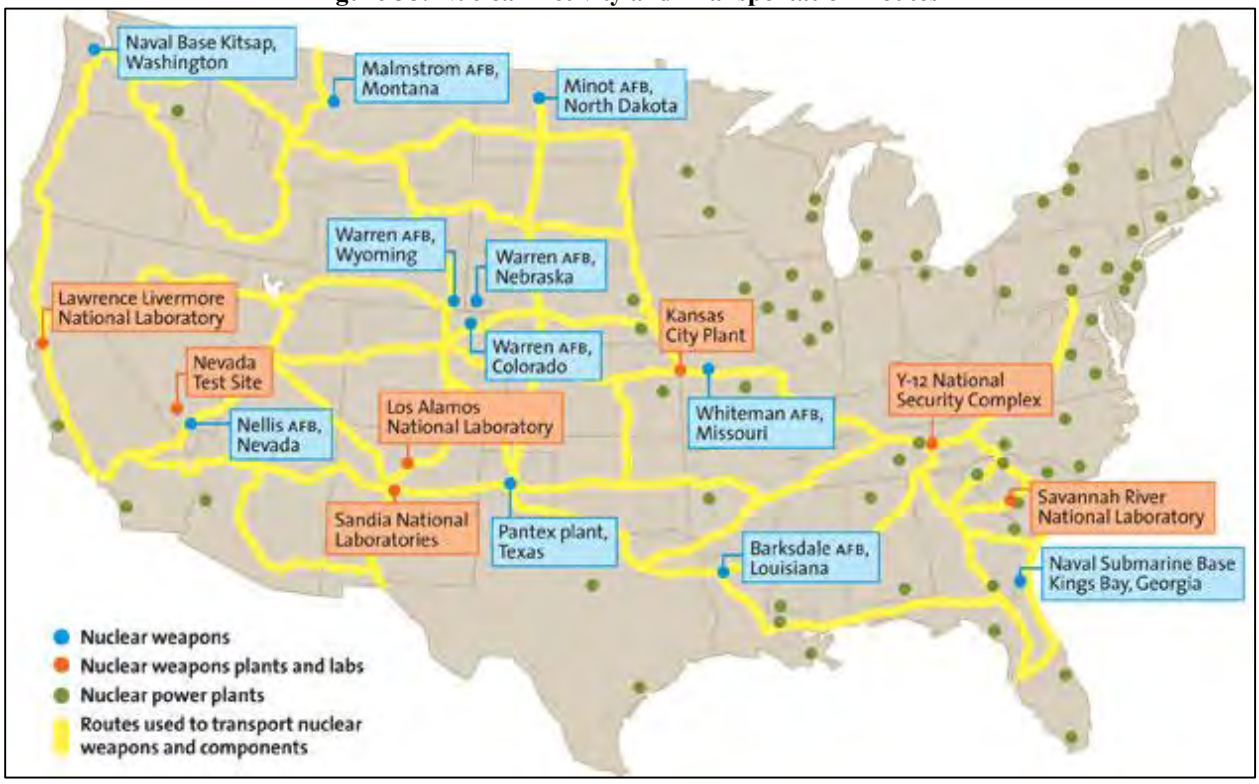
Chemical releases are more likely to occur during transportation primarily on major transportation routes as identified in Figure 37. Participating communities specifically reported transportation along railroads as having the potential to impact communities. It was also reported, however, that railroads providing service through the planning area have already developed plan to respond to chemical release along rail routes.

Figure 37: Transportation routes with one mile buffer



The following map indicates the location of Nuclear power plants, labs, and weapons, along with routes used to transport nuclear weapons and components.

Figure 38: Nuclear Activity and Transportation Routes



Source: Jeff Berlin

Extent

Probable extent related to chemical release is difficult to anticipate. Releases that have occurred in the planning area range from 9 LGA to 8,800 LGAs. Based on historic records it is likely that any spill involving hazardous materials that occur will not affect any area larger than one mile around the spill that occurs.

Given the absence of radiological incidents in the planning area the extent of an event is unknown.

Probability

The historic record would indicate that there is approximately a 25 percent chance of chemical releases occurring in a given year. There were six reported events from 1980 to 2013 within the planning area.

Averaged Annual Damages and Vulnerability

The average damage per event estimate was determined based upon PHMSA since 1980 and number of historical occurrences. This does not include losses from displacement, functional downtime, economic loss, injury, or loss of life. According to the table below, chemical releases have a low probability of future occurrences in the planning area with an annual frequency of .23.

Table 55: Chemical Release Loss Estimation

Hazard Type	Number of Events	Approximate Annual Probability	Total Property Loss	Annual Property Loss[1]	Total Crop Loss	Annual Crop Loss
Chemical Release	6	~25%	$76,151	$2,929	$0	$0

Source: PHMSA (January, 1980 to January, 2014).

Summary
There is potential for chemical releases to occur within the planning area. According to the historical record chemical releases have approximately a 25 percent chance of annual occurrence. It is difficult to accurately anticipate the likely extent of release events. Major transportation routes are the most likely location for releases.

Future Development and Vulnerability
The impacts to people and property from chemical/radiological transportation incidents are potentially severe. Most chemical/radiological transportation incidents occur on a weekday during times when day care centers and schools are likely to be in session. Other vulnerable facilities and groups include hospitals, nursing homes, and housing units with low mobility individuals and families. Vulnerable populations will live along major transportation routes or near chemical/radiological fixed site locations.

Mitigation Alternatives
Mitigation actions related to this threat include:

- Drills and exercises within potential impact zones;
    - There is no record of exercises related to chemical releases having been conducted within the planning area
- Studies to identify the primary hazardous materials transported along specific routes;
    - Highly dangerous chemicals and radiological materials are required to provide routing information
- Restrict transportation of hazardous materials at high traffic times or in high traffic areas; and
    - Transportation of chemicals is monitored
- Provide shelter-in-place kits and training for vulnerable populations such as child care and nursing homes
    - To date this has not occurred within the planning area

Section 5: Mitigation Strategy

SUMMARY OF CHANGES

This section has been update to reflect changes in prioritization and needs within the participating jurisdictions. This section contains: completed mitigation projects, an update of previously identified projects, and the addition of new projects and strategies that have been identified. The STAPLEE process remained consistent with that which was used previously.

INTRODUCTION

The primary focus of the mitigation strategy is to establish goals objectives, and identify action items to reduce the effects of hazards on existing infrastructure and property in a cost effective and technically feasible manner. The development of goals and objectives was completed through the 'hazard identification' public meetings.

After each hazard was identified, goals and objectives were established. The intent of each goal and set of objectives was to develop strategies to account for the risks associated with the hazards, and identify ways to reduce or eliminate those risks. Each goal and set of objectives is preceded by 'mitigation alternatives' or actions items.

A preliminary list of goals and objectives was provided to the planning team and participants at the 'hazard identification' public meetings. Each participant was asked to review all of the goals and objectives and comment on how to improve or change them to meet the needs of their jurisdiction. Information from this review was used to finalize the goals and objectives.

***Requirement §201.6(c)(3)(i)**: [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.*

***Requirement §201.6(c)(3)(ii)**: [The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.*

***Requirement: §201.6(c)(3)(ii)**: [The mitigation strategy] must also address the jurisdiction's participation in the National Flood Insurance Program (NFIP), and continued compliance with NFIP requirements, as appropriate.*

***Requirement: §201.6(c)(3)(iii)**: [The mitigation strategy section shall include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.*

***Requirement §201.6(c)(3)(iv)**: For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.*

DEVELOPMENT OF GOALS

Below is the final list of goals and objectives as determined by the participants and planning team. These goals and objectives provide specific direction to guide participants in reducing future hazard related losses. The goals and objectives were numbered to assist in the development and organization of mitigation alternatives 'action items', as discussed in *Section 7: Participant Section*.

Goal 1: Protect the Health and Safety of Residents

Objective 1.1: Reduce or prevent damage to property or prevent loss of life or serious injury (overall intent of the plan).

Goal 2: Reduce Future Losses from Hazard Events

Objective 2.1: Provide protection for existing structures, future development, critical facilities, services, utilities, and trees to the greatest extent possible.

Objective 2.2: Develop hazard specific plans, conduct studies or assessments, and retrofit jurisdiction to mitigate for hazards and minimize their impact.

Objective 2.3: Minimize and control the impact of hazard events through enacting or updating ordinances, permits, laws, or regulations.

Goal 3: Increase Public Awareness and Educate on the Vulnerability to Hazards

Objective 3.1: Develop and provide information to residents and businesses about the types of hazards they are exposed to, what the effects may be, where they occur, and what they can do to be better prepared.

Goal 4: Improve Emergency Management Capabilities

Objective 4.1: Develop or improve Emergency Response Plan and procedures and abilities.

Objective 4.2: Develop or improve Evacuation Plan and procedures.

Objective 4.3: Improve warning systems and ability to communicate to residents and businesses during and following a disaster or emergency.

Goal 5: Pursue Multi-Objective Opportunities (whenever possible)

Objective 5.1: When possible, use existing resources, agencies, and programs to implement the projects.

Objective 5.2: When possible implement projects that achieve several goals.

Goal 6: Enhance Overall Resilience and Promote Sustainability

Objective 6.1: Incorporate hazard mitigation and adaptation into updating other local planning endeavors (e.g., comprehensive plans, zoning ordinance, subdivision regulation, etc.)

MITIGATION ALTERNATIVES (ACTION ITEMS)

After the establishment of each participant's goals and objectives, mitigation alternatives were prioritized. The alternatives considered included: the mitigation actions in the previous plan; additional mitigation actions discussed during the planning process; actions identified in FEMA's *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards*, and recommendations from JEO for additional mitigation actions. In addition, JEO provided each participant a preliminary list of mitigation alternatives to be used as a starting point. The prioritized list of alternatives helped participants determine which actions will best assist their respective jurisdiction in alleviating damages in the event of a disaster. The listed priority does not indicate which actions will be implemented first, but will serve as a guide in determining the order at which each action should be implemented.

These projects are the heart of a hazard mitigation plan. The group was instructed that each alternative must be directly related to the goals and objectives. Alternatives must be specific activities that are concise and can be implemented individually.

Mitigation alternatives were evaluated using FEMA's STAPLEE process, as this process addresses all the major factors when weighing the costs to the benefits of implementing one action over another. Important factors when ranking the alternatives include the prohibitive costs, the communities' resource capabilities, the communities' desire and concerns, and feasibility. STAPLEE evaluation includes consideration of the social, technical, administrative, political, legal, economic and environmental benefits of the mitigation actions. STAPLEE criteria taken from FEMA's Multi-Hazard Mitigation Planning Guidance (October 2013) are summarized below.

S – Social: Mitigation actions are acceptable to the jurisdiction if they do not adversely affect a particular segment of the population, do not cause relocation of lower income people, and if they are compatible with the jurisdictions social and cultural values.
T – Technical: Mitigation actions are technically most effective if they provide long-term reduction of losses and have minimal secondary adverse impacts.
A – Administrative: Mitigation actions are easier to implement if the jurisdiction has sufficient staffing and funding.
P – Political: Mitigation actions can truly be successful if all stakeholders have been offered an opportunity to participate in the planning process and if there is public support of the action.
L – Legal: It is critical that the jurisdiction or implementing agency have the legal authority to implement and enforce a mitigation action.
E – Economical: Budget constraints can significantly deter the implementation of mitigation actions. Hence, it is important to evaluate whether an action is cost-effective, as determined by a cost-benefit review, and possible to fund.
E – Environmental: Sustainable mitigation actions that do not have an adverse effect on the environment, that comply with federal, state, and local environmental regulations, and that are consistent with the jurisdiction's environmental goals, have mitigation benefits while being environmentally sound.

Participants received a worksheet to assist them in scoring the priority of each alternative. Most participants took additional worksheets back to their communities. The key personnel and members attending the public meeting were asked to provide a designation of '+', '-', or 'O' for each STAPLEE criteria which was used to come up with a cumulative priority ranking that maximizes the benefits of each alternative. This cumulative priority ranking was created by assigning a value of 1 each +, -1 to each -, and 0 to each O. The cumulative ranking was then created by adding the numbers under each STAPLEE criteria.

The projects with the greatest benefits and lower relative costs as determined by the STAPLEE criteria were to have a "high" priority with a cumulative priority ranking of 3 to 7, while alternatives with low benefits and relatively high costs were determined to have a "low" priority with a cumulative priority ranking of -7 to -3. The alternatives with a cumulative priority ranking of -2 to 2 were determined to have a "medium" priority. The STAPLEE worksheet can be found in *Appendix C*.

A final list of alternatives was established including information on the associated hazard mitigated, description of the action, responsible party, priority, cost estimate, potential funding sources, and timeline. This information was established through input from participants and determination by the consultant.

It is important to note that not all of the mitigation actions identified may ultimately be included in the community's plan due to limited capabilities, prohibitive costs, low benefit/cost ratio, or other concerns. Even though there are cost estimates, priority scores, and responsible agencies identified, planning participants have not necessarily committed to undertaking any of the activities. This information will serve as a guide for the participants to assist in hazard mitigation for the future. Additionally, some jurisdictions may identify additional mitigation actions not identified by the county.

PARTICIPANT MITIGATION ALTERNATIVES

The following are specific actions listed by participants of the ULNRD plan intended to be utilized in the implementation of mitigation alternatives. Each action is described by the following:

- Description – general summary of the action item.
- Analysis – brief summary of what the action item will accomplish.
- Goal/Objective – which goal and objective the action item falls under.

- Hazard(s) Addressed – which hazard the mitigation action aims to address.
- Potential funding – a list of any potential funding mechanism used to fund the action.
- Timeline – a general timeline as established by planning participants and the planning team.
- Priority – based upon the STAPLEE process a general description of the importance and workability in which an action may be implemented (high/medium/low). Priority may vary between each community, mostly dependent on funding capabilities and the size of the local tax base.
- Lead agency – listing of agencies which may lead the implementation of the action item.

Implementation of the actions will vary between individual plan participants based upon the availability of existing information, funding opportunities and limitations, and administrative capabilities of smaller communities. Establishment of a cost-benefit analysis is out of the scope of this plan and could potentially be completed prior to submittal of a project grant application or as part of a 5-year update. Ongoing and highly ranked mitigation alternatives for each participating jurisdiction can be found in *Section 7: Participant Section.*

MITIGATION ALTERNATIVE PROJECT MATRIX

During public meetings, each participant was asked to list potential mitigation alternatives which would lead to action items to reduce the effects of natural hazards. Actions selected varied from community to community dependent upon the significance of each hazard present.

COMPLETED MITIGATION EFFORTS

Previously completed mitigation actions are identified per community in their specific participant section. ULNRD reported several ongoing mitigation projects but none that have been 100 percent completed since the 2009 HMP.

ONGOING OR NEW MITIGATION PROJECTS

The following projects/strategies include all actions identified in the 2009 hazard mitigation plan as well as new projects identified by the ULNRD staff. The ULNRD staff and JEO worked together to make the wording of mitigation projects more accurate as the ULNRD will do more to *assist* in the implementation of many projects rather than implementing projects themselves.

Description	**Backup Generators**
Analysis	Provide a portable or stationary source of backup power to redundant power supplies, NRD office and shop.
Goal/Objective	Goal 1/Objective 1.1
Hazard(s) Addressed	Tornados and high winds, severe winter storms, severe thunderstorms
Estimated Cost	$15,000-$30,000 per generator
Benefits	Back-up power for critical facilities (i.e. nursing home). A measure that would reduce or prevent damage to property or prevent loss of life or serious injury.
Potential Funding	HMGP
Timeline	Not yet started
Priority	High
Lead Agency	ULNRD Board
Action since 2009 plan	None

Description	Storm Shelter / Safe Rooms
Analysis	Support communities within the planning area in the design and construction of fully supplied storm shelters and safe.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Tornados and high winds, severe thunderstorms, severe winter storms
Estimated Cost	$200-$300/sf stand alone; $150-200/sf addition/retrofit
Benefits	Useful for many residents that do not have basements or cellars to go for shelter, especially beneficial for the nursing home and other vulnerable populations
Potential Funding	PDM, HMPG
Timeline	10 years
Priority	High
Lead Agency	Village Board(s), School Board(s), ULNRD
Action since 2009 plan	None

Description	Electrical System Looped Distribution / Redundancies
Analysis	Work with power suppliers and communities to provide looped distribution service and other redundancies in the electrical system as a backup power supply in the event the primary system is destroyed or fails.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Tornados and high winds, severe winter storms, severe thunderstorms
Estimated Cost	$40,000/mile
Benefits	More reliable and resistant power distribution system
Potential Funding	HMGP, PDM
Timeline	3-5 years
Priority	High
Lead Agency	Local Governments, Local Public Power District
Action since 2009 plan	None

Description	Snow Fences
Analysis	Work with communities and land owners to plant living snow fences or to construct snow fences to protect main transportation routes and critical facilities from excessive snow drifting and road closure.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Severe winter storms
Estimated Cost	$1,000+
Benefits	Increase road accessibility to the majority of people which live in rural areas; increase road access for emergency vehicles
Potential Funding	PDM, HMGP, NRCS Cost-share, FAS, NGPC
Timeline	Ongoing
Priority	High
Lead Agency	Village Utilities, ULNRD Board, Private Landowners, Nebraska Department of Roads
Action since 2009 plan	Approximately 20,000 trees install annually through the ULNRD cost share program.

Description	Hazard Tree Removal Program
Analysis	Work with communities and private landowners to identify and remove hazards limbs and/or trees.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Severe thunderstorms, tornados and high winds, severe winter storms
Estimated Cost	$20,000

Benefits	Decrease the risk of damage to electrical lines and personal property.
Potential Funding	HMGP, US Forest Service
Timeline	Ongoing
Priority	Medium
Lead Agency	Village Utilities, Village Board, ULNRD Board, ULNRD Technician
Action since 2009 plan	This is an ongoing program. Trees are removed when they are identified as "hazardous"

Description	**Fire Wise Defensible Space**
Analysis	Work with the Nebraska Forest Service and US Forest Service to become a Fire Wise Communities/USA participant. Develop a Community Wildfire Protection Plan. Train land owners about creating defensible space. Enact ordinances and building codes to increase defensible space, improve building materials to reduce structure ignitability, and increase access to structures by responders. Develop and implement brush and fuel thinning projects.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Wildfire
Estimated Cost	$20,000
Benefits	Structures are less vulnerable to wildfire, easier for firefighters to defend structure during a wildfire event, and removes fuel from an approaching fire.
Potential Funding	HMGP, NFS, USFS, ULNRD, NGPC, National Fire Plan
Timeline	5 years
Priority	High
Lead Agency	ULNRD Board, ULNRD General Manager
Action since 2009 plan	None

Description	**Water Storage**
Analysis	Work with communities to identify needs for additional water storage facilities.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Address	Severe Winter Storm, Severe Thunderstorms, Tornados and High Winds, Wildfire, Drought
Estimated Cost	$30,000+
Benefits	Back-up supplies of municipal water to fight fires, supply the needs of citizens
Potential Funding	Local
Timeline	5 years
Priority	Medium
Lead Agency	Local Governments, ULNRD Board
Action since 2009 plan	None

Description	Source Water Contingency Plan
Analysis	ULNRD will work with villages and cities to evaluate and locate new sources of groundwater to ensure adequate supplies to support the existing community and any additional growth which may occur.
Goal/Objective	Goal 2/Objective 2.2
Hazard(s) Addressed	Drought, Wildfire
Estimated Cost	$5,000+
Benefits	Plan for future water supplies.
Potential Funding	CDBG, SRF, NDEQ
Timeline	As needed
Priority	Low
Lead Agency	Local Governments, ULNRD Board
Action since 2009 plan	None

Description	Public Awareness / Education
Analysis	Through activities such as outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. In addition, educate citizens on erosion control and water conservation methods. Educate residents on response and rescue plans for all hazard types.
Goal/Objective	Goal 3/Objective 3.1 and Goal1/Objective 1.1
Hazard(s) Addressed	All hazards
Estimated Cost	$500+
Benefits	Increase knowledge to new comers to the area as well as elderly in how to react when an event is going to occur or is occurring. Education to reduce or prevent damage to property or prevent loss of life or serious injury.
Potential Funding	HMGP, PDM
Timeline	Ongoing (see capabilities discussion in *Section Three* for a description of specific programs)
Priority	Medium
Lead Agency	ULNRD Board, ULNRD Staff, ULNRD education officer
Action since 2009 plan	ULNRD works with residents on a range of educational efforts

Description	Civil Service Improvements
Analysis	Work with communities to improve emergency rescue and response equipment and facilities by providing additional, or updating existing emergency response equipment. This could include fire trucks, ATV's, water tanks/truck, snow removal equipment, etc. This would also include developing backup systems for emergency vehicles, and identifying and training additional personnel for emergency response.
Goal/Objective	Goal 4/Objective 4.1
Hazard(s) Address	All Hazards
Estimated Cost	$5,000 to $400,000 per vehicle, varies depending on what equipment is needed
Benefits	Increase local capabilities to respond to disasters
Potential Funding	Homeland Security, Emergency Management, NEMA, Governing County and Local Governing Agency, Nebraska Forest Service
Timeline	On-going; The NRD is always working to improve capabilities to respond to a range of situations.
Priority	Low
Lead Agency	Local governments and Fire Districts, ULNRD Board
Action since 2009 plan	None

Description	Weather Radios
Analysis	Provide weather radios to the ULNRD office and shop
Goal/Objective	Goal 4/Objective 4.3 and Goal 1/Objective 1.1
Hazard(s) Addressed	All hazards
Estimated Cost	$50/per radio
Benefits	Help those who do not have access to local TV or radio warnings
Potential Funding	ULNRD, HMGP, PDM
Timeline	3 years
Priority	High
Lead Agency	ULNRD
Action since 2009 plan	None

Description	Weather Spotter Training
Analysis	Work with Region 26 EMA and County EMAs to provide Weather Spotter Training program.
Goal/Objective	Goal 3/Objective 3.1
Hazard(s) Addressed	All hazards
Estimated Cost	NA
Benefits	Educate residents about storm spotting
Potential Funding	EMA offices, NRD, HMGP, PDM
Timeline	5 years
Priority	Medium
Lead Agency	Region 26 EMA, County EMA,ULNRD General Manager
Action since 2009 plan	New Action

Description	Improve Communications
Analysis	Work with regional EMAs and other first responders to ensure interoperability of communication equipment.
Goal/Objective	Goal 4/Objective 4.1
Hazard(s) Addressed	All hazards
Estimated Cost	$1,000 - $10,000
Benefits	Ensures communication during disaster events
Potential Funding	EMA offices, NRD, HMGP, PDM
Timeline	Ongoing
Priority	Medium
Lead Agency	Region 26 EMA, County EMA,ULNRD General Manager
Action since 2009 plan	New Action

Description	Preservation of Open Space
Analysis	Work with communities and landowners to preserve open spaces
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Flooding, High winds and Tornados
Estimated Cost	Unknown
Benefits	Retention of open space helps to buffer impacts from extreme events
Potential Funding	HMGP, PDM, USDA, Private Landowners
Timeline	Ongoing; the NRD works with landowners to protect open areas on an ongoing basis
Priority	Medium
Lead Agency	Local Government(s), ULNRD Board
Action since 2009 plan	New Action

Description	Standardized Hazard Communications
Analysis	Work with Region 26 EMA and other first responders to standardize language used in conveying hazard/risk related communications.
Goal/Objective	Goal 3/Objective 3.1 and Goal 1/Objective 1.1
Hazard(s) Addressed	All hazards
Estimated Cost	NA
Benefits	Reduces confusion related to hazard/risk messaging
Potential Funding	EMA offices, NRD, HMGP, PDM
Timeline	5 years
Priority	Medium
Lead Agency	Region 26 EMA, County EMA,ULNRD General Manager
Action since 2009 plan	New

Description	Education regarding CodeRed Warning Protocol
Analysis	Work with Region 26 EMA and County EMAs to educate communities and residents about the CodeRed Warning System.
Goal/Objective	Goal 3/Objective 3.1
Hazard(s) Addressed	All hazards
Estimated Cost	NA
Benefits	Educate residents about regional warning protocols
Potential Funding	EMA offices, NRD, HMGP, PDM
Timeline	Ongoing; The NRD will collaborate with Region 26 EMA to increase awareness of the CodeRed system., this will be an ongoing effort
Priority	Medium
Lead Agency	Region 26 EMA, County EMA,ULNRD General Manager
Action since 2009 plan	New

Description	Post Contact Information
Analysis	Post maps of emergency management regions and contact information on the ULNRD website for residents.
Goal/Objective	Goal 3/Objective 3.1
Hazard(s) Addressed	All hazards
Estimated Cost	NA
Benefits	Residents of the ULNRD reside in Region 26 EMA, Region 24, EMA, and county level EMAs. This has resulted in confusion for residents. Posting contact and service area information will help residents access the appropriate resource for their situation.
Potential Funding	ULNRD
Timeline	1 year
Priority	Medium
Lead Agency	ULNRD Information & Education Coordinator
Action since 2009 plan	New

Description	Back-up Power
Analysis	Develop regional residential/small business generator program
Goal/Objective	Goal 4/Objective 4.1 and Goal 2/Objective 2.1
Hazard(s) Addressed	All hazards
Estimated Cost	NA
Benefits	ULNRD would like to develop program where private landowners and small businesses could access HMGP to purchase generators and back-up power systems. A large portion of the economy in the planning area is contingent upon small business owners and farmers and ranchers it would be beneficial to the communities and counties for these entities to remain functional during major hazard events.
Potential Funding	HMGP, PDM
Timeline	5 years
Priority	Medium
Lead Agency	Region 26 EMA, County EMA,ULNRD Board
Action since 2009 plan	New

Description	Fan & Air Conditioning Program
Analysis	Work with regional EMAs, counties, and communities to develop a supply of fans and air conditioners available to low income communities members during times of extreme heat.
Goal/Objective	Goal 1/Objective 1.1
Hazard(s) Addressed	Extreme Heat
Estimated Cost	$1,000 - $10,000
Benefits	Provide a necessary resource to low income residents during extreme heat events.
Potential Funding	EMA offices, NRD, HMGP, PDM
Timeline	5 years
Priority	Medium
Lead Agency	Region 26 EMA, County EMA,ULNRD Board
Action since 2009 plan	New

REMOVED MITIGATION PROJECTS

The ULNRD did not remove any mitigation projects or strategies that were established in the 2009 Hazard Mitigation Plan.

Section 6: Plan Implementation and Maintenance

SUMMARY OF CHANGES

Section Six is consistent with what was outlined in the previous mitigation plan. It should be noted that the planning team and participating jurisdiction have designed a tool to meet the annual review requirement for this planning process.

***Requirement §201.6(c)(4)(i)**: [The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.*

***Requirement §201.6(c)(4)(ii)**: [The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.*

***Requirement §201.6(c)(4)(iii)**: [The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.*

MONITORING, EVALUATING, & UPDATING THE PLAN

Participants of the Upper Loup Natural Resources District Plan will be responsible for monitoring (annually), evaluating, and updating of the plan. Hazard mitigation projects will be prioritized by each participant's governing body with support and suggestions from the public, as well as property and business owners. Unless otherwise specified by each participant's governing body, the City Council will be responsible for implementation of the recommended projects. The responsible party for the various implementation actions will report on the status of all projects and include which implementation processes worked well, any difficulties they encountered, how coordination efforts are proceeding, and which strategies could be revised.

To assist with monitoring of the plan, as each recommended project is completed, a detailed timeline of how that project was completed will be written and attached to the plan in a format selected by the governing body. Information that should be included will address project timelines, agencies involved, area(s) benefited, total funding (if complete), etc. At the discretion of each governing body, a local task force may be used to review the original draft of the mitigation plan and to recommend changes.

Review and updating of this plan will occur at least every five years. At the discretion of each governing body, updates may be incorporated more frequently, especially in the event of a major hazard. The governing body shall start meeting to discuss mitigation updates at least six months prior to the deadline for completing the plan review. The persons overseeing the evaluation process will review the goals and objectives of the previous plan and evaluate them to determine whether they are still pertinent and current. Among other questions, they may want to consider the following:

- Do the goals and objectives address current and expected conditions?
- If any of the recommended projects have been completed, did they have the desired impact on the goal for which they were identified? If not, what was the reason it was not successful (lack of funds/resources, lack of political/popular support, underestimation of the amount of time needed, etc.)?
- Have the nature, magnitude, and/or type of risks changed?
- Are there implementation problems?
- Are current resources appropriate to implement the plan?
- Were the outcomes as expected?
- Did the plan partners participate as originally planned?
- Are there other agencies which should be included in the revision process?

Worksheets in *Appendix D* may also be used to assist with plan updates.

If major new, innovative mitigation strategies arise that could impact the planning area or elements of this plan, which are determined to be of importance, a plan amendment may be proposed and considered separate from the annual review and other proposed plan amendments. Plymouth County should compile a list of proposed amendments received annually and prepare a report providing applicable information for each proposal, and recommend action on the proposed amendments.

CONTINUED PUBLIC INVOLVEMENT

To ensure continued plan support and input from the public as well as property and business owners, public involvement should remain a top priority for each participant. Notices for public meetings involving discussion of or action on mitigation updates should be published and posted in the following locations a minimum of two weeks in advance:

- Public spaces/buildings throughout each participating community
- Web sites, local newspapers, and regionally-distributed newspapers

INCORPORATION INTO EXISTING PLANNING MECHANISMS

In addition to ensuring that the goals and objective of this plan are incorporated into revisions of each participant's planning mechanism, local governing bodies will be responsible for integrating the safe growth audit findings and recommendations into future planning improvements. Please go to *Section Seven: Participant Sections* for detailed information regarding each community.

- Comprehensive plans should take all hazards (not just flooding) into account
- Future land-use should discourage development or redevelopment within natural hazard areas
- Ensure the capital improvement plan provides funding for hazard mitigation projects
- Ensure transportation policy is able to function under disaster conditions
- Enact environmental policies to maintain ad restore protective ecosystems
- Use other plans as ways to fund different mitigation projects

Section 7: Participant Sections

SUMMARY OF CHANGES

Participant sections have remained consistent with the information included for the previous plan. This update does contain more information specific to each participating jurisdiction.

PURPOSE OF PARTICIPANT SECTIONS

Participant sections contain information specific to jurisdictions which have participated in the planning effort. Information from individual communities was collected at public meetings and used to establish the plan. Participant sections include background information such as history and development, location, geography, climate, demographics, and listing of jurisdiction specific documents used to establish the plan. In addition maps specific only to single jurisdictions are included such as: structural inventory, emergency siren ranges, critical facilities, highly vulnerable areas/populations, and 1percent floodplain boundaries.

Please note that depending on which hazards were identified by the jurisdiction and the information that was available at the time of the plan, not all participating jurisdictions will have the same information. For example, jurisdictions that do not have a 1percent annual floodplain or have not had a map delineated will not have a floodplain map in their respective sections. Below is a summary of the maps which may be included in the participant sections. Each map may not be referenced specifically in the sections.

- Critical Facilities Map – displays the locations of critical facilities as identified by the participants. Refer to *Section Three: Profile* for the definition of critical facilities.
- Flooding Hazard Area Map – displays the 1 percent annual floodplain as well as any structures located within the delineated boundary.

The overall risk assessment for the identified hazard types represents the presence and vulnerability to each hazard type area wide throughout the entire planning area. Only certain hazards are examined in depth for each participant section. The individual participant hazard identification tables and responses may or may not reflect the consensus for risk and vulnerability to each hazard type in the area.

Blaine County

Village of Brewster
Village of Dunning
Village of Halsey

Upper Loup NRD
Multi-Jurisdictional Hazard Mitigation Plan

2014

Community Profile

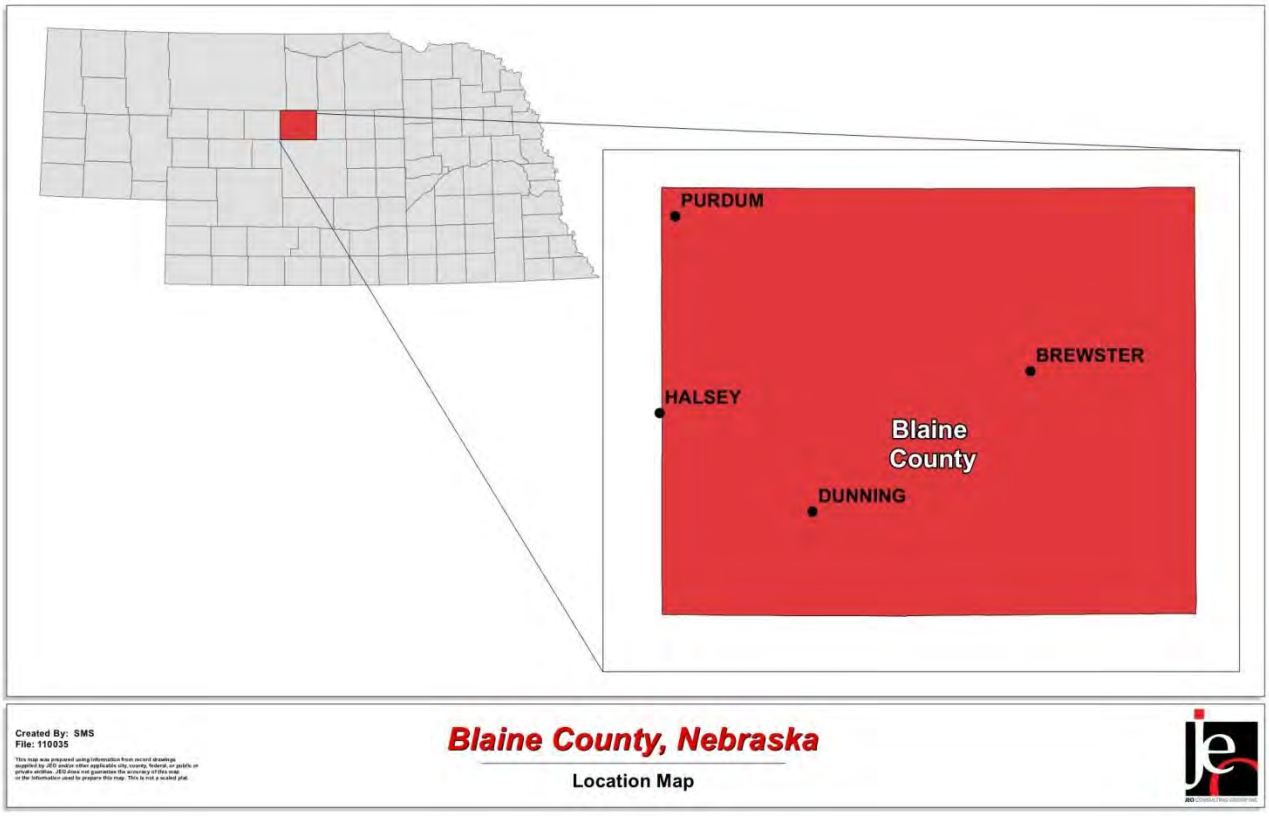
HISTORY

Blaine County was formed in 1885 and named after James G. Blaine, the Republican presidential candidate against Democrat Grover Cleveland in the 1884 election. During the summer of 1884 Henry H. Copp came with his family to claim a parcel of public domain adjoining the hill where a Sioux chief was buried. Along with Joseph Barton also moving into the county the Sioux tribe did not tolerate the invasion of their hunting grounds. There were some conflicts between the Sioux and the whites and the families needed to be constantly on guard. Among the first cattle ranchers were Rankin Brothers and Field Brothers whose spreads were on the Middle Loup, a river flowing through southwest Blaine County. Both these ranches have had much to do with the history and development of the Middle Loup territory. The first county meeting was held in January of 1886 and the first election was held in November 6, 1886.

LOCATION/GEOGRAPHY

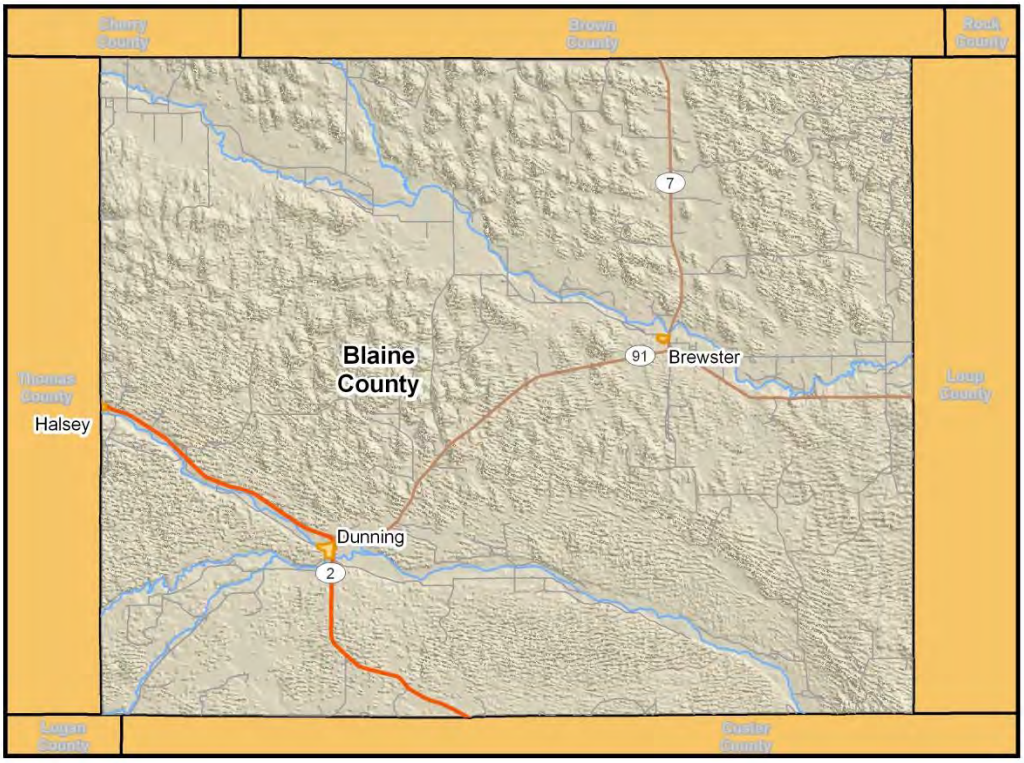
Blaine County is located in the north central region of the state. It is bordered by Brown (north), Loup (east), Custer (South), and Thomas (west) Counties. The communities in Blaine County include Brewster, Dunning, Halsey, and Purdum (unincorporated). The Village of Brewster is the county seat. Blaine County covers an area of 711 square miles and has an average elevation of 2,562 feet above sea level.

Figure BLA 1: Location



Blaine County contains two primary topographic regions according to the Conservation and Survey Division of the University of Nebraska- Lincoln. These include 'sand hills' across the large majority of the county and smaller areas of 'valleys' throughout the county. Sand hills are general categorized as hilly land composed of low to high dunes of sand stabilized by a grass cover. The sand dunes mantle stream-deposited silt, sand and gravel and sandstone. Valleys are classified as flat-lying land along the major streams. The materials of the valleys are stream-deposited silt, clay, sand and gravel. Blaine County lies primarily in the Loup River Watershed.

Figure BLA 2: Topographic Map



CLIMATE

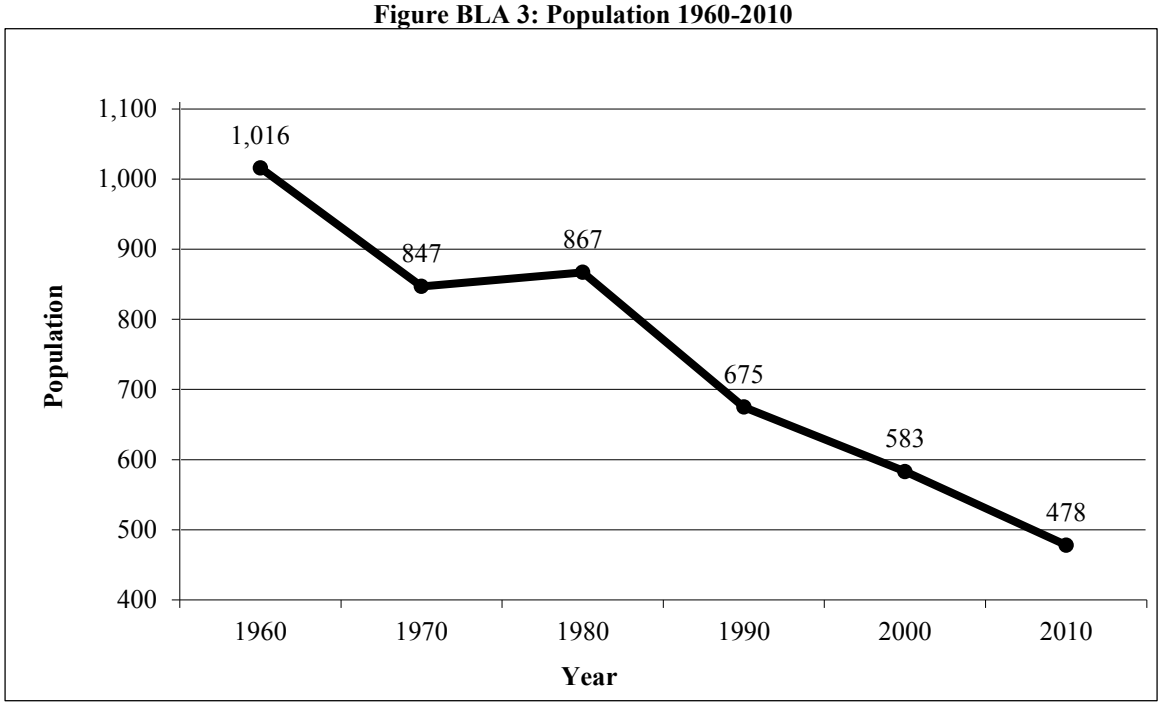
Blaine County averages 22 inches of rain per year and 31 inches of snow. There are on average 226 sunny days annually. The highest temperatures occur in July when the average daily high is 88 degrees. January is the coldest month with an average high of 9 degrees.

DEMOGRAPHICS

As of the 2010 census, there were 478 people living in 244 households. The county has consistent decline in population over the fifty year period between 1960 and 2010 with a resulting net population decline of approximately 53 percent.

Figure BLA 3 displays the historical population trend for Blaine County from 1960 to 2010.

Figure BLA 3: Population 1960-2010



Source: U.S. Census, 1960 – 2010

Table BLA 1 illustrates the population trends by jurisdiction from 1990 – 2010 and provides a population project for 2020 by applying the percent changed from 2000 to 2010 to the next decade.

Table BLA 1: Projected Trend

Jurisdiction	1990 Population	2000 Population	2010 Population	Change 2000-2010	2020 Projected Population
Blaine County	675	583	478	-18%	392
Brewster	22	29	17	-41%	10
Dunning	131	109	103	-6%	97
Halsey	110	59	76	29%	98

Source: U.S. Census, 1990 – 2010

This table illustrates a decline in all areas with the exception of the village of Halsey from 2000 to 2010. During that ten year period the village of Brewster experienced the greatest decline. All areas experienced a decline over the twenty year period.

Table BLA 2 illustrates the age distribution and median age of individuals by jurisdiction.

Table BLA 2: Population by Age

	Blaine County	Brewster	Dunning	Halsey
< 5 yrs.	4.6%	0%	4.9%	1.3%
5 - 64 yrs.	75.5%	58.2%	78.6%	73.7%
> 65 yrs.	19.9%	41.2%	16.5%	25%
Median Age	46.1	61.8	40.8	54.8

Source: US Census General Population and Housing Characteristics: 2010

Overall, the county's median age is 46.1 years. The community of Brewster has the highest median age of 61.8 years. For the county the largest individual age cohort, 45 to 49 years, represents 10.3 percent of the total population.

HOUSING AND ECONOMICS

Median household income, per capita income, home value and rent for the county as a whole compare with broader state values as shown below.

Table BLA 3: Economic and Housing Value

	Nebraska	Blaine County	Brewster	Dunning	Halsey
Median Household Income	$49,342	$39,000	19688	53162	41250
Per Capita Income	$25,229	$20,586	$7,526	$28,655	$25,851
Median Home Value	$123,900	$57,600	$14,400	$50,800	$24,700
Median Rent	$648	$631	0	$625	0

Source: Selected Housing Characteristics: 2006 - 2010 ACS 5-year estimate

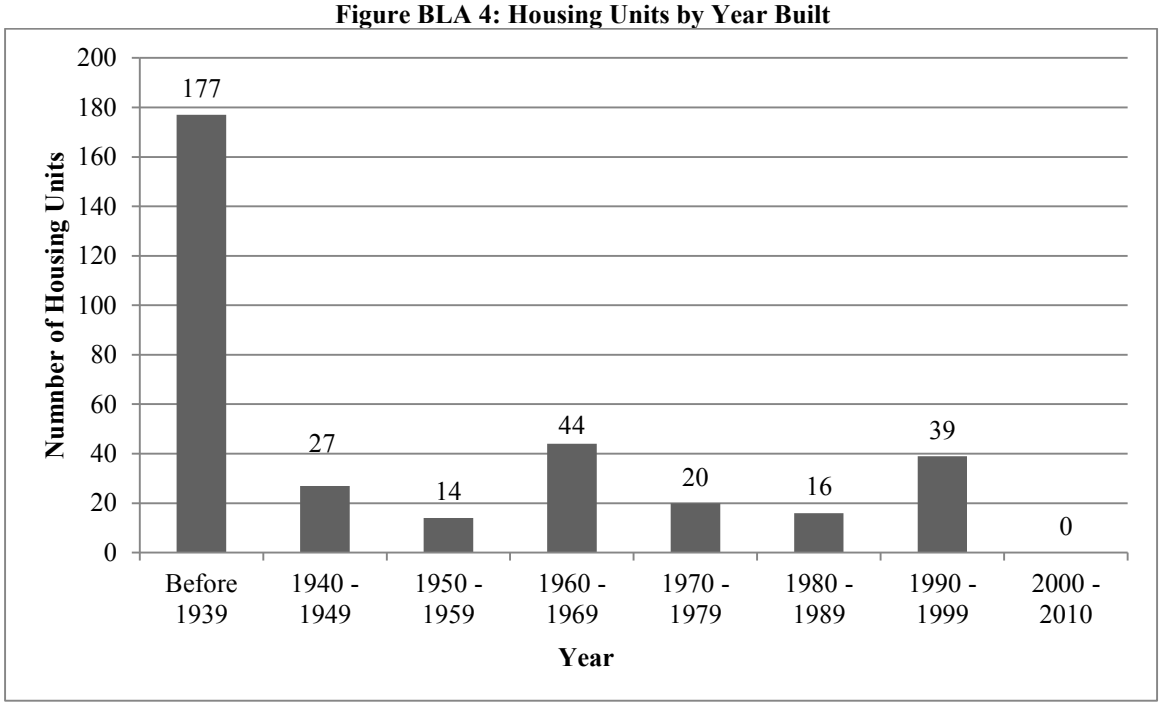
Table BLA 4: Housing Unit Occupancy

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Blaine County	242	71.8%	95	28.2%		158	65.3%	84	34.7%
Brewster	11	57.9%	8	42.1%		11	100%	0	0%
Dunning	67	72.8%	25	27.2%		54	80.6	13	19.4%
Halsey	33	64.7%	18	35.3%		29	87.9%	4	12.1%

Source: Selected Housing Characteristics: 2006 - 2010 ACS 5-year estimate

According to the US Census there are a total of 337 housing units; the majority of the units were constructed prior to 1950.

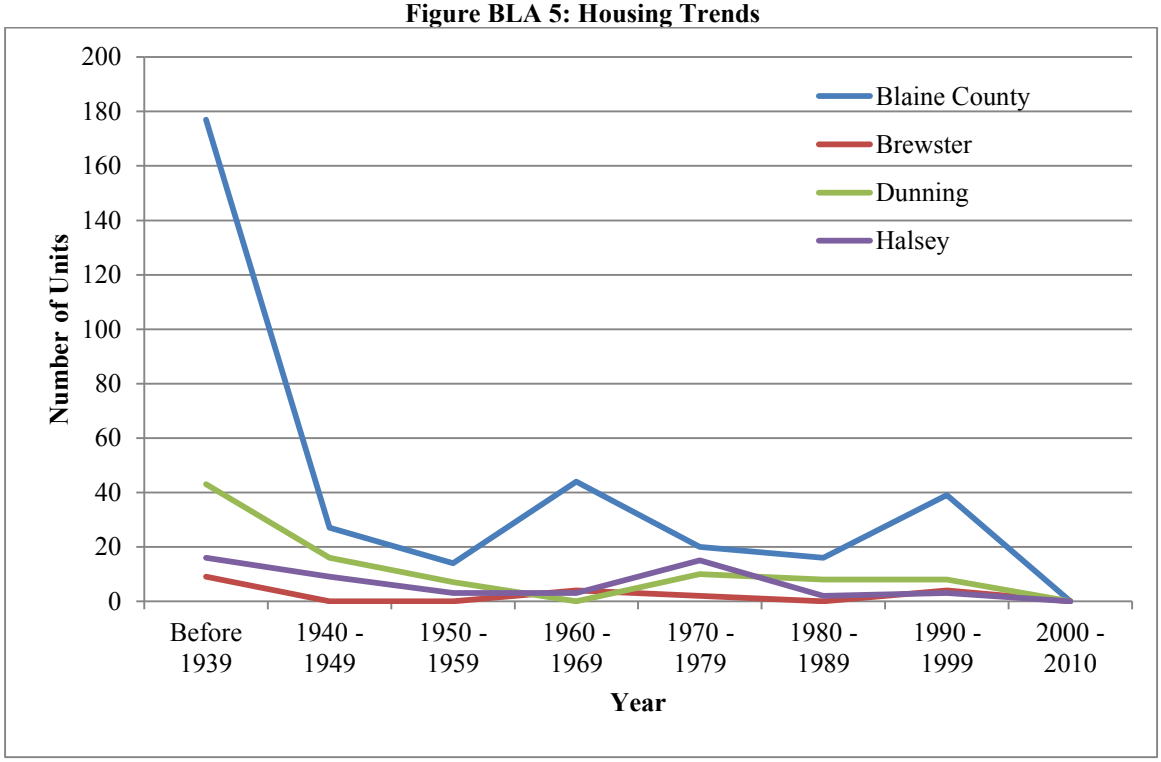
Figure BLA 4: Housing Units by Year Built



Source: Selected Housing Characteristics: 2006 -2010 ACS 5-year estimate

Overall, the number of occupied housing units in Blaine County is 242 while 95 units are reported as vacant. Of the occupied housing units 65.3 percent are owner-occupied. The village of Brewster has the largest amount (42.1 percent) of vacant units, while Dunning has the lowest percentage (27.2 percent) of vacant buildings.

Figure BLA 5: Housing Trends

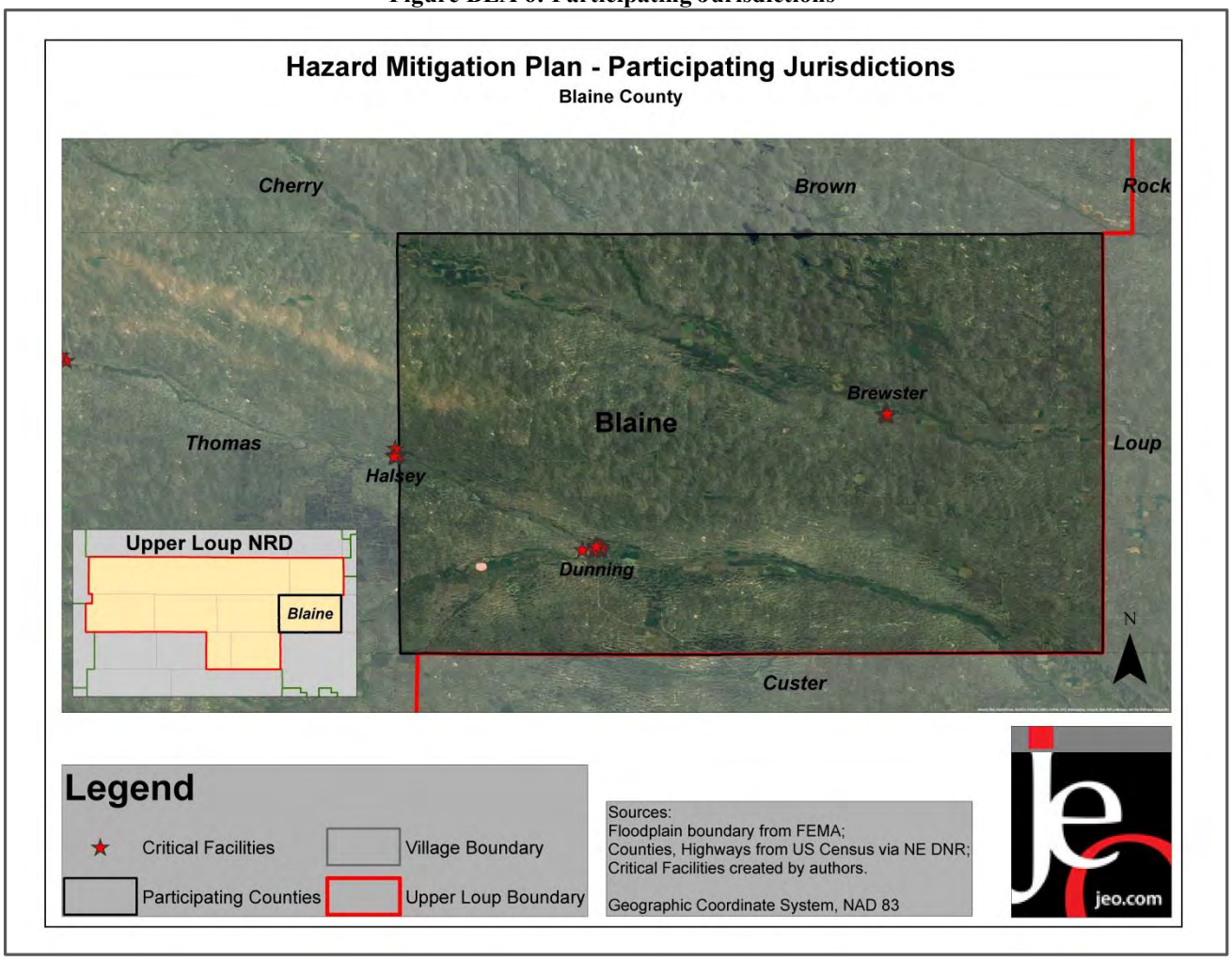


Source: Selected Housing Characteristics: 2006 -2010 ACS 5-year estimate

CRITICAL FACILITIES

Blaine County critical facilities are addressed in the section for each individual community; this is a result of all county level critical facilities being located within the corporate limits of Brewster, Dunning, and Halsey.

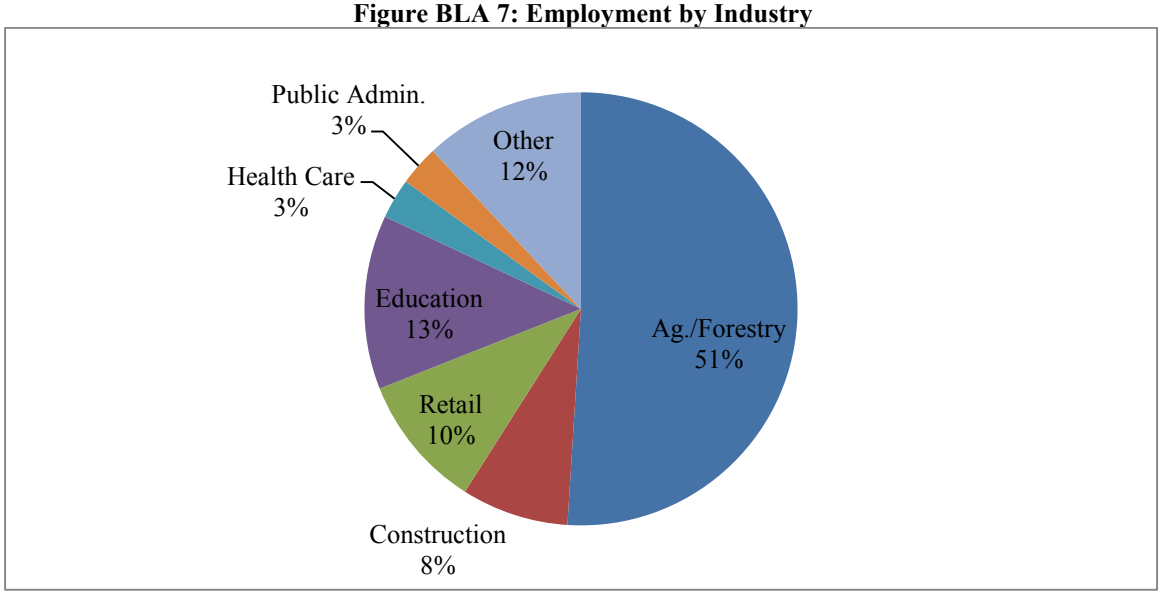
Figure BLA 6: Participating Jurisdictions



EMPLOYMENT

Figure BLA 7 shows employment by industry for Blaine County.

Figure BLA 7: Employment by Industry



Source: U.S. Census Economic Characteristics, 2010

More than 50 percent of Blaine County relies on agriculture and forestry for their employment.

AGRICULTURE

Agriculture is important to the economic fabric of Blaine County and Nebraska. Blaine County's 117 farms cover 402,530 acres of land, which accounts for 88 percent of the surface land in the county. Crop and livestock production are the visible parts of the agricultural economy, but many related businesses contribute as well by producing, processing and marketing farm and food products. These businesses generate income, employment and economic activity throughout the region.

Table BLA 5: Agricultural Inventory

Agricultural Assets	Inventory
Number of farms	117
Land in farms	402,530 acres
Estimated market value of land & buildings (per farm)	$1,760,277
Crop lands	32,578 acres
Cattle Inventory	43,542 head
Grain corn bushels	356,582
Silage corn tons	18,245

Source: USDA Census of Agriculture, 2012

FUTURE DEVELOPMENT TRENDS

New structures in the incorporated areas will likely be housing units (single family homes) and commercial and agricultural structures (no specific areas identified as growth areas). It will be important that residential areas will be protected from site specific hazards such as chemical storage and flood prone areas.

Structural Inventory and Valuation

For the 2009 HMP, a structural inventory was completed for the corporate limits of each incorporated community in Blaine County though a window survey using GIS. For the purposes of this plan update, a structural inventory for the unincorporated areas of the County was not completed. Currently assessor data is not sufficient to support a comprehensive and accurate structural inventory.

Risk Assessment

Hazard Identification

Table BLA 6 is risk assessment for the community. Refer to *Section 4: Risk Assessment* for a detailed explanation as to what this methodology is and why certain hazards did not pose a significant enough threat and were eliminated from detailed discussion due to the calculation.

Table BLA 6: Risk Assessment

Hazard	Previous Occurrence: Yes or No	County Hazard Ranking in NE 2014 State HMP	Specific Concerns Identified
Natural Hazards			
Grass/Wildfires	**Yes**	**High**	**Areas near the Halsey National Forest**
Tornados	**No**	**High**	**Lack of safe rooms**
High Winds	**Yes**	**High**	**Frequency of occurrence**
Hail Events	**Yes**	**NA**	**Economic impact especially in the ag sector. Damages to homes and other structures**
Severe Thunderstorms	**Yes**	**High**	**Frequency of occurrence, potential for secondary impacts (lightning causing wildfires)**
Extreme Heat	Yes	NA	Elderly population and economic impacts (especially in ag sector)
Earthquakes	No	Medium	None
Severe Winter Storms	Yes	High	Roadway closures, economic impacts (livestock)
Animal Disease	Yes	High	Economic impacts
Drought	Yes	High	Economic losses in the ag sector
Flooding	Yes	Medium	Mostly localized events, concerns related to transportation route closure(s)
Plant Disease	Yes	High	Losses in crop farming
Dam Failure	No	None	None
Landslides	No	NA	None
Man-made Hazards			
Chemical Spills (transportation)	**Yes**	**Medium**	**Transportation of ag chemicals along roadways**
Urban Fire	Yes	High	None
Radiological Incident (transportation)	No	NA	None
Chemical spills (fixed site)	No	Medium	Ag chemical storage areas
Radiological Fixed Sites	No	None	None
Terrorism	No	Low	Tampering with water supplies
Civil Disorder	No	Low	None

According to the local planning team the top six hazards in Blaine County are wildfires, chemical spills (transportation), tornados and high winds, hail events, and severe thunderstorms. These top hazards of Blaine County are similar to those of the entire planning area.

Historical Occurrence

The county-based records are events that affect the jurisdictions within the county while the zone-based records are those affecting the zone that include the county as part of the affected zone. Please refer to specific villages or cities within the county for the previous county-based severe weather events retrieved from NCDC. For zone-based events, there are 87 recorded events from 1996 to 2013, but due to the large number of the record, only those that resulted in property or crop damages are demonstrated in the Table BLA 7.

Table BLA 7: NCDC Data

Hazard	Date	Extent	Property Damage	Crop Damage
Drought	7/1/2012	-	$1,000,000	$500,000
Blizzard	11/27/2005	-	10,000	$0
Winter Storm	12/1902006	-	$8,000	$0
Winter Storm	11/9/1998	-	$2,000	$0
Blizzard	1/17/1996	-	$1,000	$0

Source: National Climatic Data Center, 2013

Agricultural Disease

Animal Disease

The local planning team identified animal disease as a threat for the county. In a county where cattle out number people by a ratio of 67 to 1 animal disease is a big concern. With a majority of the area being farmers and ranchers any disease that occurs may lead to losses for the farmers in treatment and quarantine or at the market. The agriculture and forestry sector accounts for 50 percent of the overall economy in Blaine County.

According to the Nebraska Department of Agriculture there was one reported case of rabies in 2013. Diseases that occur within the bovine population include: Chronic Wasting Disease, Vesicular Stomatitis, and Bovine Tuberculosis.

Table BLA 8: Agricultural Inventory – Live Stock

Blaine County Agricultural Inventory	
Number Of Cattle Ranches	93
Cattle Inventory	43,542 Head
Approximate Value*	$93,615,300

Source: USDA 2012 Agricultural Census

**Per head price based on the Samuel Roberts Nobel Foundation, 2014*

Plant Disease

The local planning team identified plant disease as a low threat for the county. For the 2014 HIRA Blaine County considered plant disease a high threat. In Blaine County only 8 percent of agricultural lands are devoted to crop farming. Crop farming in Blaine County is difficult given the low annual rainfall totals, soil conditions, and terrain. The greater cost resulting from crop damage would result from increased livestock feed costs.

Table BLA 9: Agricultural Inventory - Crops

Blaine County Agricultural Inventory	
Number Of Crop Farms	24
Crop Lands	32,578 Acres
Corn By Bushel	356,582
Approximate Value*	$1,529,756

Source: USDA 2012 Agricultural Census
**Per bushel price based on the USDA, 2014*

Drought

The local planning team considers drought as a moderate threat for the county. Drought is generally a regional event, with impacts from a single drought event impacting multiple communities, counties, and even states. For the county, more than 50 percent of the workforce relies on agricultural based income and the local economy could be significantly affected during severe droughts. Drought impacts are not always as visual as impacts of other natural hazards and are difficult to quantify. Across the county and planning area there were sizable economic impacts resulting from premature cattle sales during and following the 2012 drought. During the drought there was less grazing and higher prices for feed, as a result ranchers sold cattle sooner and at a lower weight than typical. The result was lower incomes for ranchers and secondary agricultural businesses as well as a depletion of cattle stock for subsequent years. This one year drought event will impact the entire economy and especially ranching in Blaine County for several years to come.

Table BLA 10: Historic Drought Events

Hazard	Date	Extent	Property Damage	Crop Damage
Drought	6/1/2012 – 1/1/2014	D0 – D4	$1,000,000	$1,500,000

Source: NCDC

Due to the regional nature of drought and lack of available information, drought will not be fully profiled in individual community sections that follow.

Fire

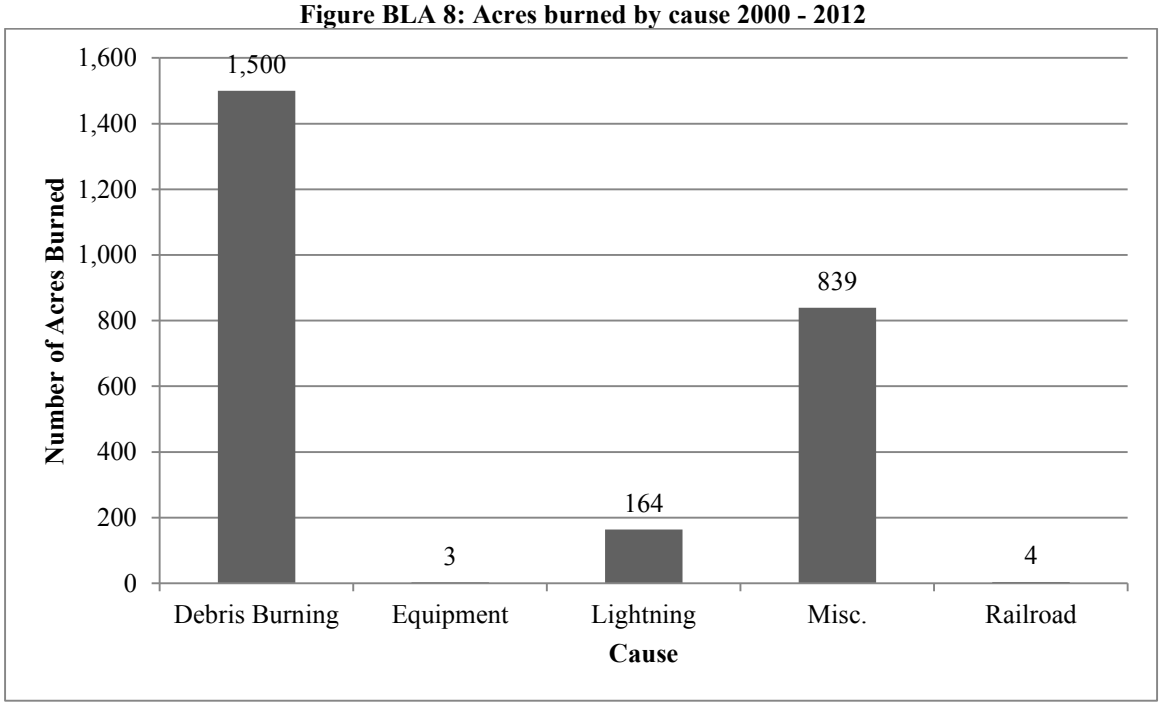
Grass/Wildfires

The county planning team identified grass/ wildfires as the greatest threat for Blaine County. According to the Nebraska Forestry Department there were 43 reported fires by the Brewster, Dunning and Halsey Fire Departments from 2000 to 2012 which consumed a total of 2,521 rangeland acres and 1 forest land acre. The fires also resulted in more than $3,000 in damages to crops and structures. Of the reported fires the most frequent cause was lightning (42 percent), followed by miscellaneous (35 percent), equipment and railroads account for nearly 19 percent of fires, and campfires and debris fires are responsible for only 4 percent of grass/wildfires in Blaine County. The location of the Halsey National Forest increases the vulnerability within Blaine County related to grass/wildfires.

The Halsey National Forest is located in both Blaine and Thomas Counties, with the majority of the forest in Thomas County. Regardless with a strong eastward wind wildfire could easily spread into Blaine County and impact both rural areas and communities. There are four fire departments within the county (Halsey split between Blaine and Thomas Counties) all of which have mutual aide agreements with fire departments in surrounding communities to provide assistance if needed. In total there are more than 100 volunteers across the four departments.

The Nebraska Forestry Service has been instrumental in developing and establishing Forest Fuels programs in the Niobrara Valley and Pine Ridge areas of Nebraska. Blaine and Thomas Counties may pursue forest fuels programs as needed to manage the wildfire risk posed by the Halsey National Forest.

Figure BLA 8: Acres burned by cause 2000 - 2012



Source: Nebraska Forestry Service

Urban Fire

The county planning team identified urban fire as a threat for the unincorporated areas of the county. Table BLA 11 shows the number of calls responded to by the fire departments within the county. It should be noted that reporting fire calls to the Nebraska Fire Marshal's office is voluntary, as a result this is likely an incomplete list of fire calls from 2008 – 2013.

Table BLA 11: Fire Calls from 2008-2013

	Fires	Ruptures	Rescue/EMS	Haz. Mat.	Service Calls	Good Intent Calls	False Alarms	Severe Weather	Special Incidents
Blaine	24	-	1	-	-	-	-	-	-

Source: NE State Fire Marshal: FDID Incident Type Summary Report 2008 - 2012

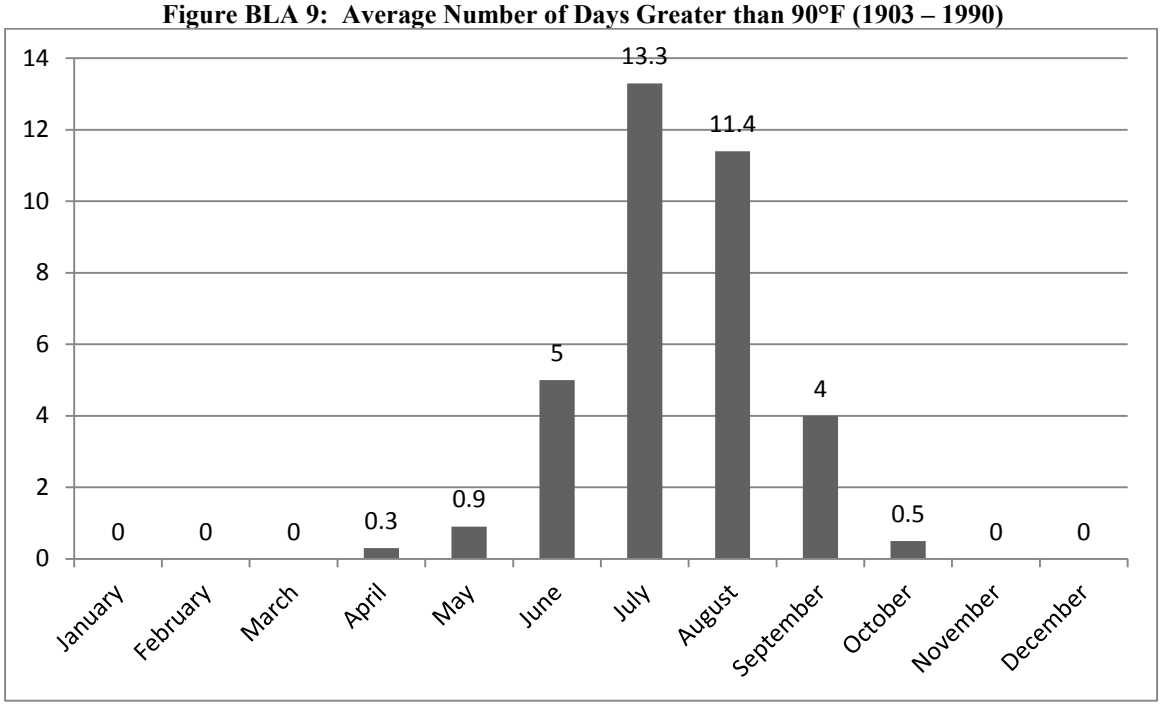
Overall, the fire departments located within the county are capable of responding to nearly all calls they receive. In a situation where additional resources are needed, there are mutual aide agreements between the various departments which provide redundancy as needed. The building stock throughout the county and planning area are mostly older structures which would burn quickly if ignited.

Severe Weather

Extreme Heat

Extreme heat is a natural part of the climate in Blaine County. Due to the regional nature of this hazard it will only be addressed in the county's portion of this plan. Figure BLA 10 illustrates the average number of days annually that Blaine County experiences temperatures 90 degrees or higher. Across the county the median age is just under 50 years and nearly 20 percent of the population is age 65 or greater. An aging population will be more vulnerable to the impacts resulting from extreme heat. In addition, a significant portion of the county economy relies on the agricultural industry which can be severely impacted during periods of prolonged high temperatures.

Figure BLA 9: Average Number of Days Greater than 90°F (1903 – 1990)



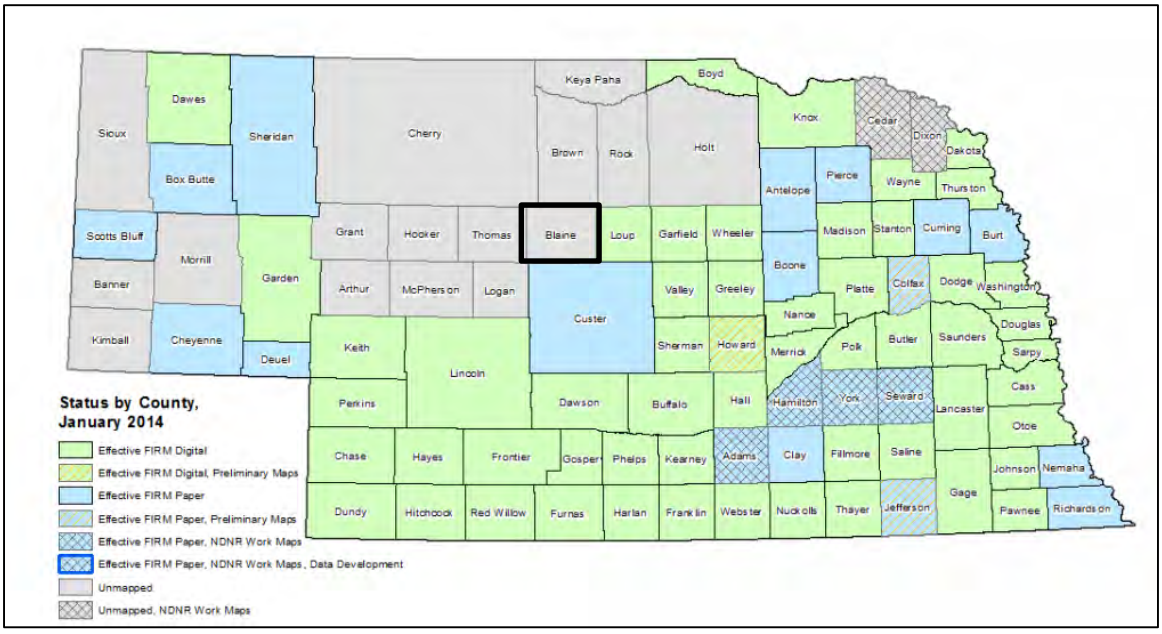
Source High Plains Climate Center

Flooding

The county planning team identified flooding as a threat for Blaine County. There was one flooding event reported by NCDC in Blaine County. The flood affected the village of Purdum and caused $130,000 in property damage and $10,000 in crop damage.

The village of Dunning also has two polices within the NFIP however no claims have been filed from these policies. The Figure below shows the status of floodplain mapping in Nebraska as of January 2014. Blaine County is outlined in black.

Figure BLA 10: Status of Floodplain Mapping in Nebraska



Source: NDNR

Hail Events

The county planning team identified hailstorms as a top threat for Blaine County. NCDC data records 156 events with a total of $229,000 in property damages and $84,000 in monetary losses recorded to crops. A summary of the events with recorded damages can be found in the participant sections. Hail in the unincorporated areas of the county is most likely to impact the agricultural areas of the county. There are more than 32,000 acres devoted to crops. Hail storms can have devastating impacts on crops, causing up to a 100 percent loss.

Severe Thunderstorm

Severe winter thunderstorms are a regular part of the climate across the ULNRD and Blaine County is no exception. The planning team understands that severe thunderstorms are highly probable in the future, but given the frequency of occurrence residents across the county are mostly prepared for the events and able to effectively cope with their occurrences. NCDC data records 17 events with a total of $206,000 in property damages. A summary of the events with recorded damages can be found in the participant sections where they occurred. Most events reported strong winds between 60 and 95 miles per hour. Damages reported include downed trees and tree limbs, roofs torn from structures, and damages to outbuildings.

Severe Winter Storms

Severe winter storms are a regular part of the climate across the UL NRD and Blaine County is no exception. The planning team understands that severe winter storms are highly probable in the future, but given the frequency of occurrence residents across the county are mostly prepared for the events and able to effectively cope with their occurrences. According to the NCDC there were 48 severe winter storms in Blaine County from 1996 through January 2014. These events resulted in $21,000 in property damage. The most costly event occurred in November of 2005 when a combination of heavy snowfall (8 - 15 inches), ice, and strong north winds resulted in closed roadways, power outages, and considerable damages to tree limbs and power lines.

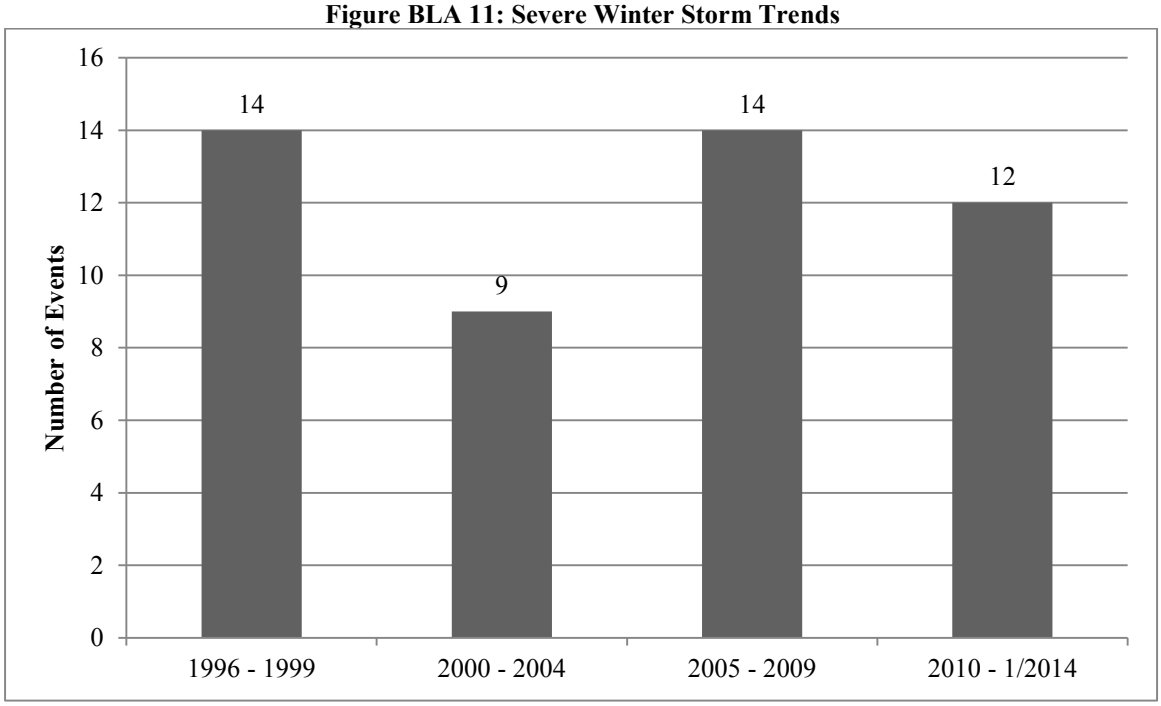
Table BLA 12: Historic Severe Winter Events

Date	Extent	Property Damage	Crop Damage
1/17/1996	3 – 5” snow, 60 mph winds	$1,000	$0
11/9/1998	< 4” snow, 50+ mph winds	$2,000	$0

11/27/2005	8 – 15" snow, 55 – 75 mph winds	$10,000	$0
12/19/2006	3 – 8" snow, 35 – 45 mph winds	$8,000	$0
Total	**-**	**$21,000**	**$0**

Source: NCDC

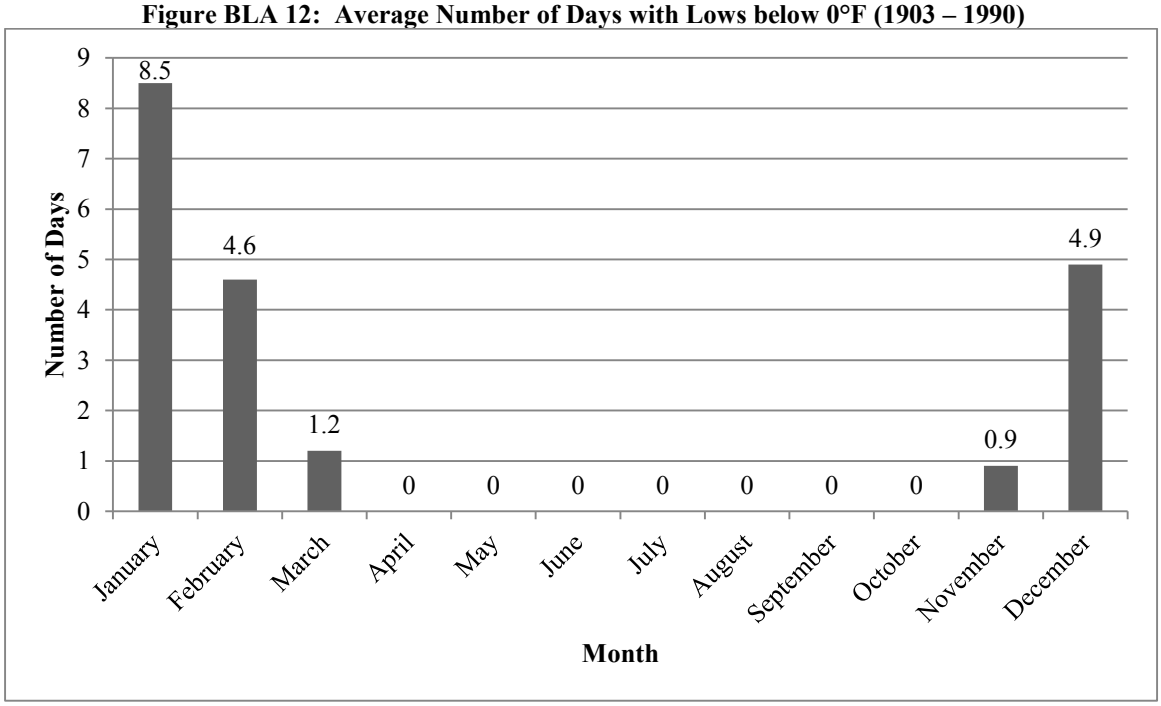
Figure BLA 11: Severe Winter Storm Trends



Source: NCDC

Most recorded events included a combination of factors including snow, wind, and ice. There were six reported events resulting from extreme cold temperatures solely. Extreme low temperatures events in Blaine County reported temperatures between 30 and 40 degrees below zero.

Figure BLA 12: Average Number of Days with Lows below 0°F (1903 – 1990)



Source: High Plains Regional Climate Center

Tornados and High Winds

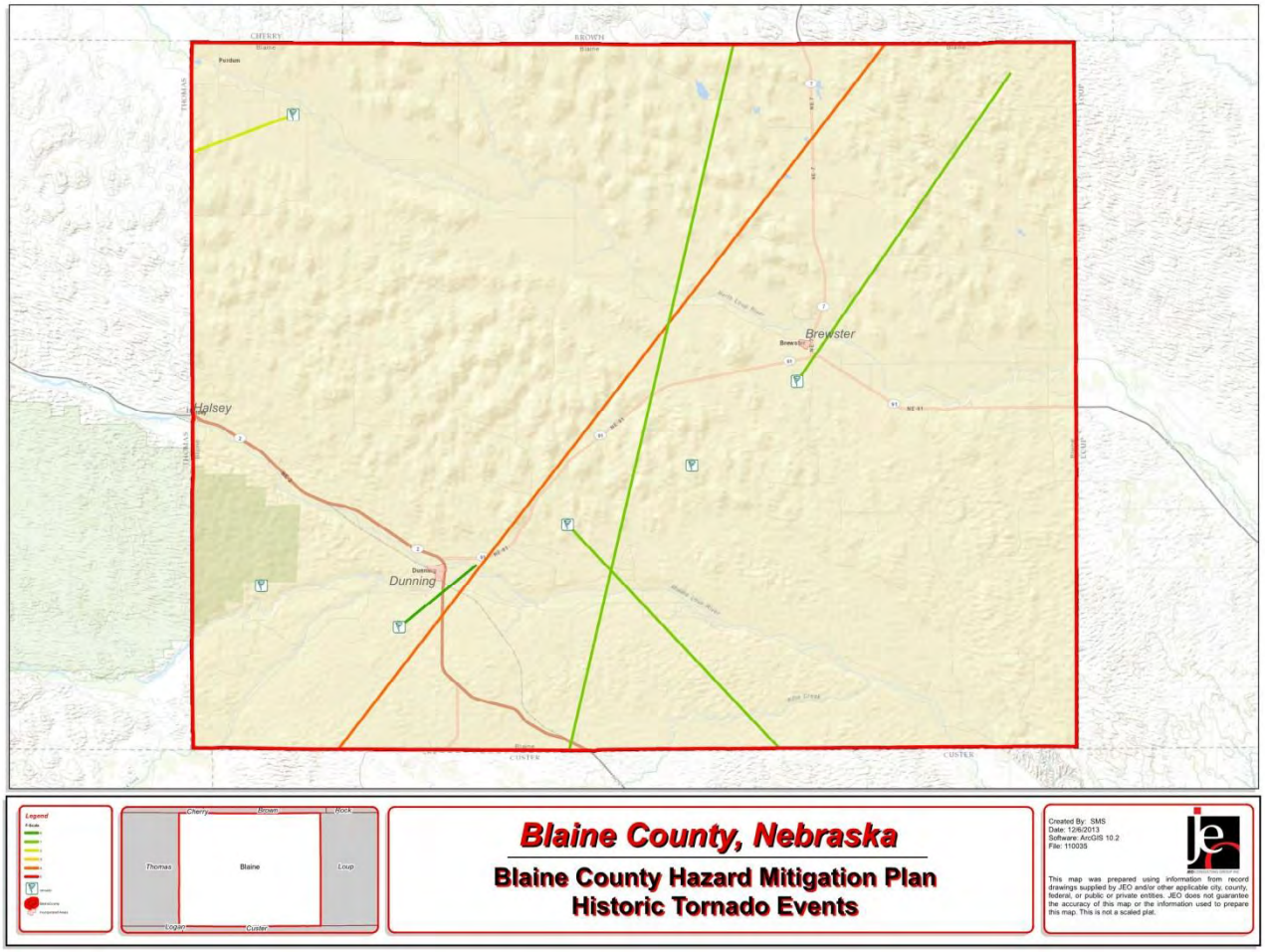
The county planning team identified tornados and high winds as a top threat for Blaine County. The NCDC recorded 21 events with a total of $20,000 in damages to property and $20,000 in crop damage. A summary of the events with recorded damages can be seen in Table BLA 13.

Table BLA 13: Historic Tornado Events

Hazard	Date	Extent	Property Damage	Crop Damage
Tornado	5/5/2007	EF1	$20,000	$0

Figure BLA 14 shows historic tornado tracks that have passed through Blaine County. The most significant event was an F4 tornado which passed nearby to the village of Dunning. An F4 tornado coming in direct contact with Brewster, Dunning, or Halsey would result in significant damages and deaths or injuries.

Figure BLA 13: Historic Tornado Tracks

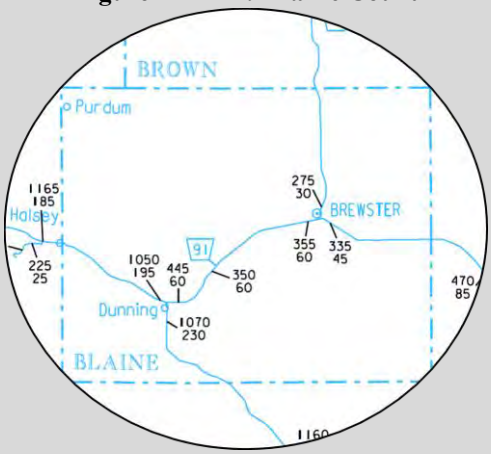


Source: NOAA SPC

Transportation Incidents /Chemical Spills/ Radiological Incident

The county planning team identified chemical spills during transportation as a top threat for Blaine County. According to the PHMSA incident reports there have been 1 spill reported from 1980 to 2013 which release 14 gallons of liquid and caused $12,425 in damages. The primary transportation routes through the county include NE HWY 91 and US HYW 2. The heaviest traffic is along US HWY 2 in the southwestern corner of the county. The traffic count on US HWY 2 entering Blaine County at Halsey is 1,165 light vehicles and 1 85 heavy trucks daily. The traffic county on US HWY south of Dunning is 1,070 light vehicles and 230 heavy trucks daily.

Figure BLA 14: Traffic Count



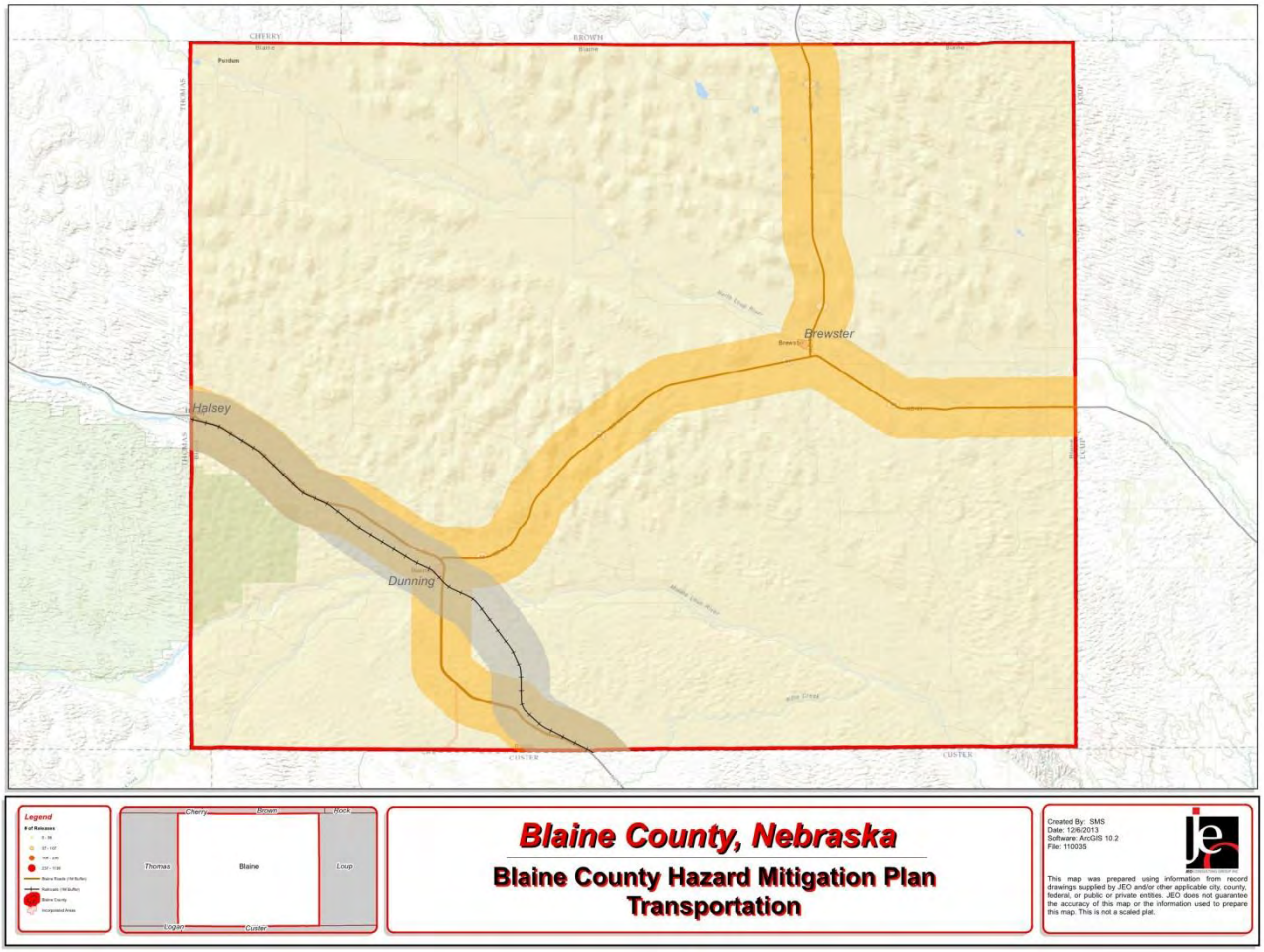
Source NDOR

Table BLA 14: Recorded Transportation Incidents

Date of Event	Location of Release	Quantity Released	Material Involved	Method of Transportation	Total Damage
9/17/2006	DUNNING	9 LGA	PHOSPHORIC ACID SOLUTION	Highway	$12,425

It is difficult to determine what materials are being transported along this route, but based on historic records from across the planning area fuel oils or agricultural materials are the most likely material to be released.

Figure BLA 15: Transportation Routes



Capability Assessment

Thus far the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism in understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capabilities, administrative & technical capability, fiscal capability, and education & outreach capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

UNINCORPORATED BLAINE COUNTY GOVERNANCE

The jurisdiction of Blaine County includes all unincorporated areas within the County boundaries. The Blaine County government structure is a three member Board of Commissioners. The Blaine County government includes the following departments and offices:

- Assessor's Office
- Attorney's Office
- Clerk's Office
- Clerk of the District Court
- Election Commissioner
- Highway Superintendent
- Emergency Management
- Veteran's Service Officer
- Extension Office
- GIS/IT (provided by contractor)
- Register of Deeds
- Sheriff's Office
- Technology/Website
- Treasurer's Office
- Weed Superintendent

Table BLA 15: Capability Assessment Survey

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	Yes, 2003
	Capital Improvements Plan	No
	Hazard Mitigation Plan	Yes
	Economic Development Plan	No
	Emergency Operational Plan	Yes
	National Resources Protection Plan	No
	Open Space Preservation plan	No
	Floodplain Management Plan	No
	Storm Water Management Plan	Yes
	Zoning Ordinance	No
	Subdivision Regulation/Ordinance	No
	Floodplain Ordinance	No
	Building Codes	No
	National Flood Insurance Program	No
	Community Rating System	No
	Other (if any)	NA
Administrative & Technical Capability	Planning Commission	Yes
	Hazard Mitigation Planning Commission	Yes
	Floodplain Administration	No
	Emergency Manager	Yes
	GIS Coordinator	Yes (by contract)
	Chief Building Official	No
	Civil Engineering	Yes (by contract)
	Staff Who Can Assess Community's Vulnerability to Hazards	Multiple Staff & Residents
	Grant Manager	Yes
	Other (if any)	NA
Fiscal Capability	Capital Improvement Project Funding	Yes
	Community Development Block Grant	No

	Authority to Levy Taxes for Specific Purposes	Yes
	Gas/Electric Service Fees	No
	Storm Water Service Fees	No
	Water/Sewer Service Fees	No
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	Yes
	Other (if any)	NA
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Yes (County/Regional EMA & NRD)
	Natural Disaster or Safety related school programs	No
	StormReady Certification	No
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	No
	Other (if any)	NA

SUMMARY

In the next update of the county's comprehensive plan Blaine County should consider incorporating information from the hazard mitigation plan into the comprehensive plan. If the county were to develop a Capital Improvement Plan mitigation projects with a high priority should be included. They county should consider zoning regulations that prevent development in hazard prone areas.

Mitigation Strategy

COMPLETED MITIGATION PROJECTS

Description	Emergency Notification
Analysis	Purchase and make available CodeRed Weather Warning service. CodeRed Weather Warnings are a voluntary emergency notification service which utilizes text and phone notification for residents within the Region 26 service Area
Goal/Objective	Goal 1/Objective 1.1
Hazard(s) Addressed	All
Benefits	Provides a service to help increase awareness of residents related to local hazard events.
Timeline	Complete
Lead Agency	Region 26 Emergency Management
Action since 2009 plan	Implemented

ONGOING MITIGATION PROJECTS

Description	Backup Generators
Analysis	Provide a portable or stationary source of backup power to redundant power supplies, municipal wells, lift stations, and other critical facilities and shelters.
Goal/Objective	Goal 1/Objective 1.1
Hazard(s) Addressed	Tornados and high winds, severe winter storms, severe thunderstorms
Estimated Cost	$15,000-$30,000 per generator
Benefits	Back-up power for critical facilities (i.e. nursing home). A measure that would reduce or prevent damage to property or prevent loss of life or serious injury.
Potential Funding	HMGP
Timeline	5 years
Priority	High
Lead Agency	Board of Commissioners, Region 26 Emergency Management
Action since 2009 plan	None

Description	Drainage Improvements
Analysis	The county utilizes stormwater systems comprising of ditches, culverts, or drainage ponds to convey runoff. Drainage improvements may include ditch upsizing, ditch cleanout and culvert improvements. Drainage ponds, both retention and detention, may also be implemented to decrease runoff rates while also decreasing the need for other stormwater system improvements.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Flooding
Estimated Cost	$10,000-$50,000
Benefits	These improvements can serve to more effectively convey runoff within jurisdictions, preventing interior localized flooding resulting in damages in all villages.
Potential Funding	HMGP, CDBG, Local Tax Revenue
Timeline	Ongoing
Priority	Medium
Lead Agency	Highway Superintendent, Board of Commissioners
Action since 2009 plan	Routine maintenance measures, upsizing of culverts as needed and able

Description	Fire Wise Defensible Space
Analysis	Work with the Nebraska Forest Service and US Forest Service to become a Fire Wise Communities/USA participant. Develop a Community Wildfire Protection Plan. Train land owners about creating defensible space. Enact ordinances and building codes to increase defensible space, improve building materials to reduce structure ignitability, and increase access to structures by responders. Develop and implement brush and fuel thinning projects.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Wildfire
Estimated Cost	$20,000
Benefits	Structures are less vulnerable to wildfire, easier for firefighters to defend structure during a wildfire event, and removes fuel from an approaching fire.
Potential Funding	HMGP, NFS, USFS, ULNRD, NGPC, National Fire Plan
Timeline	Carried over; 5 years
Priority	High
Lead Agency	Board of Commissioners, Region 26 Emergency Management, Local Communities
Action since 2009 plan	None

Description	Public Awareness / Education
Analysis	Through activities such as outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. In addition, educate citizens on erosion control and water conservation methods. Educate residents on response and rescue plans for all hazard types.
Goal/Objective	Goal 3/Objective 3.1 and Goal1/Objective 1.1
Hazard(s) Addressed	All hazards
Estimated Cost	$500+
Benefits	Increase knowledge to new comers to the area as well as elderly in how to react when an event is going to occur or is occurring. Education to reduce or prevent damage to property or prevent loss of life or serious injury.
Potential Funding	HMGP, PDM
Timeline	Ongoing
Priority	Medium
Lead Agency	County Emergency Management, Region 26 Emergency Management, NEMA, NDNR, ULNRD
Action since 2009 plan	Ongoing educational efforts from regional emergency management office and the NRD

Description	Civil Service Improvements
Analysis	Improve emergency rescue and response equipment and facilities by providing additional, or updating existing emergency response equipment. This could include fire trucks, ATV's, water tanks/truck, snow removal equipment, etc. This would also include identifying and training additional personnel for emergency response.
Goal/Objective	Goal 4/Objective 4.1
Hazard(s) Address	All Hazards
Estimated Cost	Varies depending on what equipment is needed
Benefits	Increase local capabilities to respond to disasters
Potential Funding	Homeland Security, Emergency Management, NEMA, Governing County and Board of Commissioners, Nebraska Forest Service
Timeline	On-going
Priority	Low
Lead Agency	Fire Department, Blaine County Sheriff's Office, Region 26 Emergency Management, Board of Commissioners
Action since 2009 plan	Ongoing training of emergency response staff

Description	Emergency Communications
Analysis	Establish an action plan to improve communication between agencies to better assist residents and businesses during and following emergencies. Establish inner-operable communications. Provide equipment such as satellite telephones and radios.
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	Tornados and high winds, severe winter storms, severe thunderstorms
Estimated Cost	$10,000+
Benefits	More efficient and effective communication between different departments
Potential Funding	Homeland Security
Timeline	Ongoing
Priority	Medium
Lead Agency	Fire Department, Blaine County Sheriff's Office, Region 26 Emergency Management
Action since 2009 plan	Local EOP updated within the last 5 years

Description	Alert Sirens
Analysis	Perform an evaluation of existing alert sirens in order to determine sirens which should be replaced or upgraded. Install new sirens where lacking.
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	All hazards
Estimated Cost	$15,000+
Benefits	Increase response time in order to mitigate injuries, deaths, and property damages.
Potential Funding	HMGP
Timeline	Three to five years
Priority	High
Lead Agency	County E911, Emergency Management, Local governments
Action since 2009 plan	None reported

REMOVED MITIGATION PROJECTS

None

VILLAGE OF BREWSTER

HISTORY

Settlement began in the community of Brewster in 1884 when a town was laid out by George Washington Brewster, a wealthy newspaper publisher and direct descendant of Elder William Brewster of the Mayflower. Brewster came from Oakland, Nebraska, in 1884 and homesteaded the land on which the town now stands. It is named for Elder Brewster and not George. Brewster expended his fortune building up the town, fully believing that "Brewster would soon be the state capitol" because of its excellent central location. Brewster did not incorporate until 1947. Brewster celebrated its centennial in 1987. Brewster is the county seat of Blaine County.

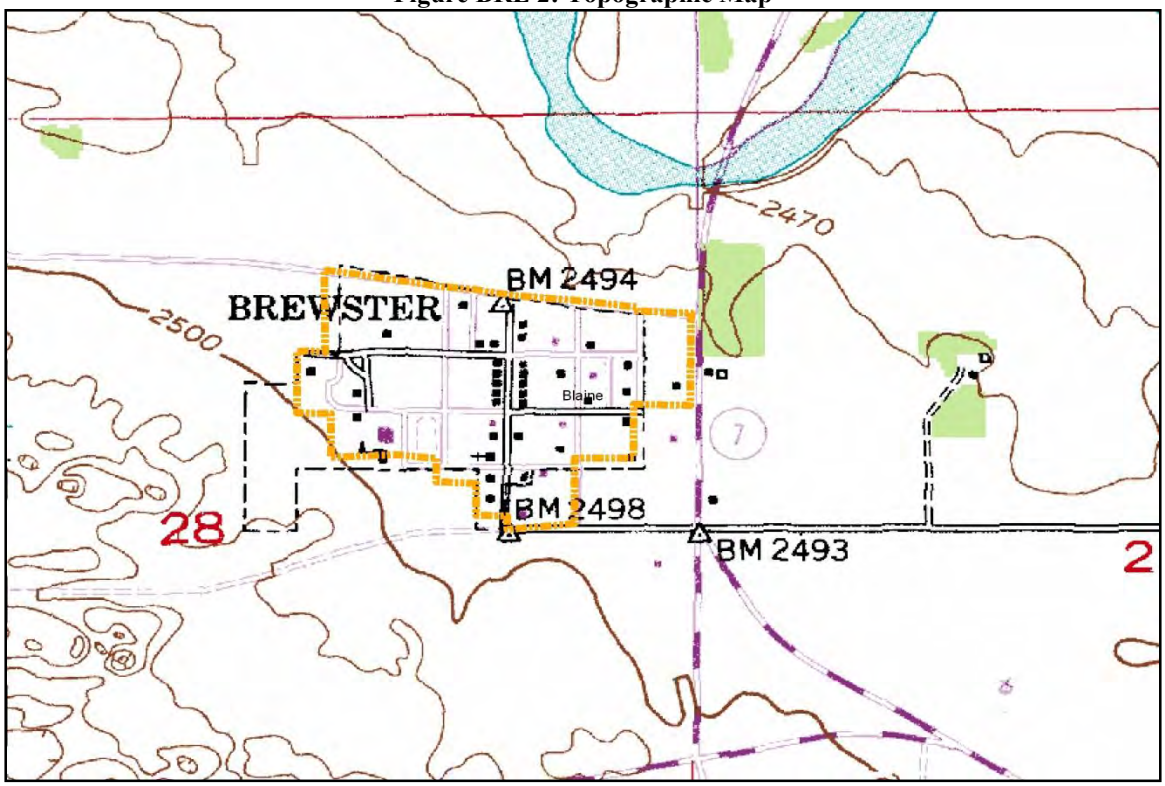
Location/Geography

Brewster is a village located in the east central portion of Blaine County. The Village of Brewster covers an area of 57.6 acres and has an elevation of 2,494 feet above sea level. Brewster is 232.7 miles northwest of Lincoln.

Figure BRE 1: Location

The community of Brewster is in an area of sand hills. The land use surrounding the community is mainly ranching with some agricultural crops in the river valleys. Hilly land composed of low to high dunes of sand stabilized by a grass cover is prevalent. The community lies immediately south of the North Loup River valley. The watershed flows generally from the northwest to the southeast. The floodplain has not been delineated for Brewster and river flooding is not a significant concern.

Figure BRE 2: Topographic Map

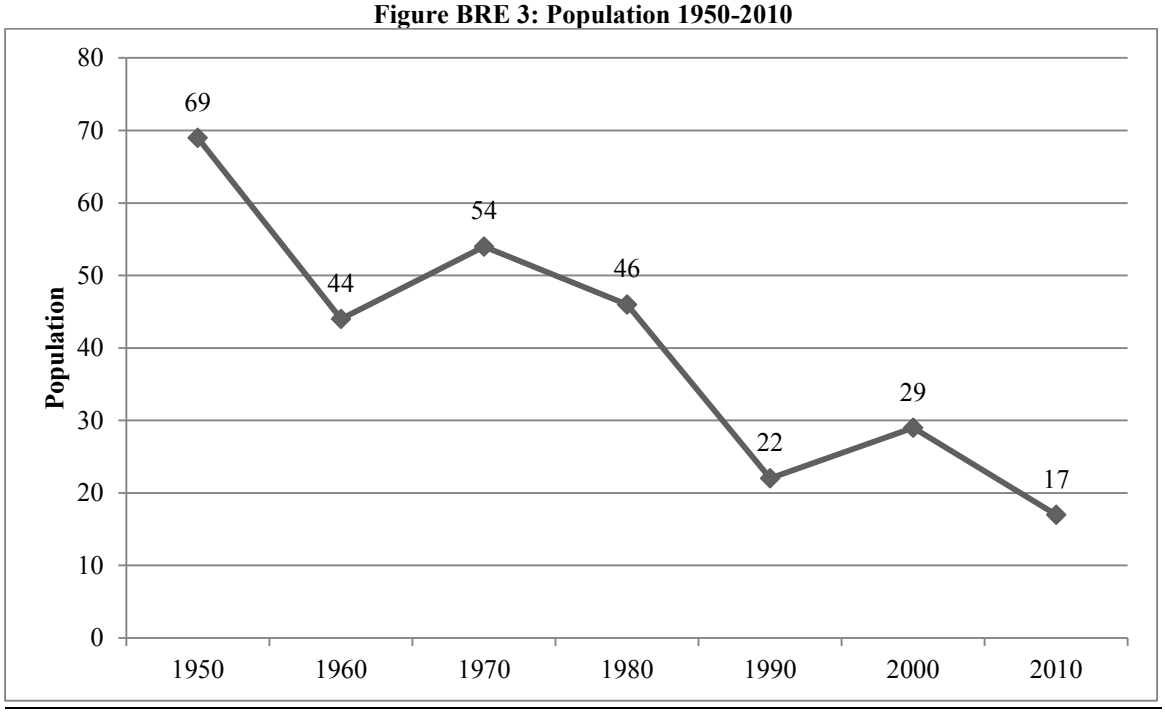


DEMOGRAPHICS

Since 1950 Brewster has seen an overall decline in population with some periods of slight growth. The first period of growth occurred between 1960 and 1970 when the population grew by more than 22 percent from 44 to 54. Over the next 20 years the population fell to 22. In 2010 the population had decreased to 17. This decline in population makes Brewster more vulnerable to hazards. The majority of the increase vulnerability relative to a declining population has to do with the vacant properties which can result. Vacant housing is often more likely to be in disrepair, and eventually add to blight. Housing in poor condition can result in added debris in the event of various different hazards. It can provide good fuel for fire as well as creating additional debris following thunderstorms winds and tornadoes. It can also provide housing for pests, such as pigeons and rats which can have other detrimental effects on neighboring houses as well as on some kinds of crops (as well as a connection back to the spread of pandemic disease).

Figure BRE 3 displays the historical population trend for Brewster from 1950 to 2010.

Figure BRE 3: Population 1950-2010



Source: US Census

Table BRE 1 illustrates the age distribution and median age for Blaine County in comparison to the village of Brewster.

Table BRE 1: Age Distribution Brewster & Blaine County

	Blaine County	Brewster
< 5 yrs.	6.50%	0.00%
5 - 64 yrs.	78.60%	52.90%
> 64 yrs.	14.60%	47.10%
Median Age	41.3	62.9

Source: U.S. Census, 2010

Overall, the residents of Brewster are older than that of the rest of the county. Nearly half of the Brewster population is over the age of 64 years. The Brewster planning team presented this as a significant concern for the community. In the past the community has possessed the necessary resources address the concerns of the community. The planning team reported that as the population increases in age they are more vulnerable to events that would previously been manageable.

HOUSING AND ECONOMICS

Median household income, per capita income, home value and rent for the county as a whole compare with that of Brewster are outlined in Table BRE 2.

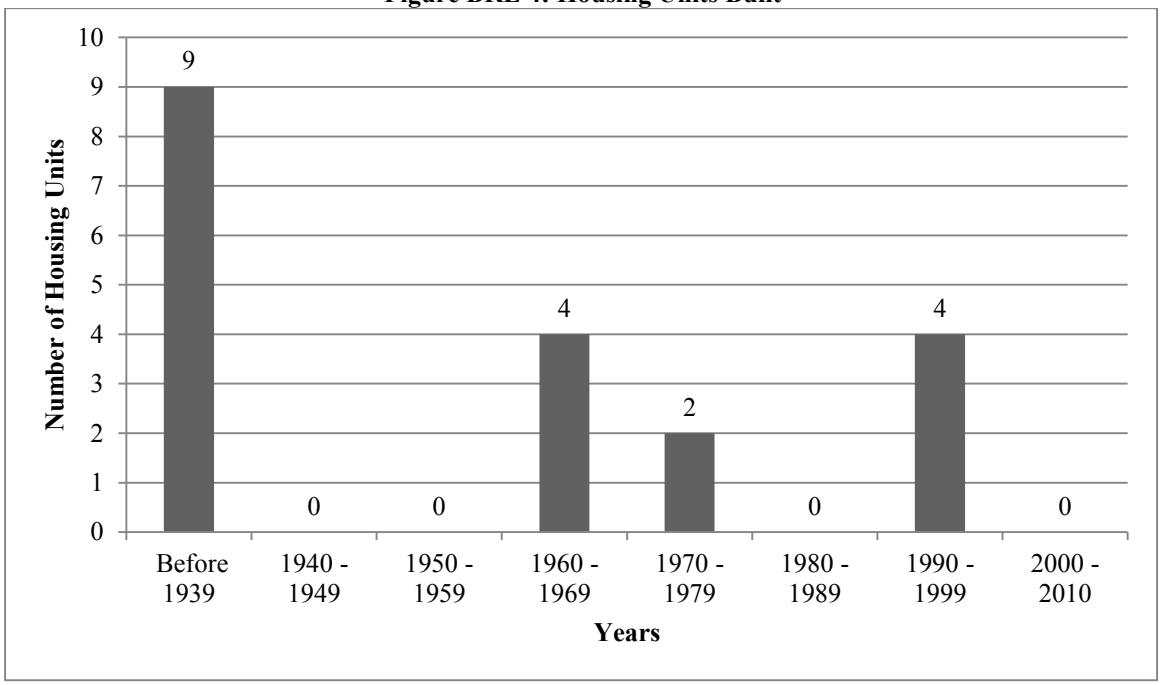
Table BRE 2: Economic Brewster & Blaine County

	Blaine County	Brewster
Median Household Income	$39,000	$19,688
Per Capita Income	$20,586	$7,526
Median Home Value	$57,600	$14,400
Median Rent	$631	NA

Source: U.S. Census American Community Survey Housing Characteristics and Income, 2012

Compared to the count as a whole Brewster has a lower household income, per capita income, and lower home values which is consistent with what would be expected from an aging community.

Figure BRE 4: Housing Units Built



Source: US Census 2006 - 2010 American Community Survey 5 Year Estimates

On total there are 19 housing units in the village. Of those units more than 42 percent are unoccupied. It was reported that there are no rental properties in the community.

Table BRE 3: Housing Unit Occupancy

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Blaine County	242	71.8%	95	28.2%		158	65.3%	84	34.7%
Brewster	11	57.9%	8	42.1%		11	100%	0	0%

Source: US Census 2006 - 2010 American Community Survey 5 Year Estimates

Structural Inventory and Valuation

A structural inventory was completed for the corporate limits of Brewster though a window survey using GIS for the 2009 hazard mitigation plan. The values of these structure types were determined from the 2013 Property Type Values as provided by the Nebraska Department of Revenue Property Assessment Division and still serve as an accurate measure for this process.

Results from the structural inventory completed by the Village of Brewster are found in Table BRE 4. Information displayed in this table includes the number of structures, value per structure, and total value of each structure type.

Table BRE 4: Structural Inventory and Valuation

Total Structures		Structure Valuation	
Structure Type	**Number of Structures**	**Total Value**	**Value per Structure**
Commercial/Industrial	12	$122,004	$10,167
Out Building	18	$63,360	$3,520
Residential	19	$274,360	$14,440
Public/Quasi Public	9	$44,901	$4,989
Total	**59**	**$504,625**	NA

**Values are rounded to the nearest dollar.*

Critical Infrastructure/Key Resources

Figure BRE 5: Location of Critical Facilities

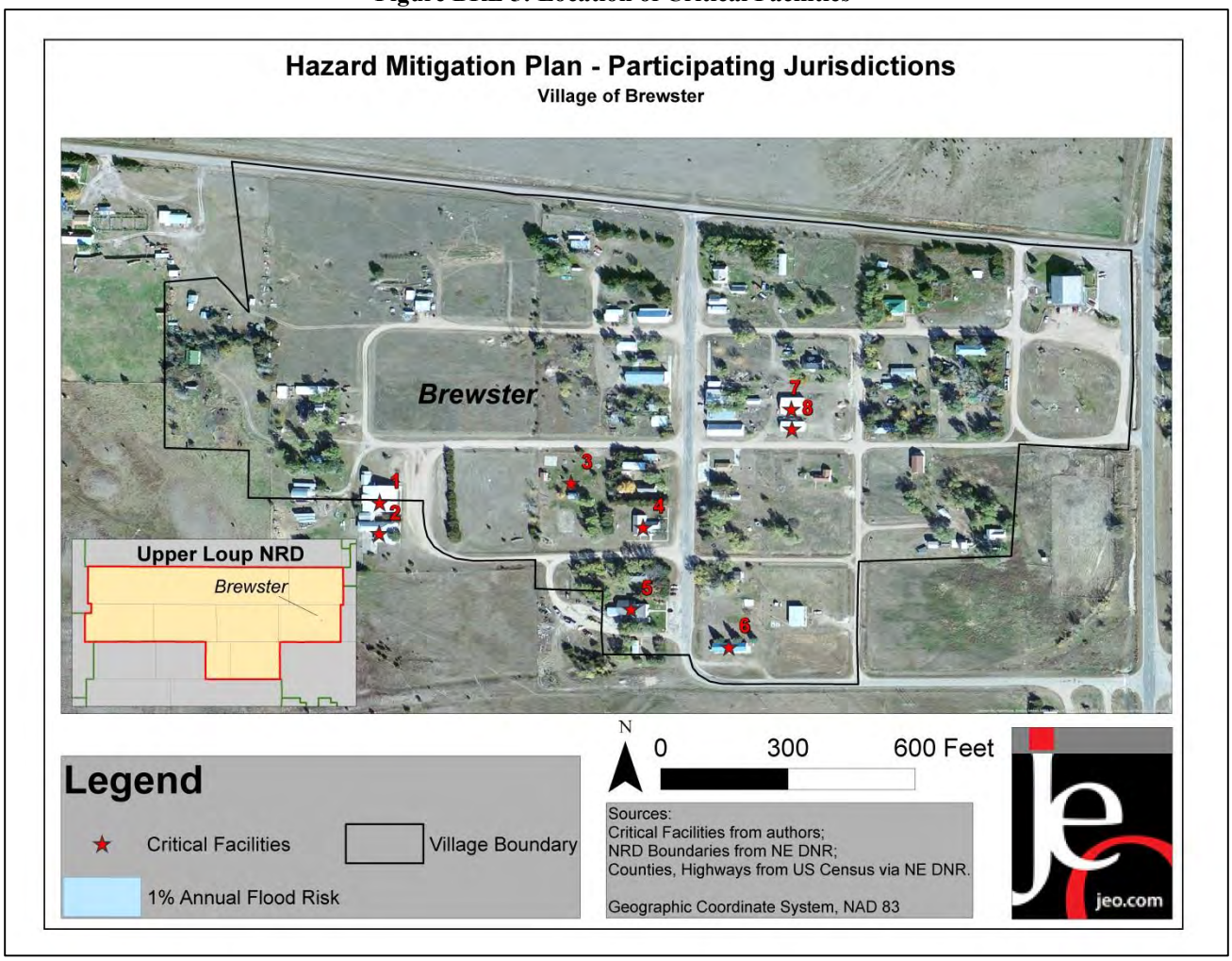


Table BRE 5: Critical Facilities

Number	Name	Function
#1	School	
#2	School	
#3	Public Park	Gathering Location
#4	United Church of Christ	Gathering Location
#5	Blaine County Courthouse	County Government
#6	American Legion Hall	Gathering Location/temporary shelter
#7/#8	Fire Department	Emergency Response

FUTURE DEVELOPMENT TRENDS

The planning team felt that in the future there would be few new buildings constructed within the community. At this time there are a number of vacant buildings within the community. These buildings would ideally be occupied in the future or removed.

Risk Assessment

Hazard Identification

Table BRE 6 is a local risk assessment for the hazards as identified specifically for the community. Refer to *Section 4: Risk Assessment* for an explanation as to what this methodology is and why certain hazards did not pose a significant enough threat and were eliminated from detailed discussion due to the calculation.

Table BRE 6: Risk Assessment

Hazard	Previous Occurrence: Yes or No	County Hazard Ranking in NE 2014 State HMP	Specific Concerns Identified
Natural Hazards			
Drought	**Yes**	**High**	**Economic losses in the ag sector**
Grass/Wildfires	**Yes**	**High**	**Fires moving from unincorporated areas into the village; limited firefighting resources within the village**
Severe Winter Storms	**Yes**	**High**	**Roadway closures, resources to remove snow and ice accumulations, prolonged power outages**
Hail Events	**Yes**	**NA**	**Economic impact especially in the ag sector. Damages to homes and other structures**
Severe Thunderstorms	Yes	High	Frequency of occurrence, potential for secondary impacts (lightning causing wildfires)
Extreme Heat	Yes	NA	Elderly population and economic impacts (especially in ag sector)
High Winds	Yes	High	Frequency of occurrence
Tornados	No	High	Lack of safe rooms
Earthquakes	No	Medium	None
Animal Disease	No	High	None
Flooding	Yes	Medium	Mostly localized events, concerns related to transportation route closure(s)
Plant Disease	No	High	None
Dam Failure	No	None	None
Landslides	No	NA	None
Man-made Hazards			
Chemical Spills (transportation)	No	Medium	None
Urban Fire	Yes	High	None
Radiological Incident (transportation)	No	NA	None
Chemical spills (fixed site)	No	Medium	Ag chemical storage areas
Radiological Fixed Sites	No	None	None
Terrorism	No	Low	Tampering with water supplies
Civil Disorder	No	Low	None

According to the risk assessment, the top hazards in the village of Brewster are drought, severe winter storms, hail events, and grass/wildfires. These top concerns are similar to those of the ULNRD. Tornados and high winds are not as high of a concern to this community due to Brewster being fairly sheltered by surrounding hills.

Historical Occurrences

The NCDC counted a total of 81 hazard events in the village of Brewster and there was no recorded of death or injury, but $295,000 in property damages and $51,000 in crop damages.

FIRE

Grass/Wildfires

The local planning team identified grass/wildfire as a significant concern for the village. According to the Nebraska Forestry Department there were 9 reported fires by Brewster Fire Department from 2000 to 2012 which consumed a total of 218 rangeland acres and no crop land acres. The fires also resulted in more than $2,500 in damages to crops and structures.

SEVERE STORMS

Flooding

Although no floods have been reported to NCDC the 2010 flood in Blaine County did affect the village of Brewster. Numbers on damage are not available.

Figure BRE 6: Flooding in Brewster

Source: Region 26 Emergency Management

Hail Events

The county planning team identified hailstorms as a top threat for the Village of Brewster. NCDC data records 75 events with a total of $105,000 in property damages and $51,000 in monetary losses recorded to crops. A summary of the events with recorded damages can be seen in Table BRE 7.

Table BRE 7: Historic Hail Events

Date	Extent	Property Damage	Crop Damage
7/22/2000	1.75	$30,000	$0
7/2/2001	1.75	$15,000	$0
8/11/2002	2.75	$15,000	$8,000
7/22/2000	1.75	$10,000	$15,000
6/24/2003	1.25	$10,000	$0
7/15/2007	1.75	$10,000	$0
7/22/2000	1.75	$5,000	$15,000
8/26/2002	1.25	$4,000	$4,000
8/26/2002	1	$3,000	$3,000
8/16/2002	1	$2,000	$1,000
8/9/2005	1.25	$1,000	$0
5/15/1996	0.75	$30,000	$0
7/5/2000	1in	$2,000	$5,000
Total		**$105,000**	**$51,000**

Source: National Climatic Data Center

Given the frequency of occurrence and level of damages, hail likely to result in greater damage totals than many other hazards. Given the age of the community's structures it is unlikely that there will be mitigation actions taken to address this threat unless funding assistance is provided, perhaps following a major hail event.

Severe Thunderstorms

For Brewster there were 6 reported severe thunderstorm events between 1996 and 2014. Significant events that resulted in damages are identified in Table BRE 8. In 2000 Brewster and the surrounding area was struck by a major thunderstorm which resulted in an estimated $150,000 in damages. The storm produced wind gusts up to 100 mph, knocking down trees, power lines, and damaging buildings. Again in 210, Brewster was impacted by another severe thunderstorm. This event had sustained winds of approximately 70 mph. The county sheriff reported roofs being blown off structures and significant damages to trees throughout the community.

Table BRE 8: Severe Thunderstorm Events

Date	Extent	Property Damage	Crop Damage
7/5/2000	70 kts.	$150,000	$0
6/10/2010	60 kts.	$40,000	$0

Source: NCDC

Severe Winter Storms

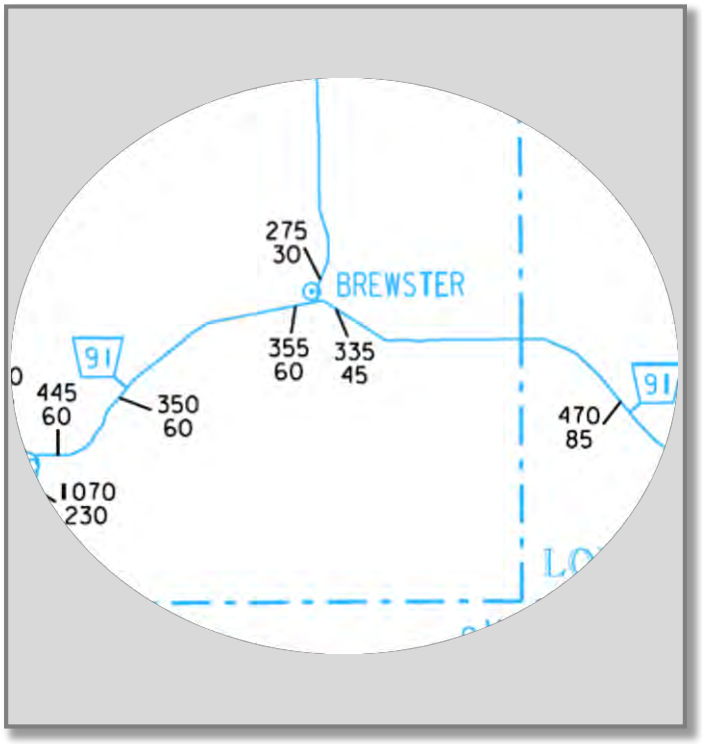
The local planning team identified severe winter storms as a significant concern for the community. The local planning team reported severe winter storms as being a natural part of the local climate. The event of greatest concern for the community is severe winter storms with strong winds, extreme low temperatures, and high snowfall totals. During these events it is difficult to clear roadways due to drifting snow. In addition, it is more difficult to provide assistance to vulnerable community members. It is not likely that structures would sustain

significant damages from severe winter storms. The loss of power during these events is a great concern for the community.

For the village, municipal roadways are cleared by members of the community while state and county roadways are responsible for clearing their respective roadways. The village also reported an informal system of monitoring vulnerable community members. As the population of the village ages it is important that members of the community monitor each other ensuring that members of the community needing additional assistance have social networks to assist them in meeting their needs.

Tornado and High winds

The local planning team identified tornados and high winds as a concern for the community. According to the NCDC data, there were two tornados (an F0 and an EF0) and one funnel cloud in/near Brewster. None of the reported events included damages to structures or crops. There was an EF0 tornado in 2011 that touched down near Brewster but there were no damages associated with that event. There was, however, 4 inch hail associated with this event.



TRANSPORTATION

Transportation Incidents /Chemical Spills/ Radiological Incident

The local planning team identified transportation incidents as a low/moderate threat for Brewster. According to the PHMSA incident reports there has been no spills reported from 1980 to 2013.

The main transportation routes through Brewster include NE HWY 91 and NE HWY 7. Traffic counts just north of Brewster provided by the Nebraska Department of Roads report 275 light vehicles and 30 heavy trucks passing through the village on NE HWY 7 daily. NE HWY 91 reports greater volume with 335 light vehicles and as much as 60 heavy trucks daily (60 heavy trucks west of town, 45 heavy trucks east of town). It is very difficult to determine what exactly is being transported along these routes. There is no evidence of radiological materials being transported through the planning area much less through Brewster.

Capability Assessment

Thus far the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism in understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capabilities, administrative & technical capability, fiscal capability, and education & outreach

capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

VILLAGE GOVERNANCE

The village is governed by a five member board. The village works with the county and Regional Emergency Management for most services. While there are few formal departments and agencies the planning team reported strong community ties. This sense of community has been essential in the past when impacted by natural hazards.

Table BRE 9: Capability Assessment

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	No
	Capital Improvements Plan	No
	Hazard Mitigation Plan	Yes
	Economic Development Plan	No
	Emergency Operational Plan	Yes (County)
	National Resources Protection Plan	No
	Open Space Preservation plan	No
	Floodplain Management Plan	No
	Storm Water Management Plan	No
	Zoning Ordinance	No
	Subdivision Regulation/Ordinance	No
	Floodplain Ordinance	No
	Building Codes	No
	National Flood Insurance Program	No
	Community Rating System	No
	Other (if any)	NA
Administrative & Technical Capability	Planning Commission	No
	Hazard Mitigation Planning Commission	Yes (3 member)
	Floodplain Administration	No
	Emergency Manager	Yes (county/regional)
	GIS Coordinator	County by contract
	Chief Building Official	No
	Civil Engineering	No
	Staff Who Can Assess Community's Vulnerability to Hazards	Multiple residents
	Grant Manager	No
	Other (if any)	NA
Fiscal Capability	Capital Improvement Project Funding	No
	Community Development Block Grant	No
	Authority to Levy Taxes for Specific Purposes	Yes
	Gas/Electric Service Fees	No

Survey Components/Subcomponents		Comments
	Storm Water Service Fees	No
	Water/Sewer Service Fees	No
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	No
	Other (if any)	NA
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	County/NRD
	Natural Disaster or Safety related school programs	No
	StormReady Certification	No
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	No
	Other (if any)	NA

SUMMARY

Brewster currently does not have comprehensive or capital improvement plans. If the village were to develop these plans it would be advised that they incorporate mitigation projects and information on hazards from this plan into the other plans.

The strength of Brewster is the sense of community and the social networks that exist within the community. It will be difficult for the village to implement mitigation projects without assistance from outside sources. Potential partners in implementing mitigation projects include (but are not limited to): Blaine County, Region 26 EMA, ULNRD, and NEMA.

Mitigation Strategy

COMPLETED MITIGATION PROJECTS

Description	Storm water Improvements
Analysis	Install new culvert and upsized storm water following flooding event
Hazard(s) Addressed	Flooding
Benefits	Relieved localized flooding problems. No reported incidents since repair were made.
Timeline	Completed 2010
Lead Agency	Village board

ONGOING MITIGATION PROJECTS

Description	Backup Generators
Analysis	Provide a portable or stationary source of backup power to redundant power supplies specifically for: Fire Department and County Offices/Courthouse
Goal/Objective	Goal 1/Objective 1.1
Hazard(s) Addressed	Tornados and high winds, severe winter storms, severe thunderstorms
Estimated Cost	$15,000-$30,000 per generator
Benefits	Back-up power for critical facilities (i.e. fire station). A measure that would reduce or prevent damage to property or prevent loss of life or serious injury.
Potential Funding	HMGP
Timeline	Carried over, 5 years
Priority	High
Lead Agency	Fire Department, Village Board, Region 26 EMA
Action since 2009 plan	None

Description	Storm Shelter / Safe Rooms
Analysis	Design and construct fully supplied storm shelters and safe rooms in highly vulnerable areas such as mobile home parks, campgrounds, school, and other areas.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Tornados and high winds, severe thunderstorms, severe winter storms
Estimated Cost	$200-$300/sf stand alone; $150-200/sf addition/retrofit
Benefits	Useful for many residents that do not have basements or cellars to go for shelter, especially beneficial for the nursing home and other vulnerable populations
Potential Funding	PDM, HMPG
Timeline	Carried over, 10 years
Priority	Low
Lead Agency	Village Board, Region 26 EMA
Action since 2009 plan	None

Description	Fire Wise Defensible Space
Analysis	Work with the Nebraska Forest Service and US Forest Service to become a Fire Wise Communities/USA participant. Develop a Community Wildfire Protection Plan. Train land owners about creating defensible space. Enact ordinances and building codes to increase defensible space, improve building materials to reduce structure ignitability, and increase access to structures by responders. Develop and implement brush and fuel thinning projects.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Wildfire
Estimated Cost	$20,000
Benefits	Structures are less vulnerable to wildfire, easier for firefighters to defend structure during a wildfire event, and removes fuel from an approaching fire.
Potential Funding	HMGP, NFS, USFS, ULNRD, NGPC, National Fire Plan
Timeline	Carried over; 5 years
Priority	High
Lead Agency	Village Board, Blaine County, Region 26 Emergency Management, Nebraska Forestry Service
Action since 2009 plan	None

Description	Public Awareness / Education
Analysis	Through activities such as outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. In addition, educate citizens on erosion control and water conservation methods. Educate residents on response and rescue plans for all hazard types.
Goal/Objective	Goal 3/Objective 3.1 and Goal1/Objective 1.1
Hazard(s) Addressed	All hazards
Estimated Cost	$500+
Benefits	Increase knowledge to new comers to the area as well as elderly in how to react when an event is going to occur or is occurring. Education to reduce or prevent damage to property or prevent loss of life or serious injury.
Potential Funding	HMGP, PDM
Timeline	Ongoing
Priority	Medium
Lead Agency	Village Board, Region 26 EMA, NEMA, NDNR, ULNRD
Action since 2009 plan	Ongoing educational efforts from regional emergency management office

Description	Weather Radios
Analysis	Conduct an inventory of weather radios at rural residents and other critical facilities; provide new radios as needed.
Goal/Objective	Goal 4/Objective 4.3 and Goal 1/Objective 1.1
Hazard(s) Addressed	All hazards
Estimated Cost	$50/per radio
Benefits	Help those who do not have access to local TV or radio warnings
Potential Funding	HMGP, PDM
Timeline	Carried over, 5 years
Priority	High
Lead Agency	Village Board, Region 26 EMA
Action since 2009 plan	Region 26 EMA now offers CodeRed Weather Warning service to the village

Description	Emergency Communications
Analysis	Establish an action plan to improve communication between agencies to better assist residents and businesses during and following emergencies. Establish inner-operable communications. Provide equipment such as satellite telephones and radios.
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	Tornados and high winds, severe winter storms, severe thunderstorms
Estimated Cost	$10,000+
Benefits	More efficient and effective communication between different departments
Potential Funding	Homeland Security
Timeline	Carried over, 5 years
Priority	Medium
Lead Agency	Fire Department
Action since 2009 plan	None

REMOVED MITIGATION PROJECTS

Description	Enroll in the National Flood Insurance Program (NFIP)
Analysis	Participate in the National Flood Insurance Program (NFIP). (Contact NDNR at 402.471.3932 for any questions or to request educational material on NFIP.
Hazard(s) Addressed	Flooding
Reason	Flood is a very low threat for the village. The planning team reported no need for the community to participate in the NFIP.

Description	Windbreaks / Living Snow Fence
Analysis	Installation of windbreaks and/or living snow fences to increase water storage capacity in soil and reduce blowing snow.
Hazard(s) Addressed	High Winds
Reason	The local planning team determined this to be unlikely to occur. The village has limited resources to implement projects.

VILLAGE OF DUNNING

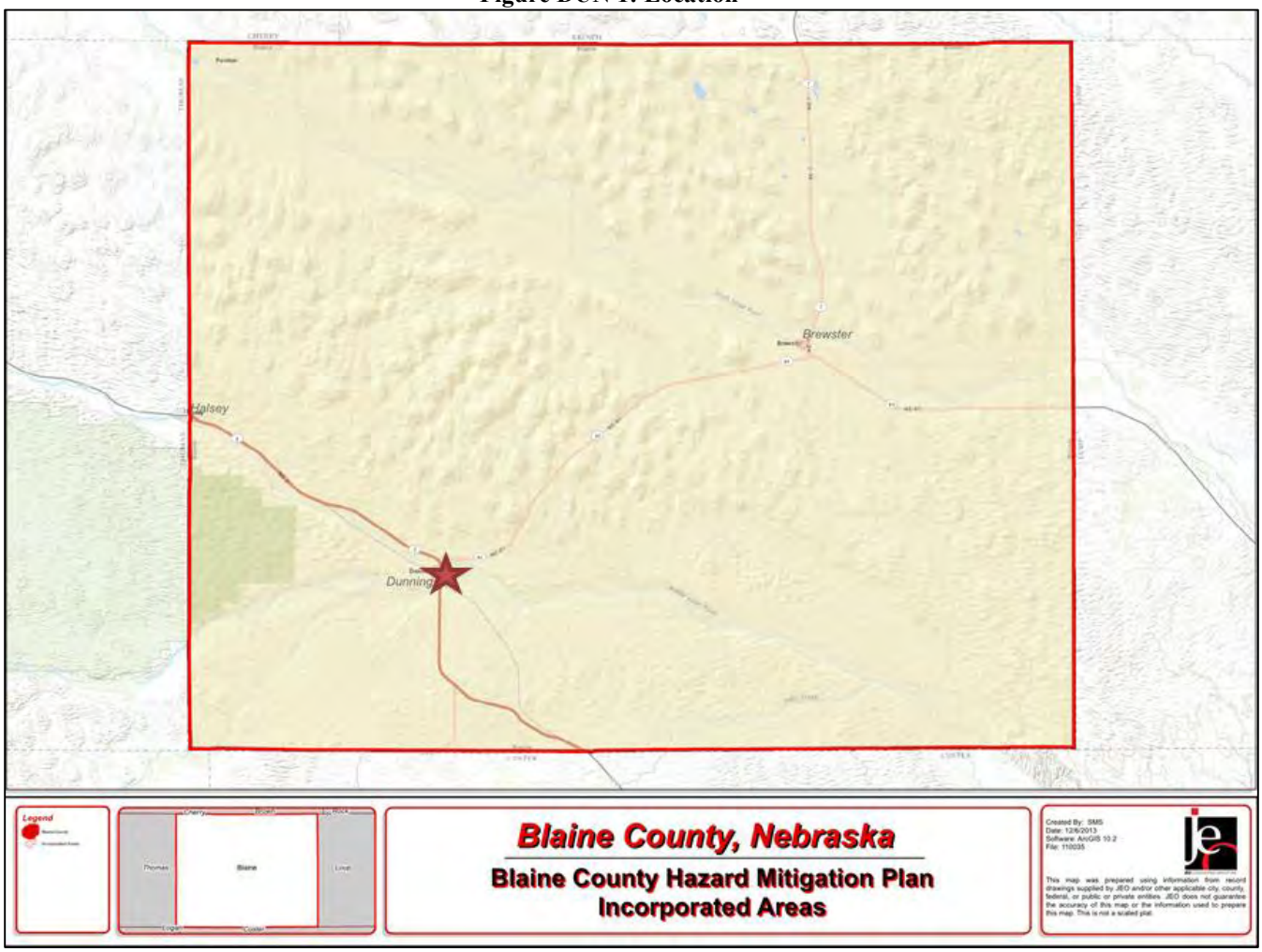
HISTORY

Settlement began in the community of Dunning in 1887 when the Burlington & Missouri River Railroad built a bridge across the Dismal River and extended its line up through the area. A town was officially platted by the Lincoln Land Company and named "Dunning" in honor of two brothers, Sam and R.O. Dunning. They did much to develop the town and get the railroad to establish a station at this location. The town grew rapidly because it was a rail-shipping point for all the settlements around it. Dunning celebrated its centennial in 1987.

LOCATION/GEOGRAPHY

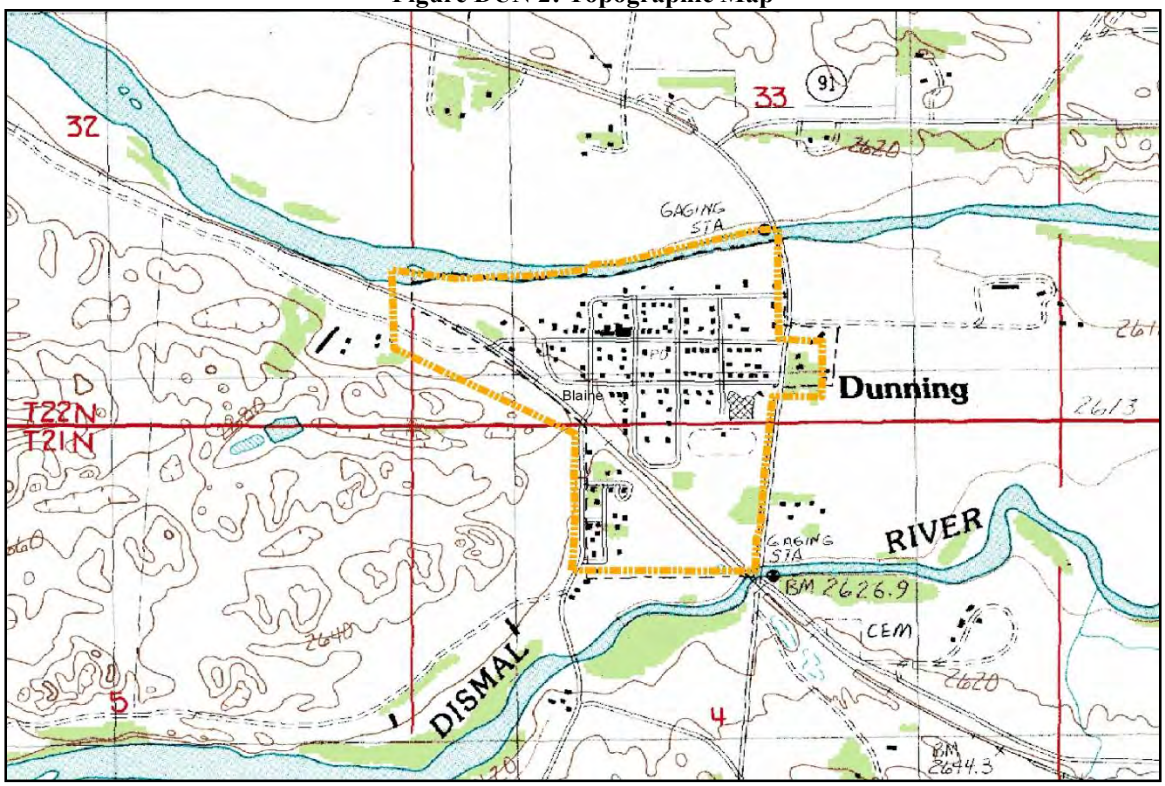
Dunning is a village located in the south west portion of Blaine County. The Village of Dunning covers an area of 147.2 acres and has an elevation of 2,615 feet above sea level.

Figure DUN 1: Location



The community of Dunning lies in an area of sand hills. The land use surrounding the community is mainly ranching with some agricultural crops in the river valleys. Hilly land composed of low to high dunes of sand stabilized by a grass cover is prevalent. The community lies immediately south of the Middle Loup River valley and north of the Dismal River valley. The watershed flows generally from the northwest to the southeast. The floodplain has been delineated for the area, but river flooding is not a significant concern.

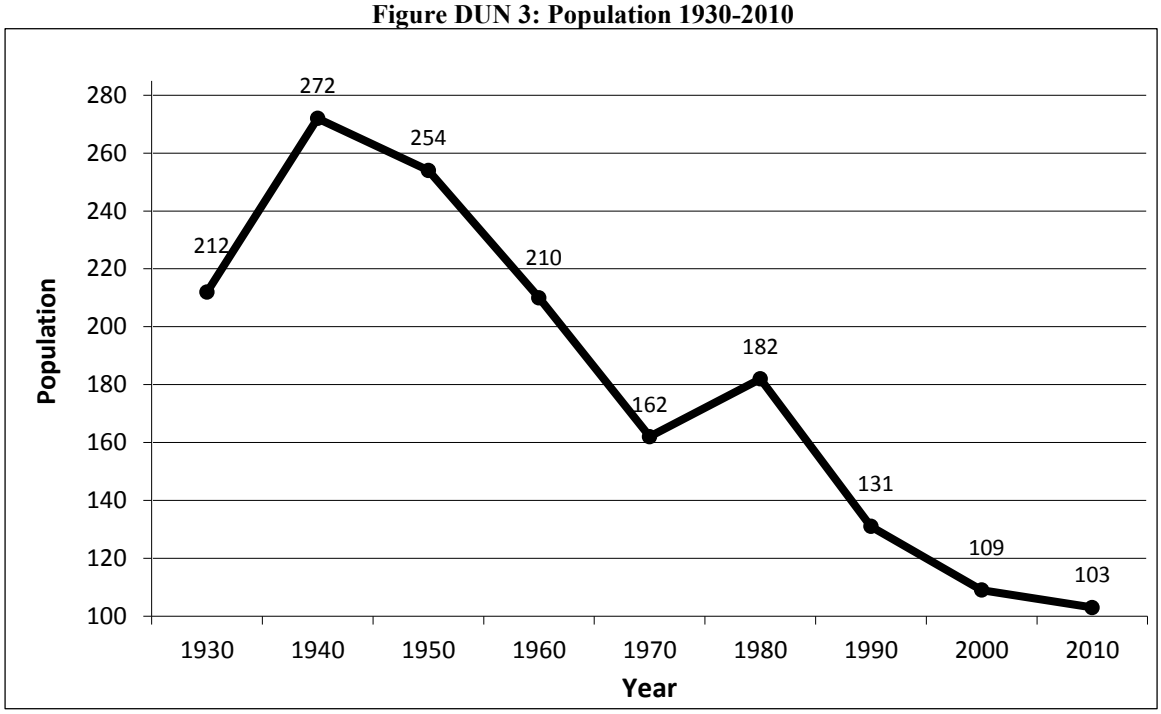
Figure DUN 2: Topographic Map



DEMOGRAPHICS

Since 1940 the population of Dunning has been declining. There was 12 percent growth between 1970 and 1980 but there was a decline 28 percent decline by 1990. Since 2000 the population has fallen 6 percent and was 103 people based on the 2010 census. The declining population does make Dunning more vulnerable to hazards. The majority of the increase vulnerability relative to a declining population has to do with the vacant properties which can result. Vacant housing is often more likely to be in disrepair, and eventually add to blight. Housing in poor condition can result in added debris in the event of various different hazards. It can provide good fuel for fire as well as creating additional debris following thunderstorms winds and tornados. It can also provide housing for pests, such as pigeons and rats which can have other detrimental effects on neighboring houses as well as on some kinds of crops (as well as a connection back to the spread of pandemic disease). Figure DUN 3 displays the historical population trend for Dunning from 1930 to 2010.

Figure DUN 3: Population 1930-2010



Source: U.S. Census, 1930 – 2010

Table DUN 1 illustrates the population trends by jurisdiction from 1990 – 2010 and provides a population project for 2020 by applying the percent changed from 2000 to 2010 to the next decade.

Table DUN 1: Projected Population Trends

Jurisdiction	1990 Population	2000 Population	2010 Population	Change 2000-2010	2020 Projected Population
Blaine County	675	583	478	-18%	392
Dunning	131	109	103	-6%	97

Source: U.S. Census, 1990 – 2010

Table DUN 2 illustrates the age distribution and median age of individuals by jurisdiction.

Table DUN 2: Age Distribution

	Blaine County	Dunning
< 5 yrs.	6.50%	1.50%
5 - 64 yrs.	78.60%	50.20%
> 64 yrs.	14.60%	48.20%
Median Age	41.3	51.8

Source: US Census ACS % yr. estimate 2008 - 2012

The median age for Dunning is higher than that of the county as a whole. Dunning also has a significantly higher percentage of residents over the age of 64 years. The age of residents in Dunning creates additional vulnerability beyond that of the county as a whole.

HOUSING AND ECONOMICS

Median household income, per capita income, home value and rent for the county as a whole compare with that of Dunning.

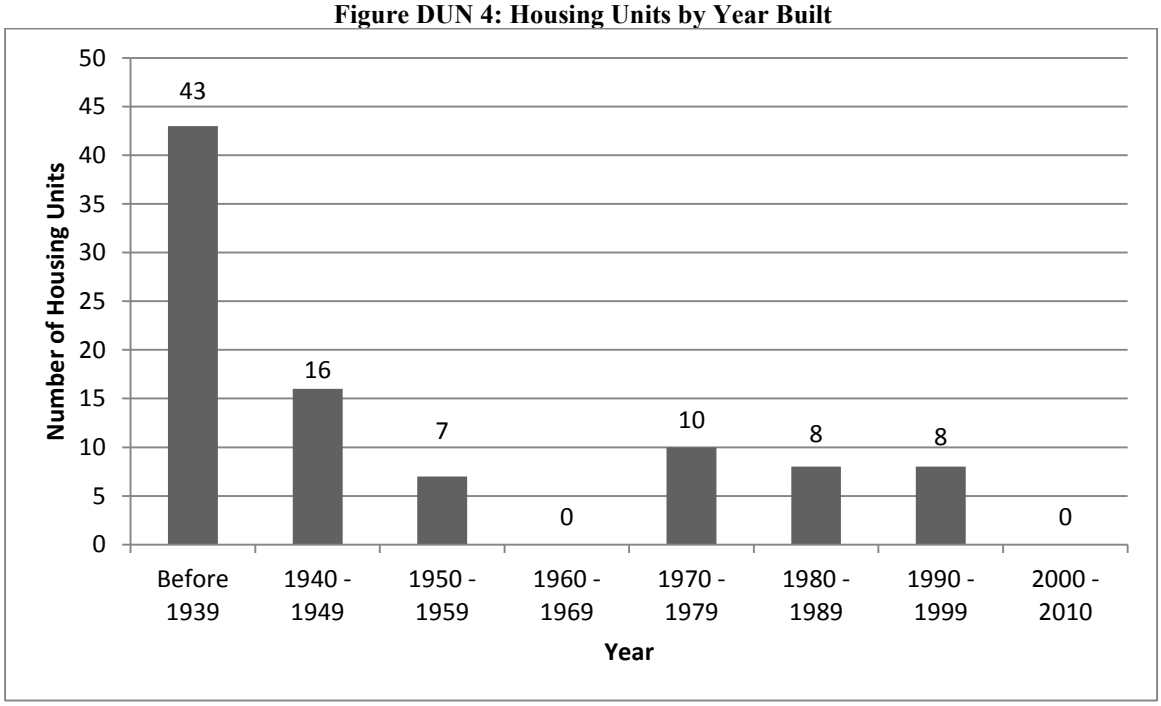
Table DUN 3: Income and Home Value

	Blaine County	Dunning
Median Household Income	$39,000	$53,162
Per Capita Income	$20,586	$28,655
Median Home Value	$57,600	$50,800
Median Rent	$631	$625

Source: U.S. Census American Community Survey Housing Characteristics and Income, 2012

According to the U.S. Census there are a total of 92 housing units in Dunning. Of those 92 units more than 27 percent (25 total units) are reported as vacant. More than 64 percent of all units (occupied and vacant) were constructed prior to 1950.

Figure DUN 4: Housing Units by Year Built



Source: U.S. Census, 2010

Table DUN 4: Housing Unit Occupancy

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Blaine County	242	71.8%	95	28.2%		158	65.3%	84	34.7%
Dunning	67	72.8%	25	27.2%		54	80.6	13	19.4%

Source: U.S. Census, 2010

Structural Inventory and Valuation

A structural inventory was completed for the corporate limits of Dunning though a window survey using GIS for the 2009 hazard mitigation plan. The values of these structure types were determined from the 2013 Property Type Values as provided by the Nebraska Department of Revenue Property Assessment Division.

See Table DUN 5 for Dunning's structural inventory data.

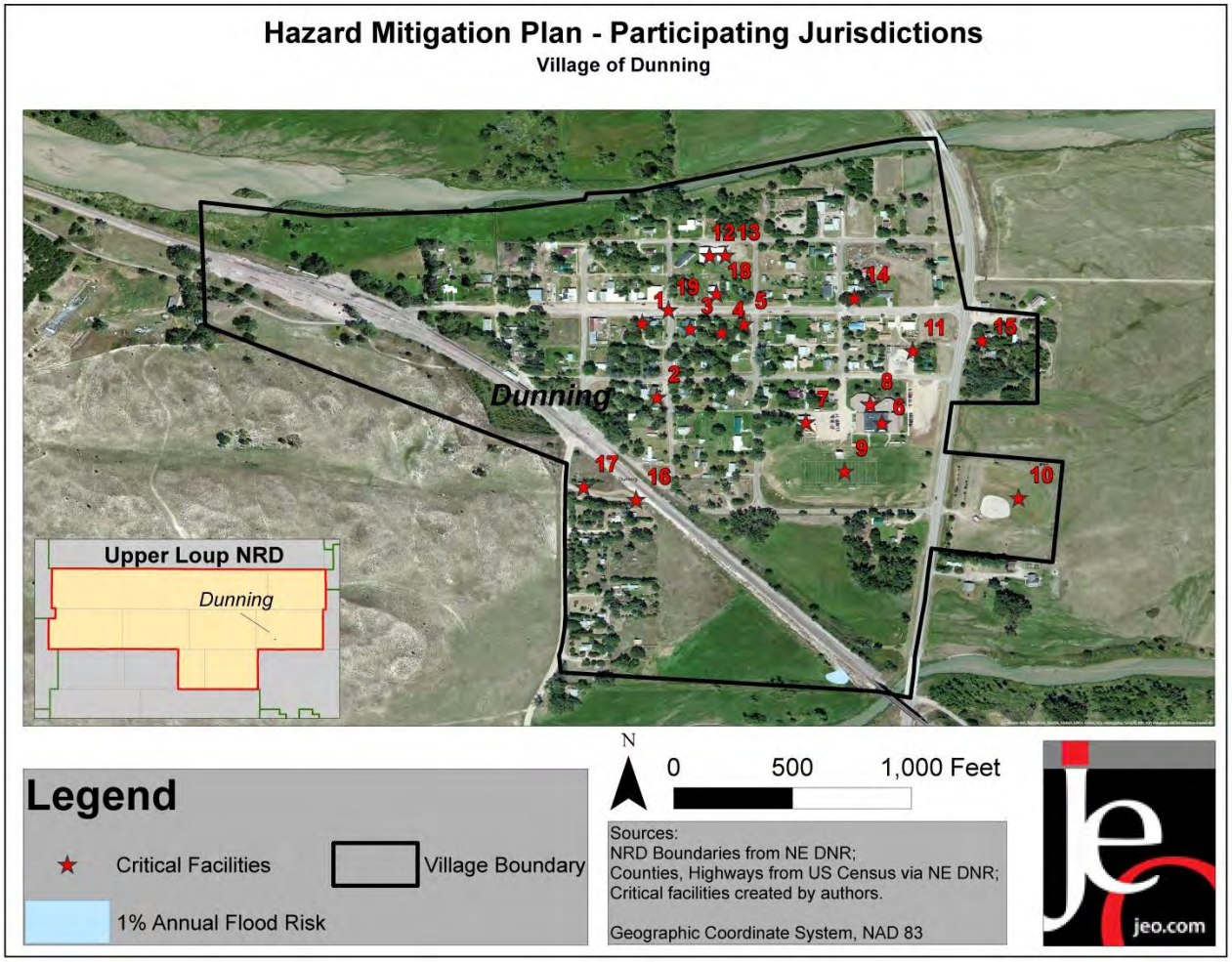
Table DUN 5: Structural Inventory

Total Structures		Structure Valuation	
Structure Type	**Number of Structures**	**Total Value**	**Value per Structure**
Commercial/Industrial	13	$525,695	$ 40,438
Out Building	20	$113,950	$ 5,698
Residential	64	$1,440,090	$ 22,501
Public/Quasi Public	13	$117,000	$ 9,000
Total	**110**	**$2,196,655**	NA

Source: Blaine County Assessor
**Values are rounded to the nearest dollar.*

Critical Infrastructure/Key Resources

Figure DUN 5: Location of Critical Facilities



* Special flood hazard area not include on this map. Refer to risk assessment for floodplain map

Table DUN 6: Critical Facilities

Number	Name	Function
#1	Post Office	Government function
#2	Sandhills Community Church	Gathering Location
#3	Community Center	Gathering Location
#4	Public Park	Gathering Location
#5	Well #1	Critical Facility
#6, #7, #8	Sandhills Public Schools	Vulnerable Population
#9	Football Field	Gathering Location
#10	Baseball Field	Gathering Location
#11	Blaine County Shop	Critical Facility
#12*	Open Bible Church	Gathering Location
#13*	Fellowship Hall	Gathering Location
#14	Lift Station	Critical Facility
#15	Lift Station	Critical Facility
#16	Main Lift Station	Critical Facility
#17	Well #2	Critical Facility
#18	Fire Hall	Emergency Response
#19	Private Childcare	Vulnerable Population

*structures located in the special flood hazard area

SANDHILLS PUBLIC SCHOOL DISTRICT

Sandhills Public Schools participated in this planning effort through attendance at the hazard identification meeting and through collaboration with the village of Dunning for the remaining process. The district is considered an indirect participant for this plan due to their inability to attend both rounds of public meetings. This section will identify school attendance, structural valuation, and risk assessment for the district. The critical facilities for the school district can be found on Figure DUN 5.

The Sandhills Public School system is a district that includes the towns of Brewster, Dunning, and Halsey and spans almost 904 square miles. The High School is located in Dunning, while the Elementary School is located in Halsey. The district operates three bus routes. The district employs 19 certificated staff members and 10 support staff members. The certificated staff is an experienced staff and have lived in the area for a significant period of time.

Enrollment

Sandhills Public School District consist of two structures which house grades pre-K- 12. The enrollment for the school is 106 (2013). Enrollment is split between the two structures with 36 students enrolled at the elementary school and 70 students enrolled in the middle/high school.

Risk Assessment

Representatives from Sandhills Public School completed a risk assessment for this planning process. The risk assessment for the school is consistent with that of the communities of Dunning and Halsey. School facilities are located outside of the special flood hazard area in the community of Dunning; the floodplain has not been mapped for the village of Halsey. Consistent with the risk assessment for the village of Halsey, structures located in that community are at an increased risk of impacts resulting from wildland fires due to the proximity to Halsey National Forest. For discussion related to Halsey National Forest and the increased risk of wildland fires please refer to the risk assessment discussion for the village of Halsey. Structural valuations are provided for the district as a whole and as such it is not possible to differentiate between structures located in Dunning and Halsey; the total value for the school district's structures is estimated at $10,310,683. The district representative did not indicate damages to school facilities in the past.

Capabilities Assessment

School districts throughout Nebraska typically do not have comprehensive plans. Sandhills Public Schools, like other districts across the state, are required to have an emergency action plan outlining response protocol for certain natural and manmade hazards. While the emergency action plan will not be discussed in detail in this report due to sensitive data it was reviewed by the school district planning team to ensure the goals, objective, and projects identified in this document are consistent with existing plans.

Sandhills Public Schools are able to implement mitigation projects (such as facility upgrades and retrofits) as needed so long as those items are included in long range budgeting for the district. The district does look for opportunities to partner with other entities (the city, local fire districts, Blaine County, ULNRD, etc.) in the implementation of major mitigation projects.

Sandhills Public Schools has a district wide website used to share information as well as to provide emergency notification for students and family members alike. In addition, the district utilizes social media (i.e. Facebook and Twitter) to communicate with parents and students.

Mitigation Efforts

Mitigation measures identified by the school district include: construction of storm shelter, installation of backup power generators, and development of public awareness materials to share with students and families. The school district relies on the community and the county to address other issues such as: localized flooding, maintenance of roadways, and improvements to infrastructure which supports the school (i.e. water, power, waste water, etc.).

FUTURE DEVELOPMENT TRENDS

At this time it is likely that there will be few (less than 10) new structures built within the corporate limits of Dunning during the next five years.

Risk Assessment

Hazard Identification

Table DUN 7 is the risk assessment for the community. Refer to *Section 4: Risk Assessment* for a detailed explanation as to what this methodology is and why certain hazards did not pose a significant enough threat and were eliminated from detailed discussion due to the calculation.

Table DUN 7: Risk Assessment

Hazard	Previous Occurrence: Yes or No	County Hazard Ranking in NE 2014 State HMP	Specific Concerns Identified
Natural Hazards			
Grass/Wildfires	**Yes**	**High**	**Fires moving from unincorporated areas into the village; proximity to Halsey National Forest; limited firefighting resources within the village**
Severe Winter Storms	**Yes**	**High**	**Roadway closures, resources to remove snow and ice accumulations, prolonged power outages**
Hail Events	**Yes**	**NA**	**Damages to homes and other structures**
Severe Thunderstorms	**Yes**	**High**	**Frequency of occurrence, potential for secondary impacts (lightning causing wildfires)**
Drought	Yes	High	Economic losses in the ag sector
Extreme Heat	Yes	NA	Elderly population and economic impacts (especially in ag sector)
High Winds	Yes	High	Frequency of occurrence
Tornados	No	High	Lack of safe rooms
Earthquakes	No	Medium	None
Animal Disease	No	High	None
Flooding	Yes	Medium	Mostly localized events, concerns related to transportation route closure(s)
Plant Disease	No	High	None
Dam Failure	No	None	None
Landslides	No	NA	None
Man-made Hazards			
Chemical Spills (transportation)	Yes	Medium	None
Urban Fire	Yes	High	None
Radiological Incident (transportation)	No	NA	None
Chemical spills (fixed site)	No	Medium	Ag chemical storage areas
Radiological Fixed Sites	No	None	None
Terrorism	No	Low	Tampering with water supplies
Civil Disorder	No	Low	None

According to the risk assessment, the top four hazards in the village of Dunning are wildfires. Severe winter storms, hail and thunderstorms, and tornados and high winds.

The NCDC counted a total of 68 hazard events in the village of Dunning and there was no recorded of death or injury, but $96,000 in property damages and $38,000 in crop damages.

Fire

Grass/Wildfires

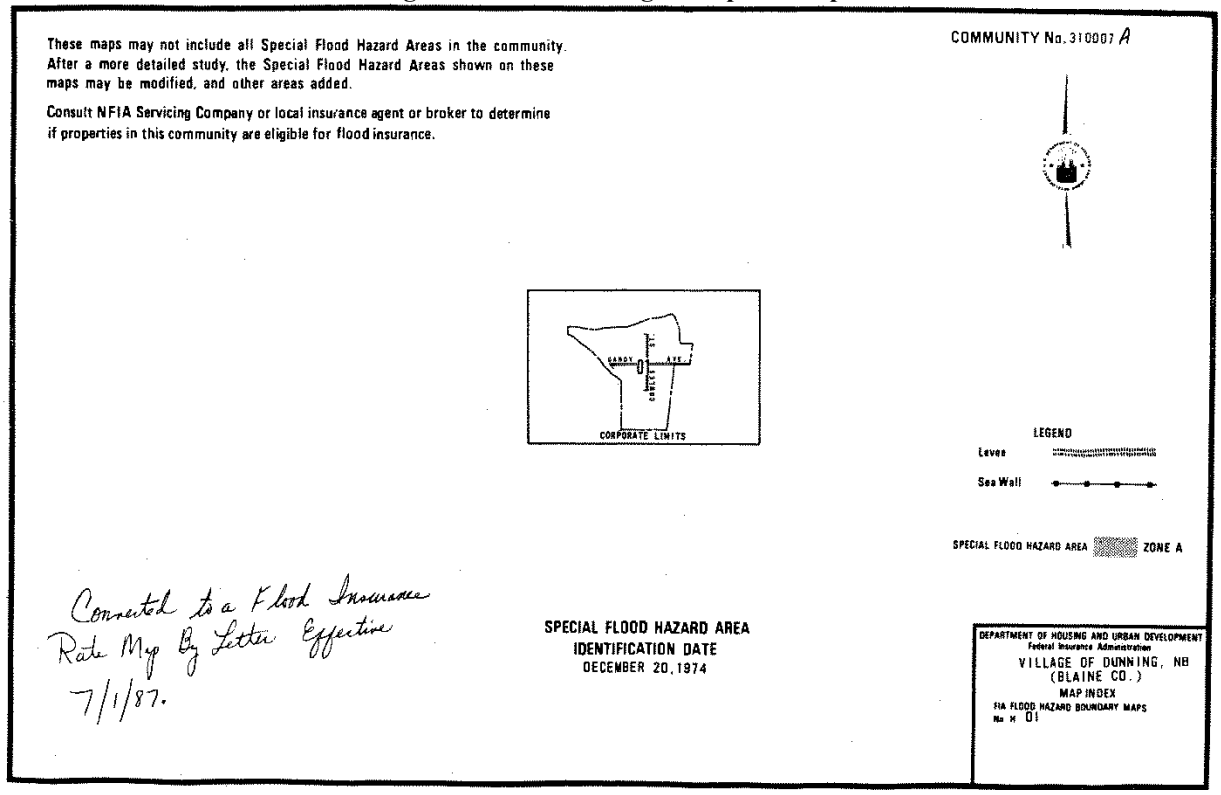
The local planning team identified grass/wildfire as a significant concern for the village. According to the Nebraska Forestry Department there were 16 reported fires by Dunning Fire Department from 2000 to 2012 which consumed a total of 673 rangeland acres and no crop land acres. Of the reported events on fire in March of 2012 consumed approximately 637 acres. Due to the proximity to the Halsey Nation Forest it is important that the community monitor grass/wildfire probabilities to guard against rapidly developing fire events. The Dunning Fire Department has mutual aid agreements with the fire departments in the surrounding areas, but during large scale events it is possible nearby fire department would be unable to lend assistance due to addressing the needs of their respective community/protection area.

Severe Storms

Flooding

Flooding was identified by the local planning team as a threat to Dunning. According to the 2013 Nebraska Flood Mitigation Plan there were two flood events which occurred near Dunning but did not cause any damage. Dunning also has two polices in the NFIP. In addition to the two polices the FEMA Map Service Center shows a floodplain map for the village of Dunning. The floodplain map is show in Figure DUN6.

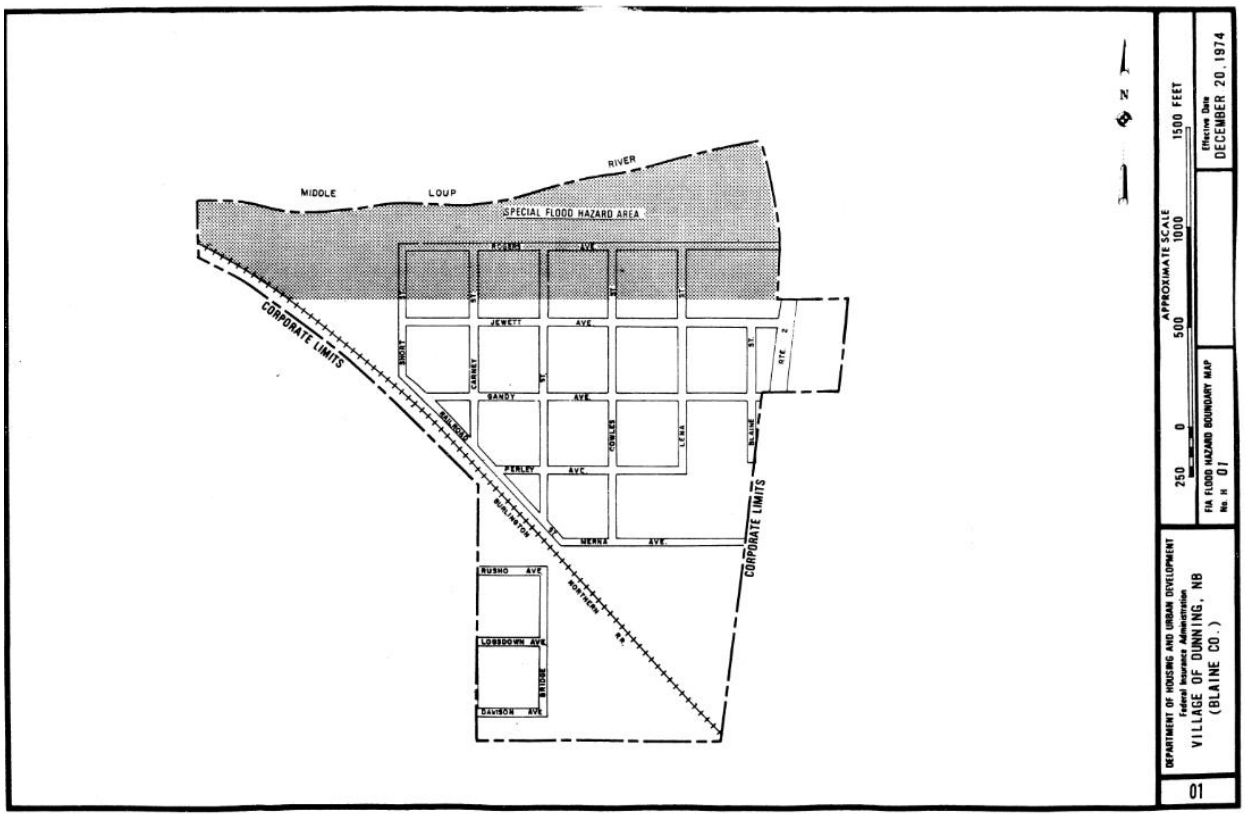
Figure DUN 6: Dunning Floodplain Map



Source: FEMA

This SFHA extends from the Railroad tracks on the west side of the village to the corporate limits on the east side. The SFHA also extends as far south as halfway between Rogers Ave and Jewett Ave. Figure DUN 7 below shows the SFHA.

Figure DUN 7: SFHA for Dunning



Hail

Within the planning area, and Dunning, hail has occurred more times than any other single hazard. For Dunning there were 57 reported hail events between 1996 and 2014. Significant events that resulted in damages are identified in Table DUN 8. The planning team ranked hail as a high probability event but felt that impacts to people and property were not as significant as with other hazards. It is possible given the regularity of occurrence the community is less concerned with hail event than other hazards. This could be related to the nature of damages from hail events as well. Hail generally damages property (roofs, siding, vehicles, etc.) but results in few major damages or loss of life.

Table DUN 8: Hail Events

Hazard	Date	Extent	Property Damage	Crop Damage
Hail	6/29/2001	1.75	$5,000	$10,000
Hail	7/2/2001	1	$5,000	$0
Hail	8/11/2002	2	$10,000	$4,000
Hail	8/11/2002	1.75	$8,000	$3,000
Hail	8/11/2002	1.75	$8,000	$3,000
Hail	8/11/2002	1	$2,000	$2,000
Hail	8/11/2002	2	$1,000	$0
Hail	6/12/2003	1.75	$5,000	$5,000
Hail	6/12/2003	1.75	$5,000	$5,000
Hail	8/23/2004	1.75	$2,000	$0
Hail	9/28/2008	1.75	$10,000	$0

Total			**$61,000**	**$38,000**

Source: National Climatic Data Center

Severe Thunderstorms

For Dunning there were 8 reported severe thunderstorm events between 1996 and 2014. Significant events that resulted in damages are identified in Table DUN 9.

Table DUN 9: Severe Thunderstorm Events

Hazard	Date	Extent	Property Damage	Crop Damage
Thunderstorm Wind	5/19/1998		$1,000	$0
Thunderstorm Wind	6/16/1998		$10,000	$0
Thunderstorm Wind	6/16/1998		$1,000	$0
Thunderstorm Wind	5/5/2001		$2,000	$0

Source: National Climatic Data Center

Severe Winter Storms

The local planning team identified severe winter storms as a significant concern for the community. The local planning team reported severe winter storms as being a natural part of the local climate. The event of greatest concern for the community is severe winter storms with strong winds, extreme low temperatures, and high snowfall totals. During these events it is difficult to clear roadways due to drifting snow. In addition, it is more difficult to provide assistance to vulnerable community members. It is not likely that structures would sustain significant damages from severe winter storms. The loss of power during these events is a great concern for the community.

For the village, municipal roadways are cleared by members of the community while state and county roadways are responsible for clearing their respective roadways. The village also reported an informal system of monitoring vulnerable community members. As the population of the village ages it is important that members of the community monitor each other ensuring that members of the community needing additional assistance have social networks to assist them in meeting their needs.

Tornados and High winds

The local planning team identified tornados and high winds as the concern for the community. According to the NCDC data, there were two tornados (an F0 and an EF1) and seven storm events which included strong winds (50 kts) which occurred in or near Dunning. In 2007 an EF1 tornado passed through Blaine County, approximately seven miles southeast of Dunning, snapping trees, breaking power poles, destroying fences and a windmill. The tornado had an average path of 220 yards wide with a total approximate length of 55 miles.

Table DUN 10: Tornado and High Wind Events

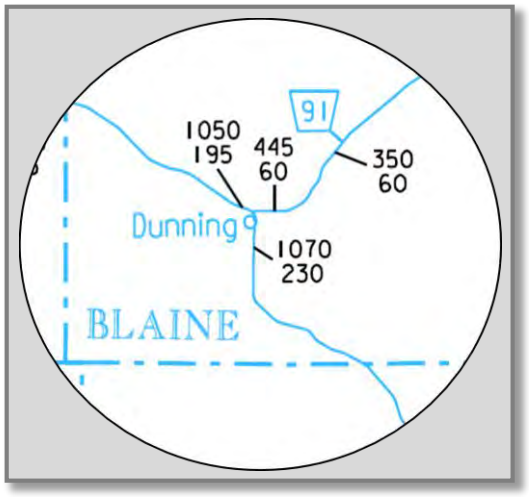
Hazard	Date	Extent	Property Damage	Crop Damage
High winds	10/8/1997	60 kts.	-	-
High winds	9/6/2001	52 kts.	-	-
Tornado	5/5/2002	F0	-	-
High winds	6/7/2006	52 kts.	-	-
Tornado	5/5/2007	EF1	$20,000	-
High winds	9/29/2007	53 kts.	-	-

Source: National Climatic Data Center

Transportation Incidents /Chemical Spills/ Radiological Incident

The local planning team identified chemical spills through transportation as a concern for Dunning. According to the PHMSA incident reports there has been 1 spill reported from 1980 to 2013 which release 14 gallons of liquid and caused $12,425 in damages. This risk ranking provided by the planning team is not consistent with the research and historic records utilized for this plan update. It is understandable that the community would express concern however give the amount of heavy truck traffic that passes through the community especially along US HWY 2.

The main transportation routes through Dunning include NE HWY 91 and US HWY 2 (Sandhills Scenic Byway). US HWY 2 accounts for a significant amount of vehicular traffic through the region. Traffic counts provided by the Nebraska Department of Roads report more than 1,000 light vehicles daily (1,050 north of Dunning and 1,070 south of Dunning) and approximately 200 heavy trucks (195 north of Dunning and 230 south of Dunning) passing through the village. NE HWY 91 reports less volume with 445 light vehicles and 60 heavy trucks daily. It is very difficult to determine what exactly is being transported along these routes. There is no evidence of radiological materials being transported through the planning area much less through Dunning.



Capability Assessment

Thus far the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism in understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capabilities, administrative & technical capability, fiscal capability, and education & outreach capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

VILLAGE GOVERNANCE

The village is governed by a five member board. The village works with the county and Regional Emergency Management for most services. While there are few formal departments and agencies the planning team reported strong community ties. This sense of community has been essential in the past when impacted by natural hazards.

Table DUN 11: Capability Assessment

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	No
	Capital Improvements Plan	No
	Hazard Mitigation Plan	Yes
	Economic Development Plan	No
	Emergency Operational Plan	Yes (county)
	National Resources Protection Plan	No
	Open Space Preservation plan	No
	Floodplain Management Plan	No
	Storm Water Management Plan	No
	Zoning Ordinance	No
	Subdivision Regulation/Ordinance	No
	Floodplain Ordinance	No
	Building Codes	No
	National Flood Insurance Program	No
	Community Rating System	No
	Other (if any)	NA
Administrative & Technical Capability	Planning Commission	No
	Hazard Mitigation Planning Commission	Yes
	Floodplain Administration	Yes
	Emergency Manager	Yes (county/regional)
	GIS Coordinator	County by contract
	Chief Building Official	No
	Civil Engineering	No
	Staff Who Can Assess Community's Vulnerability to Hazards	Multiple residents
	Grant Manager	No
	Other (if any)	NA
Fiscal Capability	Capital Improvement Project Funding	No
	Community Development Block Grant	No
	Authority to Levy Taxes for Specific Purposes	Yes
	Gas/Electric Service Fees	No
	Storm Water Service Fees	No
	Water/Sewer Service Fees	No
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	No
	Other (if any)	NA
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	No

Survey Components/Subcomponents		Comments
	Natural Disaster or Safety related school programs	No
	StormReady Certification	No
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	No
	Other (if any)	NA

SUMMARY

Dunning currently does not have comprehensive or capital improvement plans therefore the hazard mitigation plan has not been integrated into community planning documents. If the village were to develop these plans it would be advised that they incorporate mitigation projects and information on hazards from this plan into the other plans.

With an aging populace and a low tax base it will be difficult for Dunning to implement mitigation projects without the assistance of outside groups. Dunning will look for opportunities to partner with regional emergency management, ULNRD, Blaine County, and other regional and state agencies.

Mitigation Strategy

COMPLETED MITIGATION PROJECTS

Description	Wastewater Improvements
Analysis	Installation of water meters
Hazard(s) Addressed	Drought
Benefits	Metering of water helps residents better understand consumption patterns and are then able to modify behaviors to conserve water.
Timeline	Competed 2013
Lead Agency	Village of Dunning (funded by USDA)

ONGOING MITIGATION PROJECTS

Description	Backup Generators
Analysis	Provide a portable or stationary source of backup power to redundant power supplies, municipal wells, lift stations, and other critical facilities and shelters.
Goal/Objective	Goal 1/Objective 1.1
Hazard(s) Addressed	Tornados and high winds, severe winter storms, severe thunderstorms
Estimated Cost	$15,000-$30,000 per generator
Benefits	Back-up power for critical facilities (i.e. nursing home). A measure that would reduce or prevent damage to property or prevent loss of life or serious injury.
Potential Funding	HMGP
Timeline	Carried over, 5 years
Priority	High
Lead Agency	Village board, Sandhills School Board, Region 26 EMA
Action since 2009 plan	None

Description	Storm Shelter / Safe Rooms
Analysis	Design and construct fully supplied storm shelters and safe rooms in highly vulnerable areas such as mobile home parks, campgrounds, school, and other areas.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Tornados and high winds, severe thunderstorms, severe winter storms
Estimated Cost	$200-$300/sf stand alone; $150-200/sf addition/retrofit
Benefits	Useful for many residents that do not have basements or cellars to go for shelter, especially beneficial for the nursing home and other vulnerable populations
Potential Funding	PDM, HMPG
Timeline	10 years
Priority	High
Lead Agency	Village Board, Sandhills School Board, Region 26 EMA
Action since 2009 plan	None

Description	Snow Fences
Analysis	Construct snow fences to protect main transportation routes and critical facilities from excessive snow drifting and road closure.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Severe winter storms
Estimated Cost	$1,000+
Benefits	Increase road accessibility to the majority of people which live in rural areas; increase road access for emergency vehicles
Potential Funding	PDM, HMGP, NRCS Cost-share, FAS, NGPC
Timeline	5 years
Priority	Low
Lead Agency	Village Utilities, Nebraska Department of Roads
Action since 2009 plan	Ongoing action

Description	Hazard Tree Removal Program
Analysis	Identify and remove hazards limbs and/or trees.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Severe thunderstorms, tornados and high winds, severe winter storms
Estimated Cost	$20,000
Benefits	Decrease the risk of damage to electrical lines and personal property.
Potential Funding	HMGP, US Forest Service
Timeline	Ongoing (quantification data on tree maintenance is not collected by the community)
Priority	Medium
Lead Agency	Village Utilities, Village Board
Action since 2009 plan	Ongoing tree maintenance as needed throughout the community

Description	Fire Wise Defensible Space
Analysis	Work with the Nebraska Forest Service and US Forest Service to become a Fire Wise Communities/USA participant. Develop a Community Wildfire Protection Plan. Train land owners about creating defensible space. Enact ordinances and building codes to increase defensible space, improve building materials to reduce structure ignitability, and increase access to structures by responders. Develop and implement brush and fuel thinning projects.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Wildfire
Estimated Cost	$20,000
Benefits	Structures are less vulnerable to wildfire, easier for firefighters to defend structure during a wildfire event, and removes fuel from an approaching fire.
Potential Funding	HMGP, NFS, USFS, ULNRD, NGPC, National Fire Plan
Timeline	5 years
Priority	High
Lead Agency	Village Board, Fire Department, Nebraska Forestry Service
Action since 2009 plan	None

Description	Tree City USA
Analysis	Work to become a Tree City USA through the National Arbor Day Foundation in order to receive direction, technical assistance, and public education on how to establish a hazardous tree identification and removal program in order to limited potential tree damage and damages caused by trees in a community when a storm event occurs. The four main requirements include: 1) Establish a tree board; 2) Enact a tree care ordinance; 3) Establish a forestry care program; 4) Enact an Arbor Day observance and proclamation.
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Severe thunderstorms, tornados and high winds, severe winter storms
Estimated Cost	$1,000+
Benefits	Better maintained trees and hazard tree removal will eliminate damages to power lines and personal property during hazards events. Participation in Tree City USA will support community actions to mitigation damages from trees.
Potential Funding	Arbor Day Foundation, US Forest Service
Timeline	5 years
Priority	Medium
Lead Agency	Village Board
Action since 2009 plan	None

Description	Enroll in the National Flood Insurance Program (NFIP)
Analysis	Continue participation in the NFIP
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Flooding
Estimated Cost	N/A
Benefits	Property owners who purchase insurance are protected against flood losses. Good standing enables participants to apply for PDM and HMGP cost-share.
Potential Funding	N/A
Timeline	Ongoing
Priority	High
Lead Agency	Village Board, Floodplain Administrator
Action since 2009 plan	Participation has been maintained since 2009

Description	Public Awareness / Education
Analysis	Through activities such as outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. In addition, educate citizens on erosion control and water conservation methods. Educate residents on response and rescue plans for all hazard types.
Goal/Objective	Goal 3/Objective 3.1 and Goal1/Objective 1.1
Hazard(s) Addressed	All hazards
Estimated Cost	$500+
Benefits	Increase knowledge to new comers to the area as well as elderly in how to react when an event is going to occur or is occurring. Education to reduce or prevent damage to property or prevent loss of life or serious injury.
Potential Funding	HMGP, PDM
Timeline	Ongoing (the community does not collect data to allow for quantification for this action, public education is viewed as an ongoing effort)
Priority	Medium
Lead Agency	Village Board, Sandhills School Board, Region 26 EMA, NEMA, NDNR, ULNRD
Action since 2009 plan	Ongoing educational efforts from regional emergency management office

Description	Weather Radios
Analysis	Conduct an inventory of weather radios at schools, rural residents, and other critical facilities and provide new radios as needed.
Goal/Objective	Goal 4/Objective 4.3 and Goal 1/Objective 1.1
Hazard(s) Addressed	All hazards
Estimated Cost	$50/per radio
Benefits	Help those who do not have access to local TV or radio warnings
Potential Funding	HMGP, PDM
Timeline	5 years
Priority	High
Lead Agency	Village Board, Fire Department, Region 26 EMA
Action since 2009 plan	None

REMOVED MITIGATION PROJECTS

None

VILLAGE OF HALSEY

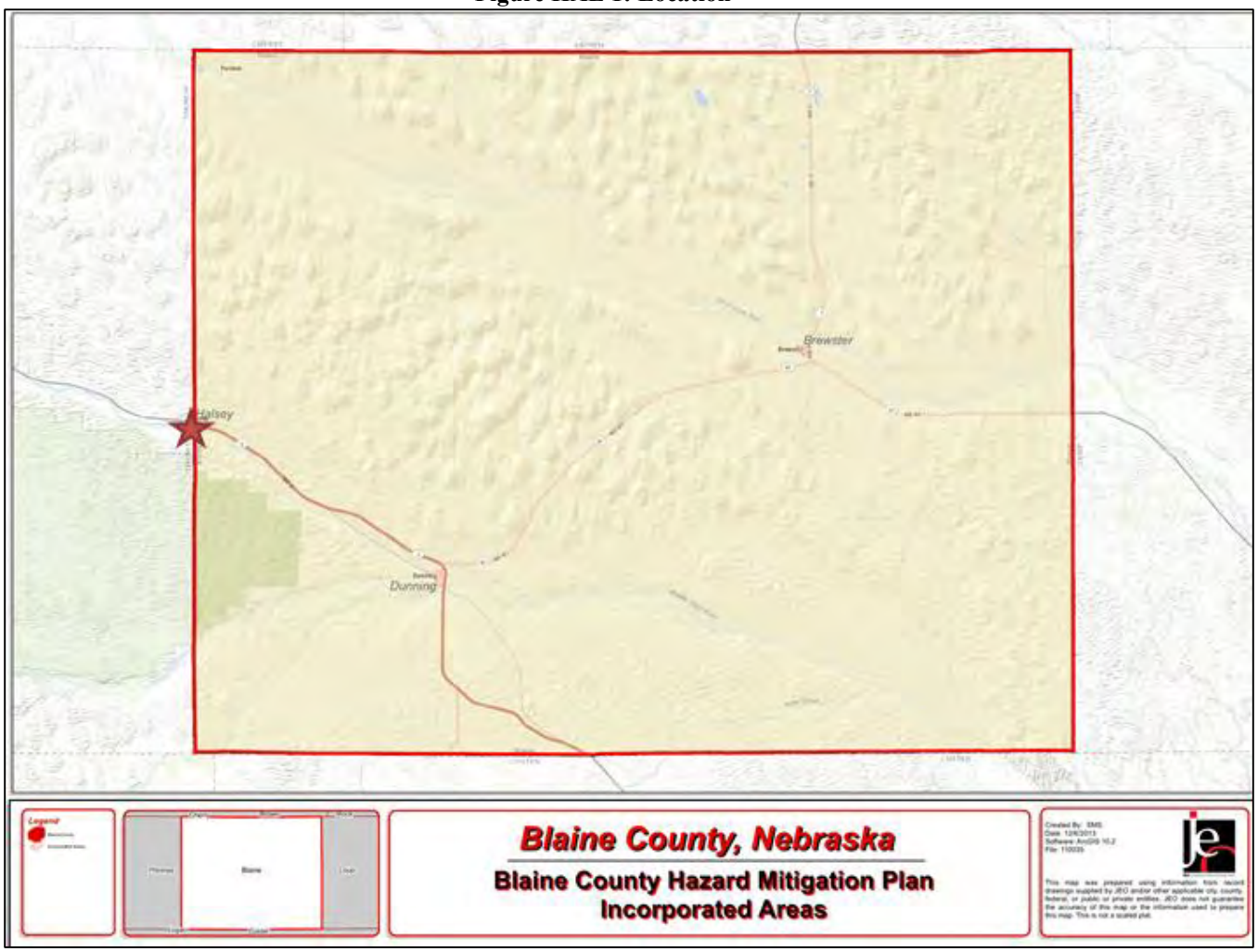
HISTORY

Settlement began in the community of Halsey in 1884 when a surveying crew, riding on horseback, followed the Middle Loup River to lay out boundaries for the Chicago, Burlington & Quincy Railroad right-of-way. Among the crew was a young man from Lincoln named Halsey Yates. The rails were laid in early 1887, and the station was named "Halsey." A depot was built right on the county line -- half in Blaine and half in Thomas County. A post office was established just to the east of the county line, putting the town in Blaine County. In 1902 President Theodore Roosevelt established the Nebraska National Forest, with headquarters and nursery located a few miles west of Halsey. In 1904 the depot burned. This event brought about a change in the configuration of Halsey, as the new depot was constructed approximately 200 yards to the west, putting it in Thomas County. The town site was then re-surveyed, platted to the west, and a new deed of dedication filed in late 1908.

Location/Geography

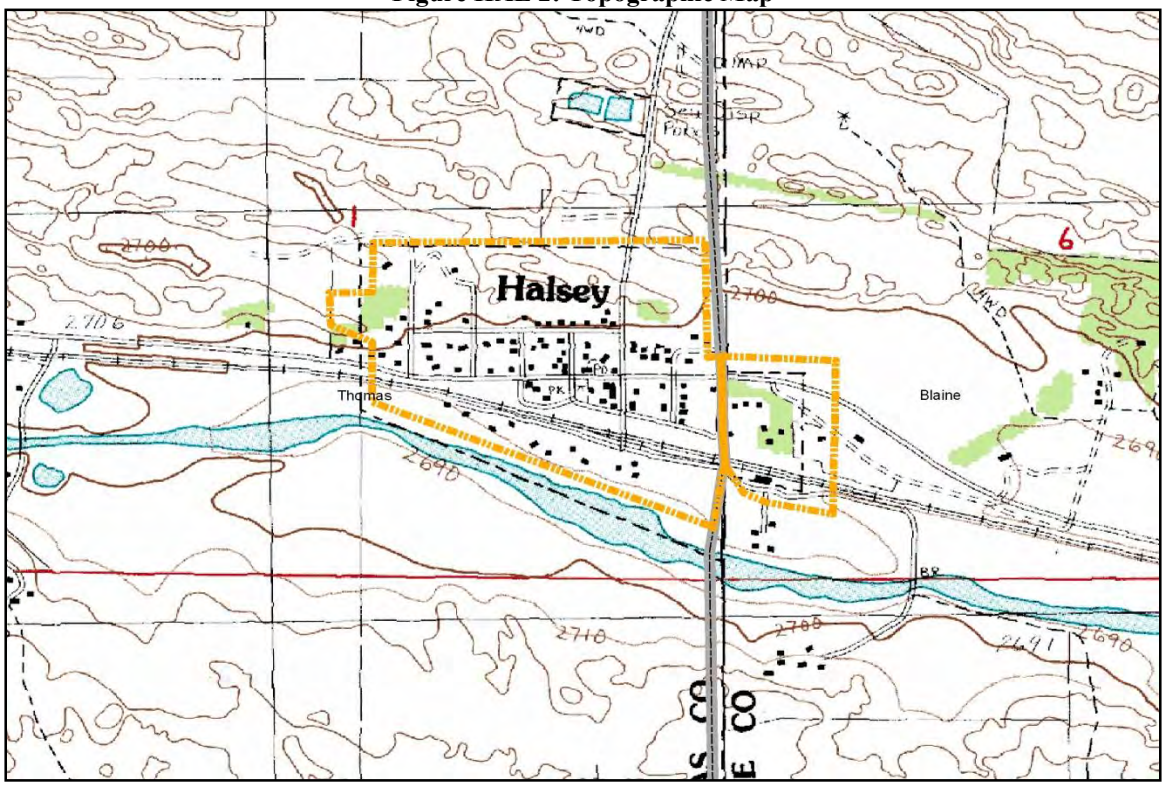
Halsey is a village located along the county line between Blaine and Thomas Counties. The Village of Halsey covers an area of 128 acres and has an elevation of 2,695 feet above sea level.

Figure HAL 1: Location



The community of Halsey lies in an area of sand hills. The land use surrounding the community is mainly ranching with some agricultural crops in the river valleys. Hilly land composed of low to high dunes of sand stabilized by a grass cover is prevalent. The community lies immediately north of the Middle Loup River valley. The watershed flows generally from the northwest to the southeast. The floodplain has not been delineated for Halsey and river flooding is not a significant concern.

Figure HAL 2: Topographic Map



DEMOGRAPHICS

The population of Halsey has had periods of growth and decline since 1960. Between 1960 and 1980 the population grew 30 percent. Between 1980 and 2000 the population declined 59 percent. The population has grown 29 percent since 2000. Figure HAL 3 displays the historical population trend for Halsey from 1960 to 2010.

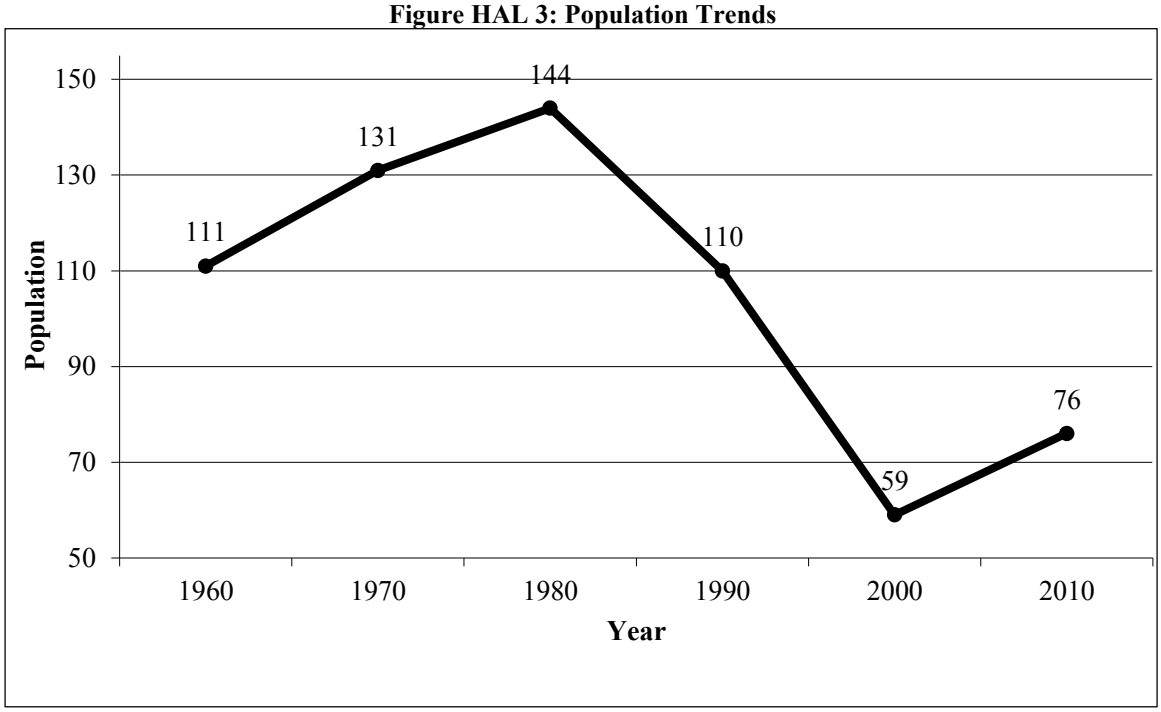
Table HAL 1 illustrates the population trends by jurisdiction from 1990 – 2010 and provides a population project for 2020 by applying the percent changed from 2000 to 2010 to the next decade.

Table HAL 1: Population 1990-2010

Jurisdiction	1990 Population	2000 Population	2010 Population	Change 2000-2010	2020 Projected Population
Blaine County	675	583	478	-18%	392
Halsey	110	59	76	29%	98

Source: U.S. Census, 1990 – 2010

Figure HAL 3: Population Trends



Source: U.S. Census, 1960 – 2010

Table HAL 2 illustrates the population trends by jurisdiction from 1990 – 2010 and provides a population project for 2020 by applying the percent changed from 2000 to 2010 to the next decade.

Table HAL 2: Projected Population

Jurisdiction	1990 Population	2000 Population	2010 Population	Change 2000-2010	2020 Projected Population
Blaine County	675	583	478	-18%	392
Halsey	110	59	76	29%	98

Source: U.S. Census, 1990 – 2010

Halsey is the only community in Blaine County with a positive growth trend. From 2000 to 2010 the population increased by 29 percent.

Table HAL 3 illustrates the age distribution and median age of individuals by jurisdiction.

Table HAL 3: Population by Age

	Blaine County	Halsey
< 5 yrs.	6.50%	4.80%
5 - 64 yrs.	78.60%	73.70%
> 64 yrs.	14.60%	21.50%
Median Age	41.3	53.4

Source: US Census ACS % yr. estimate 2008 - 2012

Overall the median age for Halsey is 53.4 years; this is higher than that of the county as a whole. The percent of population under the age of five is closer to that of the county as a whole than any of the other communities in the county.

HOUSING AND ECONOMICS

Median household income, per capita income, home value and rent for the county as a whole compare with broader state values as shown below.

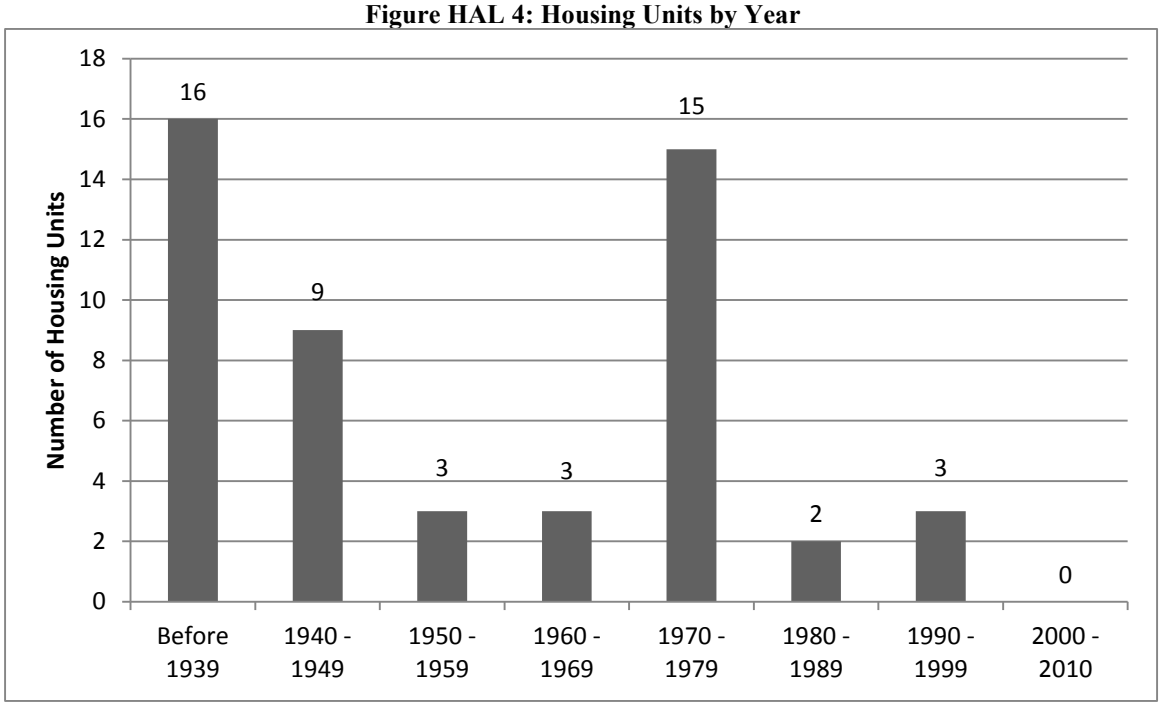
Table HAL 4: Housing and Income

	Blaine County	Halsey
Median Household Income	$39,000	$41,250
Per Capita Income	$20,586	$25,851
Median Home Value	$57,600	$24,700
Median Rent	$631	0

Source: U.S. Census American Community Survey Housing Characteristics and Income, 2012

The Halsey there 51 housing units in Halsey, 35 percent of which are vacant. Development in Halsey occurred in two distinct periods. 31 percent of housing units were constructed prior to 1939 with another 29 percent of housing units being constructed between 1970 and 1979. During the 1970s the population increased by nearly 10 percent to support the increase in housing.

Figure HAL 4: Housing Units by Year



Source: U.S. Census, 2010

Table HAL 5 compares housing statistics between the village and the county as a whole. The most significant difference is the discrepancy between county wide rental housing (34.7 percent of occupied units) and rental units in Halsey (12.1 percent of occupied units).

Table HAL 5: Housing Occupancy

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Blaine County	242	71.8%	95	28.2%		158	65.3%	84	34.7%
Halsey	33	64.7%	18	35.3%		29	87.9%	4	12.1%

Source: U. S. Census, 2010

Critical Infrastructure/Key Resources

Figure HAL 5: Critical Facility Locations

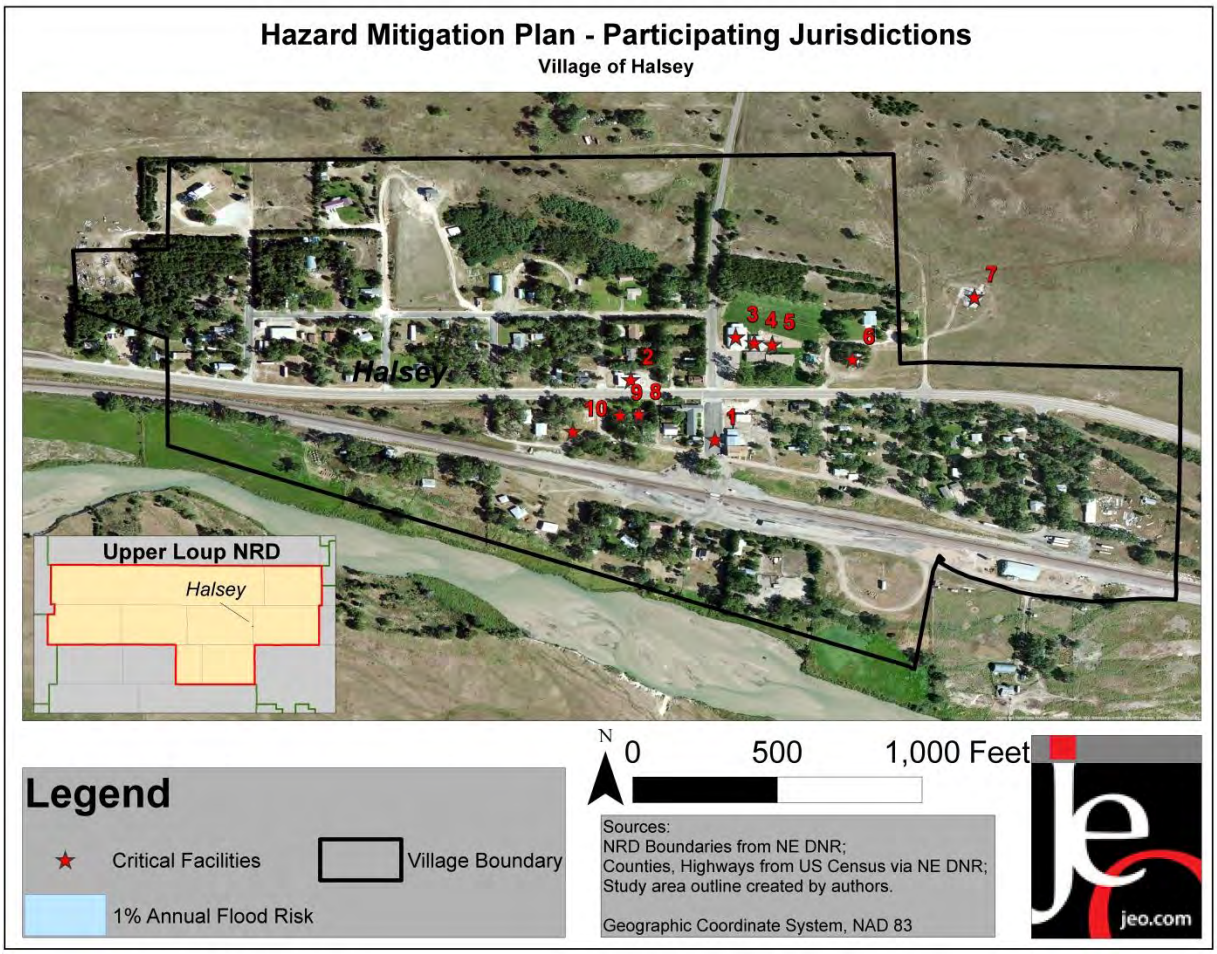


Table HAL 6: Critical Facilities

Number	Name	Function
#1	Church	Gather Location
#2	Post Office	Government Function
#3	Sandhills Public School	Vulnerable Population
#4	Sandhills Public School	Vulnerable Population
#5	Sandhills Public School	Vulnerable Population
#6	Church	Gathering Location

#7	Lift Station	Critical Facility
#8	Public Park	Gathering Location
#9	Church	Gathering Location
#10	Fire Department	Emergency Response

FUTURE DEVELOPMENT TRENDS

The planning team for Halsey expects to see a continuation of the recent population increase. It is likely that there would be a small number of new structures within the existing corporate limits. With 35 percent of housing units being vacant there are existing opportunities for infill within the existing corporate boundaries.

Structural Inventory and Valuation

A structural inventory was completed for the corporate limits of Halsey though a window survey using GIS for the 2009 hazard mitigation plan. The values of these structure types were determined from the 2013 Property Type Values as provided by the Nebraska Department of Revenue Property Assessment Division.

Results from the structural inventory completed by the Village of Halsey are found in Table HAL 7.

Table HAL 7: Structural Inventory and Valuation

Total Structures		Structure Valuation	
Structure Type	**Number of Structures**	**Total Value**	**Value per Structure**
Commercial/Industrial	9	$919,267.00	$102,141.00
Out Building	39	$195,000.00	$5,000
Residential	51	$1,351,500.00	$26,500.00
Public/Quasi Public	9	$106,705.00	$11,856.00
Total	**102**	**$2,572,472.00**	

Source: Blaine County Assessor
**Values are rounded to the nearest dollar.*

Risk Assessment

Hazard Identification

Table HAL 8 is risk assessment for the community. Refer to *Section 4: Risk Assessment* for a detailed explanation as to what this methodology is and why certain hazards did not pose a significant enough threat and were eliminated from detailed discussion due to the calculation.

Table HAL 8: Risk Assessment

Hazard	Previous Occurrence: Yes or No	County Hazard Ranking in NE 2014 State HMP	Specific Concerns Identified
Natural Hazards			
Drought	**Yes**	**High**	**Secondary impacts such as wildfires, economic impacts**
Grass/Wildfires	**Yes**	**High**	**Fires moving from unincorporated areas into the village; proximity to Halsey National Forest; limited firefighting resources within the village**
Severe Winter Storms	**Yes**	**High**	**Roadway closures, resources to remove snow and ice accumulations, prolonged power outages**
Severe Thunderstorms	**Yes**	**High**	**Frequency of occurrence, potential for secondary impacts (lightning causing wildfires)**
Hail Events	**Yes**	**NA**	**Damages to homes and other structures**
Extreme Heat	Yes	NA	Elderly population and economic impacts (especially in ag sector)
High Winds	Yes	High	Frequency of occurrence
Tornados	No	High	Lack of safe rooms
Earthquakes	No	Medium	None
Animal Disease	No	High	None
Flooding	Yes	Medium	Mostly localized events, concerns related to transportation route closure(s)
Plant Disease	No	High	None
Dam Failure	No	None	None
Landslides	No	NA	None
Man-Made Hazards			
Chemical Spills (transportation)	No	Medium	None
Urban Fire	Yes	High	None
Radiological Incident (transportation)	No	NA	None
Chemical spills (fixed site)	No	Medium	None
Radiological Fixed Sites	No	None	None
Terrorism	No	Low	Tampering with water supplies
Civil Disorder	No	Low	None

According to the risk assessment, the top four hazards in the village of Halsey are drought, severe thunderstorms, severe winter storms, extreme heat

The NCDC counted a total of 355 hazard events in the village of Halsey and there was no recorded of death or injury or damages, but $147,000 in damages to property and $171,000 in crop damages.

Drought

The local planning team ranked drought as a top threat for the community. Drought is generally a regional event, with impacts from a single drought event impacting multiple communities, counties, and even states. For the community, over 10 percent of the workforce relies on agricultural based income and the local economy could be significantly affected during severe droughts. A primary concern locally related to drought is linked to potential secondary events and impacts such as wildfires. Given the proximity to the Halsey National Forest, the village could be significantly impacted by fire outbreaks during periods of drought.

FIRE

Grass/Wildfires

The local planning team identified grass/wildfire as a concern for the village resulting from their location and relationship to the Halsey National Forest. According to the Nebraska Forestry Department there were 13 reported fires by Halsey Fire Department from 2000 to 2012 which consumed a total of 108 rangeland acres and no crop land acres. Of the reported events the fire on July 2006 consumed approximately 100 acres. Due to the proximity to the Halsey Nation Forest it is important that the community monitor grass/wildfire probabilities to guard against rapidly developing fire events, this is especially true during periods of drought. The Halsey Fire Department has mutual aid agreements with the fire departments in the surrounding areas, but during large scale events it is possible nearby fire department would be unable to lend assistance due to addressing the needs of their respective community/protection area.

SEVERE STORMS

Flooding

There has been one riverine flooding event reported in Halsey. The event caused $50,000 in property damage and $5,000 in crop damage. The flood occurred on the Thomas County side of Halsey not the Blaine County side.

Hail

Within the planning area, and Halsey, hail has occurred more times than any other single hazard. For Halsey there were 27 reported hail events between 1996 and 2014. Significant events that resulted in damages are identified in Table HAL 9. The planning team ranked hail as a high probability event but felt that impacts to people and property were not as significant as with other hazards.

Table HAL 9: Hail Events

Hazard	Date	Extent	Property Damage	Crop Damage
Hail	6/29/1999	1.75	$5,000	$55,000
Hail	7/9/2000	1	$0	$5,000
Hail	6/29/2001	2.75	$10,000	$25,000
Hail	6/29/2001	1.75	$5,000	$15,000
Hail	8/29/2001	1.75	$20,000	$0
Hail	8/11/2002	2.75	$30,000	$1,000
Hail	8/11/2002	2.75	$15,000	$10,000
Total			**$85,000**	**$111,000**

Source: National Climatic Data Center

Severe Thunderstorms

The county planning team identified severe thunderstorms as a top threat for the village of Halsey. The NCDC recorded 9 events with a total of $ 1,000 in damages to property and $55,000 in crop damage. A summary of the events with recorded damages can be seen in Table HAL 10.

Table HAL 10: Severe Thunderstorm Events

Date	Extent	Property Damage	Crop Damage
5/19/1998	-	$1,000	$0
8/10/2010	52kts	$0	$40,000
6/13/2009	52kts	$0	$15,000
Total		**$1,000**	**$55,000**

Source: National Climatic Data Center

The county has older housing stock and an aging population, both of which may lead to greater levels of vulnerability. Severe thunderstorms and hail can result in loss of electricity, blocked roadways, damages to trees, and flooding. Blocked roadways, as a result of downed trees, may also present life safety concerns to those needing immediate medical attention.

Severe Winter Storms

The local planning team identified severe winter storms as a significant concern for the community. The local planning team reported severe winter storms as being a natural part of the local climate. The event of greatest concern for the community is severe winter storms with strong winds, extreme low temperatures, and high snowfall totals. During these events it is difficult to clear roadways due to drifting snow. In addition, it is more difficult to provide assistance to vulnerable community members. It is not likely that structures would sustain significant damages from severe winter storms. The loss of power during these events is a great concern for the community.

For the village, municipal roadways are cleared by members of the community while state and county roadways are responsible for clearing their respective roadways. The village also reported an informal system of monitoring vulnerable community members. As the population of the village ages it is important that members of the community monitor each other ensuring that members of the community needing additional assistance have social networks to assist them in meeting their needs.

Tornados and High Winds

The local planning team identified tornados and high winds as a moderate concern for the community. According to the NCDC data, there was one EF0 tornado and 10 storm events which included strong winds (50 kts. Or greater). In 2011 an EF0 passed nearby Halsey; this storm included hail stones as large as tennis balls which resulted in more than $ $11,000 in $11,000 in property damages.

Table HAL 11: Tornado and High Wind Events

Hazard	Date	Extent	Property Damage	Crop Damage
Thunderstorm Wind	6/13/2009	52	$0	$15,000
Thunderstorm Wind	8/10/2010	52	$0	$40,000
Tornado	8/11/2011	EF0	$11,000	$0
Total			**$11,000**	**$55,000**

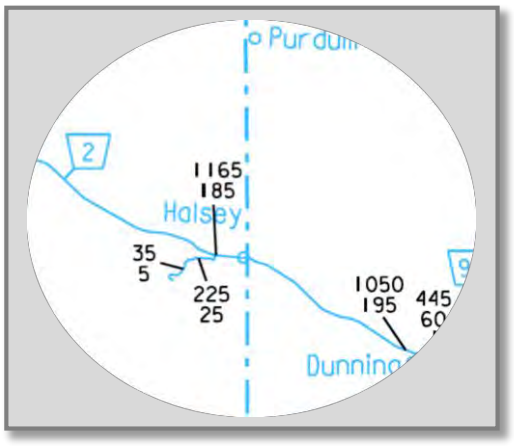
Source: National Climatic Data Center

TRANSPORTATION INCIDENTS

Transportation Incidents /Chemical Spills/ Radiological Incident

The local planning team identified transportation as the low threat for the village. According to the PHMSA incident reports there has been zero spills reported from 1980 to 2013.

The main transportation route through Halsey is US HWY 2 (Sandhills Scenic Byway). US HWY 2 accounts for a significant amount of vehicular traffic through the region. Traffic counts provided by the Nebraska Department of Roads report 1165 light vehicles daily and 185 heavy trucks passing just northwest of the village. It is very difficult to determine what exactly is being transported along these routes. There is no evidence of radiological materials being transported through the planning area much less through Halsey.



CAPABILITY ASSESSMENT

Thus far the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism in understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capabilities, administrative & technical capability, fiscal capability, and education & outreach capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

VILLAGE GOVERNANCE

The village is governed by a five member board and one part time employee that assist with paper work and municipal needs. The village works with the county and Regional Emergency Management for most services. While there are no formal departments and agencies the planning team reported strong community ties. This sense of community has been essential in the past when impacted by natural hazards.

Table HAL 12: Capability Assessment

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	No
	Capital Improvements Plan	No
	Hazard Mitigation Plan	Yes
	Economic Development Plan	No
	Emergency Operational Plan	County
	National Resources Protection Plan	No

Survey Components/Subcomponents		Comments
	Open Space Preservation plan	No
	Floodplain Management Plan	No
	Storm Water Management Plan	No
	Zoning Ordinance	No
	Subdivision Regulation/Ordinance	No
	Floodplain Ordinance	No
	Building Codes	No
	National Flood Insurance Program	No
	Community Rating System	No
	Other (if any)	NA
Administrative & Technical Capability	Planning Commission	Yes
	Hazard Mitigation Planning Commission	Yes
	Floodplain Administration	County
	Emergency Manager	County/Regional
	GIS Coordinator	County
	Chief Building Official	No
	Civil Engineering	Yes (Contractor as needed)
	Staff Who Can Assess Community's Vulnerability to Hazards	Multiple
	Grant Manager	No
	Other (if any)	NA
Fiscal Capability	Capital Improvement Project Funding	No
	Community Development Block Grant	No
	Authority to Levy Taxes for Specific Purposes	County
	Gas/Electric Service Fees	No
	Storm Water Service Fees	No
	Water/Sewer Service Fees	Yes
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	No
	Other (if any)	NA
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	No
	Natural Disaster or Safety related school programs	No
	StormReady Certification	No
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	No
	Other (if any)	NA

Summary

Given the limited number of planning mechanisms within the village little has been done to incorporate the hazard mitigation plan into existing planning documents, in fact the 2009 hazard mitigation plan is the most recent planning effort undertaken by the village. With an aging populace and a low tax base it will be difficult for Halsey to implement mitigation projects without the assistance of outside groups. Halsey will look for opportunities to partner with regional emergency management, ULNRD, Blaine County, and other regional and state agencies.

Mitigation Strategy

COMPLETED MITIGATION PROJECTS

None reported

ONGOING MITIGATION PROJECTS

Description	Backup Generators
Analysis	Provide a portable or stationary source of backup power to redundant power supplies, municipal wells, lift stations, and other critical facilities and shelters.
Goal/Objective	Goal 1/Objective 1.1
Hazard(s) Addressed	Tornados and high winds, severe winter storms, severe thunderstorms
Estimated Cost	$15,000-$30,000 per generator
Benefits	Back-up power for critical facilities (i.e. nursing home). A measure that would reduce or prevent damage to property or prevent loss of life or serious injury.
Potential Funding	HMGP
Timeline	5 years
Priority	High
Lead Agency	Village board, Region 26 EMA
Action since 2009 plan	None

Description	Storm Shelter / Safe Rooms
Analysis	Design and construct fully supplied storm shelters and safe rooms in highly vulnerable areas such as mobile home parks, campgrounds, school, and other areas.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Tornados and high winds, severe thunderstorms, severe winter storms
Estimated Cost	$200-$300/sf stand alone; $150-200/sf addition/retrofit
Benefits	Useful for many residents that do not have basements or cellars to go for shelter, especially beneficial for the nursing home and other vulnerable populations
Potential Funding	PDM, HMPG
Timeline	10 years
Priority	High
Lead Agency	Village Board, Region 26 EMA
Action since 2009 plan	None

Description	Snow Fences
Analysis	Construct snow fences to protect main transportation routes and critical facilities from excessive snow drifting and road closure.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Severe winter storms
Estimated Cost	$1,000+
Benefits	Increase road accessibility to the majority of people which live in rural areas; increase road access for emergency vehicles
Potential Funding	PDM, HMGP, NRCS Cost-share, FAS, NGPC
Timeline	5 years
Priority	Low
Lead Agency	Village Utilities, Nebraska Department of Roads
Action since 2009 plan	Ongoing action

Description	Hazard Tree Removal Program
Analysis	Identify and remove hazards limbs and/or trees.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Severe thunderstorms, tornados and high winds, severe winter storms
Estimated Cost	$20,000
Benefits	Decrease the risk of damage to electrical lines and personal property.
Potential Funding	HMGP, US Forest Service
Timeline	Ongoing (quantification data on tree maintenance is not collected by the community)
Priority	Medium
Lead Agency	Village Utilities, Village Board
Action since 2009 plan	Ongoing tree maintenance

Description	Fire Wise Defensible Space
Analysis	Work with the Nebraska Forest Service and US Forest Service to become a Fire Wise Communities/USA participant. Develop a Community Wildfire Protection Plan. Train land owners about creating defensible space. Enact ordinances and building codes to increase defensible space, improve building materials to reduce structure ignitability, and increase access to structures by responders. Develop and implement brush and fuel thinning projects.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Wildfire
Estimated Cost	$20,000
Benefits	Structures are less vulnerable to wildfire, easier for firefighters to defend structure during a wildfire event, and removes fuel from an approaching fire.
Potential Funding	HMGP, NFS, USFS, ULNRD, NGPC, National Fire Plan
Timeline	5 years
Priority	High
Lead Agency	Village Board, Fire Department, Nebraska Forestry Service
Action since 2009 plan	None

Description	Tree City USA
Analysis	Work to become a Tree City USA through the National Arbor Day Foundation in order to receive direction, technical assistance, and public education on how to establish a hazardous tree identification and removal program in order to limited potential tree damage and damages caused by trees in a community when a storm event occurs. The four main requirements include: 1) Establish a tree board; 2) Enact a tree care ordinance; 3) Establish a forestry care program; 4) Enact an Arbor Day observance and proclamation.
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Severe thunderstorms, tornados and high winds, severe winter storms
Estimated Cost	$1,000+
Benefits	Better maintained trees and hazard tree removal will eliminate damages to power lines and personal property during hazards events. Participation in Tree City USA will support community actions to mitigation damages from trees.
Potential Funding	Arbor Day Foundation, US Forest Service
Timeline	3 years
Priority	Medium
Lead Agency	Village Board
Action since 2009 plan	None

Description	Enroll in the National Flood Insurance Program (NFIP)
Analysis	Participate in the National Flood Insurance Program (NFIP). (Contact NDNR at 402.471.3932 for any questions or to request educational material on NFIP.)
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Flooding
Estimated Cost	N/A
Benefits	Enable property owners to purchase insurance protection against flood losses. Good standing enables participants to apply for PDM and HMGP cost-share.
Potential Funding	N/A
Timeline	5 years
Priority	High
Lead Agency	Village Board, NDNR
Action since 2009 plan	None

Description	Public Awareness / Education
Analysis	Through activities such as outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. In addition, educate citizens on erosion control and water conservation methods. Educate residents on response and rescue plans for all hazard types.
Goal/Objective	Goal 3/Objective 3.1 and Goal1/Objective 1.1
Hazard(s) Addressed	All hazards
Estimated Cost	$500+
Benefits	Increase knowledge to new comers to the area as well as elderly in how to react when an event is going to occur or is occurring. Education to reduce or prevent damage to property or prevent loss of life or serious injury.
Potential Funding	HMGP, PDM
Timeline	Ongoing
Priority	Medium
Lead Agency	Village Board, Region 26 EMA, NEMA, NDNR, ULNRD
Action since 2009 plan	Ongoing educational efforts from regional emergency management office

Description	Wildfire and High Winds Emergency Response and Rescue Plan
Analysis	Work with federal, county, and local emergency personal to develop a plan to for the orderly movement of people from hazard areas to safe facilities or potentially safer from an impending emergency situation and which also highlights meeting locations, available equipment, needed equipment, communication protocols, etc.
Goal/Objective	Goal 4/Objective 4.1
Hazard(s) Address	All
Estimated Cost	$5,000
Benefits	Reduce the time, cost, and effort involved in acquiring, mobilizing, positioning, and utilizing resources in response to a wildfire or high winds disaster.
Potential Funding	HMPG, National Fire Plan
Timeline	5 years
Priority	Medium
Lead Agency	Village Board, Region 26 EMA, Nebraska Department of Roads
Action since 2009 plan	None

Description	Civil Service Improvements
Analysis	Improve emergency rescue and response equipment and facilities by providing additional, or updating existing emergency response equipment. This could include fire trucks, ATV's, water tanks/truck, snow removal equipment, etc. This would also include developing backup systems for emergency vehicles, and identifying and training additional personnel for emergency response.
Goal/Objective	Goal 4/Objective 4.1
Hazard(s) Address	All Hazards
Estimated Cost	$5,000 to $400,000 per vehicle, varies depending on what equipment is needed
Benefits	Increase local capabilities to respond to disasters
Potential Funding	Homeland Security, Emergency Management, NEMA, Governing County and Local Governing Agency, Nebraska Forest Service
Timeline	5 years
Priority	Low
Lead Agency	Governing County and Local Governing Agency
Action since 2009 plan	None

Description	Training and Equipment for Volunteer Wildfire Fighters
Analysis	Provide training and necessary equipment for volunteer fire fighters.
Goal/Objective	Goal 4/Objective 4.1
Hazard(s) Address	Wildfires
Estimated Cost	$500+
Benefits	Save lives of volunteer fireman and increase efficiently to stop wildfires, and increase capabilities to apply mitigation actions in the field to lessen risk of damage to property
Potential Funding	Governing County, Nebraska Forest Service, Local Governing Agency
Timeline	On-going (fire fighter training occurs on a regular basis)
Priority	High
Lead Agency	Local Governing Agency, Nebraska Forest Service
Action since 2009 plan	None

Description	Warning Systems
Analysis	Improve/ implement city cable TV interrupt warning system and telephone interrupt system such as Reverse 911.
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	Tornados and high winds, severe winter storms, severe thunderstorms
Estimated Cost	$5,000+
Benefits	Increase response time in order to mitigate injuries, deaths, and property damages.
Potential Funding	HMGP, PDM, Governing County and Local Governing Agency
Timeline	Ongoing; Warning systems are regularly monitored and upgraded as needed and when funding assistances is available.
Priority	High
Lead Agency	Local Governments
Action since 2009 plan	None

Description	Emergency Communications
Analysis	Establish an action plan to improve communication between agencies to better assist residents and businesses during and following emergencies. Establish inner-operable communications. Provide equipment such as satellite telephones and radios.
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	Tornados and high winds, severe winter storms, severe thunderstorms
Estimated Cost	$10,000+
Benefits	More efficient and effective communication between different departments
Potential Funding	Homeland Security
Timeline	Ongoing; the local fire department works continuously to improve communications between first responders. Plans are updated periodically as needed.
Priority	Medium
Lead Agency	Village Board, Region 26 EMA
Action since 2009 plan	None

REMOVED MITIGATION PROJECTS

None reported

Hooker County

Village of Mullen

Upper Loup NRD
Multi-Jurisdictional Hazard Mitigation Plan

2014

Community Profile

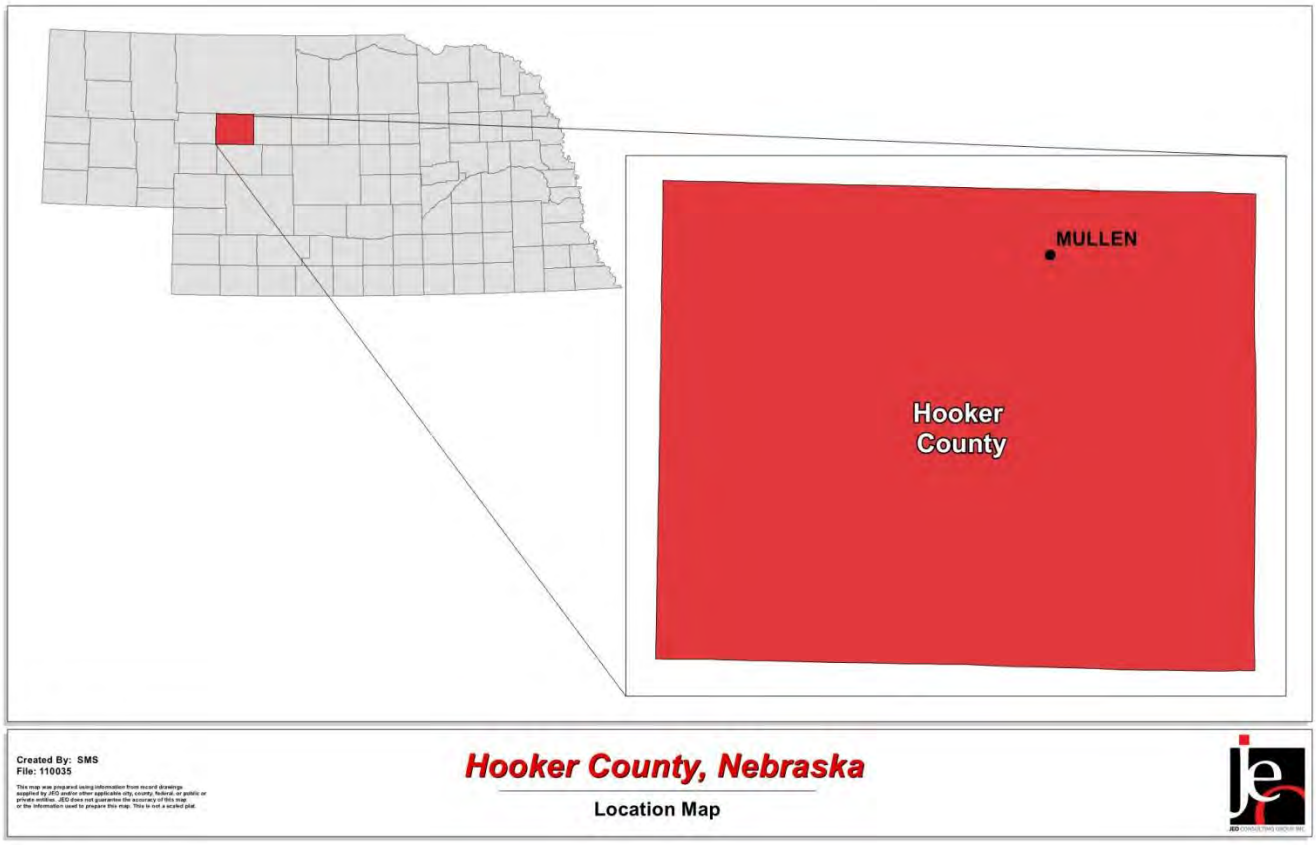
HISTORY

Hooker County was formed in March of 1889 and named after Joseph Hooker, a career officer with the United States Army and major general during the American Civil War. The first settlement in Hooker County was made by three families in 1884 before the county was laid out. The families of Chauncey Tucker, Josiah Downing and W. E. Bowers all took land on the banks of the Dismal River in the southern part of the county. They found this territory a hunter's paradise, abounding with deer, antelope, buffalo and elk. The nearest trading place and post office was North Platte, 75 miles away. The road was sandy and hilly and the round trip required from seven to ten days. Provisions, bedding, fuel and a supply of water for the trip had to be hauled. There was little settlement in the county until 1904. A few homesteads were taken along the rivers but they were a long way apart. No extensive settlement was made until 1904, when passage of the Kinkaid act permitted settlers to homestead 640 acres of land each instead of 160 acres as formerly; this new act brought many homesteaders into the county and in a few years practically all the land was taken.

LOCATION/GEOGRAPHY

Hooker County is one of the 93 counties in the State of Nebraska. It is located in the north central region of the state. The Village of Mullen is the county seat. Hooker County covers an area of 722 square miles and has an average elevation of 3,243 feet above sea level.

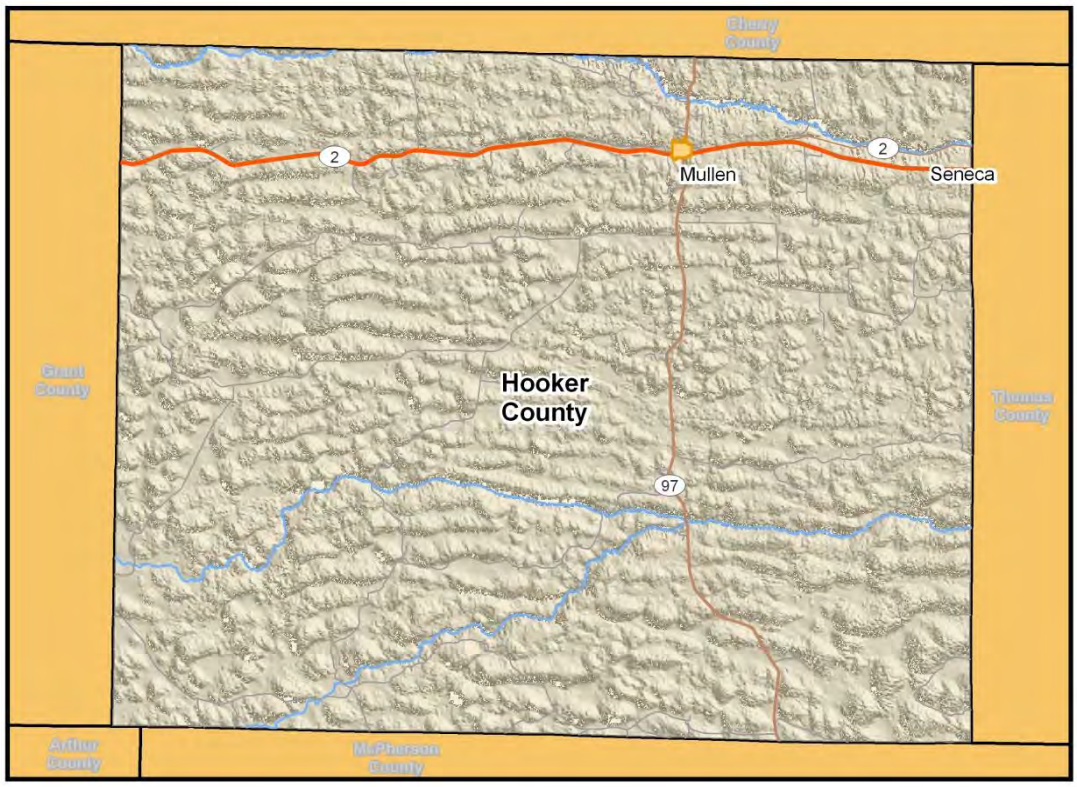
Figure HKR 1: Location



Hooker County contains one primary topographic region according to the Conservation and Survey Division of the University of Nebraska- Lincoln. This includes 'sand hills' across the entire county. Sand hills are general categorized as hilly land composed of low to high dunes of sand stabilized by a grass cover. The sand dunes

mantle stream-deposited silt, sand and gravel and sandstone. Hooker County lies primarily in the Loup River Watershed.

Figure HKR 2: Topographic Map



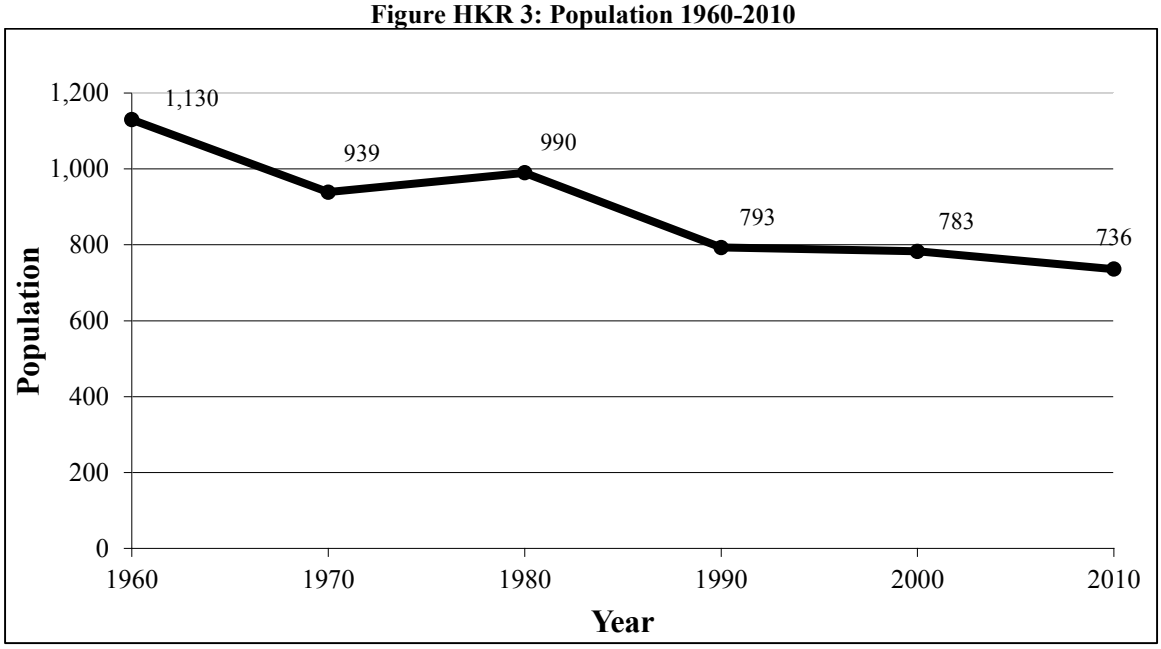
CLIMATE

Hooker County averages 20 inches of rain per year and 37 inches of snow. There are on average 228 sunny days annually. The highest temperatures occur in July when the average daily high is 89 degrees. January is the coldest month with an average high of 39 degrees.

DEMOGRAPHICS

From 1960 to 1970 the population fell from 1,130 to 939. By 1980, the population had rebounded to 990. The population fell to 793 in 1990. Since 1990, the population has been fairly steady. May rural areas across the state have experienced this same decline in population. The current population is 736. Figure HKR 3 displays the historical population trend for Hooker County from 1960 to 2010.

Figure HKR 3: Population 1960-2010



Source: U.S. Census, 1960 – 2010

Table HKR 1 illustrates the population trends by jurisdiction from 1990 – 2010 and provides a population project for 2020 by applying the percent changed from 2000 to 2010 to the next decade.

Table HKR 1: Population Trend

Jurisdiction	1990 Population	2000 Population	2010 Population	Change 2000-2010	2020 Projected Population
Hooker County	793	783	736	-6%	692
Mullen	554	491	509	4%	529

Source: U.S. Census, 1990 – 2010

This table illustrates a decline in the county from 2000 to 2010. Mullen was one of only four jurisdictions in the planning area to report positive growth numbers from 2000 to 2010. During the twenty year period however both the county as a whole and Mullen experienced population decline.

Table HKR 2: Population by Age

	Hooker County	Mullen
< 5 yrs.	4.8%	4.3%
5 - 64 yrs.	69%	66.6%
> 65 yrs.	26.2	29.1%
Median Age	50.1	50.9

Source: US Census General Population and Housing Characteristics: 2010

The demographic make-up for Hooker County and Mullen are very similar. Mullen has a slightly higher concentration of residents over the age of 65 years. Often in agricultural based communities this is the case. As farmers and ranchers reach the end of their career they often migrate to the nearest community to be closer to essential services and social networks.

HOUSING AND ECONOMICS

Median household income, per capita income, home value and rent for the county as a whole compare with broader state values as shown in Table HKR 3.

Table HKR 3: Economics and Housing Value

	Nebraska	Hooker County	Mullen
Median Household Income	$49,342	$38,750	$28,750
Per Capita Income	$25,229	$21,197	$20,154
Median Home Value	$123,900	$67,800	$62,500
Median Rent	$648	$421	$421

Source: Selected Housing Characteristics: 2006 - 2010 ACS 5-year estimate

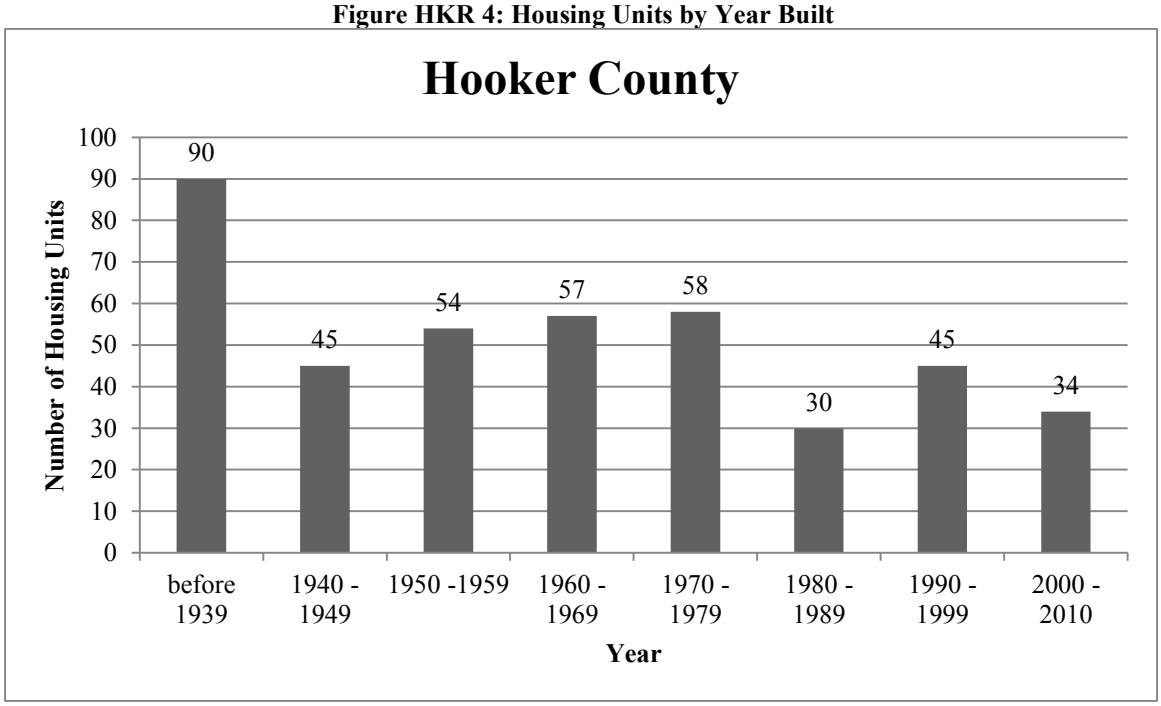
Table HKR 4: Housing Unit Occupancy

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Hooker County	320	77.5%	93	22.5%		271	84.7%	49	15.3%
Mullen	226	77.7%	65	22.3%		189	83.6%	37	16.4%

Source: Selected Housing Characteristics: 2006 - 2010 ACS 5-year estimate

According to the US Census there are a total of 320 housing units; the majority of the units were constructed prior to 1960. In the county more than 22 percent of housing units were reported as vacant; vacancy rates in Mullen are consistent with that of the county. Vacancy rates are likely a result of a declining population and new housing structures being built to accommodate population increases in growth areas (like Mullen).

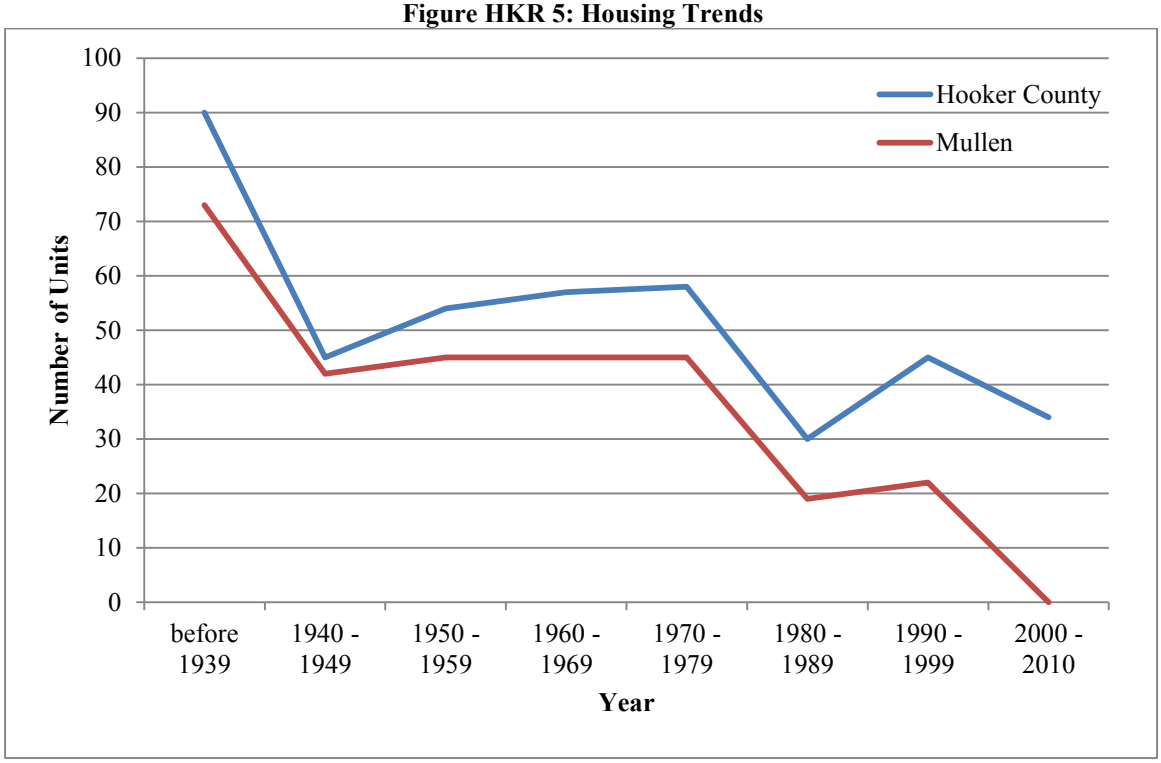
Figure HKR 4: Housing Units by Year Built



Source: Selected Housing Characteristics: 2006 -2010 ACS 5-year estimate

The age of construction for much of the county housing stock creates the potential for increased damages during extreme climactic events such as tornado, high winds, and blizzards. More than 28 percent of housing units were built before 1939. Approximately 59 percent of all housing units were built before 1960. The housing development trend for the counties and incorporated jurisdictions, Figure HRK 1, follow a very similar pattern. Peaks in development occurred pre-1939 and during the late 1960s, throughout the 1970s. Only 25 percent of housing units were constructed later than 1990.

Figure HKR 5: Housing Trends

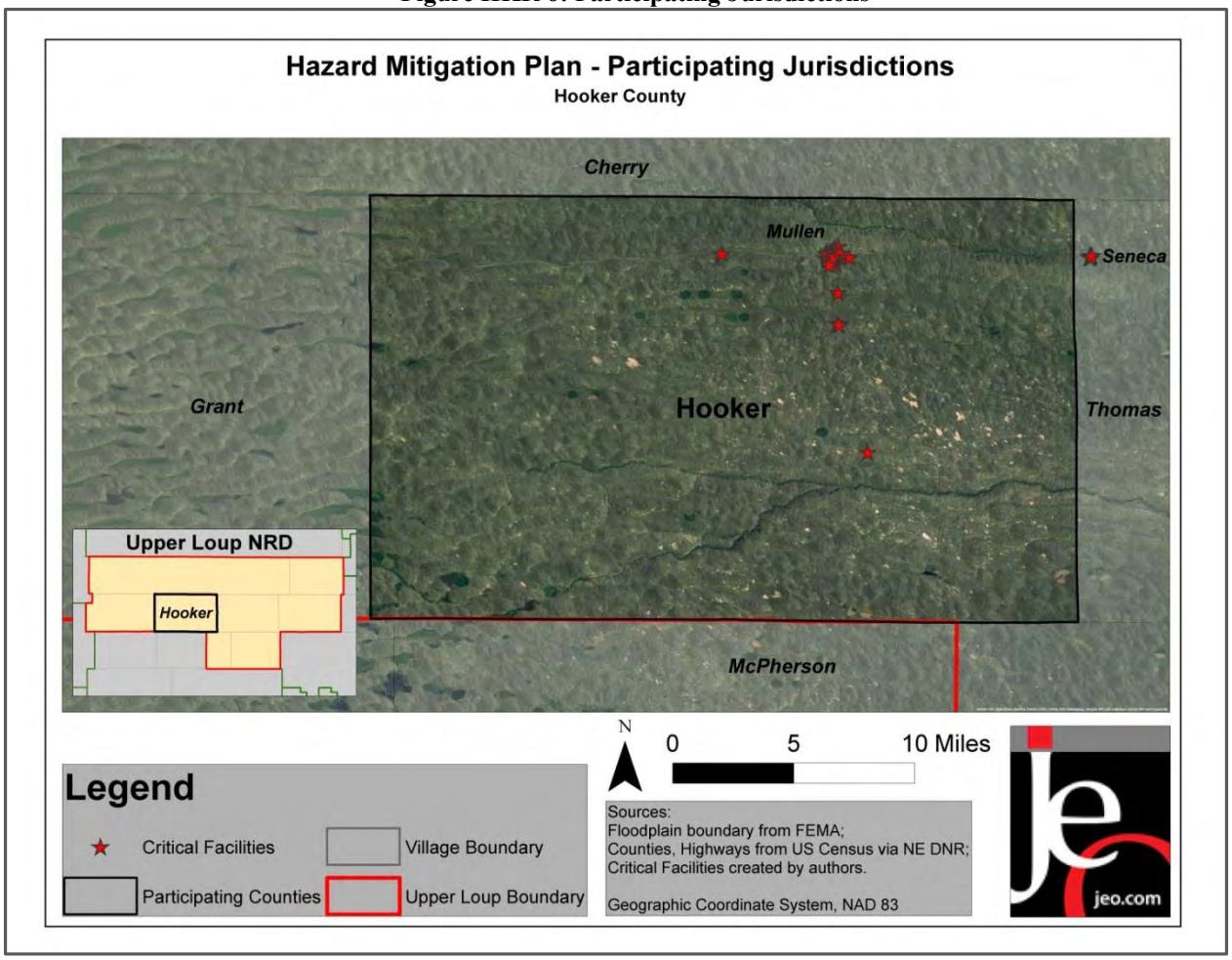


Source: Selected Housing Characteristics: 2006 - 2010

CRITICAL FACILITIES

Hooker County critical facilities are primarily addressed in the section for each individual community; this is a result of all county level critical facilities being located within the corporate limits of Mullen. There are two cellular telephone towers located in the unincorporated areas of the county.

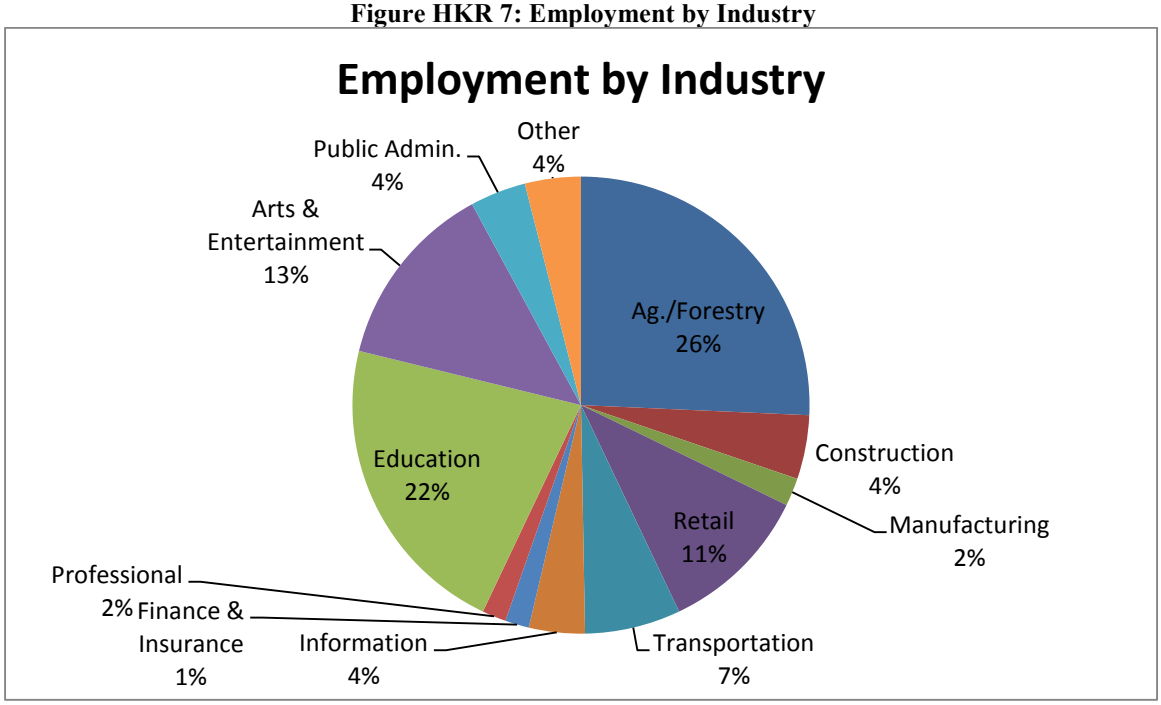
Figure HKR 6: Participating Jurisdictions



EMPLOYMENT

Figure HKR 7 shows employment by industry for Hooker County.

Figure HKR 7: Employment by Industry



Source: U.S. Census Economic Characteristics, 2010

Hooker County has a rather diverse economic situation. Agriculture and forestry jobs represent the largest individual section for the county economy at 26 percent of the total. Education is the second largest economic sector in the county (22 percent of the total). The agriculture and education sectors make-up nearly half of the jobs in Hooker County.

AGRICULTURE

Agriculture is important to the economic fabric of Hooker County and Nebraska. Hooker County's 82 farms cover 436,820 acres of land, which accounts for 94 percent of the surface land in the county. Crop and livestock production are the visible parts of the agricultural economy, but many related businesses contribute as well by producing, processing and marketing farm and food products. These businesses generate income, employment and economic activity throughout the region.

Table HKR 5: Agricultural Inventory

Agricultural Assets	Inventory
Number of farms	82
Land in farms	436,820 acres
Estimated market value of land & buildings (per farm)	$2,361,885
Crop lands	15,667 acres
Cattle Inventory	21,307 head
Grain corn bushels	-
Silage corn tons	-

Source: USDA Census of Agriculture, 2012

FUTURE DEVELOPMENT TRENDS

Future development will take place within the County as Mullen grows. According to information provided by the County Emergency Manager, there is little residential building expected, it is likely that a small amounts of growth will occur in the form of agricultural buildings. The population is not expected to fluctuate much in the future.

Structural Inventory and Valuation

For the purposes of this plan, a structural inventory for the unincorporated areas of the County was not completed. Currently assessor data is not sufficient to support a comprehensive and accurate structural inventory.

Risk Assessment

Hazard Identification

Table HKR 6 is the risk assessment for the county. Refer to *Section 4: Risk Assessment* for a detailed explanation as to what this methodology is.

Table HKR 6: Risk Assessment

Hazard	Previous Occurrence: Yes or No	County Hazard Ranking in NE 2014 State HMP	Specific Concerns Identified
Natural Hazards			
Severe Winter Storms	**Yes**	**High**	**Roadway closures, economic impacts (livestock)**
Hail Events	**Yes**	**NA**	**Economic impact especially in the ag sector. Damages to homes and other structures**
Severe Thunderstorms	**Yes**	**High**	**Frequency of occurrence, potential for secondary impacts (lightning causing wildfires)**
Tornados	**No**	**High**	**Lack of safe rooms**
High Winds	**Yes**	**High**	**Frequency of occurrence**
Grass/Wildfires	**Yes**	**High**	**Areas near the Halsey National Forest**
Drought	Yes	High	Economic losses in the ag sector
Extreme Heat	Yes	NA	Elderly population and economic impacts (especially in ag sector)
Animal Disease	Yes	Medium	Economic impacts
Flooding	Yes	Medium	Mostly localized events, concerns related to transportation route closure(s)
Plant Disease	Yes	Low	Losses in crop farming
Earthquakes	Yes	Medium	None
Dam Failure	No	None	None
Landslides	No	NA	None
Man-made Hazards			
Chemical Spills (transportation)	Yes	Medium	Transportation of ag chemicals along roadways
Urban Fire	Yes	Medium	None
Chemical spills (fixed site)	No	Medium	Ag chemical storage areas
Radiological Incident (transportation)	No	NA	None
Radiological Fixed Sites	No	None	None
Terrorism	No	Medium	Tampering with water supplies
Civil Disorder	No	Medium	None

According to the local risk assessment results, the top hazards in Hooker County are severe winter storms, hail events and severe thunderstorms, wildfires, and d drought.

Historical Occurrence

The events recorded by NCDC are broken down to two types: county-based and zone-based events. The county-based records are events that affect the jurisdictions within the county while the zone-based records are those affecting the zone that include the county as part of the affected zone. Please refer to specific villages or cities within the county for the previous county-based severe weather events retrieved from NCDC. For zone-based

events, there are 78 recorded events from 1996 to 2013, but due to the large number of the record, only those that resulted in property or crop damages are demonstrated in the following tables.

Agricultural Disease

Animal Disease

The local planning team identified animal disease as a concern for the county. In a county where cattle out number people by a ratio of 29 to 1 animal disease is a big concern. With a majority of the area being farmers and ranchers any disease that occurs may lead to losses for the farmers in treatment and quarantine or at the market. The agriculture and forestry sector accounts for 26 percent of the overall economy in Hooker County.

According to the Nebraska Department of Agriculture there were no reported animal disease cases in 2013 or thus far in 2014.

Table HKR 7: Agricultural Inventory – Live Stock

Hooker County Agricultural Inventory	
Number Of Cattle Ranches	58
Cattle Inventory	21,307 Head
Approximate Value*	$45,810,050

Source: USDA 2012 Agricultural Census
**Per head price based on the Samuel Roberts Nobel Foundation, 2014*

Drought

The local planning team ranked drought as a moderate threat for the county. Drought is generally a regional event, with impacts from a single drought event impacting multiple communities, counties, and even states. For the community, 26 percent of the workforce relies on agricultural based income and the local economy could be significantly affected during severe droughts. Across the county and planning area there were sizable economic impacts resulting from premature cattle sales during and following the 2012 drought. During the drought there was less grazing and higher prices for feed, as a result ranchers sold cattle sooner and at a lower weight than typical. The result was lower incomes for ranchers and secondary agricultural businesses as well as a depletion of cattle stock for subsequent years. This one year drought event will impact the entire economy and especially ranching in Hooker County for several years to come. Mullen did not report specific drought impacts.

Table HKR 8: Historic Drought Events

Hazard	Date	Extent	Property Damage	Crop Damage
Drought	6/1/2012 – 1/1/2014	D0 – D4	$1,000,000	$510,000

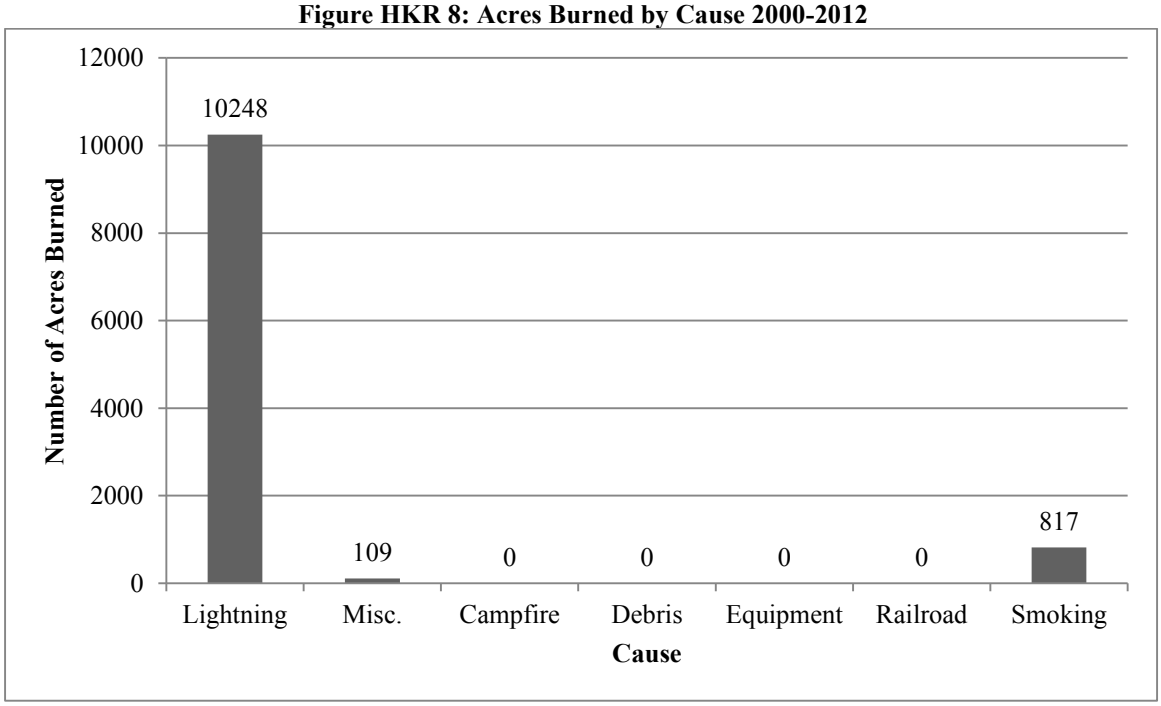
Source: NCDC

Fire

Grass/Wildfire

The county planning team identified grass/ wildfires as a top concern for Hooker County. According to the Nebraska Forestry Department there were 70 reported fires by the Mullen Fire Departments from 2000 to 2012 which consumed a total of 18,672 acres of rangelands and 100 acre of crop land. The fires also resulted in more than $13,400 in damages to crops. Of the reported fires the most frequent cause was lightning (70 percent).

Figure HKR 8: Acres Burned by Cause 2000-2012



Source: Nebraska Forestry Service

Urban Fire

The county planning team identified urban fire as a low threat for the unincorporated areas of the county. Table HKR 9 shows the number of calls responded to by the fire departments within the county. It should be noted that reporting fire calls to the Nebraska Fire Marshal's office is voluntary, as a result this is likely an incomplete list of fire calls from 2008 – 2013.

Table HKR 9: Fire Calls from 2008-2013

	Fires	Ruptures	Rescue/ EMS	Haz. Mat	Service Calls	Good Intent Calls	False Alarms	Severe Weather	Special Incidents
Hooker	82	-	12	3	4	1	11	2	-

Source: NE State Fire Marshal: FDID Incident Type Summary Report 2008 - 2012

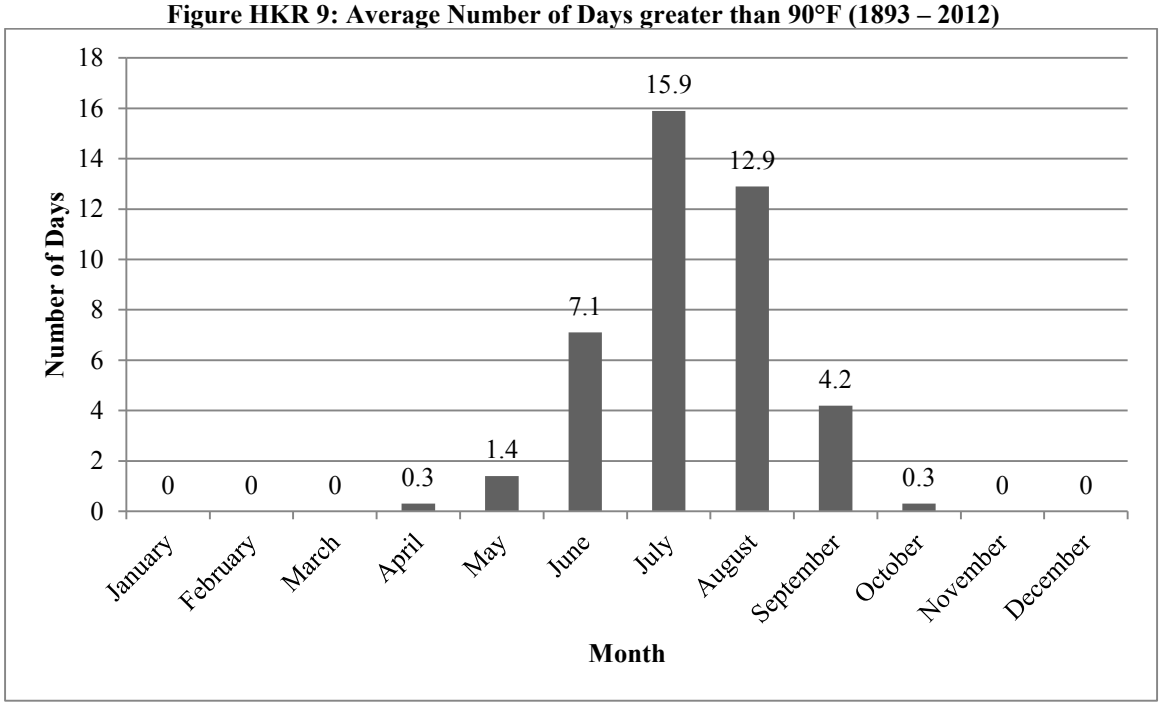
Overall, the fire departments located within the county are capable of responding to nearly all calls they receive. In a situation where additional resources are needed, there are mutual aide agreements between the various departments which provide redundancy as needed. The building stock throughout the county and planning area are mostly older structures which would burn quickly if ignited.

Severe Weather

Extreme Heat

Extreme heat is a natural part of the climate in Hooker County. Figure HKR 10 illustrates the average number of days annually that Hooker County experiences temperatures 90 degrees or higher. Across the county the median age is just over 50 years and more than 20 percent of the population is age 65 or greater. An aging population will be more vulnerable to the impacts resulting from extreme heat. In addition, a significant portion of the county economy relies on the agricultural industry which can be severely impacted during periods of prolonged high temperatures.

Figure HKR 9: Average Number of Days greater than 90°F (1893 – 2012)



Source: High Plains Climate Center

Hail Events

The county planning team identified hailstorms as a top threat for Hooker County. NCDC data records 95 events with a total of $637,500 in property damages and $1,038,000 in monetary losses recorded to crops. A summary of the events with recorded damages can be found in the participant sections. Hail in the unincorporated areas of the county is most likely to impact the agricultural areas of the county. There are more than 15,000 acres devoted to crops. Hail storms can have devastating impacts on crops, causing up to a 100 percent loss.

Severe Thunderstorm

Severe winter thunderstorms are a regular part of the climate across the ULNRD and Hooker County is no exception. The planning team estimated that severe thunderstorms were highly probable in the future, but given the frequency of occurrence residents across the county are mostly prepared for the events and able to effectively cope with their occurrences. NCDC data records 41 events with a total of $73,000 in property damages and $2,000 in crop damages. A summary of the events with recorded damages can be found in the participant sections where they occurred. Most events reported strong winds between 60 and 95 miles per hour. Damages reported include downed trees and tree limbs.

Severe Winter Storms

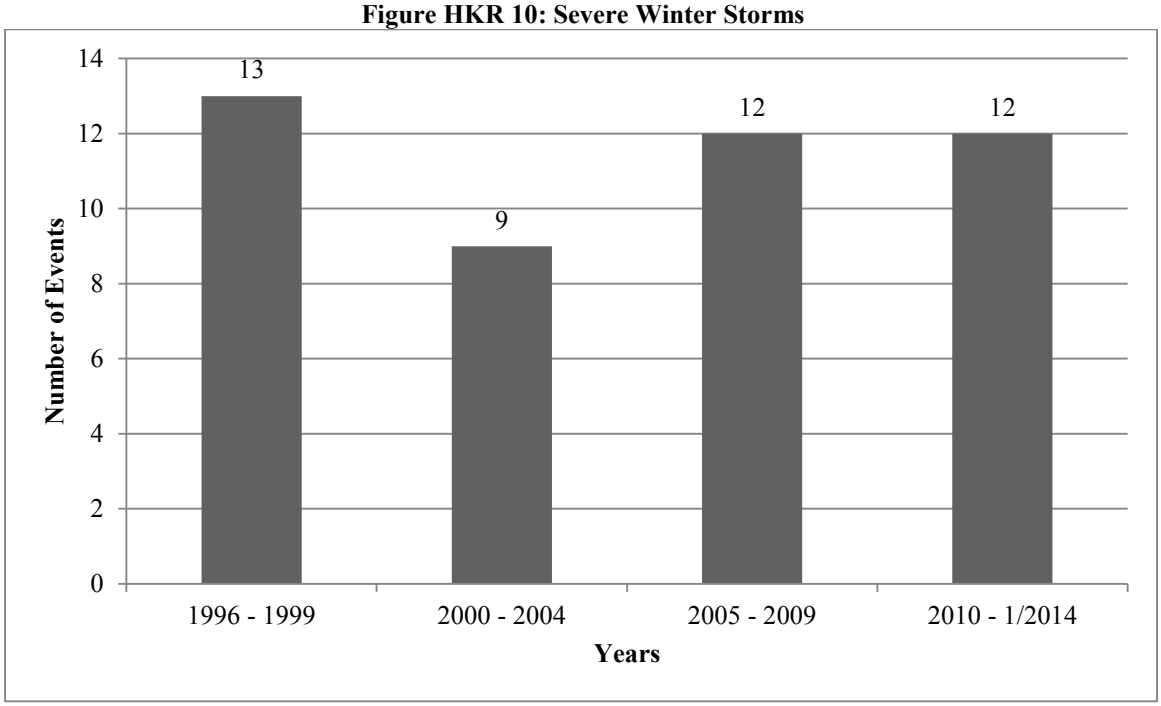
Severe winter storms are a regular part of the climate across the ULNRD and Hooker County is no exception. The planning team estimated that severe winter storms were highly probable in the future, but given the frequency of occurrence residents across the county are mostly prepared for the events and able to effectively cope with their occurrences. According to the NCDC there were 46 severe winter storms in Hooker County from 1996 through January 2014. These events resulted in $312,000 in property damage. The most costly event occurred in October of 1997 when a combination of heavy snowfall (4 – 12 inches), ice, and strong north winds resulted in closed roadways, power outages, and considerable damages to tree limbs and power lines.

Table HKR 10: Historic Severe Winter Events

Date	Extent	Property Damage	Crop Damage
10/24/1997	4- 12" snow, 40 – 60 mph winds	$200,000	$0
2/25/1998	8" snow, 60+mph winds	$82,000	$0
4/4/2009	10 -12" snow, 30 – 50 mph winds	$30,000	$0
Total	**-**	**$312,000**	**$0**

Source: NCDC

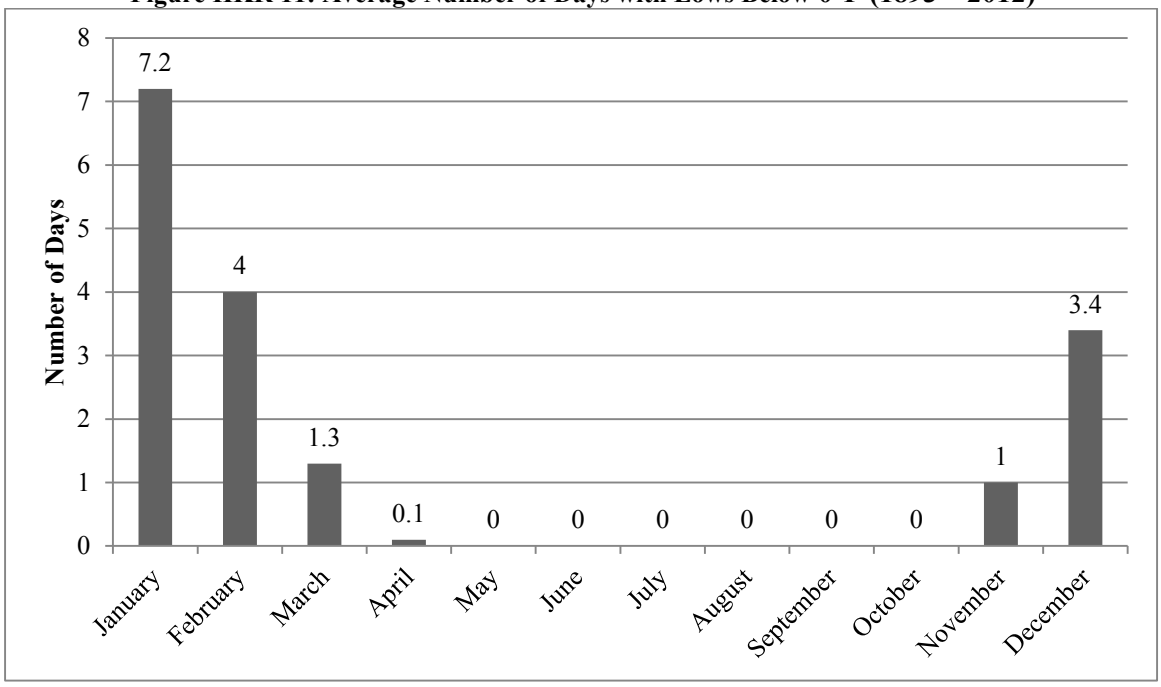
Figure HKR 10: Severe Winter Storms



Source: NCDC

Most recorded events included a combination of factors including snow, wind, and ice. There were four reported events resulting from extreme cold temperatures solely. Extreme low temperatures events in Hooker County reported temperatures between 35 and 40 degrees below zero.

Figure HKR 11: Average Number of Days with Lows Below 0°F (1893 – 2012)



Source: High Plains Regional Climate Center

Tornado and High Winds

The county planning team identified tornados and high winds as a threat for Hooker County. The NCDC recorded 5 high wind events with a total of $0 in crop damage and 14 tornados which caused $5,000 in property damages. A summary of the events with recorded damages can be seen in Table HKR 11.

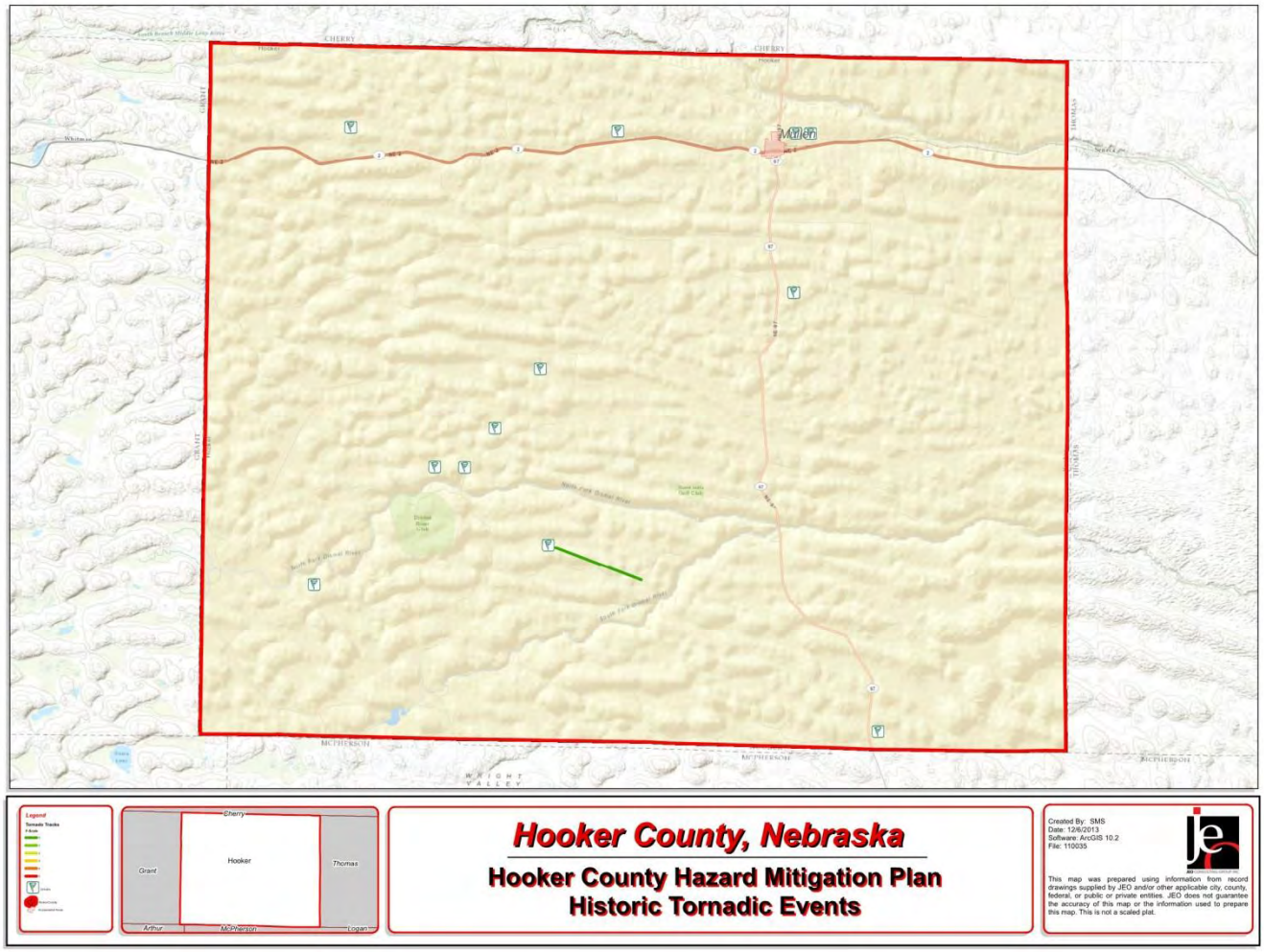
Table HKR 11: Historic Tornado Events

Hazard	Date	Extent	Property Damage	Crop Damage
Tornado	5/12/2009	EF0	$5,000	$0

Source: NCDC

Figure HKR 13 shows historic tornado tracks that have passed through Hooker County. The most significant event was an EF0 tornado which passed approximately 17 miles south southwest of Mullen. The tornado was on the ground for approximately 3.5 miles, resulting in the demolition of a metal windbreak, a tower, an outbuilding, and a windmill.

Figure HKR 12: Historic Tornado Tracks



Source: NOAA SPC

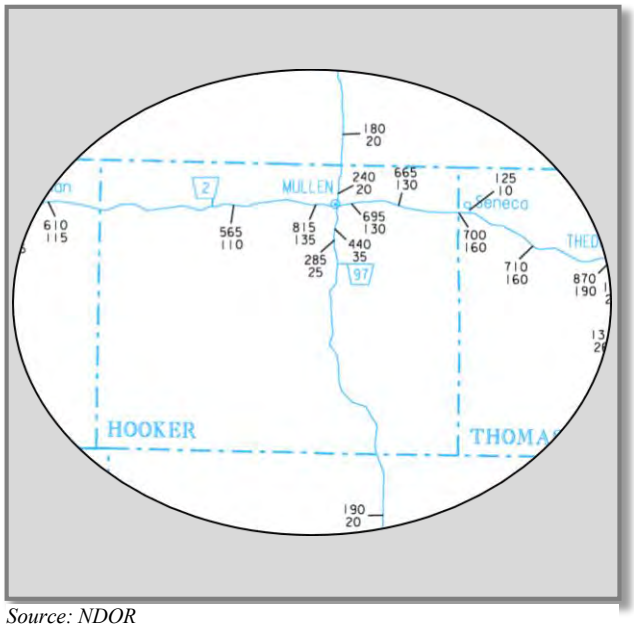
Terrorist Incidents

The planning team for the county ranked terrorism as a low concern. There has been no history of terrorist activity in or around Hooker County. The primary concerns related to terrorism discussed by the planning team include agro-terrorism and school violence. While it is not likely that attacks would occur in Hooker County or throughout the planning area the community could consider facility hardening measures at critical facilities and key infrastructure to address this concern. Currently municipal water tanks and wells are located in fenced in areas to guard against tampering.

Transportation Incidents /Chemical Spills/ Radiological Incident

The local planning team identified a major transportation incident as a low threat for the county. Incidents could be a train derailment or a mass casualty highway accident. While there is no record of these events occurring within the community the team estimated that these events could occur in the future.

The primary transportation routes through Hooker County include US HWY 2 and NE HWY 97. US HWY 2 has the greatest volume of traffic across the county. The NDOR traffic count at the eastern border is 700 light vehicles and 160 heavy trucks daily. The volume drops as US HWY moves west across the county, with a recorded count of 565 light vehicles and 110 heavy trucks in the center of the county. NE HWY 97 reports the highest volume of traffic around the village of Mullen. Traffic counts range from 240 light vehicles north of Mullen to 285 south of Mullen with a spike to 440 light vehicles just south of the village. The fluctuation for heavy trucks is not as dramatic ranging from 20 heavy trucks north of Mullen to 25 south of the village and a peak of 35 heavy trucks per day just south of Mullen.



Source: NDOR

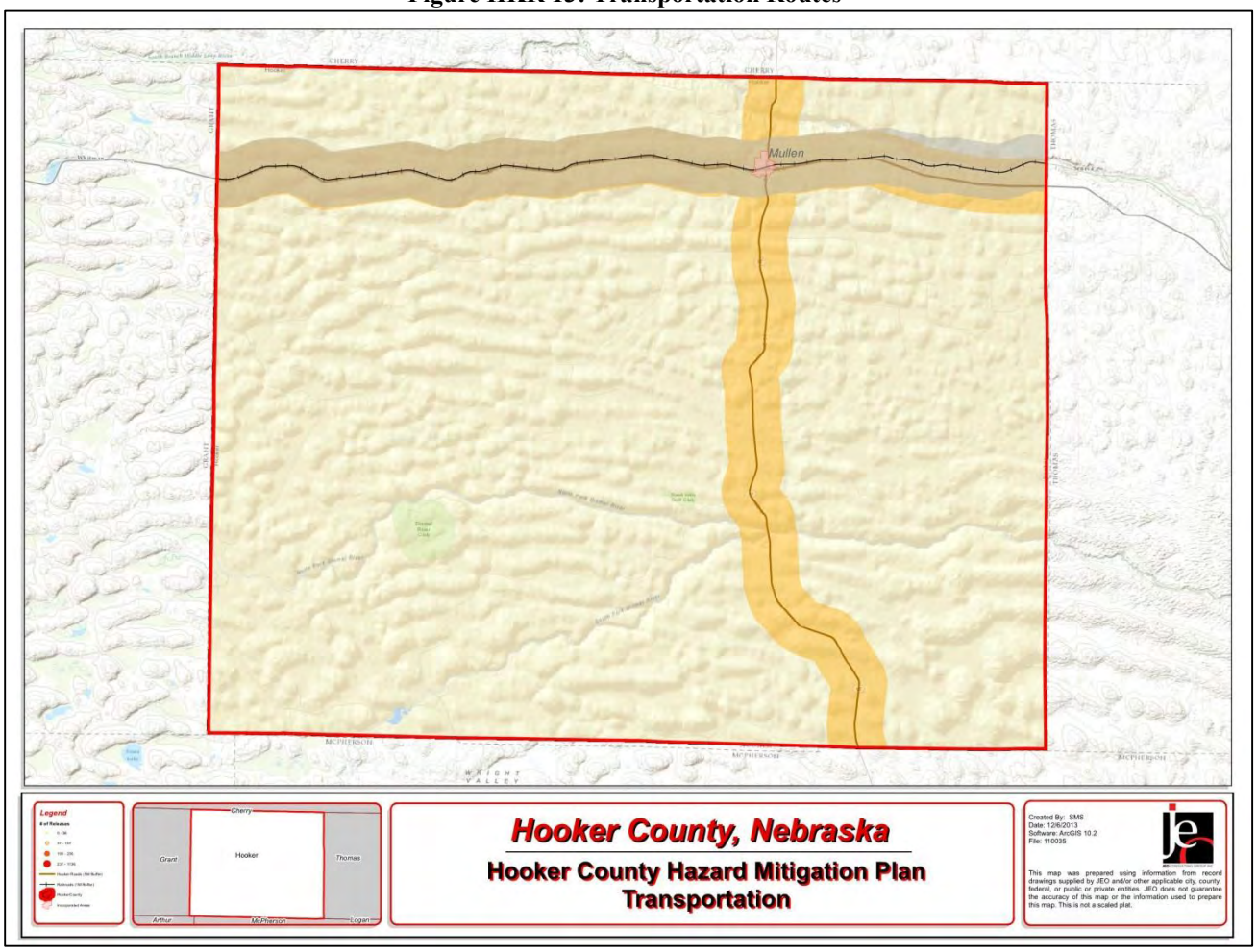
According to the PHMSA incident reports there have been two spills reported from 1980 to 2013 which release approximately 400 liquid gallons (LGA) of gasoline mixed with ethyl alcohol and fuel oils causing $2,150 in damages. The most significant event occurred in June of 1996 when 100 LGA of gasoline mixed with ethyl alcohol was released during transport via highway carrier. There is no record of what took place to result in the spill.

Table HKR 12: Chemical Spill Events

Location	Mode of Transport	Material Released	Amount	Impacts/Damages
Mullen	Highway	Gasoline with ethyl alcohol	100 LGA	$2,150

It is difficult to determine what materials are being transported along this route, but based on historic records from across the planning area fuel oils or agricultural materials are the most likely material to be released.

Figure HKR 13: Transportation Routes



Capability Assessment

Thus far, the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism in understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capabilities, administrative & technical capability, fiscal capability, and education & outreach capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses

UNINCORPORATED HOOKER COUNTY GOVERNANCE

The jurisdiction of Hooker County includes all unincorporated areas within the County boundaries. The Hooker County government structure is a five member Board of Commissioners. The Hooker County government includes the following departments and offices:

- Assessor's Office
- Attorney's Office
- Clerk's Office
- Clerk of the District Court
- Election Commissioner
- Department of Roads
- Veteran's Service Officer
- Extension Office
- GIS/IT (provided by contractor)
- Register of Deeds
- Sheriff's Office
- Technology/Website
- Treasurer's Office
- Surveyor

Table HKR 13: Capability Assessment Survey

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	Yes, 2005
	Capital Improvements Plan	Yes
	Hazard Mitigation Plan	Yes
	Economic Development Plan	No
	Emergency Operational Plan	Yes
	National Resources Protection Plan	No
	Open Space Preservation plan	No
	Floodplain Management Plan	No floodplains
	Storm Water Management Plan	No
	Zoning Ordinance	Yes, 2005
	Subdivision Regulation/Ordinance	Yes
	Floodplain Ordinance	None
	Building Codes	No
	National Flood Insurance Program	No
	Community Rating System	No
	Other (if any)	NA
Administrative & Technical Capability	Planning Commission	Yes
	Hazard Mitigation Planning Commission	Yes
	Floodplain Administration	No
	Emergency Manager	Yes
	GIS Coordinator	Yes
	Chief Building Official	No
	Civil Engineering	No
	Staff Who Can Assess Community's Vulnerability to Hazards	Multiple Staff & Residents
	Grant Manager	No
	Other (if any)	NA
Fiscal Capability	Capital Improvement Project Funding	Yes
	Community Development Block Grant	No
	Authority to Levy Taxes for Specific Purposes	Yes

Survey Components/Subcomponents		Comments
	Gas/Electric Service Fees	Yes
	Storm Water Service Fees	Yes
	Water/Sewer Service Fees	Yes
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	Yes
	Other (if any)	NA
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Yes; volunteer fire department and emergency managers
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Yes; volunteer fire department
	Natural Disaster or Safety related school programs	No
	StormReady Certification	No
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	No
	Other (if any)	NA

SUMMARY

To date the hazard mitigation plan has not been incorporated into existing planning mechanisms. In the next update of the county's comprehensive plan Hooker County should consider incorporating information from the hazard mitigation plan into the comprehensive plan. If the county were to develop a Capital Improvement Plan mitigation projects with a high priority should be included. The county should consider updating zoning regulations that prevent development in hazard prone areas.

Hooker County will be able to implement some mitigation projects without assistance. The county does rely upon regional emergency management services for assistance with related efforts. Hooker County has the second highest population in the planning area and tied for second highest number of occupied housing units. Having a higher population and structural inventory allows for a higher tax base than some of the other counties in the planning area. Hooker County will look for opportunities to partner with regional and state level agencies when possible for implementation of mitigation projects.

Mitigation Strategy

COMPLETED MITIGATION PROJECTS

Description	Weather Radios
Analysis	Conduct an inventory of weather radios at schools, rural residents, and other critical facilities and provide new radios as needed.
Goal/Objective	Goal 4/Objective 4.3 and Goal 1/Objective 1.1
Hazard(s) Addressed	All hazards
Benefits	Help those who do not have access to local TV or radio warnings
Funding	Regional EMA
Timeline	Completed
Lead Agency	Keith County EMA
Action since 2009 plan	Weather radios or other monitoring systems are located in critical facilities

ONGOING/NEW MITIGATION PROJECTS

Description	Backup Generators
Analysis	Provide a portable or stationary source of backup power to redundant power supplies, municipal lift stations and other critical facilities and shelters.
Goal/Objective	Goal 1/Objective 1.1
Hazard(s) Addressed	Tornados and high winds, severe winter storms, severe thunderstorms
Estimated Cost	$15,000-$30,000 per generator
Benefits	Back-up power for critical facilities. A measure that would reduce or prevent damage to property or prevent loss of life or serious injury.
Potential Funding	HMGP
Timeline	5 years
Priority	High
Lead Agency	County Board, Keith County EMA
Action since 2009 plan	None

Description	Storm Shelter / Safe Rooms
Analysis	Design and construct fully supplied storm shelters and safe rooms in highly vulnerable areas such as mobile home parks, campgrounds, school, and other areas.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Tornados and high winds, severe thunderstorms, severe winter storms
Estimated Cost	$200-$300/sf stand alone; $150-200/sf addition/retrofit
Benefits	Useful for many residents that do not have basements or cellars to go for shelter, especially beneficial for the nursing home and other vulnerable populations
Potential Funding	PDM, HMPG
Timeline	10 years
Priority	High
Lead Agency	County Board, Keith County EMA
Action since 2009 plan	None

Description	Bury Power and Service Lines
Analysis	Communities can work with their local Public Power District or Electricity Department to identify vulnerable transmission and distribution lines and plan to bury lines underground or retrofit existing structures to be less vulnerable to storm events. Electrical utilities shall be required to use underground construction methods where possible for future installation of power lines.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Tornados and high winds, severe winter storms, severe thunderstorms
Estimated Cost	$70,000/mile
Benefits	Eliminate the possibility of power lines being damaged or destroyed.
Potential Funding	HMGP, PDM
Timeline	Ongoing; At this time a small percentage of power lines have been buried across the county.
Priority	Low
Lead Agency	Local Public Power District/ Local Electric Dept., County Board
Action since 2009 plan	None

Description	Windbreaks / Living Snow Fence
Analysis	Installation of windbreaks and/or living snow fences to increase water storage capacity in soil and reduce blowing snow.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	High Winds
Estimated Cost	$2,000+
Benefits	Ongoing; property owners across the ULNRD install approximately 20,000 trees annually that serve as windbreaks and snow fences.
Potential Funding	ULNRD, NRCS, FST, Nebraska Game and Parks Commission
Timeline	Ongoing
Priority	Medium
Lead Agency	County Board, ULNRD
Action since 2009 plan	ULNRD has worked with countless landowners to help install living snow fences.

Description	Anchor Fertilizer, Fuel and Propane Tanks
Description	Anchor fuel tanks to prevent movement. If left unanchored, tanks could present a major threat to property and safety in a tornado or high wind event.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Address	Tornados and High Winds
Estimated Cost	$1,000+
Benefits	Limits the chance of fuel/chemical spills. Reduces chance that propane tanks and other items become missiles during tornadic events.
Potential Funding	PDM, HMGP
Timeline	Ongoing; existing stationary tanks are anchored the county will continue to enforce this requirement as new tanks are installed
Priority	Medium
Lead Agency	County Board, Residents and Fuel Suppliers
Action since 2009 plan	None

Description	Tree Removal Equipment
Analysis	Provide for equipment to remove hazardous trees.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Severe thunderstorms, tornados and high winds, severe winter storms
Estimated Cost	$20,000+
Benefits	Enable tree removal to be completed locally limiting long term cost to contract labor.
Potential Funding	Local funds
Timeline	Ongoing (quantification data on tree maintenance is not collected by the community)
Priority	Low
Lead Agency	County Board, County Utilities
Action since 2009 plan	Regular tree care and maintenance

Description	Fire Wise Defensible Space
Analysis	Work with the Nebraska Forest Service and US Forest Service to become a Fire Wise Communities/USA participant. Develop a Community Wildfire Protection Plan. Train land owners about creating defensible space. Enact ordinances and building codes to increase defensible space, improve building materials to reduce structure ignitability, and increase access to structures by responders. Develop and implement brush and fuel thinning projects.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Wildfire
Estimated Cost	$20,000
Benefits	Structures are less vulnerable to wildfire, easier for firefighters to defend structure during a wildfire event, and removes fuel from an approaching fire.
Potential Funding	HMGP, NFS, USFS, ULNRD, NGPC, National Fire Plan
Timeline	5 years
Priority	High
Lead Agency	County Board, Zoning & Planning Commission
Action since 2009 plan	None

Description	Water Storage
Analysis	Develop additional water storage alternatives
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Address	Severe Winter Storm, Severe Thunderstorms, Tornados and High Winds, Wildfire
Estimated Cost	$30,000+
Benefits	Back-up supplies of municipal water to fight fires, supply the needs of citizens
Potential Funding	Local
Timeline	10 years
Priority	Medium
Lead Agency	County Board, Local Governments, Fire Departments
Action since 2009 plan	None

Description	Source Water Contingency Plan
Analysis	Villages and cities can evaluate and locate new sources of groundwater to ensure adequate supplies to support the existing community and any additional growth which may occur.
Goal/Objective	Goal 2/Objective 2.2
Hazard(s) Addressed	Drought
Estimated Cost	$5,000+
Benefits	Plan for future water supplies.
Potential Funding	CDBG, SRF, NDEQ
Timeline	5 years
Priority	Low
Lead Agency	County Board, ULNRD
Action since 2009 plan	None

Description	Warning Systems
Analysis	Improve/ implement city cable TV interrupt warning system and telephone interrupt system such as Reverse 911.
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	Tornados and high winds, severe winter storms, severe thunderstorms
Estimated Cost	$5,000+
Benefits	Increase response time in order to mitigate injuries, deaths, and property damages.
Potential Funding	HMGP, PDM, Governing County and Local Governing Agency
Timeline	Ongoing; Warning systems are monitored and priorities for upgrades and improvements. Improvements are often contingent upon funding assistance.
Priority	High
Lead Agency	County Board
Action since 2009 plan	None

Description	Emergency Signage
Analysis	Place signs around communities and vulnerable areas to warn of potential hazards and indicate locations of storm shelters, evacuation routes, or safest places to be during an event.
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	All
Estimated Cost	NA
Benefits	Enable people to find adequate shelter or safest places to be when a disaster strikes.
Potential Funding	PDM and HMGP for shelters constructed to FEMA standards
Timeline	As needed over next 5-years
Priority	Medium
Lead Agency	County Board, Keith County EMA
Action since 2009 plan	None

Description	Continuity Planning
Analysis	Develop continuity of operations plans for critical facilities.
Goal/Objective	Goal 2/Objective 2.2
Hazard(s) Addressed	All
Estimated Cost	NA
Benefits	Helps establish continuity of operations procedures for critical facilities
Potential Funding	County, Hooker County EMA
Timeline	5-years
Priority	Medium
Lead Agency	County Board, Sheriff's Department, Fire Departments, Keith County EMA
Action since 2009 plan	New to this plan

Description	Database of Vulnerable Populations
Analysis	Work with communities to develop a database of vulnerable populations
Goal/Objective	Goal1/Objective 1.1
Hazard(s) Addressed	All
Estimated Cost	NA
Benefits	Provides the county and local communities with a list of individuals requiring additional assistance should a disaster occur
Potential Funding	NA
Timeline	5-years
Priority	Low
Lead Agency	County Board, Sheriff's Department, Fire Department
Action since 2009 plan	New to this plan

Description	Hail Resistant Building Materials
Analysis	Provide information related to hail resistant building materials to individuals constructing new buildings.
Goal/Objective	Goal 2.Objective 2.4
Hazard(s) Addressed	Hail, Severe Thunderstorms, Severe Winter Storms
Estimated Cost	NA
Benefits	Educates community members about alternative building materials.
Potential Funding	NA
Timeline	5-years
Priority	Low
Lead Agency	Planning Commission, County Clerk
Action since 2009 plan	New to this plan

Description	Natural Benefit of Floodplains
Analysis	Preserve the natural and beneficial functions of floodplains and flood prone areas through measures including but not limited to: retaining natural vegetation, restoring streambeds, and preserving open spaces.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Flooding
Estimated Cost	NA
Benefits	Preserves natural functions of the floodplain and ecosystems.
Potential Funding	NA
Timeline	Ongoing; land preservation is a common practice in Hooker County
Priority	Low
Lead Agency	Planning and Zoning Commission, County Board
Action since 2009 plan	New to this plan

Description	Vehicular Barriers
Analysis	Install vehicular barriers around critical facilities.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Terrorism, Civil Disorder
Estimated Cost	$500 - $25,000
Benefits	Provides protection for critical facilities
Potential Funding	HMGP, DHHS
Timeline	5 years
Priority	Medium
Lead Agency	County Board, Local Governments
Action since 2009 plan	New to this plan

REMOVED MITIGATION PROJECTS

Description	Civil Service Improvements
Analysis	Improve emergency rescue and response equipment and facilities by providing additional, or updating existing emergency response equipment. This could include fire trucks, ATV's, water tanks/truck, snow removal equipment, etc. This would also include developing backup systems for emergency vehicles, and identifying and training additional personnel for emergency response.
Goal/Objective	Goal 4/Objective 4.1
Hazard(s) Address	All Hazards
Lead Agency	Governing County and Local Governing Agency
Reason for Removal	It is not likely that the county will purchase ATVs and/or snow mobiles

VILLAGE OF MULLEN

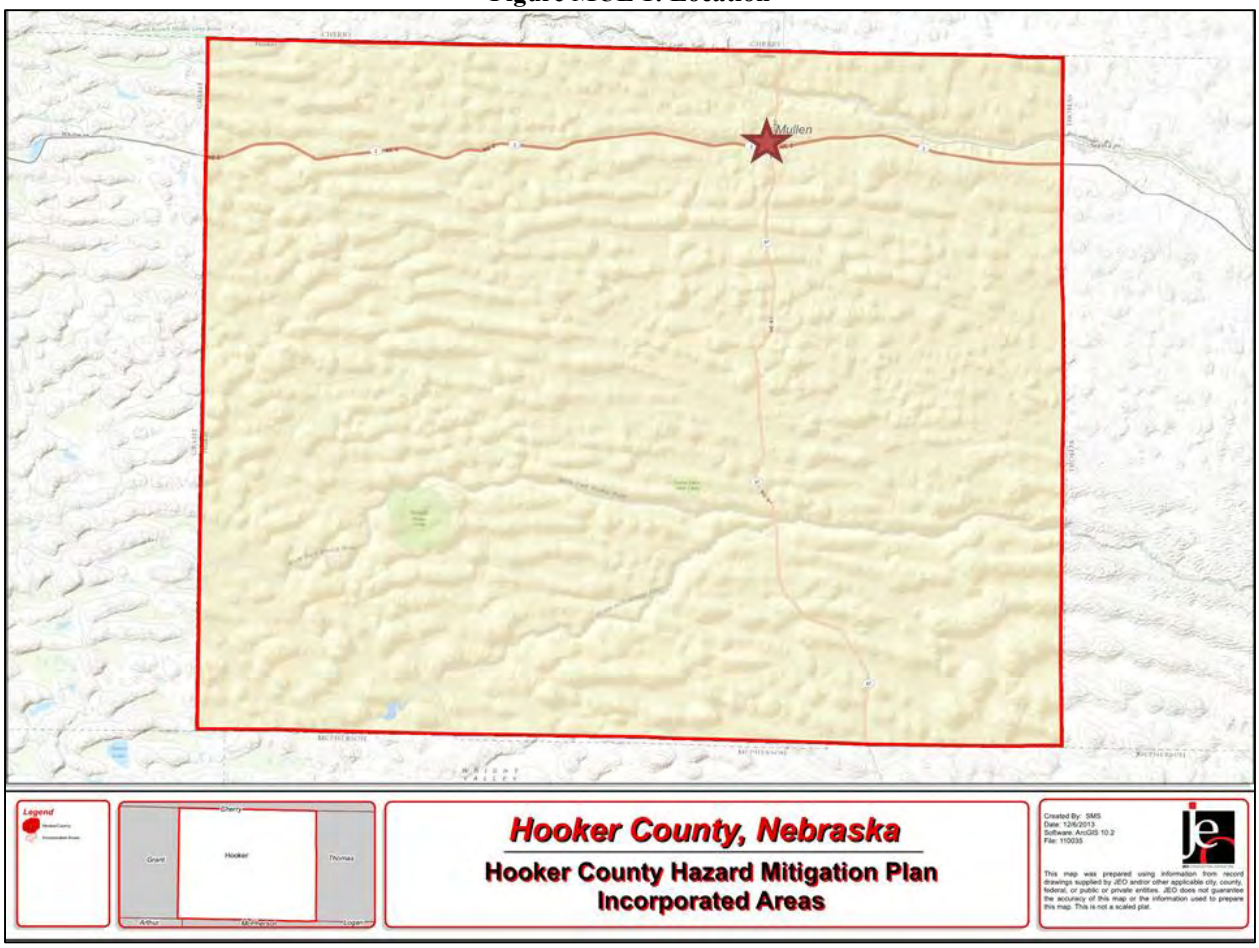
HISTORY

Settlement began in the community of Mullen in 1887 when the Grand Island & Wyoming, a subsidiary line of the Chicago, Burlington & Quincy Railroad, laid rails from Broken Bow west to Whitman in Grant County. A siding was built one mile east, a telegraph was hooked up to a box car, and it was named "Mullen," for Charles Mullen, Chief Clerk of the CB&Q. Amos Gandy and George Trefren bought land near the "depot" from George W. Vleit for a town site. With organization of the county eminent, Gandy and Trefren laid out the town of Mullen in 1888. They designated block 5 on a hill "...for a courthouse if and when a county be formed." Mullen incorporated in 1907.

Location/Geography

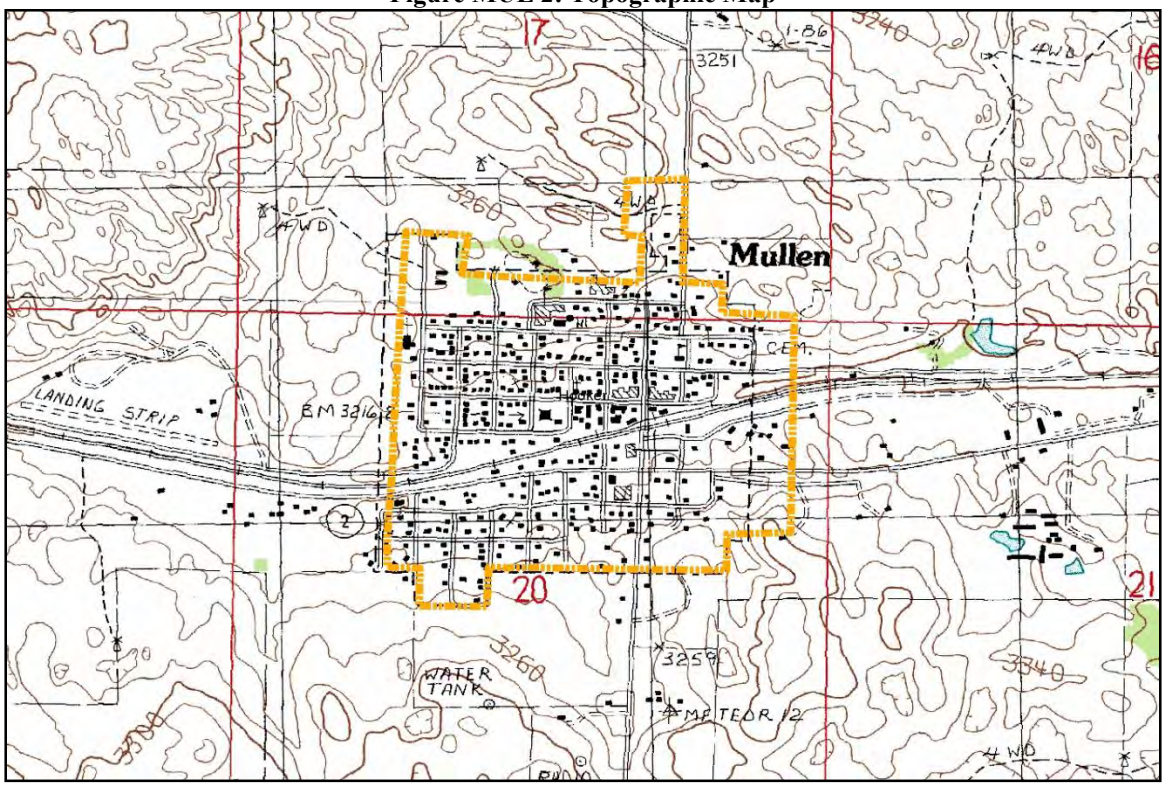
Mullen is a village located in the north east portion of Hooker County. The Village of Mullen covers an area of 243.2 acres and has an elevation of 3,215 feet above sea level.

Figure MUL 1: Location



The community of Mullen lies in an area of sand hills. The land use surrounding the community is mainly ranching with some agricultural crops in the river valleys. Hilly land composed of low to high dunes of sand stabilized by a grass cover is prevalent. The community lies approximately 1.5 miles south of the Middle Loup River valley. The watershed flows generally from the northwest to the southeast. A current floodplain has not been delineated for Mullen and river flooding is not a significant concern.

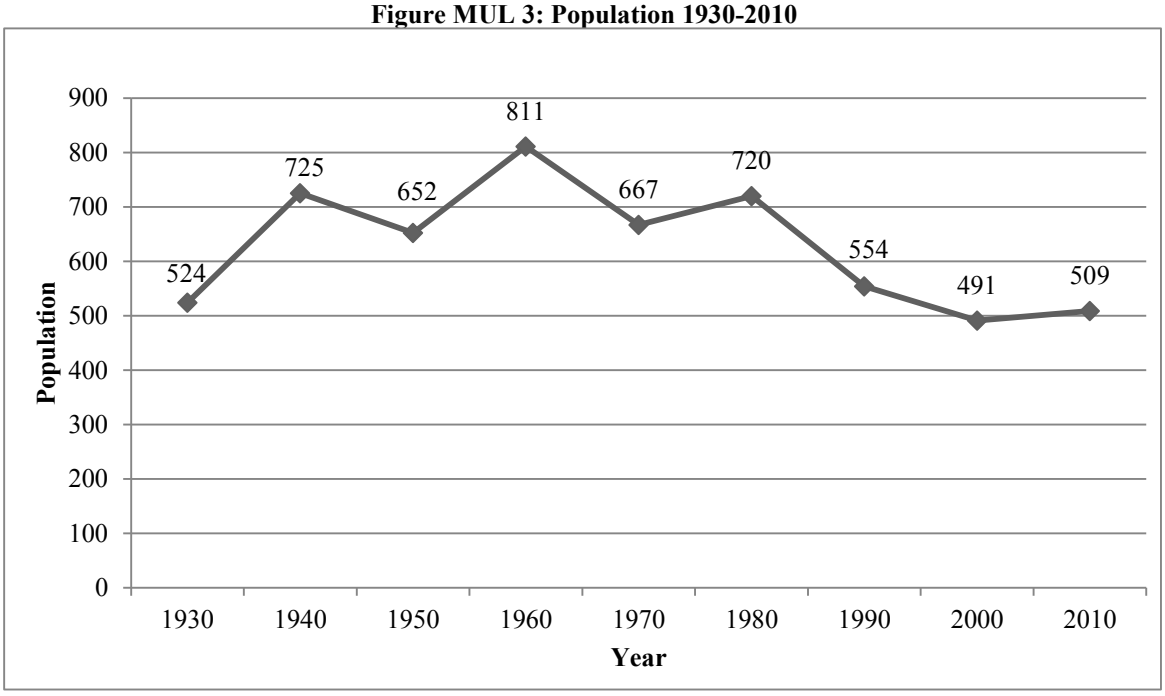
Figure MUL 2: Topographic Map



DEMOGRAPHICS

Since 1930 Mullen has seen periods of slight growth and decline. At its peak the population was 811 people in 1980. The lowest population was 491 in 2000. Since 2000 the population has grown roughly 4 percent to 509. Figure MUL 3 displays the historical population trend for Mullen from 1930 to 2000.

Figure MUL 3: Population 1930-2010



Source: US Census

Table MUL 1 illustrates the age distribution and median age for Hooker County in comparison to the village of Mullen.

Table MUL 1: Age Distribution Mullen & Hooker County

	Hooker County	Mullen
< 5 yrs.	4.8%	4.3%
5 - 64 yrs.	69%	66.6%
> 65 yrs.	26.2	29.1%
Median Age	50.1	50.9

Source: U.S. Census, 2010

The demographics for Mullen are very close to those of the county as a whole.

HOUSING AND ECONOMICS

Median household income, per capita income, home value and rent for the county as a whole compare with the village of Mullen.

Table MUL 2: Economics Mullen & Hooker County

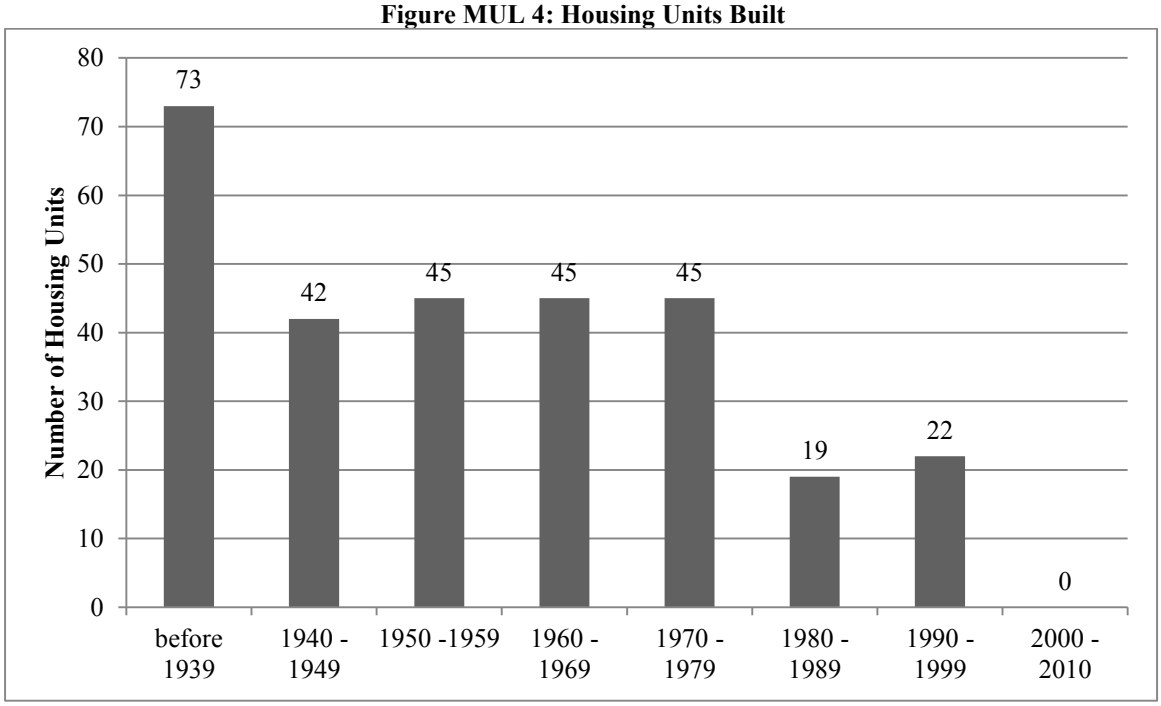
	Hooker County	Mullen
Median Household Income	$38,750	$28,750
Per Capita Income	$21,197	$20,154
Median Home Value	$67,800	$62,500
Median Rent	$421	$421

Source: U.S. Census American Community Survey Housing Characteristics and Income, 2012

According to the U.S. Census there are a total of 291 housing units in Mullen. Of those 291 units more than 22 percent (65 total units) are reported as vacant.

According to the US Census there are a total of 320 housing units; the majority of the units were constructed prior to 1960. In the county more than 22 percent of housing units were reported as vacant; vacancy rates in Mullen are consistent with that of the county.

Figure MUL 4: Housing Units Built



Source: US Census 2006 - 2010 American Community Survey 5 Year Estimates

Table MUL 3: Housing Unit Occupancy

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Hooker County	320	77.5%	93	22.5%		271	84.7%	49	15.3%
Mullen	226	77.7%	65	22.3%		189	83.6%	37	16.4%

Source: US Census 2006 - 2010 American Community Survey 5 Year Estimates

Structural Inventory and Valuation

A structural inventory was completed for the corporate limits of Mullen though a window survey using GIS for the 2009 hazard mitigation plan. The values of these structure types were updated utilizing the 2013 Property Type Values as provided by the Nebraska Department of Revenue Property Assessment Division.

Results from the structural inventory completed by the Village of Mullen are found in Table MUL 4 below.

Table MUL 4: Structural Inventory and Valuation

Total Structures		Structure Valuation	
Structure Type	Number of Structures	Total Value	Value per Structure
Commercial/Industrial	60	$3,274,500	$54,575
Out Building	112	$637,280	$5,690
Residential	272	$8,817,968	$32,419
Public/Quasi Public	23	$288,880	$12,560
Total	**467**	**$11,441,210.00**	NA

**Values are rounded to the nearest dollar.*

Critical Infrastructure/Key Resources

Figure MUL 5: Location of Critical Facilities

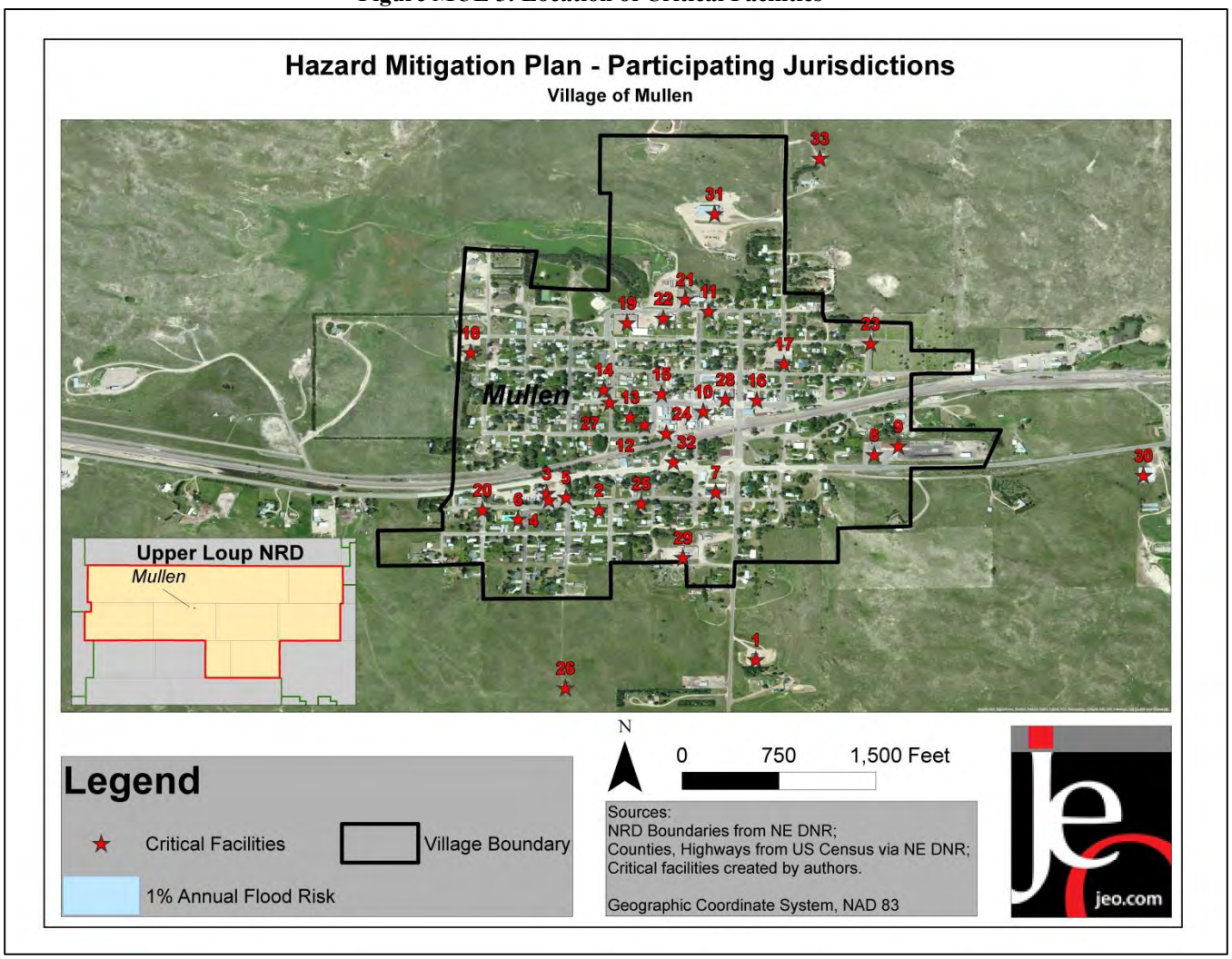


Table MUL 5: Critical Facilities

Number	Name	Function
#1	Church	Gathering Location
#2	Church	Gathering Location
#3	Fire Department	Emergency Response
#4	Fire Department	Emergency Response
#5	Fire Department	Emergency Response
#6	Pool	Gathering Location
#7	School Gym	Gathering Location
#8	State Maintenance Shop	Critical Facility
#9	State Maintenance Shop	Critical Facility
#10	Village Office	Government function
#11	Village Light Plant	Critical Facility
#12	Public Park	Gathering Location
#13	Hooker County Court House	Government function
#14	Church	Gathering Location
#15	Church	Gathering Location
#16	Post Office	Government function
#17	Mullen Grade School	Vulnerable Population
#18	Church	Gathering Location
#19	Mullen High School	Vulnerable Population
#20	Mullen High School Football Field	Vulnerable Population
#21	Nursing Home	Vulnerable Population
#22	Well Pump House	Critical Facility
#23	Well Pump House	Critical Facility
#24	Well Pump House	Critical Facility
#25	Well Pump House	Critical Facility
#26	Water Storage Tank	Critical Facility
#27	Public Library	Gathering Location
#28	Grocery Store	Critical Facility
#29	Shop	Critical Facility
#30	Power Substation	Critical Facility
#31	Shop	Critical Facility
#32	Gas Station	Critical Facility
#33	Cell Tower	Critical Facility

FUTURE DEVELOPMENT TRENDS

At this time the planning team for Mullen does not expect much growth over the next five to ten years. The population is expected to stabilize. Given the rate of vacant buildings there will be sufficient space for development to occur within the existing corporate limits. At this time the planning team did not expect to see an increase in codes or zoning.

MULLEN PUBLIC SCHOOL DISTRICT

Mullen Public Schools participated in this planning effort through attendance at meetings and completion of a risk assessment and project identification. This section will identify school attendance, structural valuation, and risk assessment for the district. The critical facilities for the school district can be found on Figure MUL 5.

The Mullen School District is a Class III K-12 District encompassing an area of 1,383.8 sq. miles, including all of Hooker Co., 520 sq. miles of Cherry Co. and 72 sq. miles of Thomas Co. The school has been established by the community for the purpose of developing efficient, responsible citizens. To meet these needs the school has adopted the Nebraska Standards and Assessment system. A staff of 8 elementary teachers and a secondary staff of 15 teachers. Mullen experiences little student mobility and low staff turnover thus creating a very personal and positive learning environment.

Enrollment

Mullen Public School District consist of three structures which house grades K- 12. The enrollment for the school is 171 (2013). Enrollment is split between the two structures with 83 students enrolled at the elementary school and 88 students enrolled in the middle/high school.

Risk Assessment

Representatives from Mullen Public School completed a risk assessment for this planning process. The risk assessment for the school is consistent with that of the community. Because the flood risk has not been mapped there are no structures located in the floodplain. School structures are located within the community of Mullen as such they have lower exposure to hazards such as wildland fires. The total value for the school district's structures is estimated at $11,474,944. The district representative did not indicate damages to school facilities in the past.

The district did, however, identify greater vulnerability to manmade hazards than did the community of Mullen. In the past the district has discussed vulnerability to manmade hazards and designed approaches to prepare for and respond to these types of events. Again, due to the sensitive nature of these plans they will not be discussed in this document.

Capabilities Assessment

School districts throughout Nebraska typically do not have comprehensive plans. Mullen Public Schools, like other districts across the state, are required to have an emergency action plan outlining response protocol for certain natural and manmade hazards. While the emergency action plan will not be discussed in detail in this report due to sensitive data it was reviewed by the school district planning team to ensure the goals, objective, and projects identified in this document are consistent with existing plans.

Mullen Public Schools are able to implement mitigation projects (such as facility upgrades and retrofits) as needed so long as those items are included in long range budgeting for the district. The district does look for opportunities to partner with other entities (the city, local fire districts, Hooker County, ULNRD, etc.) in the implementation of major mitigation projects. For example, the school district, through this process, expressed an interested in constructing a safe room in partnership with Mullen and Hooker County.

Mullen Public Schools does not have a district wide website but does use social media (i.e. Facebook) to share information with students and families. As is evident through this planning process Mullen Public Schools have a close relationship with the local community and the county as a whole. It is likely that these established working relationships will be critical during the implementation of mitigation projects.

Mitigation Efforts

Mitigation measures identified by the school district include: construction of storm shelter, installation of backup power generators, and development of public awareness materials to share with students and families. The school district relies on the community and the county to address other issues such as: localized flooding,

maintenance of roadways, and improvements to infrastructure which supports the school (i.e. water, power, waste water, etc.).

Risk Assessment

Hazard Identification

Table MUL 6 is the local risk assessment. Refer to *Section 4: Risk Assessment* for an explanation as to what this methodology is and why certain hazards did not pose a significant enough threat and were eliminated from detailed discussion due to the calculation.

Table MUL 6: Risk Assessment

Hazard	Previous Occurrence: Yes or No	County Hazard Ranking in NE 2014 State HMP	Specific Concerns Identified
Natural Hazards			
Severe Winter Storms	**Yes**	**High**	**Roadway closures, economic impacts**
Hail Events	**Yes**	**NA**	**Economic impact especially in the ag sector. Damages to homes and other structures**
Severe Thunderstorms	**Yes**	**High**	**Frequency of occurrence, potential for secondary impacts (lightning causing wildfires)**
Tornados	**Yes**	**High**	**Lack of safe rooms, school located in the community without sufficient safe rooms for student body**
High Winds	**Yes**	**High**	**Frequency of occurrence**
Grass/Wildfires	**No**	**High**	**Fires moving from rangelands into the community; age of structures**
Drought	Yes	High	Economic losses in the ag sector
Extreme Heat	Yes	NA	Elderly population, economic impacts (especially in ag sector), secondary events/impacts (wildfires)
Animal Disease	No	Medium	Economic impacts
Flooding	No	Medium	Mostly localized events, concerns related to transportation route closure(s)
Plant Disease	No	Low	None
Earthquakes	No	Medium	None
Dam Failure	No	None	None
Landslides	No	NA	None
Man-made Hazards			
Chemical Spills (transportation)	Yes	Medium	Transportation of ag chemicals along roadways
Urban Fire	Yes	Medium	Age of structures within the village
Chemical spills (fixed site)	No	Medium	Ag chemical storage areas
Radiological Incident (transportation)	No	NA	None
Radiological Fixed Sites	No	None	None
Terrorism	No	Medium	Tampering with water supplies
Civil Disorder	No	Medium	None

The top hazards in the village of Mullen are tornados and high winds, severe winter storms, severe thunderstorms and hail events, and grass/wildfire.

Historical Occurrences

The NCDC counted a total of 200 hazard events in the village of Mullen and there were no recorded deaths or injuries, but $$1,195,500 in damages to property and $980,000 in crop damages.

FIRE

Grass/wildfires

The local planning team identified grass/wildfire as a significant concern for the village. According to the Nebraska Forestry Department there were 70 reported fires by the Mullen Fire Department from 2000 to 2012 which consumed a total of 18,672 rangeland acres and 100 crop land acres. The fires also resulted in more than $13,400 in damages to crops and structures. The most significant fire took place in 2000 when approximately 5,000 acres of range lands were burned. The Mullen Fire Department has mutual aid agreements with neighboring fire districts when fires exceed local capabilities.

SEVERE STORMS

Flooding

The village of Mullen has had one flooding event reported to NCDC. The one event was a flash flood that caused $500,000 in property damage and no crop damage. Mullen does have one policy with the NFIP, but does not have a flood map or SFHA available from FEMA.

Hail Events

The local planning team identified hailstorms as a threat for Mullen. NCDC data records 95 events with a total of $637,500 in property damages and $1,038,000 in monetary losses recorded to crops. A summary of the events with recorded damages can be seen in Table MUL 7.

Table MUL 7: Historic Hail Events

Date	Extent	Property Damage	Crop Damage
6/16/1998	1.75 in	$0	$5,000
6/4/1999	4.5 in	$20,000	$125,000
6/8/1999	2.5 in	$7,000	$0
6/29/2000	1 in	$250,000	$750,000
7/9/2000	2.75 in	$35,000	$55,000
7/26/2000	1.75 in	$10,000	$25,000
6/29/2001	1.75 in	$14,000	$10,000
7/2/2001	1.5 in	$10,000	$0
7/4/2001	2.5 in	$31,000	$16,000
8/8/2002	1 in	$2,000	$2,000
8/10/2002	1 in	$2,000	$2,000
8/29/2002	1 in	$3,000	$3,000
5/22/2004	1.75 in	$2,000	$0
6/6/2005	2.5 in	$30,000	$0
8/19/2005	1.75 in	$1,000	$0
6/2/2006	1.75 in	$3,000	$0
7/13/2007	3 in	$80,000	$45,000
6/3/2008	1.5 in	$1,500	$0
5/12/2009	1.75 in	$5,000	$0
6/6/2009	1.75 in	$20,000	$0
7/23/2009	2.5 in	$100,000	$0

7/7/2013	1.5	$1,000	$0
Total		**$637,500**	**$1,038,000**

Source: NCDC

Severe Thunderstorms

Severe thunderstorms are a regular part of the climate for Hooker County and Mullen. The planning team identified severe thunderstorms as a threat for the village.

The NCDC counted a total of 28 severe thunderstorm events in the village of Mullen which resulted in $73,000 in property damages and $2,000 in crop damages. A summary of storms recording losses can be seen in Table MUL 8.

Table MUL 8: Historic Thunderstorm Events

Hazard	Date	Extent	Property Damage	Crop Damage
Thunderstorm Wind	8/2/1997		$3,000	$0
Thunderstorm Wind	7/15/1998		$10,000	$0
Thunderstorm Wind	7/19/1999	80 kts.	$7,000	$0
Thunderstorm Wind	4/18/2000	57 kts.	$1,000	$0
Thunderstorm Wind	7/9/2000		$1,000	$0
Thunderstorm Wind	7/27/2000		$2,000	$0
Thunderstorm Wind	8/26/2002	52 kts.	$1,000	$1,000
Thunderstorm Wind	8/29/2002	52 kts.	$1,000	$1,000
Thunderstorm Wind	6/10/2004	60 kts.	$10,000	$0
Thunderstorm Wind	7/8/2004	52 kts.	$2,000	$0
Thunderstorm Wind	10/8/2010	52 kts.	$20,000	$0
Thunderstorm Wind	6/22/2013	61 kts.	$15,000	$0
Total			**$73,000**	**$2,000**

Source: NCDC

Of the reported events one of the more severe storms occurred in October of 2010 when a frontal boundary sparked storms that left winds damages across the western and north central portions of Nebraska. In Mullen damages included large tree limbs downed throughout the town, closed roadways, and loss of power.

Severe Winter Storms

The local planning team identified severe winter storms as a top concern for the community. NCDC data records severe winter storms as "zonal" events meaning there is not a specific record of what communities are impacted or at least what the level impacts were per community. No historical occurrences were reported by residents, local officials, or found in any other document.

The local planning team reports sufficient resources to clear roadways and maintain transportation routes during typical snow events. The village also reported having back-up power generators for the municipal well houses.

Tornados and High winds

The local planning team identified tornados and high winds as the greatest concern for the community. According to the NCDC data, there were seven tornados (all F0 or EF0) and ten storm events which included strong winds (50 kts.). Winds of this magnitude, according to the Beaufort Wind Force Ranking, can cause trees to uproot, considerable structure damage, and over turning of improperly anchored mobile homes.

For the village there are two mobile homes located within the corporate limits that are at higher risk of damage resulting from tornados and high winds. The mobile homes are located near a community church which would serve as emergency shelter during severe weather events.

Table MUL 9: Historic Tornado Events

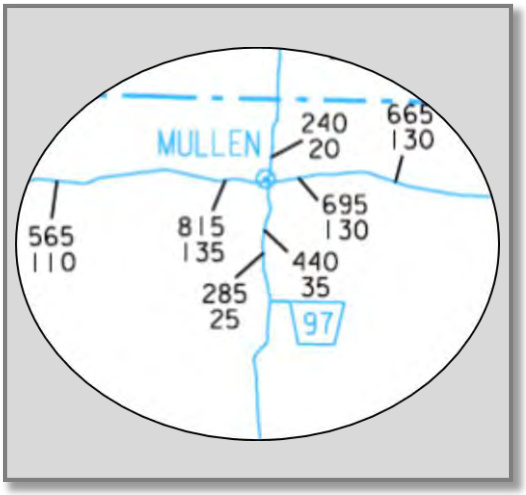
Hazard	Date	Extent	Property Damage	Crop Damage
Tornado	5/12/2009	EF0	$5,000	$0

Source: NCDC

TRANSPORTATION

Transportation Incidents /Chemical Spills/ Radiological Incident

The local planning team identified transportation concerns as a significant threat facing the village. According to the PHMSA incident reports there have been two spills in Mullen reported from 1980 to 2013. The largest release was recorded in 1981 when approximately 300 LGA of fuel oil was released during unloading.



The primary transportation routes through Mullen include US HWY 2 and NE HWY 97. US HWY 2 has the greatest volume of traffic across the county. The NDOR traffic count for US HWY 2 east of Mullen is 695 light vehicles and 130 heavy trucks per day. West of Mullen traffic volume on US HWY to increases slightly to 815 light vehicles and 135 heavy trucks. NE HWY 97 reports the highest volume of traffic around the village of Mullen. Traffic counts range from 240 light vehicles north of Mullen to 285 south of Mullen with a spike to 440 light vehicles just south of the village. The fluctuation for heavy trucks is not as dramatic ranging from 20 heavy trucks north of Mullen to 25 south of the village and a peak of 35 heavy trucks per day just south of Mullen.

It is difficult to ascertain exactly what materials are being transported across the state, especially along US HWY 2 which serves as a major transportation route across central and northern Nebraska. Radiological loads are monitored during transport.

The planning team also discussed the potential for train derailment and the potential impacts that could have on the community. The BNSF railway runs along the community and could result in closure of critical facilities if derailment occurred.

Capability Assessment

Thus far the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism in understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning &

regulatory capabilities, administrative & technical capability, fiscal capability, and education & outreach capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

VILLAGE GOVERNANCE

Mullen is governed by a five member board. Boards and committees within the village include:

- Parks Committee
- Streets Committee
- Trash Committee
- Water/Sewer Board

Table MUL 10: Capability Assessment

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	Yes, 2010
	Capital Improvements Plan	Yes, 2010
	Hazard Mitigation Plan	Yes, 2009
	Economic Development Plan	No
	Emergency Operational Plan	Yes (County)
	National Resources Protection Plan	No
	Open Space Preservation plan	No
	Floodplain Management Plan	No
	Storm Water Management Plan	No
	Zoning Ordinance	Yes, 1999
	Subdivision Regulation/Ordinance	No
	Floodplain Ordinance	No
	Building Codes	Yes, 1999
	National Flood Insurance Program	Yes
	Community Rating System	No
	Other (if any)	NA
Administrative & Technical Capability	Planning Commission	Yes
	Hazard Mitigation Planning Commission	Yes (3 member)
	Floodplain Administration	Yes
	Emergency Manager	Yes (county/regional)
	GIS Coordinator	County by contract
	Chief Building Official	County
	Civil Engineering	Yes, Contractor as needed
	Staff Who Can Assess Community's Vulnerability to Hazards	Multiple staff & residents
	Grant Manager	No
	Other (if any)	NA
Fiscal Capability	Capital Improvement Project Funding	No
	Community Development Block Grant	No

Survey Components/Subcomponents		Comments
	Authority to Levy Taxes for Specific Purposes	Yes
	Gas/Electric Service Fees	Yes
	Storm Water Service Fees	Yes
	Water/Sewer Service Fees	Yes
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	No
	Other (if any)	NA
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	County/NRD
	Natural Disaster or Safety related school programs	No
	StormReady Certification	No
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	No
	Other (if any)	NA

SUMMARY

Mullen currently has a comprehensive and capital improvement plans. The current plans were updated after the 2009 Hazard Mitigation Plan update but the hazard mitigation plan was not incorporate the hazard mitigation plan into the plans at that time. It is suggested that when the village does update these plans that they link the current hazard mitigation plans with the updated comprehensive and capital improvements plans.

A strength of Mullen is the sense of community and the social networks that exist within the community. The village will be able to implement mitigation projects independently but will also look for opportunities to partner with outside groups. Potential partners in implementing mitigation projects include (but are not limited to): Hooker County, regional emergency management, ULNRD, and NEMA.

Mitigation Strategy

COMPLETED MITIGATION PROJECTS

Description	Weather Radios
Analysis	Conduct an inventory of weather radios at schools, rural residents, and other critical facilities and provide new radios as needed.
Goal/Objective	Goal 4/Objective 4.3 and Goal 1/Objective 1.1
Hazard(s) Addressed	All hazards
Benefits	Help those who do not have access to local TV or radio warnings
Funding	Village
Timeline	Completed
Lead Agency	Village Board, Fire Department, Keith County EMA
Action since 2009 plan	Weather radios or other monitoring systems are located in critical facilities

Description	Warning Systems
Analysis	Improve/ implement city cable TV interrupt warning system and telephone interrupt system such as Reverse 911.
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	Tornados and high winds, severe winter storms, severe thunderstorms
Benefits	Increase response time in order to mitigate injuries, deaths, and property damages.
Timeline	Ongoing
Priority	Completed
Lead Agency	Keith County EMA
Action since 2009 plan	Code Red Warning system implemented

ONGOING/NEW MITIGATION PROJECTS

Description	Backup Generators
Analysis	Provide a portable or stationary source of backup power to redundant power supplies, municipal lift stations, municipal offices, and other critical facilities and shelters.
Goal/Objective	Goal 1/Objective 1.1
Hazard(s) Addressed	Tornados and high winds, severe winter storms, severe thunderstorms
Estimated Cost	$15,000-$30,000 per generator
Benefits	Back-up power for critical facilities. A measure that would reduce or prevent damage to property or prevent loss of life or serious injury.
Potential Funding	HMGP
Timeline	Ongoing
Priority	low
Lead Agency	Village board, Keith County EMA, Mullen School Board
Action since 2009 plan	Installed back-up power on municipal well houses.

Description	Public Awareness / Education
Analysis	Through activities such as outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. In addition, educate citizens on erosion control and water conservation methods. Educate residents on response and rescue plans for all hazard types.
Goal/Objective	Goal 3/Objective 3.1 and Goal1/Objective 1.1
Hazard(s) Addressed	All hazards
Estimated Cost	$500+
Benefits	Increase knowledge to new comers to the area as well as elderly in how to react when an event is going to occur or is occurring. Education to reduce or prevent damage to property or prevent loss of life or serious injury.
Potential Funding	HMGP, PDM
Timeline	Ongoing
Priority	Medium
Lead Agency	Village Board, Mullen School Board, Keith County EMA, NEMA, NDNR, ULNRD
Action since 2009 plan	Ongoing educational efforts from regional emergency management office

Description	Storm Shelter / Safe Rooms
Analysis	Design and construct fully supplied storm shelters and safe rooms in highly vulnerable areas such as mobile home parks, campgrounds, school, and other areas.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Tornados and high winds, severe thunderstorms, severe winter storms
Estimated Cost	$200-$300/sf stand alone; $150-200/sf addition/retrofit
Benefits	Useful for many residents that do not have basements or cellars to go for shelter, especially beneficial for the nursing home and other vulnerable populations
Potential Funding	PDM, HMPG
Timeline	10 years
Priority	Medium
Lead Agency	Village Board, Keith County EMA, Mullen Public Schools
Action since 2009 plan	None

Description	Electrical System Looped Distribution / Redundancies
Analysis	Provide looped distribution service and other redundancies in the electrical system as a backup power supply in the event the primary system is destroyed or fails.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Tornados and high winds, severe winter storms, severe thunderstorms
Estimated Cost	$40,000/mile
Benefits	More reliable and resistant power distribution system
Potential Funding	HMGP, PDM
Timeline	3-5 years
Priority	High
Lead Agency	Village Board, Custer Public Power District,
Action since 2009 plan	None

Description	Drainage Improvements
Analysis	Utilize stormwater systems comprising of ditches, culverts, or drainage ponds to convey runoff. Drainage improvements may include ditch upsizing, ditch cleanout and culvert improvements. Drainage ponds, both retention and detention, may also be implemented to decrease runoff rates while also decreasing the need for other stormwater system improvements.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Flooding
Estimated Cost	$10,000-$50,000
Benefits	These improvements can serve to more effectively convey runoff within jurisdictions, preventing interior localized flooding resulting in damages in all villages.
Potential Funding	HMGP, CDBG, village
Timeline	Ongoing
Priority	Medium
Lead Agency	Village Board, Village Utilities
Action since 2009 plan	General Maintenance, no specific project to report percentage completed

Description	Maintain good standing in National Flood Insurance Program (NFIP)
Analysis	Maintain good standing with National Flood Insurance Program (NFIP).
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Flooding
Estimated Cost	N/A
Benefits	Enable property owners to purchase insurance protection against flood losses. Good standing enables participants to apply for PDM and HMGP cost-share.
Potential Funding	N/A
Timeline	Ongoing
Priority	Low
Lead Agency	Village Board, Floodplain Administrator
Action since 2009 plan	Still participating in the NFIP

Description	Railroad Crossing Guard
Analysis	Install railroad crossing guard at sidewalk crossing.
Goal/Objective	Goal4/Objective 4.3
Hazard(s) Addressed	Transportation Incidents
Estimated Cost	$150,000 - $200,000
Benefits	Protect pedestrian from accidently crossing in front of an oncoming train.
Potential Funding	BNSF, NDOR, Village
Timeline	10 years
Priority	High
Lead Agency	Village Board, BNSF Railroad
Action since 2009 plan	New to this plan

Description	Fire Wise Defensible Space
Analysis	Work with the Nebraska Forest Service and US Forest Service to become a Fire Wise Communities/USA participant. Develop a Community Wildfire Protection Plan. Train land owners about creating defensible space. Enact ordinances and building codes to increase defensible space, improve building materials to reduce structure ignitability, and increase access to structures by responders. Develop and implement brush and fuel thinning projects.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Wildfire
Estimated Cost	$20,000
Benefits	Structures are less vulnerable to wildfire, easier for firefighters to defend structure during a wildfire event, and removes fuel from an approaching fire.
Potential Funding	HMGP, NFS, USFS, ULNRD, NGPC, National Fire Plan
Timeline	5 years
Priority	High
Lead Agency	Village Board, Fire Department, Nebraska Forestry Service
Action since 2009 plan	None

REMOVED MITIGATION PROJECTS

Description	Tree City USA
Analysis	Work to become a Tree City USA through the National Arbor Day Foundation in order to receive direction, technical assistance, and public education on how to establish a hazardous tree identification and removal program in order to limited potential tree damage and damages caused by trees in a community when a storm event occurs. The four main requirements include: 1) Establish a tree board; 2) Enact a tree care ordinance; 3) Establish a forestry care program; 4) Enact an Arbor Day observance and proclamation.
Hazard(s) Addressed	Severe thunderstorms, tornados and high winds, severe winter storms
Reason for Removal	There is little support from the community or local officials regarding participation in the Tree City USA program. Mullen does currently have a tree care program that meets the needs of the village.

Description	Snow Fences
Analysis	Construct snow fences to protect main transportation routes and critical facilities from excessive snow drifting and road closure.
Hazard(s) Addressed	Severe winter storms
Reason for Removal	This is not a realistic project for the community. For the planning area snow fences and windbreaks are more valuable in the unincorporated areas.

Logan County

Village of Gandy
Village of Stapleton

Upper Loup NRD
Multi-Jurisdictional Hazard Mitigation Plan

2014

LOGAN COUNTY

Community Profile

HISTORY

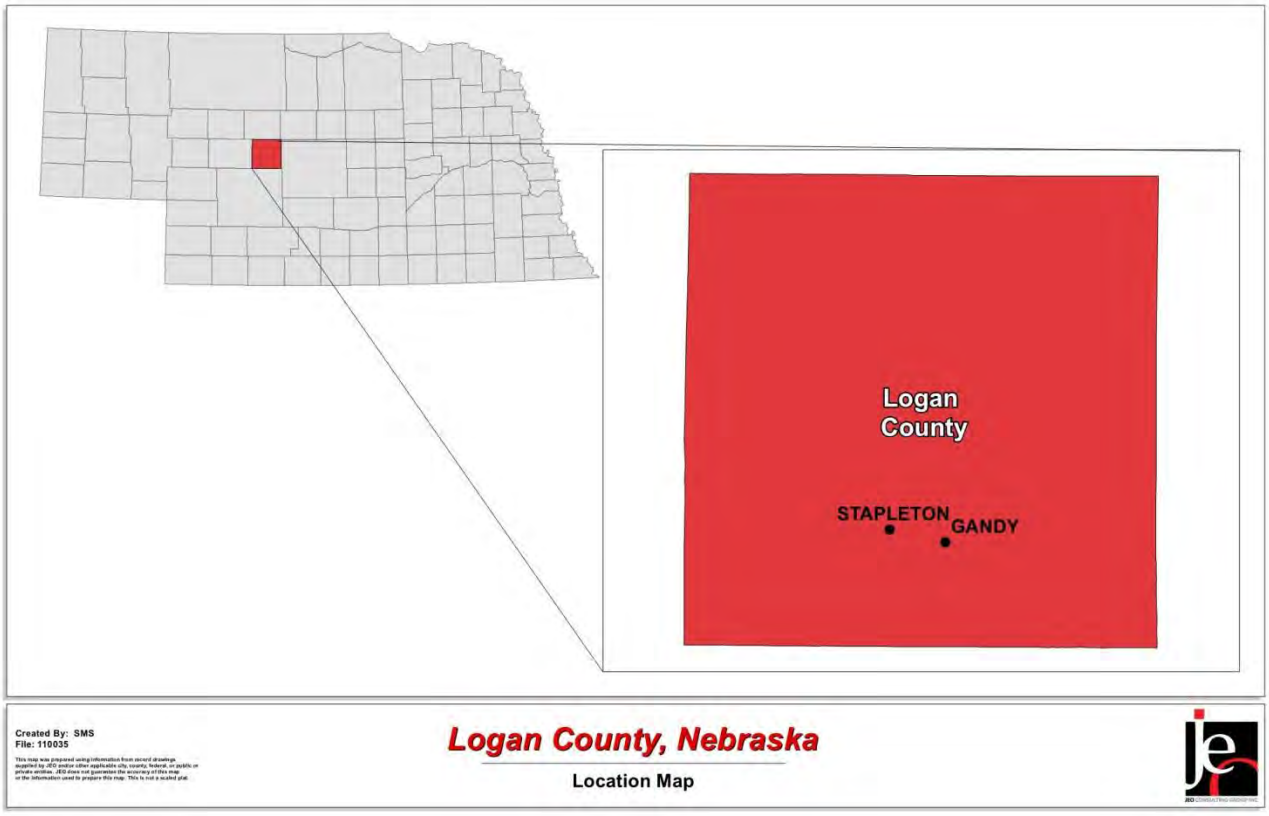
Logan County was formed in 1885 and named after John A. Logan, a soldier with the United States Army and Union General during the American Civil War. Logan County was organized as a soldier's colony of about 300 members who settled upon government lands under the homestead and timber culture acts of Congress. The colony was organized in 1883 at the office of J.S. Hoagland, then a practicing lawyer in Lincoln, Nebraska. Several veterans of the Civil War designing to enter upon government land consulted with Mr. Hoagland as to where such land could be found. They were advised that such information could be obtained by organized effort at much less expense than if each one attempted to ascertain such information for himself.

A date for a meeting was sized and the Lincoln papers printed a notice that there was to be a soldier's colony organized at Mr. Hoagland's office at a certain time. At this appointed time there were 220 ex-soldiers on hand who joined the organization. Each paid in one dollar and a committee of 5 members was selected to go out and find a good location where government land could be obtained. All railroads offered free transportation to the members of the committee and half fare and half the regular freight rates for members of the colony. The committee, after having carefully examined the country in the northwest, southwest and central western portions, made its report to a meeting of the colony called to act upon such report and it was decided almost unanimously to locate in the un-organized territory where Logan County is now situated. The South Loup River, a beautiful little stream, runs through the center of the county. The valleys and table lands are very productive, and the prosperity of many members of the colony is shown by the comfortable houses, barns, splendid stock, fertile fields and growing trees. The people have prospered without the aid of a railroad as no railroad company has as yet constructed any line through this county. Land there is selling from ten to thirty dollars per acre because of its great productiveness. The farmers ship but little grain because of the long haul necessitated in the marketing of their product. Mr. Hoagland, the organizer of the colony went with his comrades to their new home, procured a patent from the government for his quarter section of land in 1885 and is now one of the leading lawyers in North Platte. Logan County will probably have a railroad in the near future and so lands will rapidly increase in value. A daily mail runs between North Platte and Gandy, the county seat of the county, and nearly every resident of the county has his telephone service. The raising of the best breeds of cattle, horses, hogs and sheep is the principal industry. They have good schools and churches and the people are happy even though they do not hear the whistle of the locomotive and the rumble of the railroad trains.

LOCATION/GEOGRAPHY

Logan County is one of the 93 counties in the State of Nebraska. It is located in the north central region of the state. The communities in Logan County include Gandy and Stapleton. The Village of Stapleton is the county seat. Logan County covers an area of 571 square miles and has an average elevation of 2,990 feet above sea level.

Figure LOG 1: Location



Logan County contains two primary topographic regions according to the Conservation and Survey Division of the University of Nebraska- Lincoln. These include 'sand hills' across the northern two thirds of the county and 'dissected plains' throughout the southern third of the county. Sand hills are general categorized as hilly land composed of low to high dunes of sand stabilized by a grass cover. The sand dunes mantle stream-deposited silt, sand and gravel and sandstone. Dissected plains are classified as hilly land with moderate to steep slopes, sharp ridge crests and remnants of the old, nearly level plain. These are old plains eroded by water and wind. Logan County lies primarily in the Loup River Watershed.

Figure LOG 2: Topographic Map

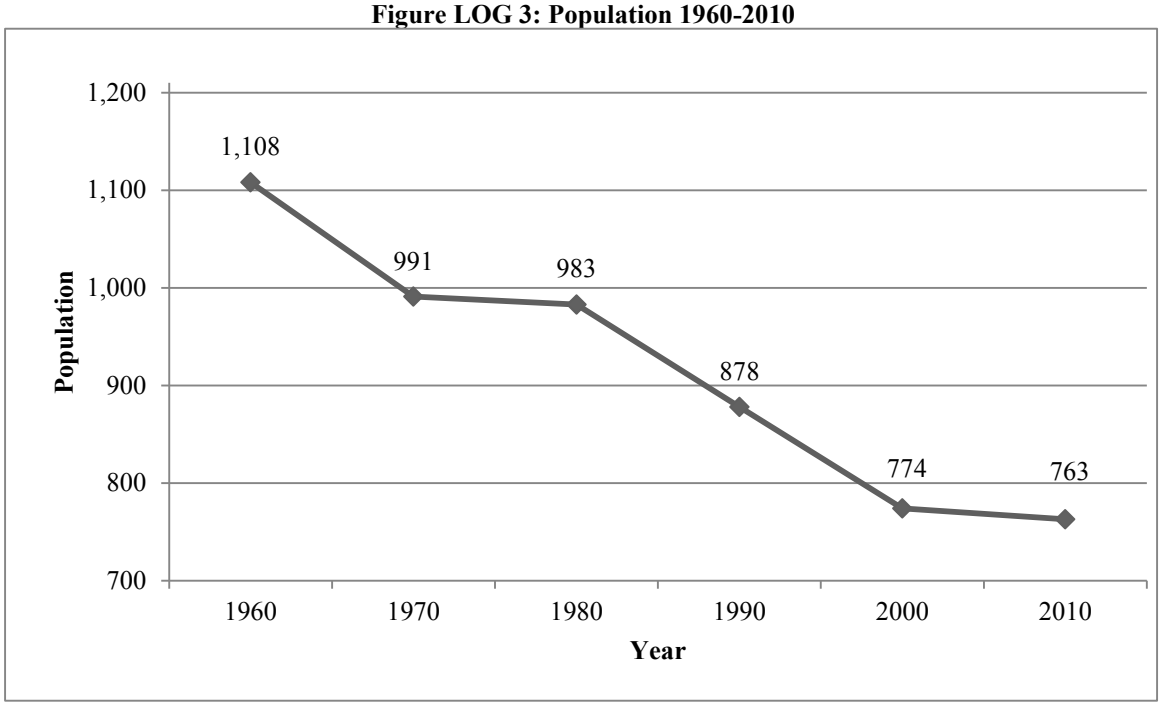
CLIMATE

Logan County averages 22 inches of rain per year and 32 inches of snow. There are on average 226 sunny days annually. The highest temperatures occur in July when the average daily high is 87 degrees. January is the coldest month with an average high of 34 degrees.

DEMOGRAPHICS

Between 1960 and 1990 Logan County lost about 20% of its population. Since 1990 that rate has slowed to a rate of -13%. The current population is 763. A declining population makes an area more to hazards due to vacant housing. Vacant housing is more likely to be in disrepair. This can provide fuel for fires or create additional debris following thunderstorms winds and tornadoes. Figure LOG 3 displays the historical population trend for Logan County from 1960 to 2010.

Figure LOG 3: Population 1960-2010



Source: U.S. Census, 1960 – 2010

Table LOG 1 illustrates the population trends by jurisdiction from 1990 – 2010 and provides a population project for 2020 by applying the percent changed from 2000 to 2010 to the next decade.

Table LOG 1: Population Trend

Jurisdiction	1990 Population	2000 Population	2010 Population	Change 2000-2010	2020 Projected Population
Logan County	878	774	763	-1%	755
Stapleton	299	301	305	1%	308
Gandy	51	30	32	7%	34

Source: U.S. Census, 1990 – 2010

As illustrated in table LOG 1, Logan County has the most stable population within the planning area from 2000 to 2010. Prior to that time, however, Logan County experienced a steady decline in population from 1960 to 2000 (30 percent decline 1960 – 2000). The county planning team expects the population will stabilize moving forward. The communities within Logan County both experienced growth from 2000 to 2010. Despite recent growth trends Gandy is still rebounding from a 41 percent decrease from 1990 to 2000. Stapleton has a two decade growth trend underway, one of the only communities in the planning area in that situation.

Table LOG 2: Population by Age

	Logan County	Gandy	Stapleton
< 5 yrs.	7.1%	9.4%	9.5%
5 - 64 yrs.	71.8%	56.2%	70.2%
> 65 yrs.	21.1%	34.4%	20.3%
Median Age	43.3	60.5	41.1

Source: US Census General Population and Housing Characteristics: 2010

The median age across the county is just over 43 years. Gandy's median age is significantly higher than that of the entire county. In fact, for the village of Gandy more than 40 percent of the population is between the ages of 55 and 64 years. The population of Stapleton more closely resembles that of the county.

HOUSING AND ECONOMICS

Median household income, per capita income, home value and rent for the county as a whole compare with broader state values as shown below.

Table LOG 3: Economic and Housing Values

	Nebraska	Logan County	Gandy	Stapleton
Median Household Income	$49,342	$445,192	$29,063	$36,667
Per Capita Income	$25,229	$22,320	$22,846	$21,820
Median Home Value	$123,900	$72,200	$67,100	$56,600
Median Rent	$648	$588	NA	$688

Source: Selected Housing Characteristics: 2006 - 2010 ACS 5-year estimate

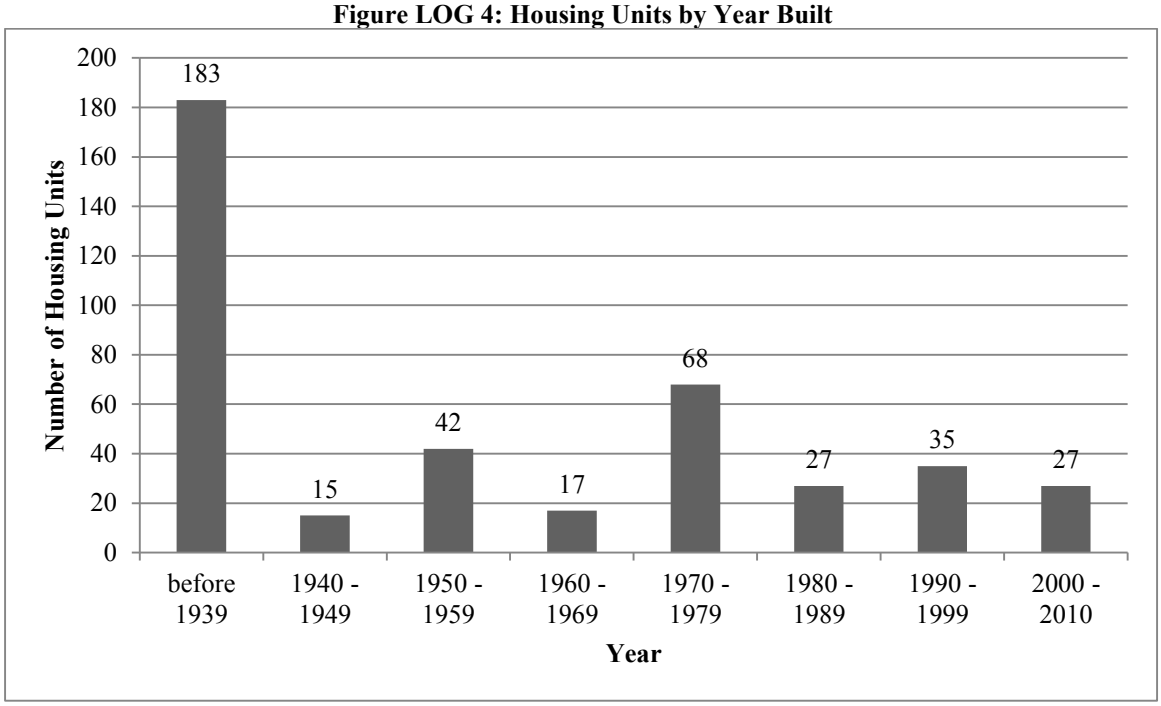
Table LOG 4: Housing Unit Occupancy

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Logan County	320	77.3%	94	22.7%		218	68.1%	102	31.9%
Gandy	24	100%	0	0		24	100%	0	0%
Stapleton	114	85.7%	19	14.3%		90	78.9%	24	21.1%

Source: Selected Housing Characteristics: 2006 - 2010 ACS 5-year estimate

According to the US Census there are a total of 414 housing units; the majority of the units were constructed prior to 1960. In the county more than 22 percent of housing was reported vacant; vacancy in Gandy is considerably lower than in the county as a whole. Reporting zero vacant properties in town indicates there should be some growth in housing units in or near the village of Gandy in the next decade. Stapleton is also below the county average for vacant structures with just over 14 percent of housing units reported as vacant.

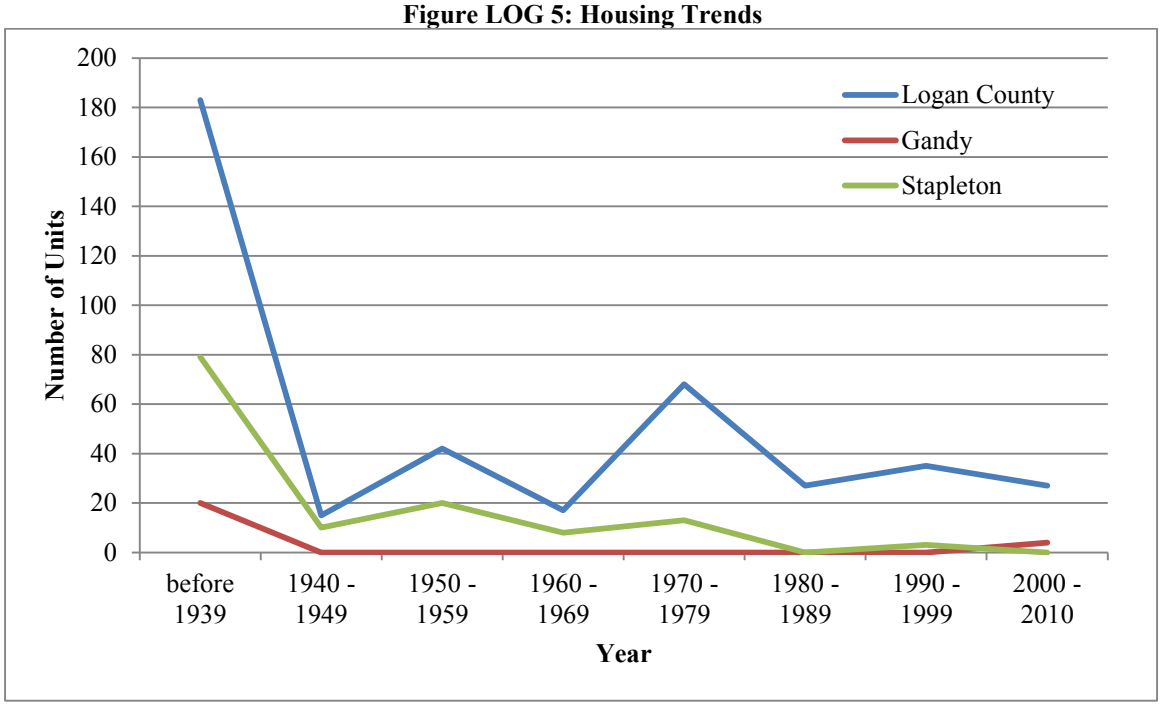
Figure LOG 4: Housing Units by Year Built



Source: Selected Housing Characteristics: 2006 -2010 ACS 5-year estimate

The age of construction for much of the county housing stock creates the potential for increased damages during extreme climactic events such as tornado, high winds, and blizzards. More than 44 percent of housing units were built before 1939. Approximately 58 percent of all housing units were built before 1960. The housing development trend for the counties and incorporated jurisdictions, Figure LOG 5, follow a very similar pattern (with the exception of Gandy which developed very few housing units between 1939 and 2004). Peaks in development occurred pre-1939 and throughout the 1970s. Only 14 percent of housing units were constructed later than 1990.

Figure LOG 5: Housing Trends



Source: Selected Housing Characteristics: 2006 - 2010

CRITICAL FACILITIES

Logan County critical facilities are addressed in the section for each individual community; this is a result of all county level critical facilities being located within the corporate limits of Gandy and Stapleton.

Figure LOG 6: Logan County Critical Facilities

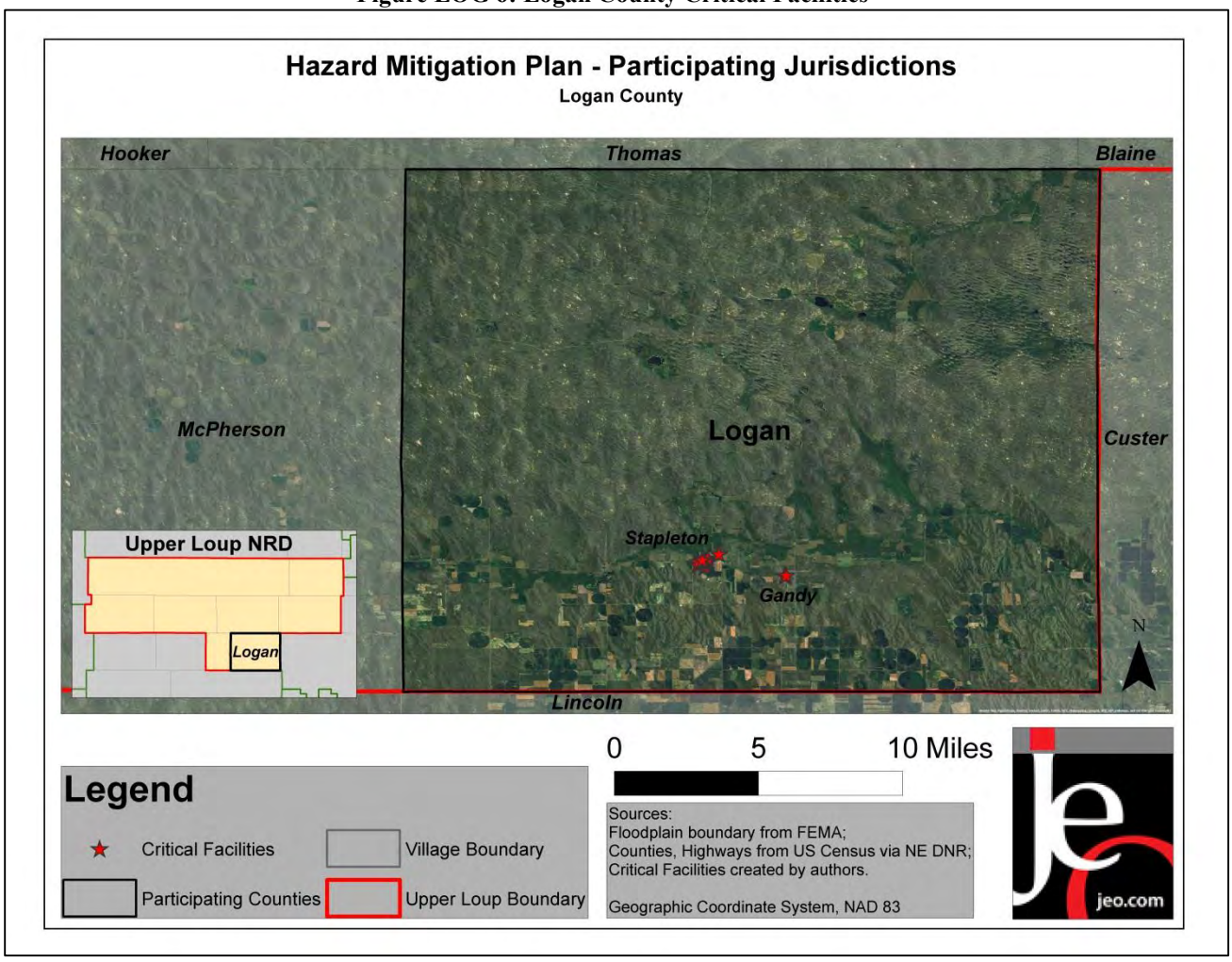
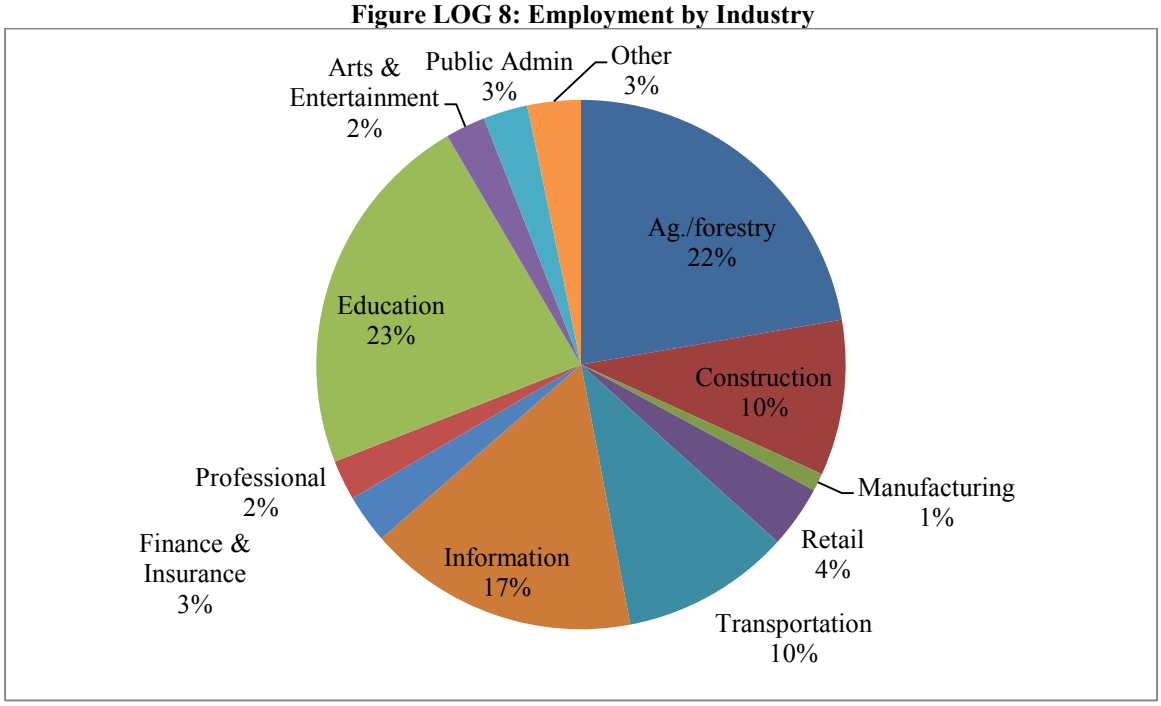


Figure LOG 7: Logan County Court House

EMPLOYMENT

Figure LOG 8 shows employment by industry for Logan County.

Figure LOG 8: Employment by Industry



Source: U.S. Census Economic Characteristics, 2010

Logan County has a rather diverse economic situation. Jobs in the education field represent the largest individual section for the county economy at 23 percent of the total. Information, transportation, and agriculture combined represent 49 percent of the total economy.

AGRICULTURE

Agriculture is important to the economic fabric of Logan County and Nebraska. Logan County's 149 farms cover 330,151 acres of land, which accounts for more than 90 percent of the surface land in the county. Logan County has more land in crop farming than any other portion of the planning area. Crop and livestock production are the visible parts of the agricultural economy, but many related businesses contribute as well by producing, processing and marketing farm and food products. These businesses generate income, employment and economic activity throughout the region.

Table LOG 5: Agricultural Inventory

Agricultural Assets	Inventory
Number of farms	149
Land in farms	330,151 acres
Estimated market value of land & buildings (per farm)	$2,518,111
Crop lands	61,448 acres
Cattle Inventory	28,823 head
Grain corn bushels	3,081,790
Silage corn tons	-

Source: USDA Census of Agriculture, 2012

FUTURE DEVELOPMENT TRENDS

Any future development will take place within the County as communities grow. See the participant sections of the communities for their own future development trends.

Structural Inventory and Valuation

For the purposes of this plan, a structural inventory for the unincorporated areas of the County was not completed.

Risk Assessment

Hazard Identification

Table LOG 6 is the risk assessment of hazards identified specifically in the county. Refer to *Section 4: Risk Assessment* for an explanation as to what this methodology is and why certain hazards did not pose a significant enough threat and were eliminated from detailed discussion due to the calculation.

Table LOG 6: Risk Assessment

Hazard	Previous Occurrence: Yes or No	County Hazard Ranking in NE 2014 State HMP	Specific Concerns Identified
Natural Hazards			
Grass/Wildfires	**Yes**	**High**	**Fires on rangelands spreading to incorporated areas, economic impacts resulting from fires**
Hail Events	**Yes**	**NA**	**Economic impact especially in the ag sector. Damages to homes and other structures**
Severe Thunderstorms	**Yes**	**High**	**Frequency of occurrence, potential for secondary impacts (lightning causing wildfires)**
Extreme Heat	**Yes**	**NA**	**Elderly population and economic impacts (especially in ag sector)**
Severe Winter Storms	**Yes**	**High**	**Roadway closures, economic impacts (livestock)**
Tornados	**Yes**	**High**	**Lack of safe rooms**
High Winds	**Yes**	**High**	**Frequency of occurrence**
Animal Disease	**Yes**	**High**	**Economic impacts**
Plant Disease	**Yes**	**High**	**Losses in crop farming**
Drought	Yes	High	Economic losses in the ag sector
Flooding	Yes	High	Mostly localized events, concerns related to transportation route closure(s)
Earthquakes	No	Medium	None
Dam Failure	No	Low	None
Landslides	No	NA	None
Man-made Hazards			
Chemical Spills (transportation)	Yes	Medium	Transportation of ag chemicals along roadways
Urban Fire	Yes	High	None
Radiological Incident (transportation)	No	Medium	None
Chemical spills (fixed site)	No	High	Ag chemical storage areas
Radiological Fixed Sites	No	Medium	None
Terrorism	No	Low	Tampering with water supplies
Civil Disorder	No	Medium	None

According to the risk assessment and input from the county planning tam, the hazards of greatest concern to Logan County are grass/wildfires, hail events, severe thunderstorms, extreme heat, severe winter storms, tornados and high winds, and agricultural disease. These top hazards of concern for Logan County are similar to those of the ULNRD.

Historical Occurrence

The events recorded by NCDC are broken down to two types: county-based and zone-based events. The county-based records are events that affect the jurisdictions within the county while the zone-based records are those affecting the zone that include the county as part of the affected zone. Please refer to specific villages or cities within the county for the previous county-based severe weather events retrieved from NCDC. For zone-based events, there are 84 recorded events from 1996 to 2013, but due to the large number of the record, only those that resulted in property or crop damages are demonstrated in the county hazard profiles.

Agricultural Disease

Animal Disease

The local planning team identified animal disease as a significant threat for the county. In a county where cattle out number people by a ratio of 37 to 1 animal disease is a big concern. With a majority of the area being farmers and ranchers any disease that occurs may lead to losses for the farmers in treatment and quarantine or at the market. According to the Nebraska Department of Agriculture for Logan County there was one reported incident of Enzootic Bovine Leukosis in 2014. Diseases that occur within the bovine population include: Chronic Wasting Disease, Vesicular Stomatitis, and Bovine Tuberculosis.

Table LOG 7: Agricultural Inventory – Live Stock

Logan County Agricultural Inventory	
Number Of Cattle Ranches	92
Cattle Inventory	28,823 Head
Approximate Value*	$61,969,450

Source: USDA 2012 Agricultural Census
**Per head price based on the Samuel Roberts Nobel Foundation, 2014*

Plant Disease

The local planning team identified animal disease as a high threat for the county. In Logan County more than 18 percent of agricultural lands are devoted to crop farming. Logan County has more crop agriculture than any other portion of the planning area. This is a result of different soil conditions and annual precipitation.

Table LOG 8: Agricultural Inventory - Crops

Logan County Agricultural Inventory	
Number of Crop Farms	57
Crop Lands	61,448 ACRES
Corn by Bushel	$3,081,790
Approximate Value*	$13,221,048

Source: USDA 2012 Agricultural Census
**Per bushel price based on the USDA, 2014*

Drought

The local planning team ranked drought as a low threat for the county. Drought is generally a regional event, with impacts from a single drought event impacting multiple communities, counties, and even states. For the community, 22 percent of the workforce relies on agricultural based income and the local economy could be

significantly affected during severe droughts. Drought impacts are always not as visual as impacts of other natural hazards and are hard to quantify. In 2012 Logan County experienced a severe drought for several consecutive months. Due to the nature of drought there was less grazing and higher prices for feed, as a result ranchers sold cattle sooner and at a lower weight than typical. The result was lower incomes for ranchers and secondary agricultural businesses as well as a depletion of cattle stock for subsequent years.

Table LOG 9: Historic Drought Events

Hazard	Date	Extent	Property Damage	Crop Damage
Drought	6/1/2012 – 1/1/2014	D0 – D4	$1,000,000	$2,000,000

Source: NCDC

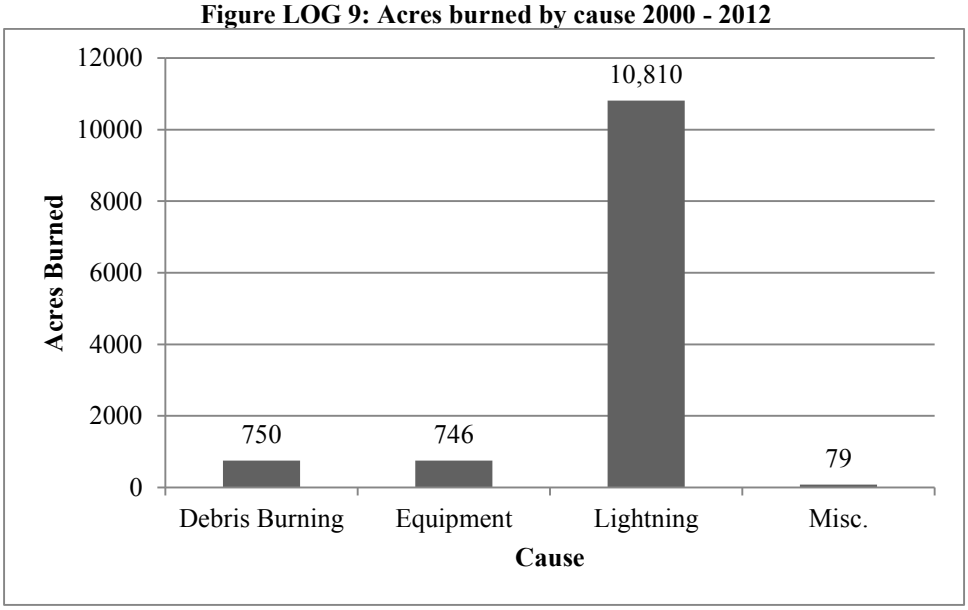
Due to the regional nature of drought and lack of available information, drought will not be fully profiled in individual community sections that follow.

Fire

Grass/Wildfire

The local planning team identified grass/wildfire as a significant concern for the county. According to the Nebraska Forestry Department there were 37 reported fires by Stapleton Fire Departments from 2000 to 2012 which consumed a total of 12,385 rangeland acres and 65 crop land acres. The fires also resulted in more than $3,850 in damages to crops and structures. Of the fires reported the most common cause was miscellaneous while fires started by lightning resulted in the greatest area impacted.

Figure LOG 9: Acres burned by cause 2000 - 2012



Source: Nebraska Forestry Service

Urban Fire

The county planning team identified urban fire as a low threat for the unincorporated areas of the county. Table LOG 10 shows the number of calls responded to by the fire departments within the county. It should be noted that reporting fire calls to the Nebraska Fire Marshal's office is voluntary, as a result this is likely an incomplete list of fire calls from 2008 – 2013.

Table LOG 10: Fire Calls from 2000 - 2013

	Fires	Ruptures	Rescue/ EMS	Haz. Mat	Service Calls	Good Intent Calls	False Alarms	Severe Weather	Special Incidents
Logan	13	1	1	-	-	-	-	-	-

Source: NE State Fire Marshal: FDID Incident Type Summary Report 2008 - 2012

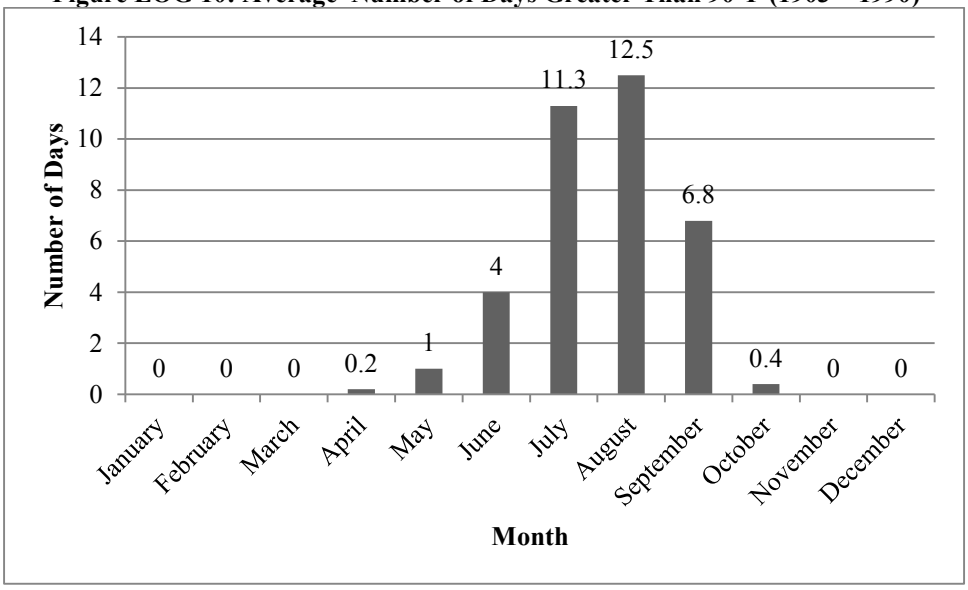
Overall, the fire departments located within the county are capable of responding to nearly all calls they receive. In a situation where additional resources are needed, there are mutual aide agreements between the various departments which provide redundancy as needed. The building stock throughout the county and planning area are mostly older structures which would burn quickly if ignited.

Severe Weather

Extreme Heat

Extreme heat is a natural part of the climate in Logan County. The High Plains Regional Climate Center does not have a data collection station located in Logan County so it is not possible to report count specific data related to annual climatic extremes or patterns. Data from Blaine County (northeast of Logan County) and Hooker County (northwest) were averaged to provide an estimate for this plan. Figure LOG 10 illustrates the average number of days annually that Blaine and Hooker Counties experience of temperatures 90 degrees or higher. Across the county the median age is just over 46 years and more than 20 percent of the population is age 65 or greater. A significant portion of the county economy relies on the agricultural industry which can be severely impacted during periods of prolonged high temperatures.

Figure LOG 10: Average Number of Days Greater Than 90°F (1903 – 1990)



Source: High Plains Climate Center

Hail Events

The county planning team identified hailstorms as the second greatest threat for Logan County. NCDC data records 77 events with a total of $418,000 in property damages and $986,000 in monetary losses recorded to crops. A summary of the events with recorded damages can be found in the participant sections. Hail in the unincorporated areas of the county is most likely to impact the agricultural areas of the county. There are more than 61,448 acres devoted to crops. Hail storms can have devastating impacts on crops, causing up to a 100 percent loss.

Severe Thunderstorms

Severe winter thunderstorms are a regular part of the climate across the ULNRD and Logan County is no exception. The planning team estimated that severe thunderstorms were highly probable in the future, but given the frequency of occurrence residents across the county are mostly prepared for the events and able to effectively cope with their occurrences. NCDC data records 21 events with a total of $45,000 in damages to property and no crop damage. A summary of the events with recorded damages can be found in the participant sections where they occurred. All but one event reported strong winds between 60 and 90 miles per hour. Damages reported include downed trees and tree limbs.

Severe Winter Storm

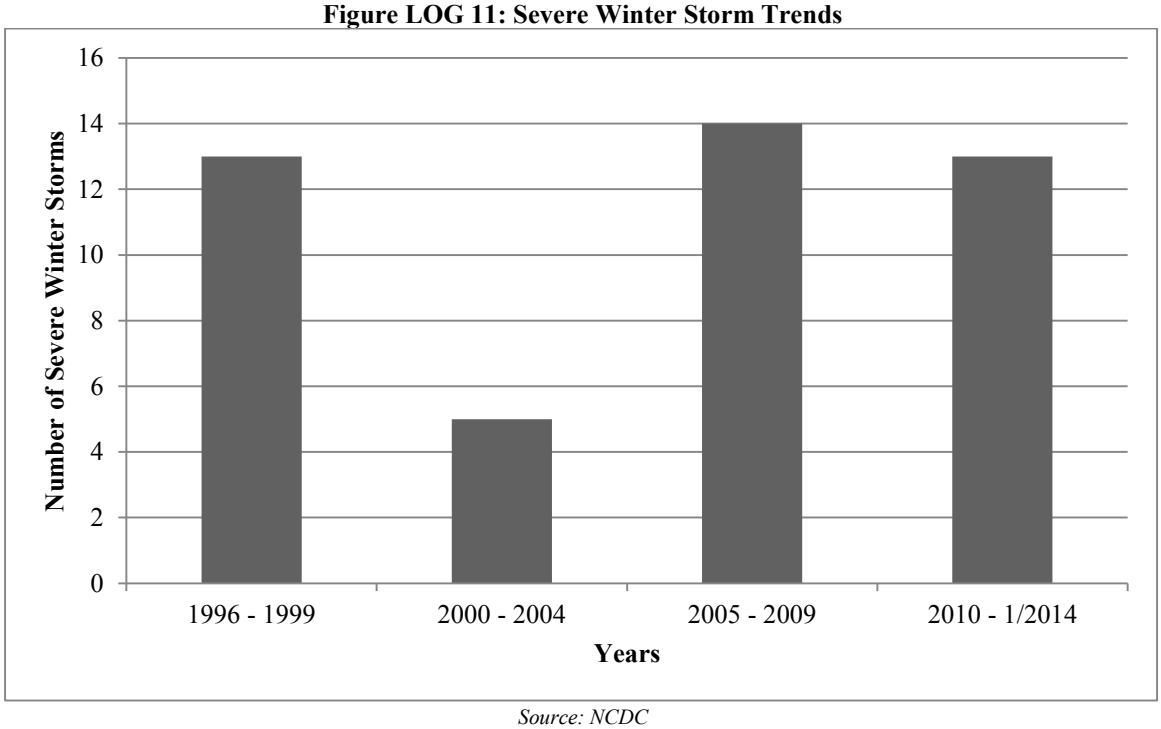
Severe winter storms are a regular part of the climate across the ULNRD and Logan County is no exception. According to the NCDC there were 45 severe winter storms in Logan County from 1996 through January 2014. These events resulted in two deaths and $81,000 in property damage. The deaths occurred in 1998 when a light freezing drizzle fell across the county, a car accident outside of Stapleton resulted in two deaths and one injury. The most costly event occurred in November 2005 when a combination of heavy snowfall (6 – 10 inches) and strong north winds resulted in closed roadways, power outages, and the death of several newborn calves.

Table LOG 11: Historic Severe Winter Events

Date	Extent	Death/ Injuries	Property Damage	Crop Damage
2/3/1998	Light freezing drizzle	2/1	$16,000	$0
11/27/2005	8 – 15” snow, 55 – 75 mph winds	0/0	$35,000	$0
12/19/2006	3 – 8” snow, 35 – 45 mph winds	0/0	$15,000	$0
4/4/2009	6 – 18” snow, 30 – 50 mph winds	0/0	$15,000	$0
Total	**-**	**2/1**	**$81,000**	**$0**

Source: NCDC

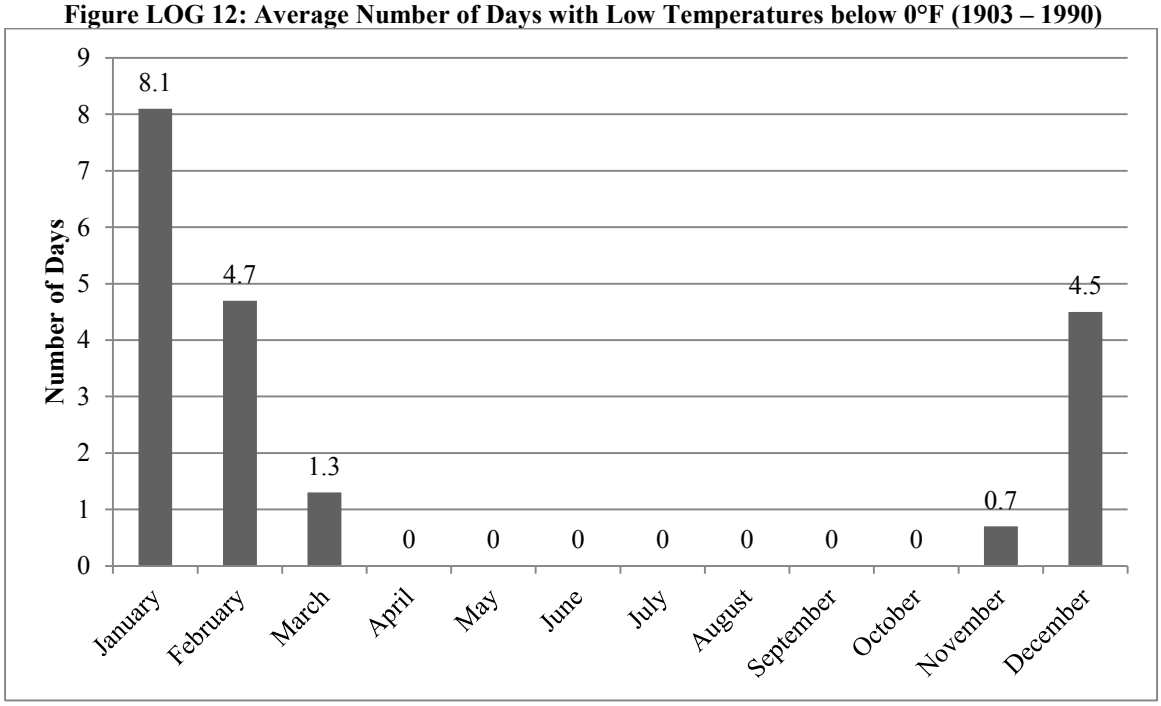
Figure LOG 11: Severe Winter Storm Trends



Source: NCDC

Most recorded events included a combination of factors including snow, wind, and ice. There were five reported events resulting from extreme cold temperatures solely. Extreme low temperatures events in Logan County reported temperatures between 35 and 40 degrees below zero.

Figure LOG 12: Average Number of Days with Low Temperatures below 0°F (1903 – 1990)



Source: High Plains Regional Climate Center

Tornado and High Winds

The county planning team identified tornados and high winds as a moderate threat for Logan County. The NCDC recorded 16 high wind events with a total of $20,000 in crop damage and four tornados which caused $8,000 in property damages. A summary of the events with recorded damages can be seen in Table LOG 12.

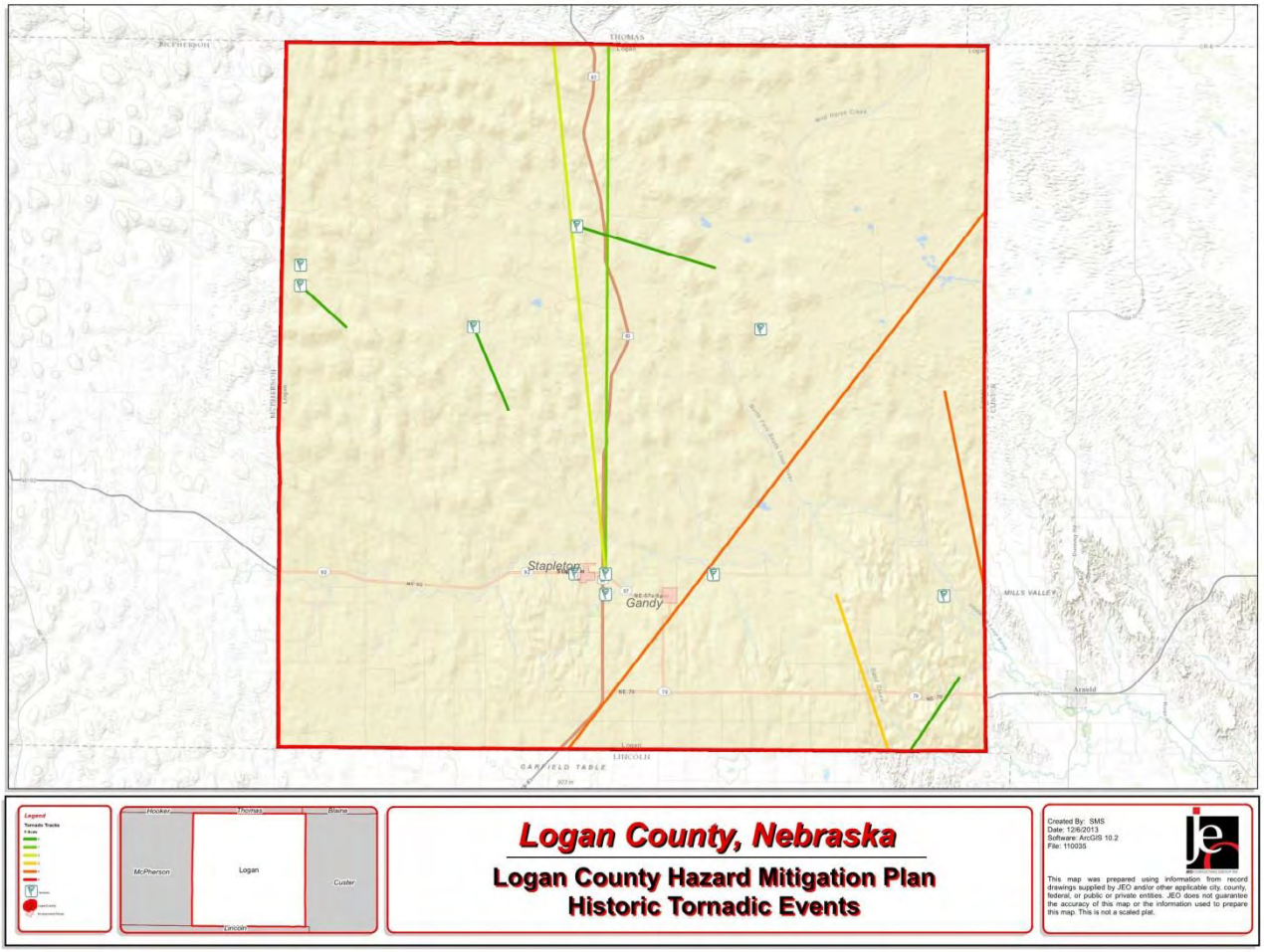
Table LOG 12: Historic Tornado Events

Hazard	Date	Extent	Property Damage	Crop Damage
High Wind	11/1/1997	40 kts.	$0	$20,000
Tornado	2/28/2012	EF0	$8,000	$0

Source: NCDC

Figure LOG 13 shows historic tornado tracks that have passed through Logan County. The most significant event was an EF0 tornado which passed nearby to the village of Stapleton.

Figure LOG 13: Historic Tornado Tracks



Source: NOAA SPC

Terrorist Incidents

The planning team for the county identified terrorism as a concern. There has been no history of terrorist activity in or around Logan County. The primary concerns related to terrorism discussed by the planning team include agro-terrorism and school violence. While it is not likely that attacks would occur in Logan County or throughout the planning area the community could consider facility hardening measures at critical facilities and key infrastructure to address this concern. Currently municipal water tanks and wells are located in fenced in areas to guard against tampering.

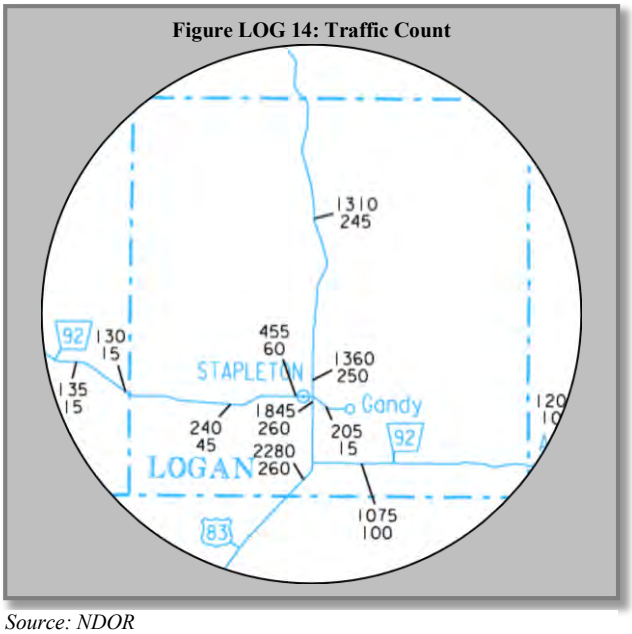
Transportation Incidents /Chemical Spills/ Radiological Incident

The local planning team identified a major transportation incident as a low threat for the county. Incidents could be a train derailment or a mass casualty highway accident. While there is no record of these events occurring within the community the team estimated that these events could occur in the future. According to the PHMSA incident reported zero spills from 1980 to 2013.

The primary transportation routes through the county include HWY 92 and NE HWY 83. The heaviest traffic occurs along NE HWY 83 which runs north and south through the center of the county. The traffic count for NE HWY 83 on the southern border of the county where the highway crosses the county line the NDOR reports daily usage by 2,280 light vehicles and 260 heavy trucks; in the northern portion or the county the NDOR reports 1,310 light vehicles and 245 heavy trucks a day. Traffic counts for HWY 92 peak around the Stapleton and Gandy. The NDOR traffic count for HWY 92 east of Stapleton reports 205 light vehicles and 15 heavy trucks per day; west of Stapleton the count is 240 light vehicles and 45 heavy trucks per day.

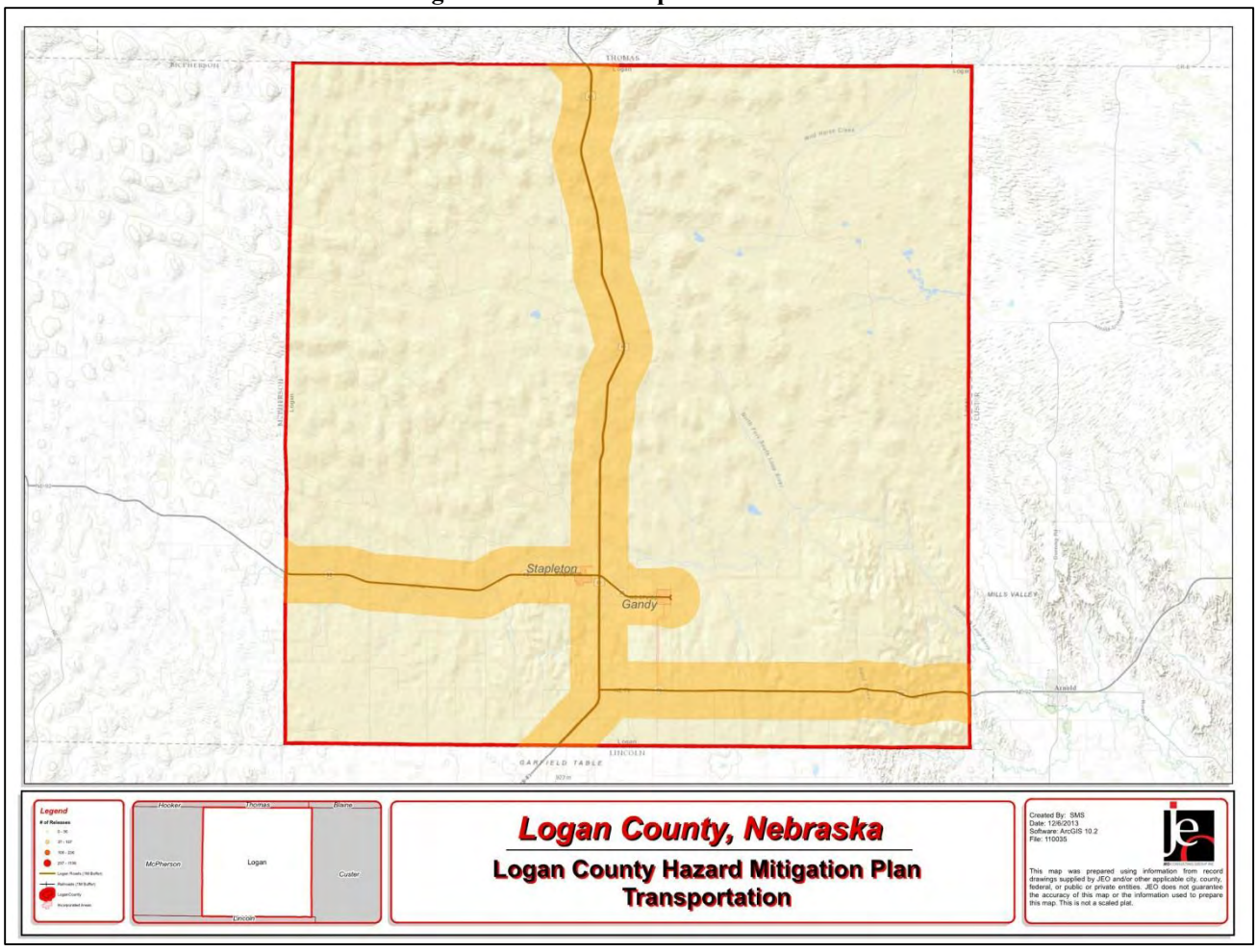
It is difficult to determine what materials are being transported along this route, but based on historic records from across the planning area fuel oils or agricultural materials are the most likely material to be released.

Figure LOG 14: Traffic Count



Source: NDOR

Figure LOG 15: Transportation Routes



Capability Assessment

Thus far the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism in understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capabilities, administrative & technical capability, fiscal capability, and education & outreach capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

UNINCORPORATED LOGAN COUNTY GOVERNANCE

The jurisdiction of Logan County includes all unincorporated areas within the County boundaries. The Logan County government structure is a three member Board of Commissioners. The Logan County government includes the following departments and offices:

- Assessor's Office
- Attorney's Office
- Clerk's Office
- Clerk of the District Court
- Election Commissioner
- Department of Roads
- Emergency Management (regional)
- Veteran's Service Officer
- Extension Office
- GIS/IT (provided by contractor)
- Register of Deeds
- Sheriff's Office
- Technology/Website
- Treasurer's Office
- Weed Superintendent

Table LOG 13: Capability Assessment Survey

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	Yes, 2003
	Capital Improvements Plan	No
	Hazard Mitigation Plan	Yes
	Economic Development Plan	No
	Emergency Operational Plan	Yes
	National Resources Protection Plan	No
	Open Space Preservation plan	No
	Floodplain Management Plan	No
	Storm Water Management Plan	No
	Zoning Ordinance	Yes, 2003
	Subdivision Regulation/Ordinance	No
	Floodplain Ordinance	No

Survey Components/Subcomponents		Comments
	Building Codes	No
	National Flood Insurance Program	No
	Community Rating System	No
	Other (if any)	NA
Administrative & Technical Capability	Planning Commission	Yes
	Hazard Mitigation Planning Commission	Yes
	Floodplain Administration	No
	Emergency Manager	Yes (regional)
	GIS Coordinator	Yes (by contract)
	Chief Building Official	No
	Civil Engineering	By contract
	Staff Who Can Assess Community's Vulnerability to Hazards	Multiple Staff & Residents
	Grant Manager	No
	Other (if any)	NA
Fiscal Capability	Capital Improvement Project Funding	Yes
	Community Development Block Grant	No
	Authority to Levy Taxes for Specific Purposes	Yes
	Gas/Electric Service Fees	No
	Storm Water Service Fees	No
	Water/Sewer Service Fees	No
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	Yes
	Other (if any)	NA
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Yes
	Natural Disaster or Safety related school programs	No
	StormReady Certification	No
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	No
	Other (if any)	NA

SUMMARY

The current comprehensive plan was developed prior to the 2009 hazard mitigation plan, no efforts have been made to amend the county comprehensive plan with information from the hazard mitigation plan. In the next update of the county's comprehensive plan Logan County should consider incorporating information from the hazard mitigation plan into the comprehensive plan. If the county were to develop a Capital Improvement Plan mitigation projects with a high priority should be included. The county should consider updating zoning regulations that prevent development in hazard prone areas.

The county has the ability to implement mitigation projects, they will continue to look for opportunities to partner with outside agency

Mitigation Strategy

COMPLETED MITIGATION PROJECTS

None reported.

ONGOING MITIGATION PROJECTS

Description	Public Awareness / Education
Analysis	Through activities such as outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. In addition, educate citizens on erosion control and water conservation methods. Educate residents on response and rescue plans for all hazard types.
Goal/Objective	Goal 3/Objective 3.1 and Goal1/Objective 1.1
Hazard(s) Addressed	All hazards
Estimated Cost	$500+
Benefits	Increase knowledge to new comers to the area as well as elderly in how to react when an event is going to occur or is occurring. Education to reduce or prevent damage to property or prevent loss of life or serious injury.
Potential Funding	HMGP, PDM
Timeline	Ongoing
Priority	Medium
Lead Agency	Logan County EMA, NEMA, NDNR, ULNRD
Action since 2009 plan	Ongoing educational efforts from regional emergency management office

Description	Backup Generators
Analysis	Provide a portable or stationary source of backup power to redundant power supplies, municipal wells, lift stations, and other critical facilities and shelters.
Goal/Objective	Goal 1/Objective 1.1
Hazard(s) Addressed	Tornados and high winds, severe winter storms, severe thunderstorms
Estimated Cost	$15,000-$30,000 per generator
Benefits	Back-up power for critical facilities (i.e. nursing home). A measure that would reduce or prevent damage to property or prevent loss of life or serious injury.
Potential Funding	HMGP
Timeline	5 years
Priority	High
Lead Agency	County Board, Logan County EMA
Action since 2009 plan	None
Description	**Drainage Improvements**
Analysis	The county utilizes stormwater systems comprising of ditches, culverts, and drainage ponds to convey runoff. Undersized systems can contribute to localized flooding. Drainage improvements may include ditch upsizing, ditch cleanout and culvert improvements. Drainage ponds, both retention and detention, may also be implemented to decrease runoff rates while also decreasing the need for other stormwater system improvements.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Flooding
Estimated Cost	$10,000-$50,000
Benefits	These improvements can serve to more effectively convey runoff within jurisdictions, preventing interior localized flooding resulting in damages in all villages.
Potential Funding	HMGP, CDBG
Timeline	Ongoing
Priority	Medium
Lead Agency	Logan County Department of Roads
Action since 2009 plan	Improvements and repairs made as needed, no specific project to report

Description	Community Hazard Warning System Improvements
Analysis	Warning systems are important to life safety. Having up to date warning sirens can help save lives especially of residents who out outside during extreme weather events. The county planning team reported a need to replace and update warning sirens in both Stapleton and Gandy.
Goal/Objective	Goal 3/Objective 3.1 and Goal1/Objective 1.1
Hazard(s) Addressed	All hazards
Estimated Cost	$15,000+
Benefits	Provide warning to residents regarding hazardous events.
Potential Funding	HMGP, PDM
Timeline	Ongoing; improvements are an ongoing effort, warning systems are monitored and updated as needed and funds are available
Priority	Medium
Lead Agency	Logan County EMA, NEMA, NDNR, ULNRD
Action since 2009 plan	None

Description	Civil Service Improvements
Analysis	Improve emergency rescue and response equipment and facilities by providing additional, or updating existing emergency response equipment. This could include fire trucks, ATV's, water tanks/truck, snow removal equipment, etc. This would also include identifying and training additional personnel for emergency response.
Goal/Objective	Goal 4/Objective 4.1
Hazard(s) Address	All Hazards
Estimated Cost	Varies depending on what equipment is needed
Benefits	Increase local capabilities to respond to disasters
Potential Funding	Homeland Security, Emergency Management, NEMA, Governing County and Board of Commissioners, Nebraska Forest Service
Timeline	On-going
Priority	Low
Lead Agency	Fire Department, Logan County Sheriff's Office, Logan County EMA, Board of Commissioners
Action since 2009 plan	Ongoing training of emergency response staff

REMOVED MITIGATION PROJECTS

Description	Weather Radios
Analysis	Conduct an inventory of weather radios at schools, rural residents, and other critical facilities and provide new radios as needed.
Goal/Objective	Goal 4/Objective 4.3 and Goal 1/Objective 1.1
Hazard(s) Addressed	All hazards
Benefits	Help those who do not have access to local TV or radio warnings
Lead Agency	Logan County Board, Fire Department, Logan County EMA
Reason for removal	The county felt that with the wide range of public notification systems already in place this was not necessary at this time nor was it likely to occur.

Description	Storm Shelter / Safe Rooms
Analysis	Design and construct fully supplied storm shelters and safe rooms in highly vulnerable areas such as mobile home parks, campgrounds, school, and other areas.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Tornados and high winds, severe thunderstorms, severe winter storms
Benefits	Useful for many residents that do not have basements or cellars to go for shelter, especially beneficial for the nursing home and other vulnerable populations
Lead Agency	Logan County Board, Logan County EMA
Reason for Removal	Constructing storm shelters in unincorporated areas of the county is not likely to occur. Rather Logan County would support the construction of storm shelters within the corporate limits of Stapleton and possibly Gandy.

Description	Enroll in the National Flood Insurance Program (NFIP)
Analysis	Participate in the National Flood Insurance Program (NFIP). (Contact NDNR at 402.471.3932 for any questions or to request educational material on NFIP.
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Flooding
Priority	High
Lead Agency	Logan County Board
Reason for Removal	Flooding in Logan County is a low threat. At this time the county does not see a need to participate in the NFIP

VILLAGE OF GANDY

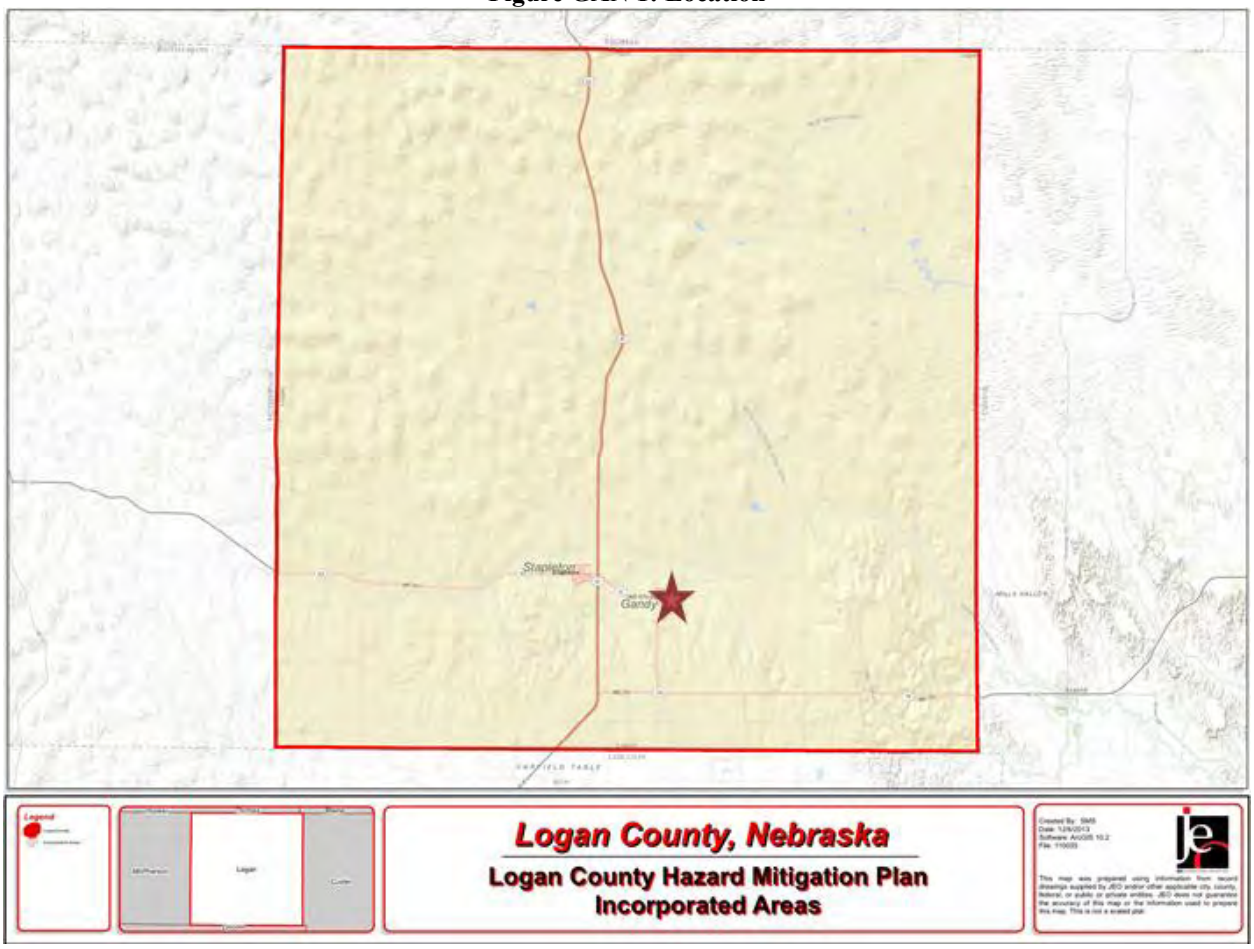
HISTORY

Settlement began in the community of Gandy in 1885 when by a 69 to 51 vote a new town site was chosen in a special election as the Logan County seat. Jim Gandy, a Broken Bow business man, donated a section of land, and promised to bring a lot of business and capital to the town if it was named for him. Gandy's plat, designating two parks and a "courthouse square" in the center, was filed in November 1885. Passage of the Kinkaid Act in 1904, and rumors that a branch line of the Union Pacific Railroad was coming through Logan County, made Gandy flourish. In 1911 the grade was being built along a line two miles north of town, and a new town site was being laid out several miles further down the track. Gandy incorporated that November and included a narrow strip of land running from the northeast corner of town to the railroad. Since Gandy was the county seat the railroad eventually put in a siding and depot. At the special election called in 1929 to re-locate the county seat, voters favored that "other town" of Stapleton. Gandy celebrated its centennial in 1985.

Location/Geography

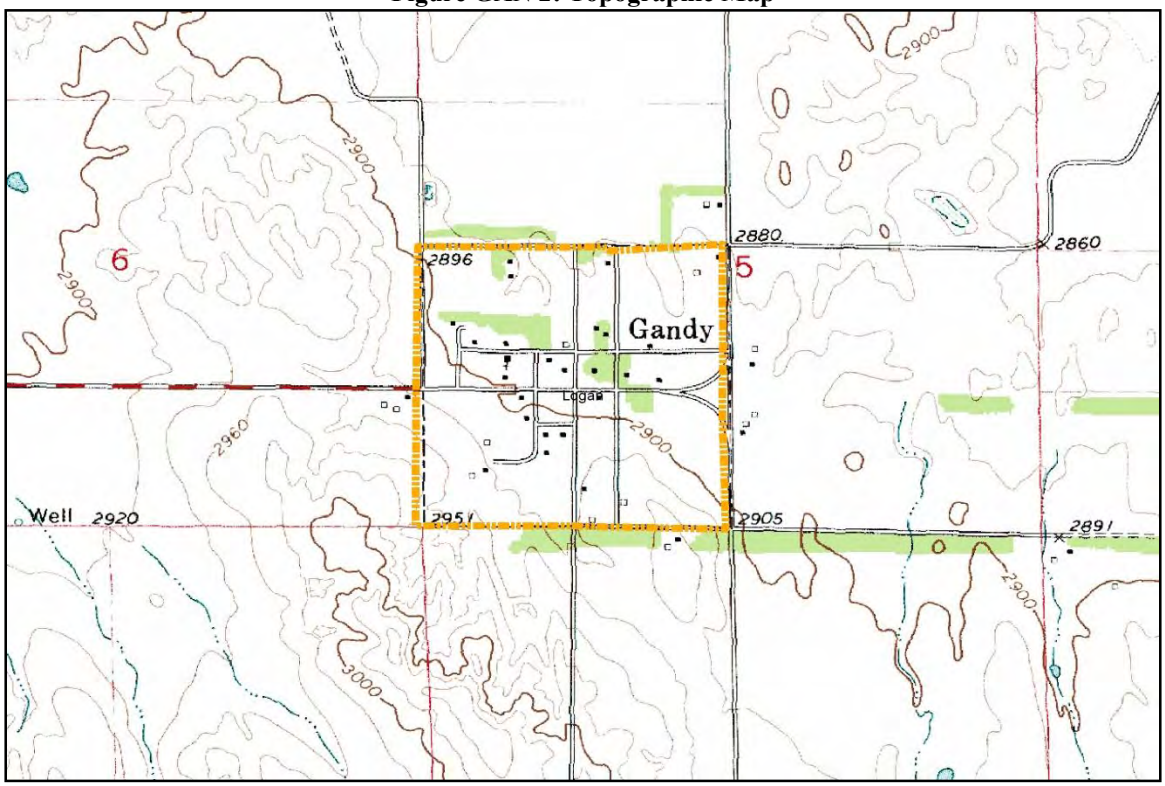
Gandy is a village located in the south central portion of Logan County. The Village of Gandy covers an area of 153.6 acres and has an elevation of 2,900 feet above sea level. Gandy is 263.9 miles northwest of Lincoln.

Figure GAN 1: Location



The community of Gandy lies in an area of dissected plains. The land use surrounding the community is mainly ranching with some agricultural crops in the river valleys. Hilly land with moderate to steep slopes, sharp ridge crests and remnants of the old, nearly level plains eroded by water and wind is prevalent. The community lies approximately 1.5 miles south of the South Loup River valley. The watershed flows generally from the northwest to the southeast. A current floodplain has not been delineated for Gandy and river flooding is not a significant concern.

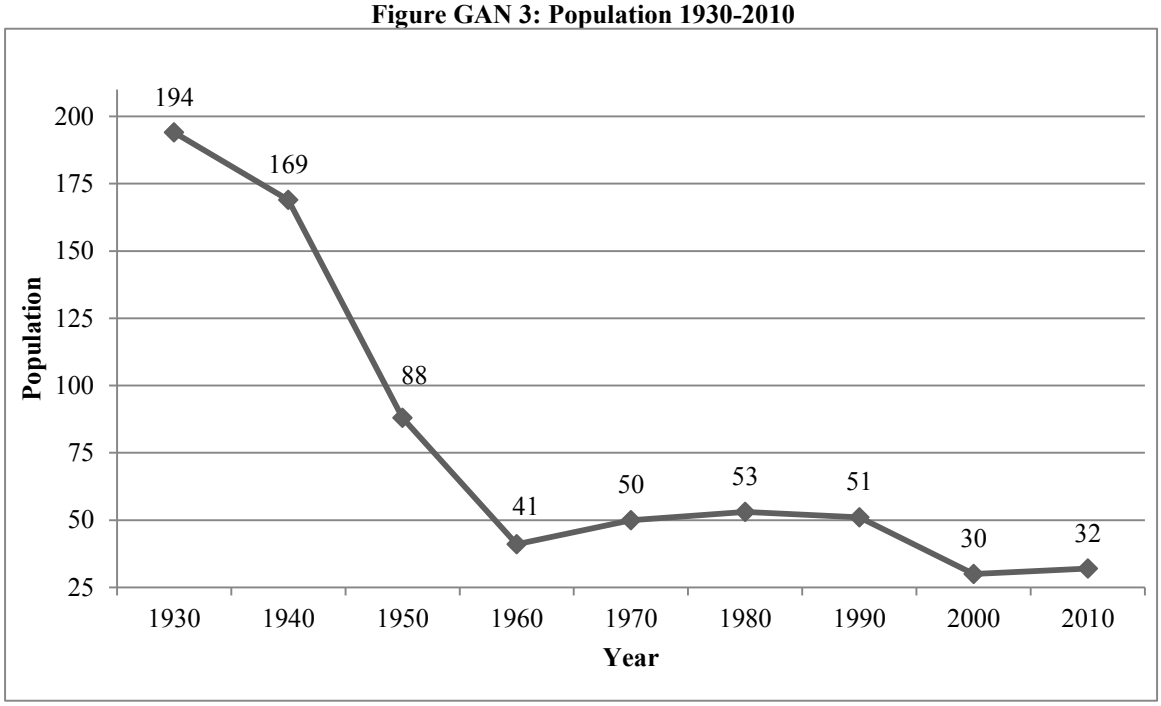
Figure GAN 2: Topographic Map



DEMOGRAPHICS

Gandy's population fell from 194 people in 1930 to a low of 41 in 1960. It grew slightly starting in 1970 before declining again in 2000. In 2010 the population barely grew. Even though the population is growing it is an older population. This still makes Gandy vulnerable to hazards since older populations may have decreases mobility. Figure GAN 3 displays the historical population trend for Gandy from 1930 to 2010.

Figure GAN 3: Population 1930-2010



Source: US Census

Table GAN 1 illustrates the age distribution and median age for Logan County in comparison to the village of Gandy.

Table GAN 1: Age Distribution

	Logan County	Gandy
< 5 yrs.	7.1%	9.4%
5 - 64 yrs.	71.8%	56.2%
> 65 yrs.	21.1%	34.4%
Median Age	43.3	60.5

Source: U.S. Census, 2010

The median age for the residents of Gandy is higher to that of the entire county. In addition there is a higher concentration of residents over the age of 65 within the village than the rest of the county. The population group between 5 and 64 years is smaller than the rest of the county. Gandy has an increased vulnerability to many of the hazards present within the planning area due to the age of residents.

HOUSING AND ECONOMICS

Median household income, per capita income, home value and rent for the county as a whole compare with that of Gandy are outlined in Table GAN 2.

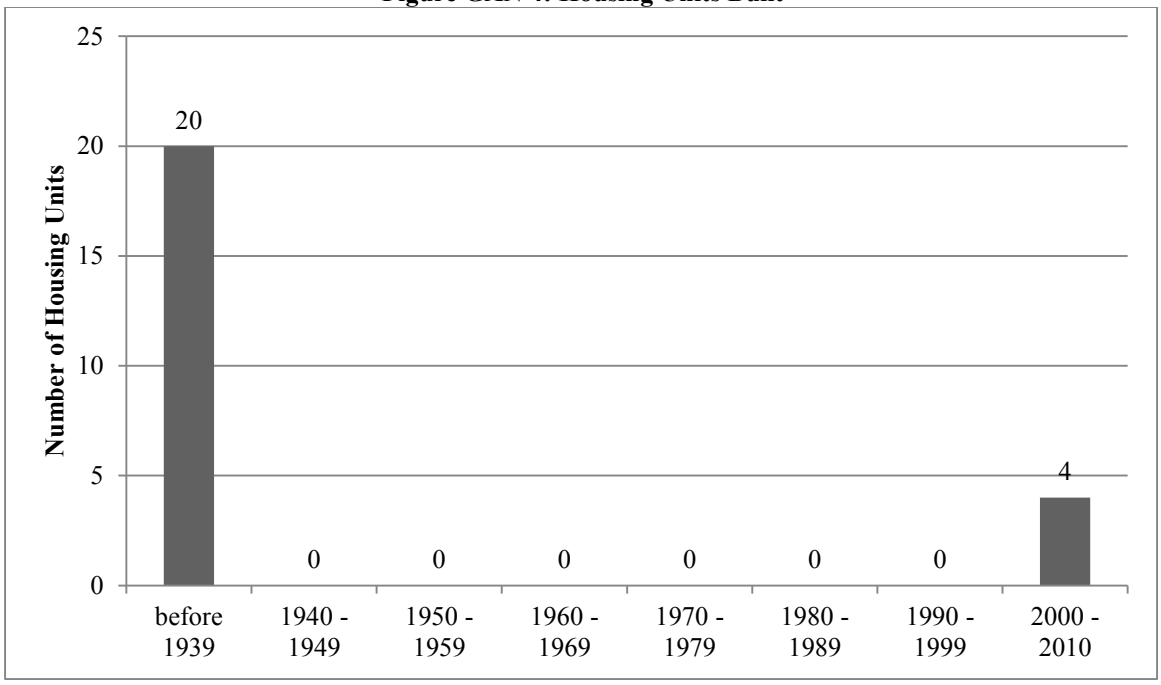
Table GAN 2: Economics

	Logan County	Gandy
Median Household Income	$445,192	$29,063
Per Capita Income	$22,320	$22,846
Median Home Value	$72,200	$67,100
Median Rent	$588	NA

Source: U.S. Census American Community Survey Housing Characteristics and Income, 2012

According to the U.S. Census there are a total of 24 housing units in Gandy. Of those 24 units none are reported as vacant. More than 83 percent of all units were constructed prior to 1940.

Figure GAN 4: Housing Units Built



Source: US Census 2006 - 2010 American Community Survey 5 Year Estimates

Table GAN 3: Housing Unit Occupancy

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Logan County	320	77.3%	94	22.7%		218	68.1%	102	31.9%
Gandy	24	100%	0	0		24	100%	0	0%

Source: US Census 2006 - 2010 American Community Survey 5 Year Estimates

Structural Inventory and Valuation

A structural inventory was completed for the corporate limits of Gandy though a window survey using GIS for the 2009 hazard mitigation plan. The values of these structure types were determined from the 2013 Property Type Values as provided by the Nebraska Department of Revenue Property Assessment Division.

Results from the structural inventory completed by the Village of Gandy are found in Table GAN 4. Information displayed in this table includes the number of structures, value per structure, and total value of each structure type.

Table GAN 4: Structural Inventory and Valuation

Total Structures		Structure Valuation	
Structure Type	**Number of Structures**	**Total Value**	**Value per Structure**
Commercial/Industrial	1	$9,957.00	$9,957.00
Out Building	22	$114,356.00	$5,198.00
Residential	24	$699,168.00	$29,132.00
Public/Quasi Public	2	$10,396.00	$5,198.00
Total	**49**	**$833,877.00**	NA

**Values are rounded to the nearest dollar.*

Critical Infrastructure/Key Resources

Figure GAN 5: Critical Facilities Map

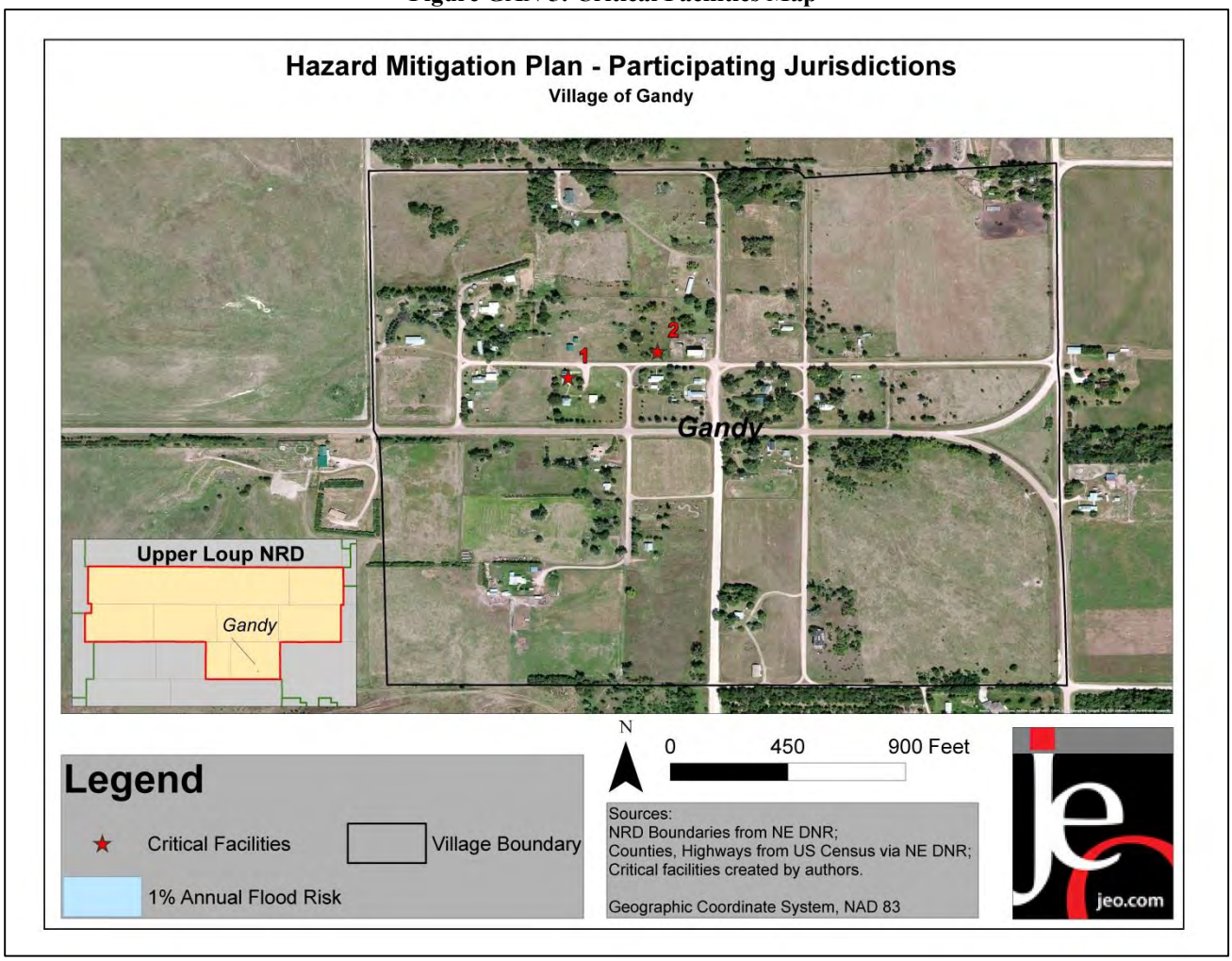


Table GAN 5: Critical Facilities List

Number	Name	Function
#1	Church	Gathering Location/Emergency Shelter
#2	Park	Gathering Location

FUTURE DEVELOPMENT TRENDS

At this time Gandy has few available housing units available should the population increase. Over the past two decades Gandy has experienced a declining population, but over the last ten years there has been a slight rebound. If the population increases over the next decade Gandy will need to add additional housing units. At this time it is expected that new construction would occur within the current corporate boundaries. There are no mapped floodplains within the community nor are there areas identified as being highly vulnerable to flooding or other hazards. In addition there are relatively low traffic counts for the village so building along transportation routes is not a significant concern.

Risk Assessment

Hazard Identification

Table GAN 6 is the local risk assessment. Refer to *Section 4: Risk Assessment* for an explanation as to what this methodology is and why certain hazards did not pose a significant enough threat and were eliminated from detailed discussion due to the calculation.

Table GAN 6: Risk Assessment

Hazard	Previous Occurrence: Yes or No	County Hazard Ranking in NE 2014 State HMP	Specific Concerns Identified
Natural Hazards			
Grass/Wildfires	**No**	**High**	**Fires on rangelands spreading into the village, economic impacts resulting from fires**
Severe Winter Storms	**Yes**	**High**	**Roadway closures, economic impacts**
Tornados	**No**	**High**	**Lack of safe rooms**
High Winds	**Yes**	**High**	**Frequency of occurrence**
Extreme Heat	**Yes**	**NA**	**Elderly population and economic impacts (especially in ag sector)**
Hail Events	**Yes**	**NA**	**Economic impact especially in the ag sector. Damages to homes and other structures**
Severe Thunderstorms	**Yes**	**High**	**Frequency of occurrence, potential for secondary impacts (lightning causing wildfires)**
Drought	Yes	High	Economic losses in the ag sector
Animal Disease	No	High	None
Plant Disease	No	High	None
Flooding	No	High	None
Earthquakes	No	Medium	None
Dam Failure	No	Low	None
Landslides	No	NA	None
Man-made Hazards			
Chemical Spills (transportation)	No	Medium	Transportation of ag chemicals along roadways
Chemical spills (fixed site)	No	High	Ag chemical storage areas
Urban Fire	Yes	High	Age of wood built structures throughout the community
Radiological Incident (transportation)	No	Medium	None
Radiological Fixed Sites	No	Medium	None
Terrorism	No	Low	None
Civil Disorder	No	Medium	None

The top hazards for the village of Gandy are grass/wildfire, severe winter storms, and tornados and high winds. These top hazards of concern for the Village of Gandy are similar to the top concerns of the ULNRD.

Historical Occurrences

The NCDC counted a total of 8 hazard events in the village of Gandy and there were no recorded deaths or injuries, but $5,000 in damages to property.

FIRE

Grass/wildfires

The local planning team identified grass/wildfire as a significant concern for the village. According to the Nebraska Forestry Department there were 38 reported fires by Stapleton Fire Departments (the nearest responding fire department) from 2000 to 2012 which consumed a total of 12,385 rangeland acres and 65 crop land acres. The fires also resulted in more than $3,850 in damages to crops and structures.

SEVERE STORMS

Flooding

There is no floodplain in Gandy nor was there a report of problems related to localized flooding within the community.

Hail Events

The local planning team identified hailstorms as a moderate threat for the village of Gandy. NCDC data records five hail events within Gandy, there were no reported losses related to these events

Severe Thunderstorms

Severe thunderstorms are a regular part of the climate for Logan County and Gandy. The county planning team identified severe thunderstorms as a low threat for the village. The NCDC recorded 2 events with a total of $5,000 in damages to property or zero losses related to crops.

Table GAN 7: NCDC Data

Hazard	Date	Extent	Property Damage	Crop Damage
Thunderstorm Wind	2/28/2012	62 kts	$5,000	$0
Total			**$5,000**	**$0**

Source: NCDC

Severe thunderstorms and hail can result in loss of electricity, blocked roadways, damages to trees, and flooding. Blocked roadways, as a result of downed trees, may also present life safety concerns to those needing immediate medical attention.

Severe Winter Storms

The local planning team identified severe winter storms as a significant concern for the community. NCDC data records severe winter storms as "zonal" events meaning there is not a specific record of what communities are impacted or at least what the level impacts were per community. No historical occurrences were reported by residents, local officials, or found in any other document.

The elderly (34 percent of Gandy's population) may be more likely to sustain an injury or have a medical emergency as a result of shoveling snow following a winter storm. Community members and families below the poverty line are also as higher risk related to severe winter storms, as they may lack resources needed to sustain themselves through a major severe winter storm.

Tornados and High winds

The local planning team identified tornados and high winds as a top concern for the community. According to the NCDC data, there were no tornados and 15 storm events which included strong winds (50 kts) and winds of this magnitude, according to the Beaufort Wind Force Ranking, can cause trees to uproot, considerable structure damage, and over turning of improperly anchored mobile homes.

TRANSPORTATION

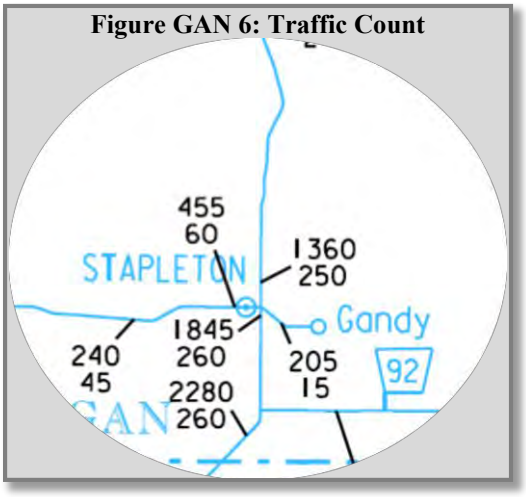
Transportation Incidents /Chemical Spills/ Radiological Incident

The local planning team identified transportation concerns as a significant concern for the village. According to the PHMSA incident reports there have been zero spills in Gandy reported from 1980 to 2013.

The main transportation routes through Gandy include HWY 92. The traffic count reported by NDOR for US HWY west of Gandy is 205 light vehicles and 15 heavy trucks daily.

It is difficult to ascertain exactly what materials are being transported across the state. Given the low volume of traffic it is not likely that highly dangerous materials are regularly transported along local routes. There are a number of agricultural materials that are transported through Gandy; these should continue to be monitored to ensure the safety of residents.

Figure GAN 6: Traffic Count



Capability Assessment

Thus far the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism in understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capabilities, administrative & technical capability, fiscal capability, and education & outreach capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

VILLAGE GOVERNANCE

Gandy is governed by a five member board. Boards and committees within the village include:

- Parks Committee
- Streets Committee
- Trash Committee
- Water/Sewer Board

Table GAN 8: Capability Assessment

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	No
	Capital Improvements Plan	No
	Hazard Mitigation Plan	Yes
	Economic Development Plan	No
	Emergency Operational Plan	Yes (county)
	National Resources Protection Plan	No
	Open Space Preservation plan	No
	Floodplain Management Plan	No
	Storm Water Management Plan	No
	Zoning Ordinance	No
	Subdivision Regulation/Ordinance	No
	Floodplain Ordinance	No
	Building Codes	No
	National Flood Insurance Program	No
	Community Rating System	No
	Other (if any)	NA
Administrative & Technical Capability	Planning Commission	No
	Hazard Mitigation Planning Commission	Yes
	Floodplain Administration	No
	Emergency Manager	Yes (county/regional)
	GIS Coordinator	County by contract
	Chief Building Official	No
	Civil Engineering	No
	Staff Who Can Assess Community's Vulnerability to Hazards	Multiple residents
	Grant Manager	No/County assists as needed
	Other (if any)	NA
Fiscal Capability	Capital Improvement Project Funding	No
	Community Development Block Grant	No
	Authority to Levy Taxes for Specific Purposes	Yes
	Gas/Electric Service Fees	No
	Storm Water Service Fees	No
	Water/Sewer Service Fees	No
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	Yes

Survey Components/Subcomponents		Comments
	Other (if any)	NA
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Yes (County/NRD)
	Natural Disaster or Safety related school programs	No
	StormReady Certification	No
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	No
	Other (if any)	NA

SUMMARY

Gandy currently does not have comprehensive or capital improvement plans therefore the hazard mitigation plan has not been incorporated into local planning documents. If the village were to develop these plans it would be advised that they incorporate mitigation projects and information on hazards from this plan into the other plans.

With an aging populace and a low tax base it will be difficult for Gandy to implement mitigation projects without the assistance of outside groups. Gandy will look for opportunities to partner with regional emergency management, ULNRD, Logan County, and other regional and state agencies.

Mitigation Strategy

COMPLETED MITIGATION PROJECTS

Description	Storm water Improvements
Analysis	Install new culvert on the south end of Broadway Avenue
Hazard(s) Addressed	Flooding
Benefits	Relieved localized flooding problems. No reported incidents since repair were made.
Timeline	Completed 2005
Lead Agency	Village board

ONGOING/NEW MITIGATION PROJECTS

Description	Backup Generators
Analysis	Provide a portable or stationary source of backup power to redundant power supplies, municipal lift stations and other critical facilities and shelters.
Goal/Objective	Goal 1/Objective 1.1
Hazard(s) Addressed	Tornados and high winds, severe winter storms, severe thunderstorms
Estimated Cost	$15,000-$30,000 per generator
Benefits	Back-up power for critical facilities. A measure that would reduce or prevent damage to property or prevent loss of life or serious injury.
Potential Funding	HMGP
Timeline	Ongoing
Priority	High
Lead Agency	Village board, Logan County EMA
Action since 2009 plan	Installed back-up power on municipal well.

Description	Storm Shelter / Safe Rooms
Analysis	Design and construct fully supplied storm shelters and safe rooms in highly vulnerable areas such as mobile home parks, campgrounds, school, and other areas.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Tornados and high winds, severe thunderstorms, severe winter storms
Estimated Cost	$200-$300/sf stand alone; $150-200/sf addition/retrofit
Benefits	Useful for many residents that do not have basements or cellars to go for shelter, especially beneficial for the nursing home and other vulnerable populations
Potential Funding	PDM, HMPG
Timeline	10 years
Priority	High
Lead Agency	Village Board, Logan County EMA
Action since 2009 plan	None

Description	Snow Fences
Analysis	Construct snow fences to protect main transportation routes and critical facilities from excessive snow drifting and road closure.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Severe winter storms
Estimated Cost	$1,000+
Benefits	Increase road accessibility to the majority of people which live in rural areas; increase road access for emergency vehicles
Potential Funding	PDM, HMGP, NRCS Cost-share, FAS, NGPC
Timeline	Ongoing
Priority	Low
Lead Agency	Village Streets Department, Nebraska Department of Roads
Action since 2009 plan	Snow fences are used annually as need to protect transportation routes

Description	Hazard Tree Removal Program
Analysis	Identify and remove hazards limbs and/or trees.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Severe thunderstorms, tornados and high winds, severe winter storms
Estimated Cost	$20,000
Benefits	Decrease the risk of damage to electrical lines and personal property.
Potential Funding	HMGP, US Forest Service
Timeline	Ongoing
Priority	Medium
Lead Agency	Village Utilities, Village Board
Action since 2009 plan	Ongoing tree maintenance, no specific project to report

Description	Fire Wise Defensible Space
Analysis	Work with the Nebraska Forest Service and US Forest Service to become a Fire Wise Communities/USA participant. Develop a Community Wildfire Protection Plan. Train land owners about creating defensible space. Enact ordinances and building codes to increase defensible space, improve building materials to reduce structure ignitability, and increase access to structures by responders. Develop and implement brush and fuel thinning projects.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Wildfire
Estimated Cost	$20,000
Benefits	Structures are less vulnerable to wildfire, easier for firefighters to defend structure during a wildfire event, and removes fuel from an approaching fire.
Potential Funding	HMGP, NFS, USFS, ULNRD, NGPC, National Fire Plan
Timeline	5 years
Priority	High
Lead Agency	Village Board, Nebraska Forestry Service
Action since 2009 plan	None

Description	Tree City USA
Analysis	Work to become a Tree City USA through the National Arbor Day Foundation in order to receive direction, technical assistance, and public education on how to establish a hazardous tree identification and removal program in order to limited potential tree damage and damages caused by trees in a community when a storm event occurs. The four main requirements include: 1) Establish a tree board; 2) Enact a tree care ordinance; 3) Establish a forestry care program; 4) Enact an Arbor Day observance and proclamation.
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Severe thunderstorms, tornados and high winds, severe winter storms
Estimated Cost	$1,000+
Benefits	Better maintained trees and hazard tree removal will eliminate damages to power lines and personal property during hazards events. Participation in Tree City USA will support community actions to mitigation damages from trees.
Potential Funding	Arbor Day Foundation, US Forest Service
Timeline	3 years
Priority	Medium
Lead Agency	Village Board
Action since 2009 plan	None

Description	Public Awareness / Education
Analysis	Through activities such as outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. In addition, educate citizens on erosion control and water conservation methods. Educate residents on response and rescue plans for all hazard types.
Goal/Objective	Goal 3/Objective 3.1 and Goal1/Objective 1.1
Hazard(s) Addressed	All hazards
Estimated Cost	$500+
Benefits	Increase knowledge to new comers to the area as well as elderly in how to react when an event is going to occur or is occurring. Education to reduce or prevent damage to property or prevent loss of life or serious injury.
Potential Funding	HMGP, PDM
Timeline	Ongoing
Priority	Medium
Lead Agency	Village Board, Logan County EMA, NEMA, NDNR, ULNRD
Action since 2009 plan	Ongoing educational efforts from regional emergency management office

Description	Weather Radios
Analysis	Conduct an inventory of weather radios at schools, rural residents, and other critical facilities and provide new radios as needed.
Goal/Objective	Goal 4/Objective 4.3 and Goal 1/Objective 1.1
Hazard(s) Addressed	All hazards
Estimated Cost	$50/per radio
Benefits	Help those who do not have access to local TV or radio warnings
Potential Funding	HMGP, PDM
Timeline	5 years
Priority	High
Lead Agency	Village Board, Logan County EMA
Action since 2009 plan	None

REMOVED MITIGATION PROJECTS

Description	Enroll in the National Flood Insurance Program (NFIP)
Analysis	Participate in the National Flood Insurance Program (NFIP).
Hazard(s) Addressed	Flooding
Reason for Removal	No interest from residents in flood insurance program.

VILLAGE OF STAPLETON

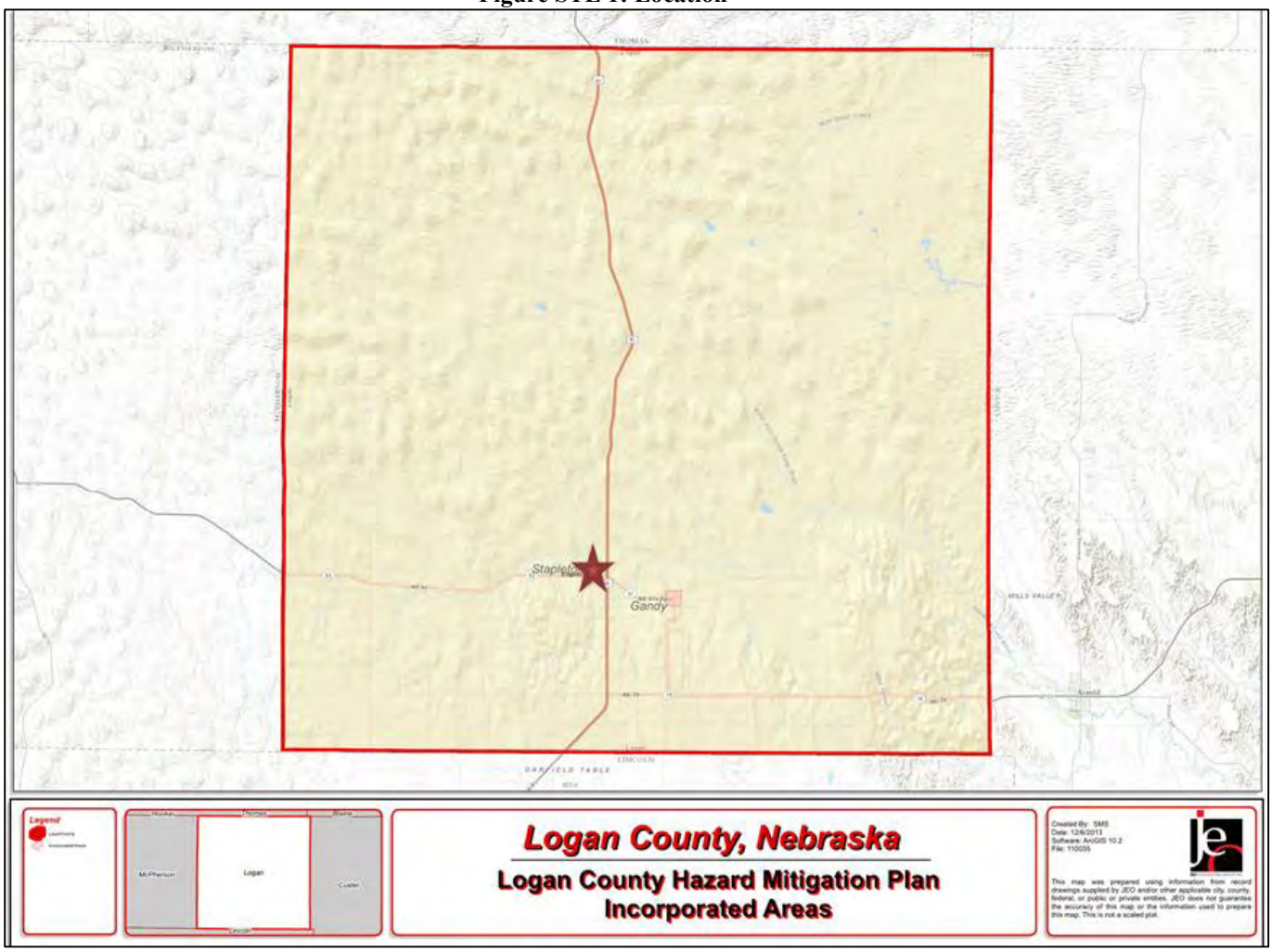
HISTORY

Settlement began in the community of Stapleton in 1912 when the Union Pacific Railroad extended a branch line west from Callaway into Logan County. That line, built from Kearney to Callaway in 1890, was to eventually cross McPherson and Arthur counties and link up with a main line along the North Platte River in Garden County. However, that part of the plan did not materialize, so Stapleton remained a terminus station. The station was established in the south part of the county. It is said that the town was named for a Mr. Stapleton who had offered to give the town a sizable donation. The town was incorporated in 1913, with the city limits defined by an ordinance. An election to move the seat of government, held by Gandy since 1885 to Stapleton, held on May 2, 1929, favored Stapleton.

Location/geography

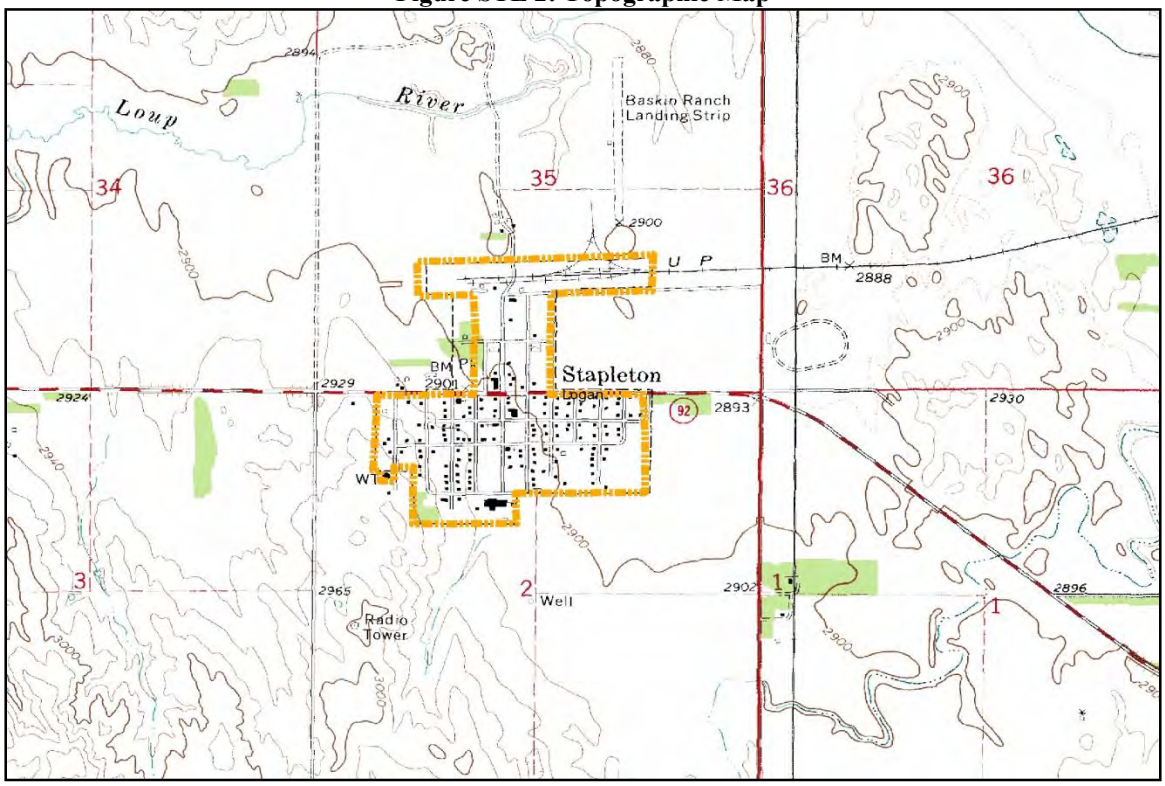
Stapleton is a village located in the south central portion of Logan County. The Village of Stapleton covers an area of 160 acres and has an elevation of 2,901 feet above sea level. Stapleton is 267.7 miles northwest of Lincoln

Figure STL 1: Location



The community of Stapleton lies in an area of dissected plains. The land use surrounding the community is mainly ranching with some agricultural crops in the river valleys. Hilly land with moderate to steep slopes, sharp ridge crests and remnants of the old, nearly level plains eroded by water and wind is prevalent. The community lies approximately half a mile south of the South Loup River valley. The watershed flows generally from the northwest to the southeast. A current floodplain has not been delineated for Stapleton and river flooding is not a significant concern.

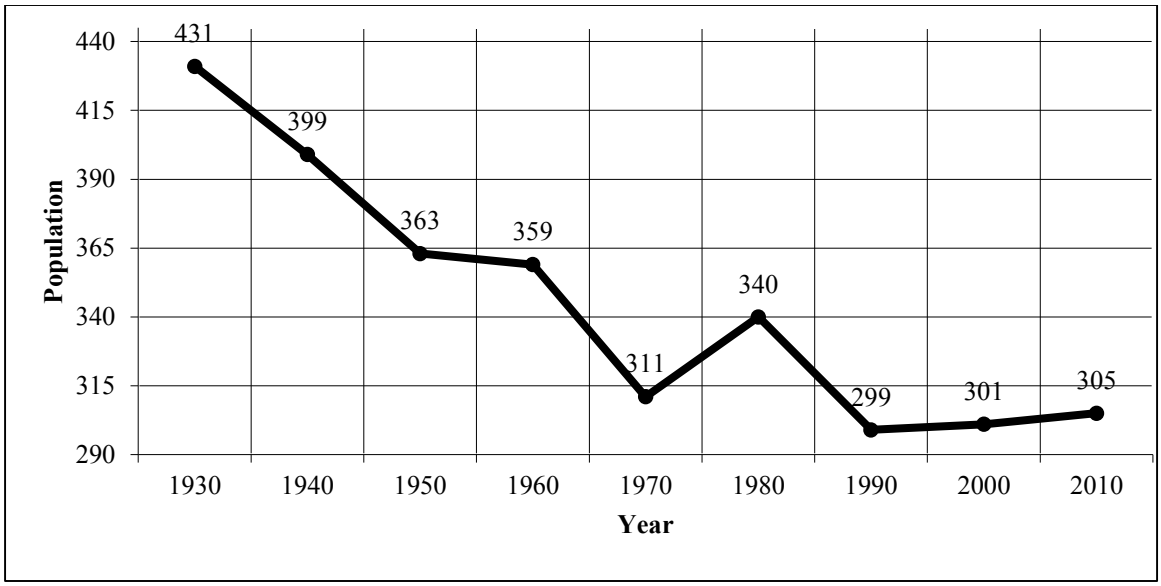
Figure STL 2: Topographic Map



DEMOGRAPHICS

Between 1930 and 1970 Stapleton lost 27 percent of its population. The population had a small rebound in 1980 before falling to its lowest point in 1990. The population has grown at a very slow rate since 1999 and now sits at 305. The population may continue to grow over the next few years as the highest population cohorts are 20-34 and 35-54. Figure STL 3 displays the historical population trend for Stapleton from 1930 to 2010.

Figure STL 3: Population 1930 - 2010



Source: US Census

Table STL 1 illustrates the age distribution and median age for Logan County in comparison to the village of Stapleton.

Table STL 1: Age Distribution

	Logan County	Stapleton
< 5 yrs.	7.1%	9.5%
5 - 64 yrs.	71.8%	70.2%
> 65 yrs.	21.1%	20.3%
Median Age	43.3	41.1

Source: U.S. Census, 2010

The demographics for Stapleton are close to those of the entire county. The median age is slightly lower than that of the county but not significantly.

HOUSING AND ECONOMICS

Median household income, per capita income, home value and rent for the county as a whole compare with that of Stapleton are outlined in Table STL 2.

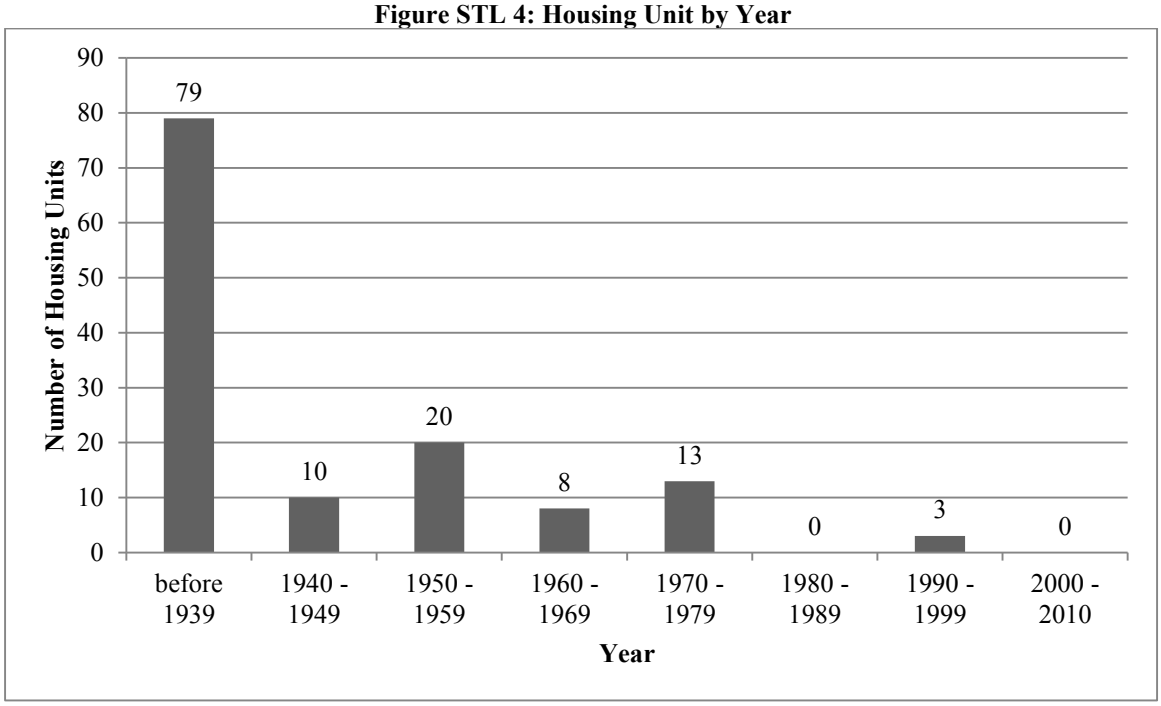
Table STL 2: Economy

	Logan County	Stapleton
Median Household Income	$445,192	$36,667
Per Capita Income	$22,320	$21,820
Median Home Value	$72,200	$56,600
Median Rent	$588	$688

Source: U.S. Census American Community Survey Housing Characteristics and Income, 2012

According to the U.S. Census there are a total of 133 housing units in Stapleton. Of those 133 units 14 percent (19 total units) are reported as vacant. More than 67 percent of all units (occupied and vacant) were constructed prior to 1950.

Figure STL 4: Housing Unit by Year



Source: US Census 2006 - 2010 American Community Survey 5 Year Estimates

Table STL 3: Housing Unit Occupancy

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Logan County	320	77.3%	94	22.7%		218	68.1%	102	31.9%
Stapleton	114	85.7%	19	14.3%		90	78.9%	24	21.1%

Source: US Census 2006 - 2010 American Community Survey 5 Year Estimates

STRUCTURAL INVENTORY AND VALUATION

A structural inventory was completed for the corporate limits of Stapleton through a window survey using GIS for the 2009 hazard mitigation plan. The updated values of these structure types were determined from the 2013 Property Type Values as provided by the Nebraska Department of Revenue Property Assessment Division.

Results from the structural inventory completed by the Village of Stapleton are found in Table STL 4.

Table STL 4: Structural Inventory

Total Structures		Structure Valuation	
Structure Type	Number of Structures	Total Value	Value per Structure
Commercial/Industrial	38	$1,227,362.00	$32,299.00
Out Building	83	$462,227.00	$5,569.00
Residential	149	$7,562,942.00	$50,758.00
Public/Quasi Public	13	$139,161	$10,704.00
Total	**283**	**$9,391,692.00**	-

**Values are rounded to the nearest dollar.*

Critical Infrastructure/Key Resources

Figure STL 5: Critical Facilities Map

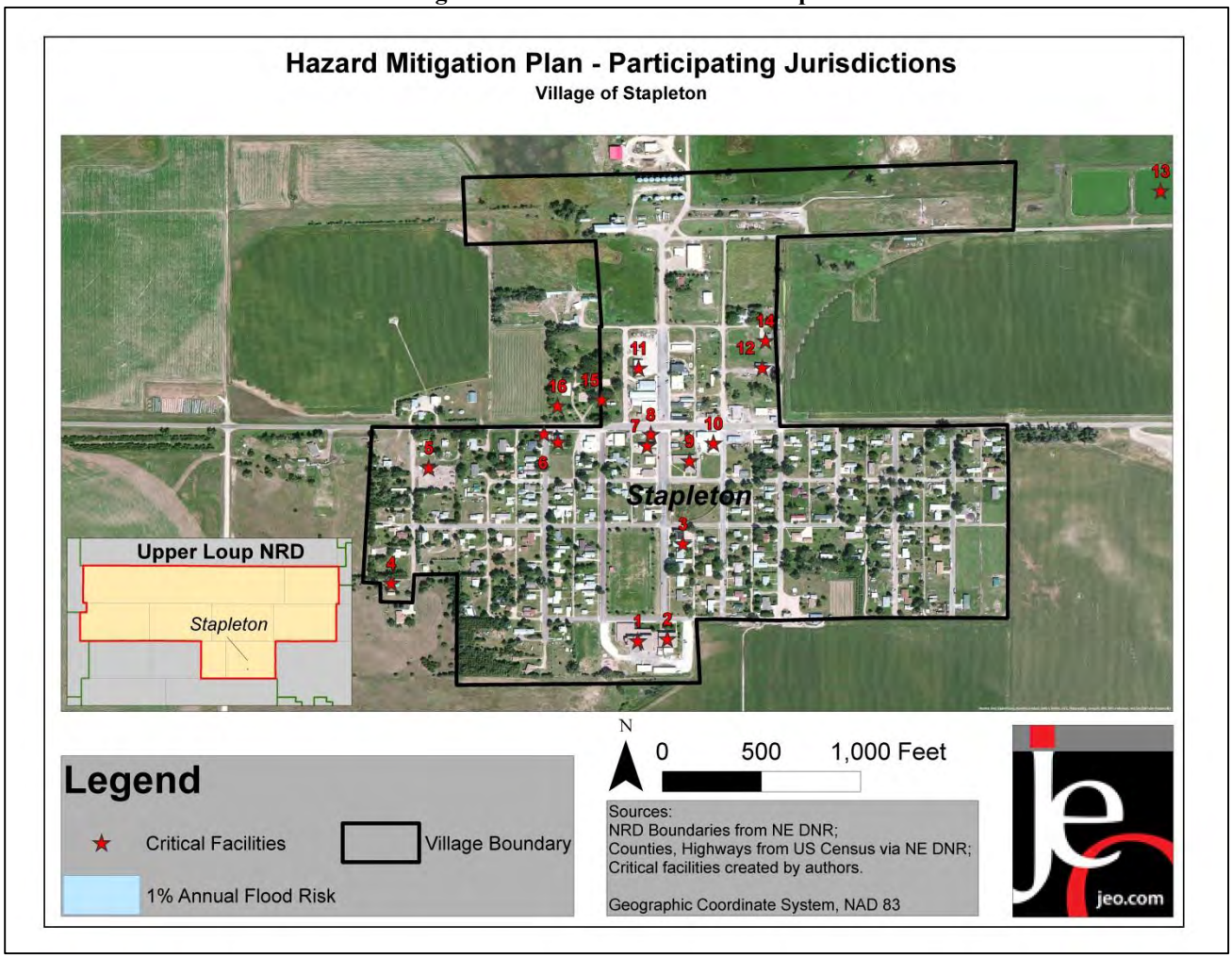


Table STL 5: List of Critical Facilities

Number	Name	Function
1	High School	Vulnerable Population
2	High School	Vulnerable Population
3	Church	Gathering Location/Emergency Shelter
4	Water Tower	Critical Facility
5	Village Storage	Critical Facility
6	Church	Gathering Location/Emergency Shelter
#7	Village Office & Shop	Government function
#8	Post Office	Government function
9	County Court House	Government function
10	Fire Hall	Emergency Response
11	County Shop	Gathering Location/Emergency Shelter
12	Village Storage	Critical Facility
13	Lagoons	Critical Facility
14	Lift Station	Critical Facility
15	Well	Critical Facility
16	Well	Critical Facility

FUTURE DEVELOPMENT TRENDS

At this time the planning team for Stapleton expects slow growth over the next several years. There is currently more than 14 percent of housing units reported as vacant. In addition there are opportunities to construct new housing units within the corporate limits without expansion. The planning team did not report concerns related to localized flooding and there is no formal floodplain within the community so new construction is likely to occur outside of know hazard areas.

Risk Assessment

Hazard Identification

Table STL 6 is risk assessment competed . Refer to *Section 4: Risk Assessment* for a detailed explanation as to what this methodology is and why certain hazards did not pose a significant enough threat and were eliminated from detailed discussion due to the calculation.

Table STL 6: Risk Assessment

Hazard	Previous Occurrence: Yes or No	County Hazard Ranking in NE 2014 State HMP	Specific Concerns Identified
Natural Hazards			
Grass/Wildfires	**No**	**High**	**Fires on rangelands spreading into the village, economic impacts resulting from fires**
Severe Winter Storms	**Yes**	**High**	**Roadway closures, economic impacts**
Tornados	**No**	**High**	**Lack of safe rooms**
High Winds	**Yes**	**High**	**Frequency of occurrence**
Extreme Heat	**Yes**	**NA**	**Elderly population and economic impacts (especially in ag sector)**

Hail Events	**Yes**	**NA**	**Economic impact especially in the ag sector. Damages to homes and other structures**
Severe Thunderstorms	**Yes**	**High**	**Frequency of occurrence, potential for secondary impacts (lightning causing wildfires)**
Drought	Yes	High	Economic losses in the ag sector
Animal Disease	No	High	None
Plant Disease	No	High	None
Flooding	No	High	None
Earthquakes	No	Medium	None
Dam Failure	No	Low	None
Landslides	No	NA	None
Man-made Hazards			
Chemical Spills (transportation)	No	Medium	Transportation of ag chemicals along roadways
Chemical spills (fixed site)	No	High	Ag chemical storage areas
Urban Fire	Yes	High	Age of wood built structures throughout the community
Radiological Incident (transportation)	No	Medium	None
Radiological Fixed Sites	No	Medium	None
Terrorism	No	Low	None
Civil Disorder	No	Medium	None

According to the risk assessment, the top four hazards in the village of Stapleton are grass/wildfire, urban fire, hail events, and tornados and high winds.

Historical Occurrence

The NCDC counted a total of 147 hazard events in the village of Stapleton and there were no recorded deaths or injuries, but $469,000 in property damages and $913,000

FIRE

Grass/wildfires

The local planning team identified grass/wildfire as a significant concern for the county. According to the Nebraska Forestry Department there were 38 reported fires by Stapleton Fire Departments from 2000 to 2012 which consumed a total of 12,385 rangeland acres and 65 crop land acres. The fires also resulted in more than $3,850 in damages to crops and structures.

SEVERE STORMS

Flooding

The planning team reported localized flooding in low areas within the community. There is no formal floodplain within the community. Localized flooding will be addressed through improvements in the storm water system such as upsizing culvers, replacing damaged culverts, and maintaining ditches and drainage areas.

Hail Events

The local planning team identified hailstorms as a threat for the Village of Stapleton. NCDC data records 65 events with a total of $413,000 in property damages and $986,000 in monetary losses from crops. A summary of the events with recorded damages can be seen in Table STL 7.

Table STL 7: Hail Events

Date	Extent	Property Damage	Crop Damage
6/20/1997	0.88 in.	$10,000	$400,000
8/14/1998	1.75 in.	$200,000	$25,000
6/5/1999/	2.75 in.	$50,000	$25,000
6/22/1999	0.88 in.	$30,000	$60,000
6/12/2000	2.00 in.	$10,000	$25,000
6/12/2000	1.75 in.	$5,000	$10,000
6/29/2000	1.75 in.	$25,000	$200,000
6/29/2000	2.50 in.	$25,000	$200,000
6/19/2002	1.75 in.	$4,000	$10,000
6/20/2002	2.00 in.	$4,000	$8,000
6/24/2003	1.75 in.	$2,000	$3,000
6/7/2004	1.75 in.	$2,000	$8,000
8/3/2005	1.75 in.	$2,000	$2,000
4/2/2007	1.50 in.	$1,000	$0
5/5/2007	1.75 in.	$3,000	$0
9/28/2007	1.75 in.	$2,000	$0
6/18/2009	1.00 in.	$15,000	$0
6/18/2009	1.00 in.	$8,000	$0
4/14/2012	1.00 in.	$15,000	$0
Total		**$413,000**	**$986,000**

Source: NCDC

Severe Thunderstorms

Severe thunderstorms are a regular part of the climate for Logan County and Stapleton. The county planning team identified severe thunderstorms as a moderate threat for the village. The NCDC recorded 17 events with no injuries and $40,000 in damages to property.

Table STL 8: Severe Thunderstorm Events

Hazard	Date	Extent	Property Damage	Crop Damage
Thunderstorm Wind	6/13/1998		$10,000	$0
Thunderstorm Wind	6/7/2004		$2,000	$0
Thunderstorm Wind	6/7/2006		$20,000	$0
Thunderstorm Wind	7/10/2011		$1,000	$0
Thunderstorm Wind	8/7/2011		$7,000	$0
Total			**$40,000**	**$0**

Source: NCDC

Severe thunderstorms and hail can result in loss of electricity, blocked roadways, damages to trees, and flooding. Blocked roadways, as a result of downed trees, may also present life safety concerns to those needing immediate medical attention. Currently the village has back-up power on the municipal well.

Severe Winter Storms

The local planning team identified severe winter storms as a significant concern for the community. NCDC data records severe winter storms as "zonal" events meaning there is not a specific record of what communities are impacted or at least what the level impacts were per community.

Tornados and High Winds

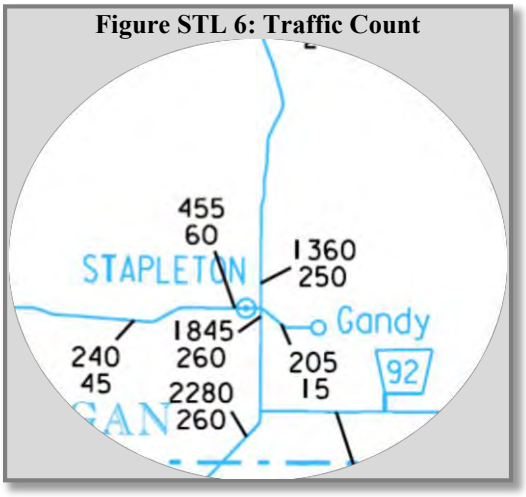
The local planning team identified tornados and high winds as a top concern for the community. According to the NCDC data, there were four tornados and 15 storm events which included strong winds (50 kts) and winds of this magnitude, according to the Beaufort Wind Force Ranking, can cause trees to uproot, considerable structure damage, and over turning of improperly anchored mobile homes.

TRANSPORTATION

Transportation Incidents /Chemical Spills/ Radiological Incident

The local planning team identified transportation concerns as a low concern for the village. According to the PHMSA incident reports there have been zero spills in Stapleton reported from 1980 to 2013.

Figure STL 6: Traffic Count



The primary transportation routes through Stapleton include HWY 92 and NE HWY 83. The heaviest traffic occurs along NE HWY 83 which runs north and south through the center of the Stapleton. The traffic count at the intersection of NE HWY 83 and HWY 92, southeast of Stapleton, is 1,845 light vehicles and 260 heavy trucks per day. This is the highest traffic volume anywhere in the county. HWY 92 west of Stapleton reported 455 light vehicles and 60 heavy trucks.

It is difficult to ascertain exactly what materials are being transported across the state. There are a number of agricultural materials that are transported through Stapleton; these should continue to be monitored to ensure the safety of residents.

Capability Assessment

Thus far the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism in understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capabilities, administrative & technical capability, fiscal capability, and education & outreach capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

VILLAGE GOVERNANCE

Stapleton is governed by a five member board. Boards and committees within the village include:

- Parks Committee
- Streets Committee
- Trash Committee
- Water/Sewer Board

Table STL 9: Capability Assessment

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	No
	Capital Improvements Plan	No
	Hazard Mitigation Plan	Yes
	Economic Development Plan	No
	Emergency Operational Plan	Yes (county)
	National Resources Protection Plan	No
	Open Space Preservation plan	No
	Floodplain Management Plan	No
	Storm Water Management Plan	Yes
	Zoning Ordinance	No
	Subdivision Regulation/Ordinance	No
	Floodplain Ordinance	No
	Building Codes	No
	National Flood Insurance Program	No
	Community Rating System	No
	Other (if any)	NA
Administrative & Technical Capability	Planning Commission	No
	Hazard Mitigation Planning Commission	Yes (with county)
	Floodplain Administration	No
	Emergency Manager	Yes (county & regional)
	GIS Coordinator	Yes (county by contract)
	Chief Building Official	No
	Civil Engineering	No
	Staff Who Can Assess Community's Vulnerability to Hazards	Multiple residents
	Grant Manager	No
	Other (if any)	NA
Fiscal Capability	Capital Improvement Project Funding	Yes
	Community Development Block Grant	No
	Authority to Levy Taxes for Specific Purposes	Yes
	Gas/Electric Service Fees	No
	Storm Water Service Fees	No
	Water/Sewer Service Fees	No
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	Yes

Survey Components/Subcomponents		Comments
	Other (if any)	NA
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Yes (county & NRD)
	Natural Disaster or Safety related school programs	No
	StormReady Certification	No
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	No
	Other (if any)	NA

SUMMARY

Stapleton currently does not have comprehensive or capital improvement plans, as such little has been done to include the hazard mitigation plan into other community planning and regulatory mechanisms. If the village were to develop these plans it would be advised that they incorporate mitigation projects and information on hazards from this plan into the other plans.

Stapleton will be able to implement some mitigation projects independently. Stapleton will look for opportunities to partner with regional emergency management, ULNRD, Logan County, and other regional and state agencies on many projects.

Mitigation Strategy

COMPLETED MITIGATION PROJECTS

Description	Drainage Improvements
Analysis	Rebuilt two storm drain manholes, cleaned culverts and adjacent ditches.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Flooding
Benefits	Relieved localized flooding, no additional flooding reported.
Potential Funding	Village Board
Completed	2008

ONGOING/NEW MITIGATION PROJECTS

Description	Backup Generators
Analysis	Provide a portable or stationary source of backup power to redundant power supplies, municipal lift stations and other critical facilities and shelters.
Goal/Objective	Goal 1/Objective 1.1
Hazard(s) Addressed	Tornados and high winds, severe winter storms, severe thunderstorms
Estimated Cost	$15,000-$30,000 per generator
Benefits	Back-up power for critical facilities. A measure that would reduce or prevent damage to property or prevent loss of life or serious injury.
Potential Funding	HMGP
Timeline	Ongoing
Priority	High
Lead Agency	Village board, Logan County EMA
Action since 2009 plan	Installed back-up power on municipal well.

Description	Public Awareness / Education
Analysis	Through activities such as outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. In addition, educate citizens on erosion control and water conservation methods. Educate residents on response and rescue plans for all hazard types.
Goal/Objective	Goal 3/Objective 3.1 and Goal1/Objective 1.1
Hazard(s) Addressed	All hazards
Estimated Cost	$500+
Benefits	Increase knowledge to new comers to the area as well as elderly in how to react when an event is going to occur or is occurring. Education to reduce or prevent damage to property or prevent loss of life or serious injury.
Potential Funding	HMGP, PDM
Timeline	Ongoing
Priority	Medium
Lead Agency	Village Clerk, Logan County EMA, NEMA, NDNR, ULNRD
Action since 2009 plan	Ongoing educational efforts from regional emergency management office

Description	Storm Shelter / Safe Rooms
Analysis	Design and construct fully supplied storm shelters and safe rooms in highly vulnerable areas such as mobile home parks, campgrounds, school, and other areas.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Tornados and high winds, severe thunderstorms, severe winter storms
Estimated Cost	$200-$300/sf stand alone; $150-200/sf addition/retrofit
Benefits	Useful for many residents that do not have basements or cellars to go for shelter, especially beneficial for the nursing home and other vulnerable populations
Potential Funding	PDM, HMPG
Timeline	10 years
Priority	High
Lead Agency	Village Board, Logan County EMA
Action since 2009 plan	None

Description	Enroll in the National Flood Insurance Program (NFIP)
Analysis	Participate in the National Flood Insurance Program (NFIP). (Contact NDNR at 402.471.3932 for any questions or to request educational material on NFIP.
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Flooding
Estimated Cost	N/A
Benefits	Enable property owners to purchase insurance protection against flood losses. Good standing enables participants to apply for PDM and HMGP cost-share.
Potential Funding	N/A
Timeline	5 years
Priority	High
Lead Agency	Village Board, Hazard Mitigation Board
Action since 2009 plan	None

Description	Warning Systems
Analysis	Improve/replace outdoor warning sirens.
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	Tornados and high winds, severe winter storms, severe thunderstorms
Estimated Cost	$15,000+
Benefits	Increase response time in order to mitigate injuries, deaths, and property damages.
Potential Funding	HMGP, PDM, Governing County and Local Governing Agency
Timeline	5 years
Priority	High
Lead Agency	Village Board
Action since 2009 plan	None

Description	Drainage Improvements
Analysis	The village utilizes stormwater systems comprising of ditches and culverts to convey runoff. Undersized systems can contribute to localized flooding. Drainage improvements may include ditch upsizing, ditch cleanout and culvert improvements. Drainage ponds, both retention and detention, may also be implemented to decrease runoff rates while also decreasing the need for other stormwater system improvements.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Flooding
Estimated Cost	$10,000-$50,000
Benefits	These improvements can serve to more effectively convey runoff within jurisdictions, preventing interior localized flooding resulting in damages in all villages.
Potential Funding	HMGP, CDBG
Timeline	Ongoing;
Priority	Medium
Lead Agency	Village Board
Action since 2009 plan	This action is related to regular ongoing maintenance required throughout the village, there is no specific project to report progress on.

REMOVED MITIGATION PROJECTS

Description	Snow Fences
Analysis	Construct snow fences to protect main transportation routes and critical facilities from excessive snow drifting and road closure.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Severe winter storms
Lead Agency	Village Utilities, Nebraska Department of Roads
Reason for Removal	This is not a realistic project for the community. For the planning area snow fences and windbreaks are more valuable in the unincorporated areas.

Thomas County

Village of Thedford

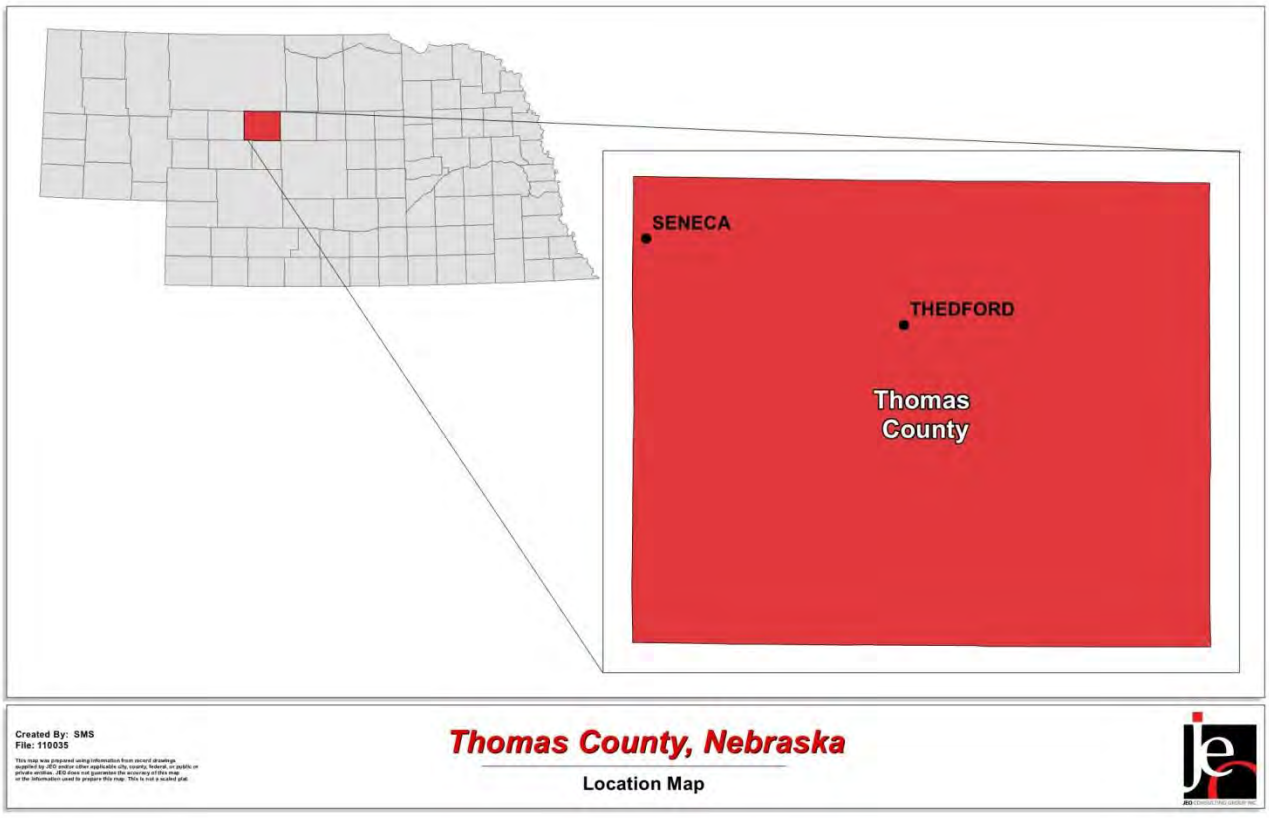
Upper Loup NRD
Multi-Jurisdictional Hazard Mitigation Plan

2014

THOMAS COUNTY
Community Profile
HISTORY
Thomas County was formed in 1887 from the unorganized territory west of Blaine County. Governor Thayer appointed C. C. Wright, one of the earliest settlers, special commissioner to carry out the county's formation. Wright had homesteaded in Fillmore County in 1871 before moving to Thomas. The new county was named for Major General George H. Thomas of Civil War fame and its boundaries fixed by a legislative act on March 31, 1887. To carry out the new county's business until officers could be elected, Governor Thayer appointed C. E. Callender, county clerk, B. F. Dill, treasurer, W. W. Cowles, judge, Lulu Wright, superintendent, J. F. Swain, sheriff, J. P. Walters, attorney , W. R. Harper, surveyor, C. C. Wright, H. W. Pierson and John W. Carney, commissioners.

LOCATION/GEOGRAPHY
Thomas County is one of the 93 counties in the State of Nebraska. It is located in the north central region of the state. The communities in Thomas County include Halsey and Thedford. The Village of Thedford is the county seat. Thomas County covers an area of 714 square miles and has an average elevation of 2,887 feet above sea level.

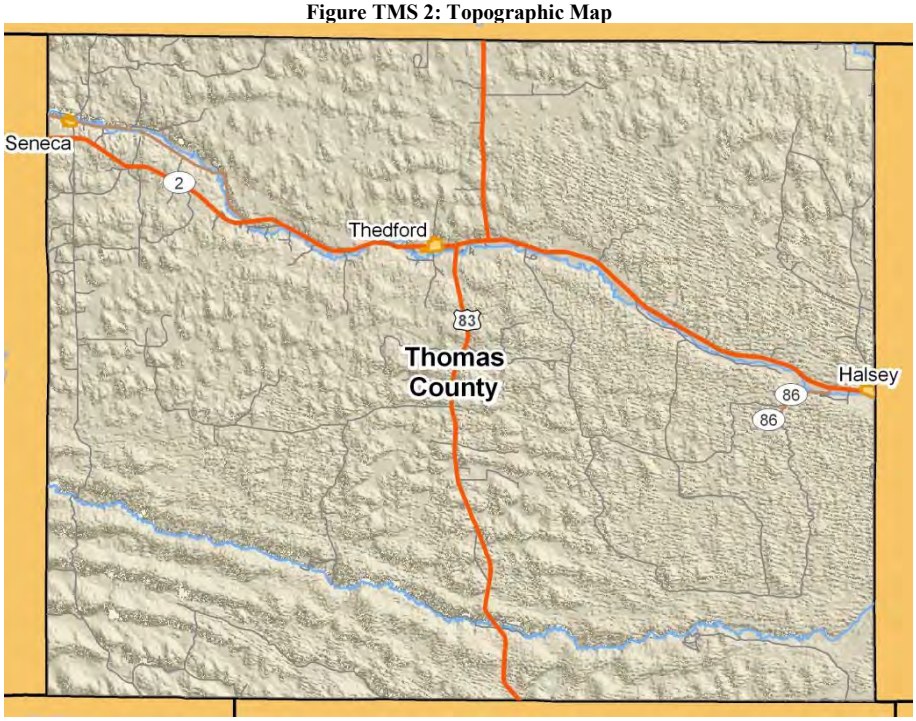
Figure TMS 1: Location



Thomas County contains two primary topographic regions according to the Conservation and Survey Division of the University of Nebraska- Lincoln. These include 'sand hills' across the large majority of the county and smaller areas of 'valleys' throughout the county. Sand hills are general categorized as hilly land composed of low to high dunes of sand stabilized by a grass cover. The sand dunes mantle stream-deposited silt, sand and

gravel and sandstone. Valleys are classified as flat-lying land along the major streams. The materials of the valleys are stream-deposited silt, clay, sand and gravel. Thomas County lies primarily in the Loup River Watershed.

Figure TMS 2: Topographic Map



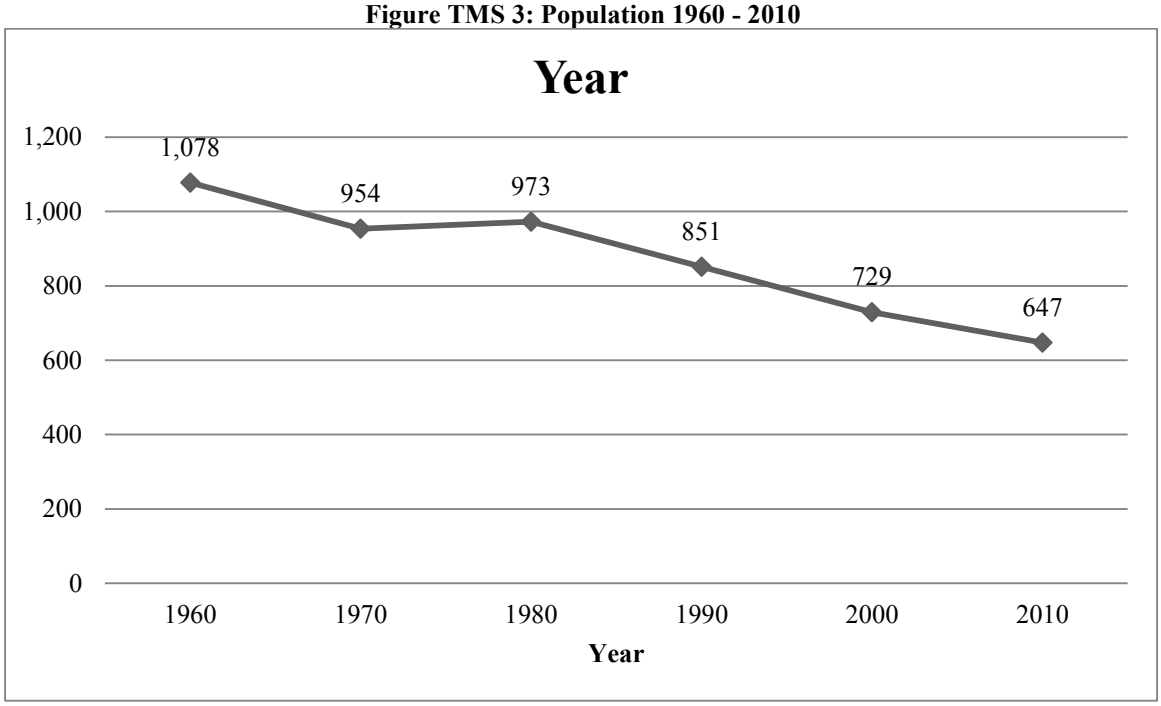
CLIMATE

Thomas County averages 23 inches of rain per year and 31 inches of snow. There are on average 226 sunny days annually. The highest temperatures occur in July when the average daily high is 86 degrees. January is the coldest month with an average high of 34 degrees.

DEMOGRAPHICS

Thomas County has experienced a decrease in population from 1960 to 1970 when the county lost 11 percent of its population. Between 1970 and 1980 the population grew to 973 about a 2 percent increase. Since then the population has declined. Declining populations increase the vulnerability of Thomas County. The majority of the increase vulnerability relative to a declining population has to do with the vacant properties which can result. Figure TMS 3 displays the historical population trend for Thomas County from 1960 to 2005.

Figure TMS 3: Population 1960 - 2010



Source: U.S. Census, 1960 – 2010

Table TMS 1 illustrates the population trends by jurisdiction from 1990 – 2010 and provides a population project for 2020 by applying the percent changed from 2000 to 2010 to the next decade.

Table TMS 1: Population Trend

Jurisdiction	1990 Population	2000 Population	2010 Population	Change 2000-2010	2020 Projected Population
Thomas County	851	729	647	-11%	576
Thedford	211	301	188	-38%	117

Source: U.S. Census, 1990 – 2010

The table illustrates a decline in the county and all incorporated jurisdictions from 2000 to 2010. During the twenty year period the village of Thedford experienced significant population fluctuation, increasing from 1990 to 2000 by 42 percent, only to experience a 38 percent decline from 2000 to 2010. Overall, the Thedford population change from 1990 to 2010 is less dramatic than it appears (decrease by 11 percent). Thomas County has experienced consistent population decline over the twenty year period. For Thomas County the population has declined by 24 percent from 1990 to 2010. Table TMS 2 illustrates the age distribution and median age of individuals by jurisdiction.

Table TMS 2: Population by Age

	Thomas County	Thedford
< 5 yrs.	5.1%	5.9%
5 - 64 yrs.	79%	71.2%
> 65 yrs.	20.9%	22.9%
Median Age	46.7	44.7

Source: US Census General Population and Housing Characteristics: 2010

HOUSING AND ECONOMICS

Median household income, per capita income, home value and rent for the county as a whole compare with broader state values as shown below.

Table TMS 3: Economic and Housing Value

	Nebraska	Thomas County	Thedford
Median Household Income	$49,342	$48,250	$46,625
Per Capita Income	$25,229	$31,499	$27,484
Median Home Value	$123,900	$71,100	$51,300
Median Rent	$648	$588	$538

Source: Selected Housing Characteristics: 2006 - 2010 ACS 5-year estimate

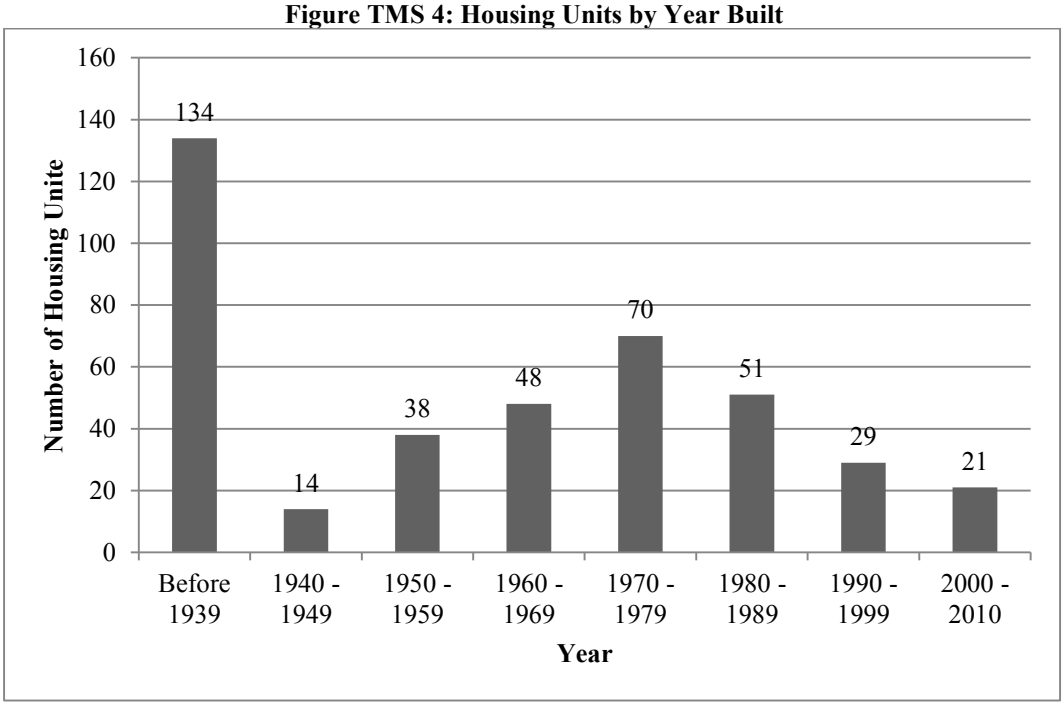
Table TMS 4: Housing Unit Occupancy

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Thomas County	332	82%	73	18%		256	77.1%	76	22.9%
Thedford	100	91.7	9	8.3%		80	80%	20	20%

Source: Selected Housing Characteristics: 2006 - 2010 ACS 5-year estimate

According to the US Census there are a total of 332 housing units; the majority of the units were constructed prior to 1960. In the county 18 percent of housing were reported vacant. Thedford, however, has very few vacant properties (8.3 percent of the total) and will likely need additional housing units in the near future.

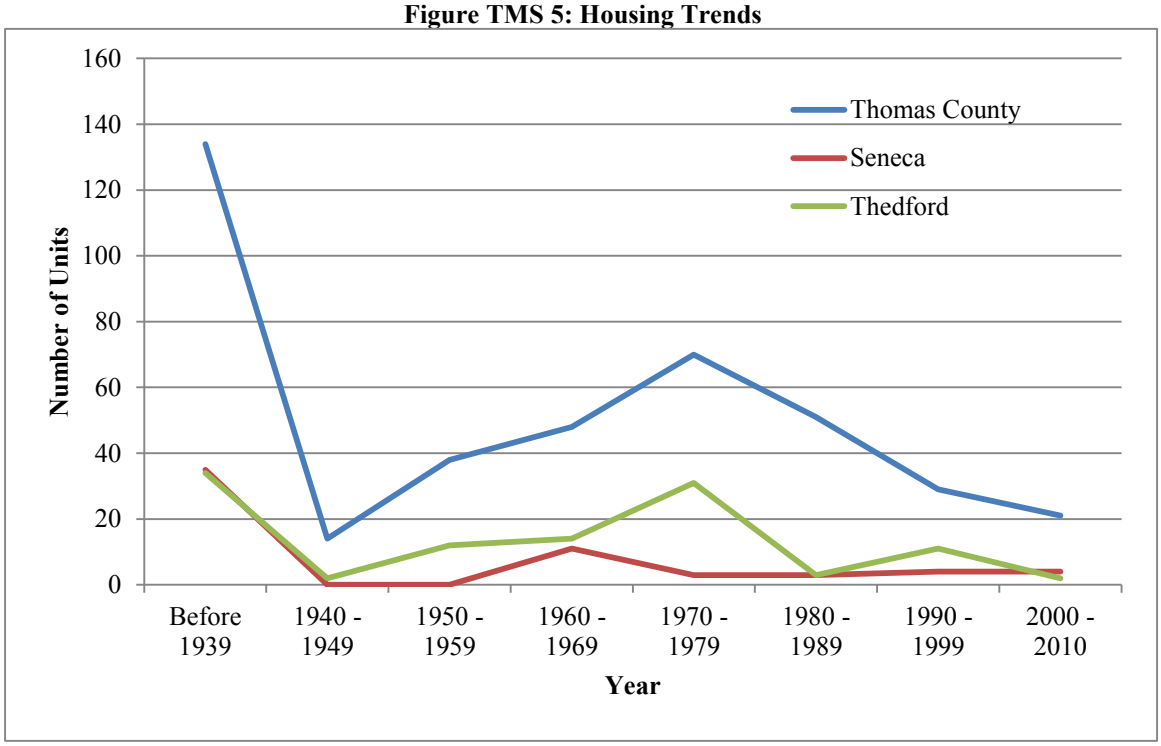
Figure TMS 4: Housing Units by Year Built



Source: Selected Housing Characteristics: 2006 -2010 ACS 5-year estimate

The age of construction for much of the county housing stock creates the potential for increased damages during extreme climactic events such as tornado, high winds, and blizzards. More than 33 percent of housing units were built before 1939. Approximately 46 percent of all housing units were built before 1960. The housing development trend for the counties and incorporated jurisdictions, Figure TMS 5, follow a very similar pattern. Peaks in development occurred pre-1939 and during the late 1960s, throughout the 1970s and well into the 1980s. Only 12 percent of housing units were constructed later than 1990.

Figure TMS 5: Housing Trends



Source: Selected Housing Characteristics: 2006 – 2010

CRITICAL FACILITIES

Thomas County critical facilities are addressed in the section for each individual community; this is a result of all county level critical facilities being located within the corporate limits of Thedford and in the recently disenfranchised Seneca.

Figure TMS 6: Participating Jurisdictions

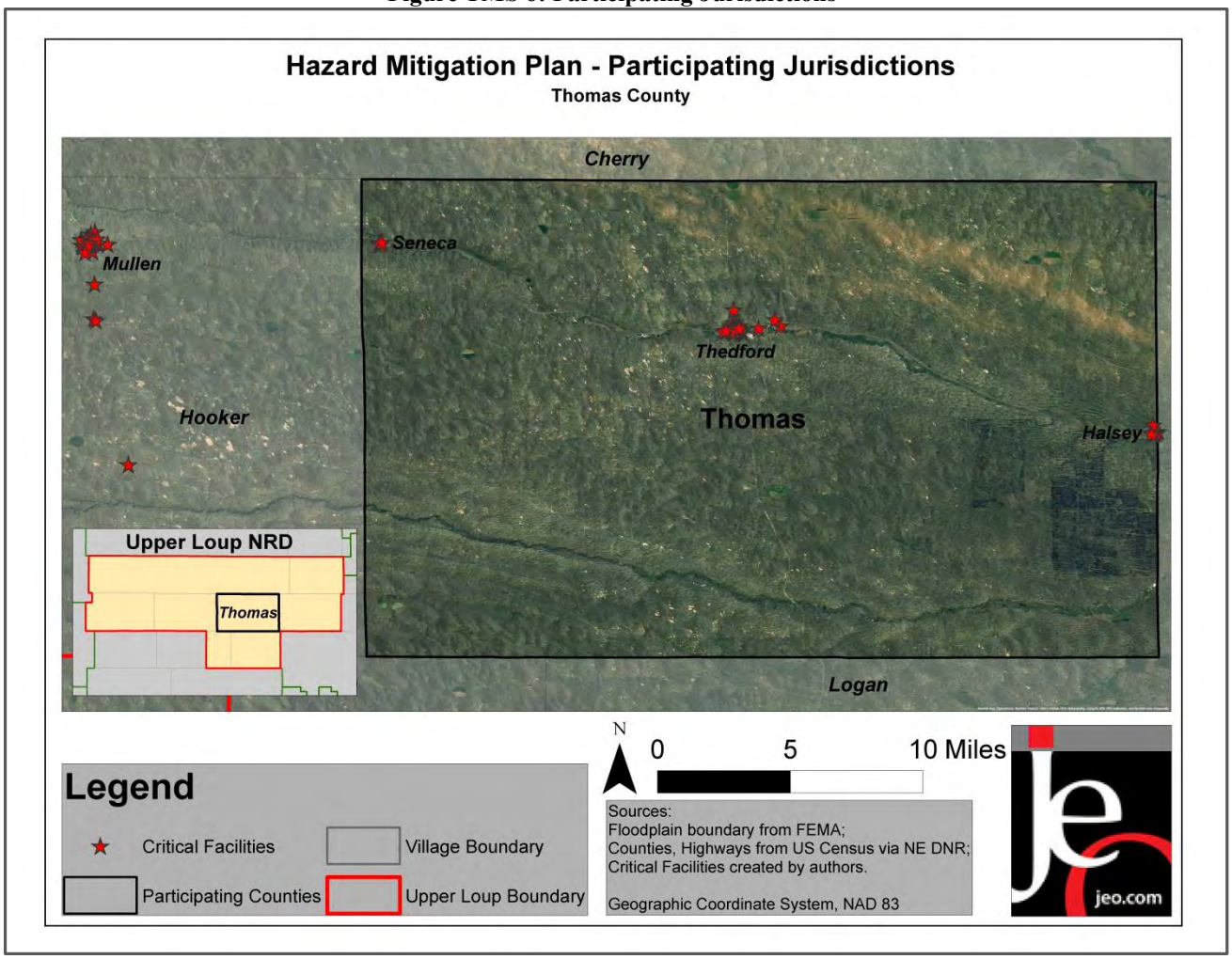
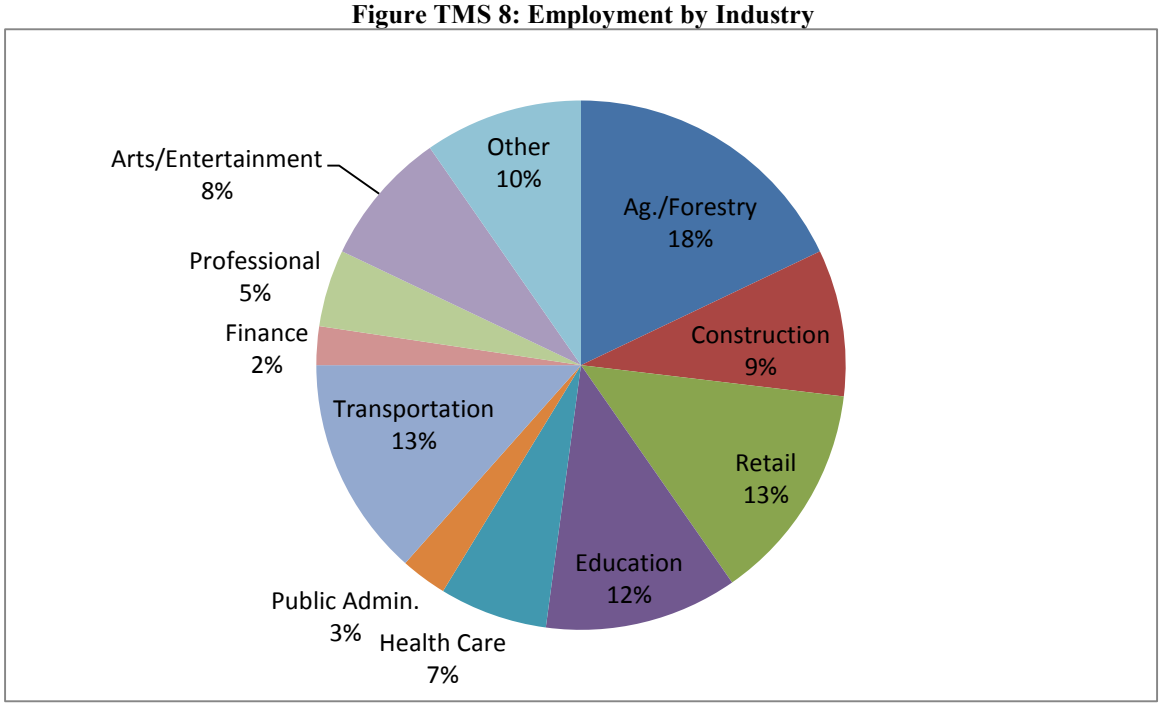


Figure TMS 7: Thomas County Courthouse

EMPLOYMENT

Figure TMS 8 shows employment by industry for Thomas County.

Figure TMS 8: Employment by Industry



Source: U.S. Census Economic Characteristics, 2010

Thomas County has a rather diverse economic situation. Agriculture and forestry jobs represent the largest individual section for the county economy at 18 percent of the total. Retail, transportation, and education combined represent 38 percent of the total economy.

AGRICULTURE

Agriculture is important to the economic fabric of Thomas County and Nebraska. Thomas County's 87 farms cover 367,535 acres of land, which accounts for 80 percent of the surface land in the county. Crop and livestock production are the visible parts of the agricultural economy, but many related businesses contribute as well by producing, processing and marketing farm and food products. These businesses generate income, employment and economic activity throughout the region.

Table TMS 5: Agricultural Inventory

Agricultural Assets	Inventory
Number of farms	87
Land in farms	367,535 acres
Estimated market value of land & buildings (per farm)	$2,125,345
Crop lands	8,007 acres
Cattle Inventory	39,471 head
Grain corn bushels	8,557
Silage corn tons	-

Source: USDA Census of Agriculture, 2012

Future Development Trends

Any future development will take place within the County as communities grow. See the participant sections of the communities for their own future development trends.

Structural Inventory and Valuation

For the purposes of this plan, a structural inventory for the unincorporated areas of the County was not required.

Risk Assessment

Hazard Identification

Table TMS 6 below is risk assessment completed for Thomas County. Refer to *Section 4: Risk Assessment* for an explanation as to what this methodology is.

Table TMS 6: Risk Assessment

Hazard	Previous Occurrence: Yes or No	County Hazard Ranking in NE 2014 State HMP	Specific Concerns Identified
Natural Hazards			
Grass/Wildfires	**Yes**	**High**	**Areas near the Halsey National Forest**
Drought	**Yes**	**High**	**Economic losses in the ag sector**
Hail Events	**Yes**	**NA**	**Economic impact especially in the ag sector. Damages to homes and other structures**
Severe Thunderstorms	**Yes**	**High**	**Frequency of occurrence, potential for secondary impacts (lightning causing wildfires)**
Extreme Heat	**Yes**	**NA**	**Elderly population and economic impacts (especially in ag sector)**
Tornados	Yes	High	Lack of safe rooms
High Winds	Yes	High	Frequency of occurrence
Severe Winter Storms	Yes	High	Roadway closures, economic impacts (livestock)
Animal Disease	Yes	High	Economic impacts
Plant Disease	Yes	High	Losses in crop farming
Earthquakes	No	Medium	None
Flooding	Yes	Medium	Mostly localized events, concerns related to transportation route closure(s)
Dam Failure	No	None	None
Landslides	No	NA	None
Man-made Hazards			
Chemical Spills (transportation)	Yes	Medium	Transportation of ag chemicals along roadways
Urban Fire	Yes	High	None
Radiological Incident (transportation)	No	Medium	None
Chemical spills (fixed site)	No	Medium	Ag chemical storage areas
Radiological Fixed Sites	No	None	None
Terrorism	No	Low	Tampering with water supplies
Civil Disorder	No	Low	None

According to the county planning team, the top hazards in Thomas County are drought, severe thunderstorms and hail events, extreme heat, and wildfire.

Historical Occurrence

The events recorded by NCDC are broken down to two types: county-based and zone-based events. The county-based records are events that affect the jurisdictions within the county while the zone-based records are those affecting the zone that include the county as part of the affected zone. Please refer to specific villages or cities within the county for the previous county-based severe weather events retrieved from NCDC. For zone-based events, there are 80 recorded events from 1996 to 2013, but due to the large number of the record, only those that resulted in property or crop damages are demonstrated in the county hazard profiles.

Agricultural Disease

Animal Disease

The local planning team identified animal disease as a top threat for the county. In a county where cattle out number people by a ratio of 82 to 1 animal disease is a big concern. With a majority of the area being farmers and ranchers any disease that occurs may lead to losses for the farmers in treatment and quarantine or at the market. According to the Nebraska Department of Agriculture there were no reported animal disease cases in 2013 or thus far in 2014. Diseases that occur within the bovine population include: Chronic Wasting Disease, Vesicular Stomatitis, and Bovine Tuberculosis. Table TMS 7 displays an inventory of cattle ranches and an estimate of cattle population and value within the county as provided by the *2012 USDA Agricultural Census*.

Table TMS 7: Agricultural Inventory – Live Stock

Thomas County Agricultural Inventory	
Number Of Cattle Ranches	76
Cattle Inventory	39,471
Approximate Value*	$84,862,650

Source: USDA 2012 Agricultural Census
**Per head price based on the Samuel Roberts Nobel Foundation, 2014*

Plant Disease

The local planning team identified animal disease as a low threat for the county. In Thomas County only 2 percent of agricultural lands are devoted to crop farming. Crop farming in Thomas County is difficult given the low annual rainfall totals, soil conditions, and terrain. According to the USDA the approximate price of corn per bushel in February of 2014 is $4.29. The total value of crops in Thomas County is approximately $36,710. The greater cost resulting from crop damage would result from increased livestock feed costs. Table TMS 8 displays an inventory of crop related agricultural assets.

Table TMS 8: Agricultural Inventory - Crops

Thomas County Agricultural Inventory	
Number of Crop Farms	4
Crop Lands	8,007 ACRES
Corn by Bushel	8,557
Approximate Value*	$36,710

Source: USDA 2012 Agricultural Census
**Per bushel price based on the USDA, 2014*

Drought

The local planning team ranked drought as a top threat for the county. Drought is generally a regional event, with impacts from a single drought event impacting multiple communities, counties, and even states. For the community, 18 percent of the workforce relies on agricultural based income and the local economy could be significantly affected during severe droughts. Drought impacts are always not as visual as impacts of other natural hazards and are hard to quantify. The planning team for Thomas County reported significant impacts during/after the 2012 drought. Across the county and planning area there were sizable economic impacts resulting from premature cattle sales. During the drought there was less grazing and higher prices for feed, as a result ranchers sold cattle sooner and at a lower weight than typical. The result was lower incomes for ranchers and secondary agricultural businesses as well as a depletion of cattle stock for subsequent years. This one year drought event will impact the entire economy and especially ranching in Thomas County for several years to come. Thedford did not report specific drought impacts.

Table TMS 9: Historic Drought Events

Hazard	Date	Extent	Property Damage	Crop Damage
Drought	6/1/2012 – 1/1/2014	D0 – D4	$1,000,000	$500,000

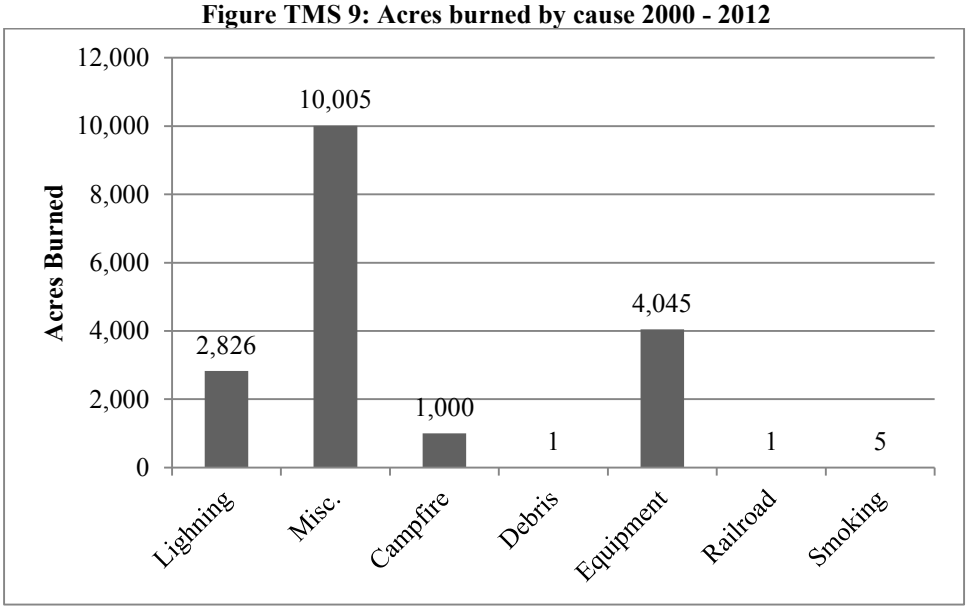
Source: NCDC

Fire

Grass/Wildfire

The county planning team identified grass/ wildfires as the greatest threat for Thomas County. According to the Nebraska Forestry Department there were 39 reported fires by the Thedford Fire Departments from 2000 to 2012 which consumed a total of 17,380, 500 forest acres, and 1 acre of crop land. The fires also resulted in more than $57,950 in damages to crops and $275,000 in damages to structures. Of the reported fires the most frequent cause us lightning (49 percent), followed by equipment fires (18 percent). The location of the Halsey National Forest increases the vulnerability within Thomas County related to grass/wildfires.

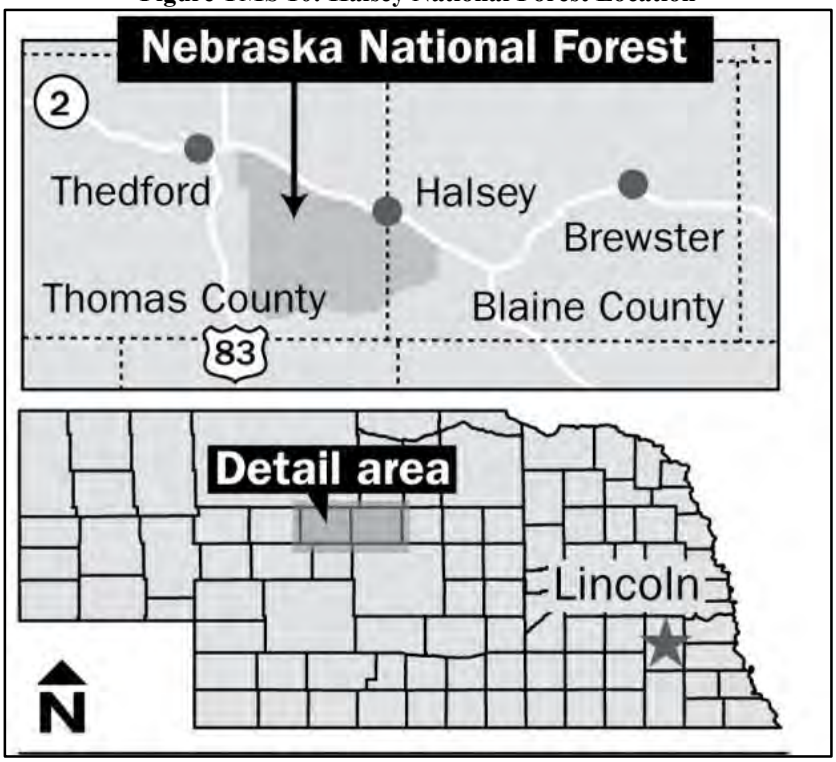
Figure TMS 9: Acres burned by cause 2000 - 2012



Source: Nebraska Forestry Service

The Halsey National Forest is located in both Blaine and Thomas Counties, with the majority of the forest in Thomas County. The Nebraska Forestry Service has been instrumental in developing and establishing Forest Fuels programs in the Niobrara Valley and Pine Ridge areas of Nebraska. Blaine and Thomas Counties may pursue forest fuels programs as needed to manage the wildfire risk posed by the Halsey National Forest.

Figure TMS 10: Halsey National Forest Location



Urban Fire

The county planning team identified urban fire as a low threat for the unincorporated areas of the county. Table TMS 10 shows the number of calls responded to by the two fire departments within the county. It should be noted that reporting fire calls to the Nebraska Fire Marshal's office is voluntary, as a result this is likely an incomplete list of fire calls from 2008 – 2013.

Table TMS 10: Fire Calls from 2008-2013

	Fires	Ruptures	Rescue/EMS	Haz. Mat	Service Calls	Good Intent Calls	False Alarms	Severe Weather	Special Incidents
Thomas	3	0	0	0	0	0	0	0	0

Source: NE State Fire Marshal: FDID Incident Type Summary Report 2008 - 2012

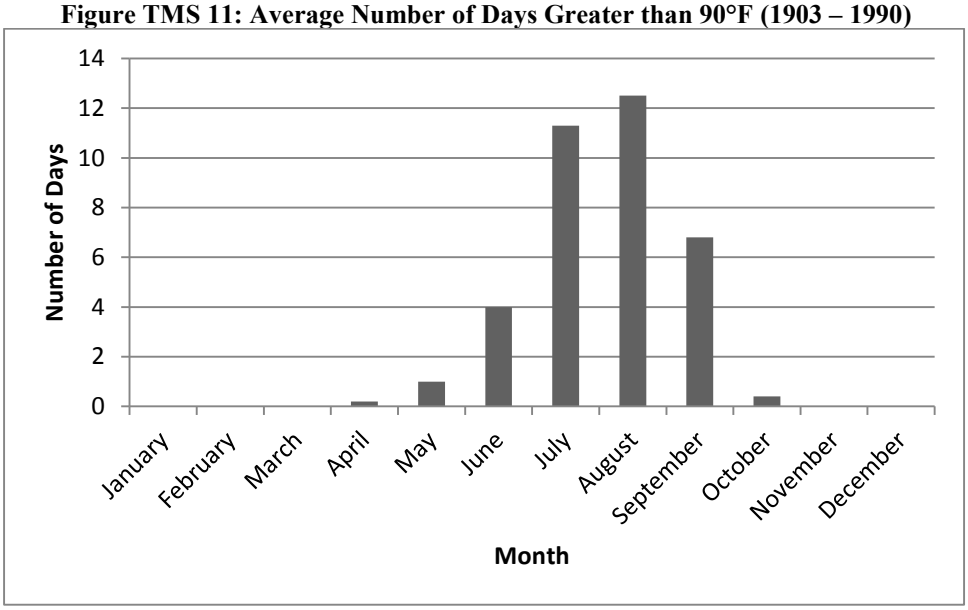
Overall, the fire departments located within the county are capable of responding to nearly all calls they receive. In a situation where additional resources are needed, there are mutual aide agreements between the various departments which provide redundancy as needed. The building stock throughout the county and planning area are mostly older structures which would burn quickly if ignited.

Severe Weather

Extreme Heat

Extreme heat is a natural part of the climate in Thomas County. The High Plains Regional Climate Center does not have a data collection station located in Thomas County so it is not possible to report count specific data related to annual climatic extremes or patterns. Data from Blaine County (immediately east of Thomas County) Cherry County (immediately north) and Hooker County (immediately west) were averaged to provide an estimate for this plan. Figure TMS 12 illustrates the average number of days annually that Blaine, Cherry, and Hooker Counties experience of temperatures 90 degrees or higher. Across the county the median age is just over 46 years and more than 20 percent of the population is age 65 or greater. In the community Thedford the percentage of residents over the age of 65 years is much greater. An aging population will be more vulnerable to the impacts resulting from extreme heat. In addition, a significant portion of the county economy relies on the agricultural industry which can be severely impacted during periods of prolonged high temperatures.

Figure TMS 11: Average Number of Days Greater than 90°F (1903 – 1990)



Source: High Plains Regional Climate Center

Hail Events

The county planning team identified hailstorms as a threat for Thomas County. NCDC data records 99 events with a total of $212,000 in property damages and $128,000 in monetary losses recorded to crops. A summary of the events with recorded damages can be found in the participant sections. Hail in the unincorporated areas of the county is most likely to impact the agricultural areas of the county. There are more than 8,000 acres devoted to crops, primarily corn. Hail storms can have devastating impacts on crops, causing up to a 100 percent loss.

Severe Thunderstorm

Severe thunderstorms are a regular part of the climate across the ULNRD and Thomas County is no exception. The planning team estimated that severe thunderstorms were highly probable in the future, but given the frequency of occurrence residents across the county are mostly prepared for the events and able to effectively cope with their occurrences. NCDC data records 15 events with a total of $2,000 in property damages. A summary of the events with recorded damages can be found in the participant sections where they occurred. All but one event reported strong winds between 60 and 90 miles per hour. Damages reported include downed trees and tree limbs.

Severe Winter Storm

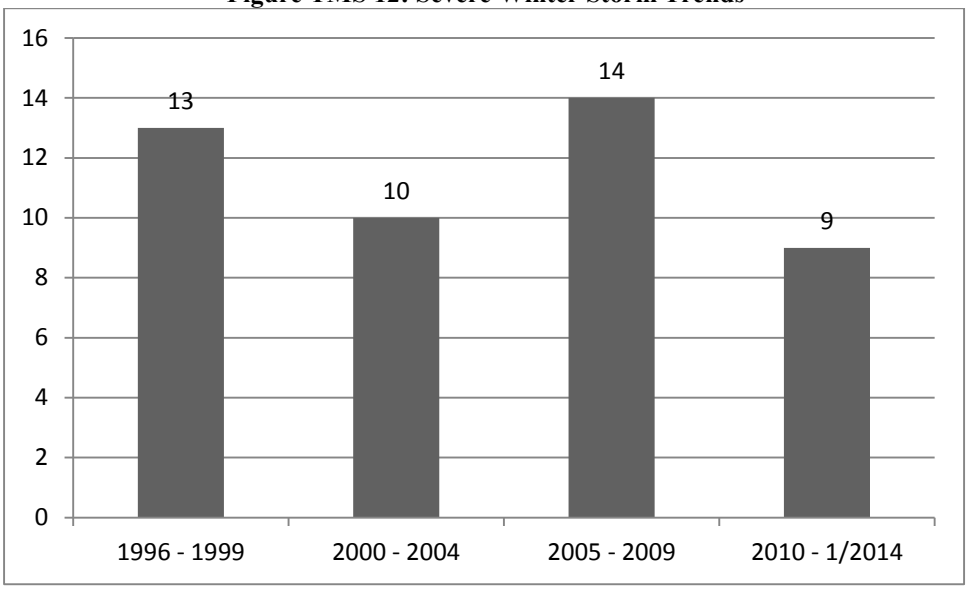
Severe winter storms are a regular part of the climate across the ULNRD and Thomas County is no exception. The planning team estimated that severe winter storms were highly probable in the future, but given the frequency of occurrence residents across the county are mostly prepared for the events and able to effectively cope with their occurrences. According to the NCDC there were 46 severe winter storms in Thomas County from 1996 through January 2014. These events resulted in $32,000 in property damage. The most costly event occurred in April of 2009 when a combination of heavy snowfall (6 – 10 inches) and strong north winds resulted in closed roadways, power outages, and the death of several newborn calves.

Table TMS 11: Historic Severe Winter Events

Date	Extent	Property Damage	Crop Damage
4/4/2009	6 – 18" snow, 30 – 40 mph winds	$20,000	$0
12/19/2006	3 – 8" snow, 35 – 45 mph winds	$8,000	$0
11/28/2005	3 – 8" snow, 55 – 75 mph winds	$4,000	$0
Total	**-**	**$32,000**	**$0**

Source: NCDC

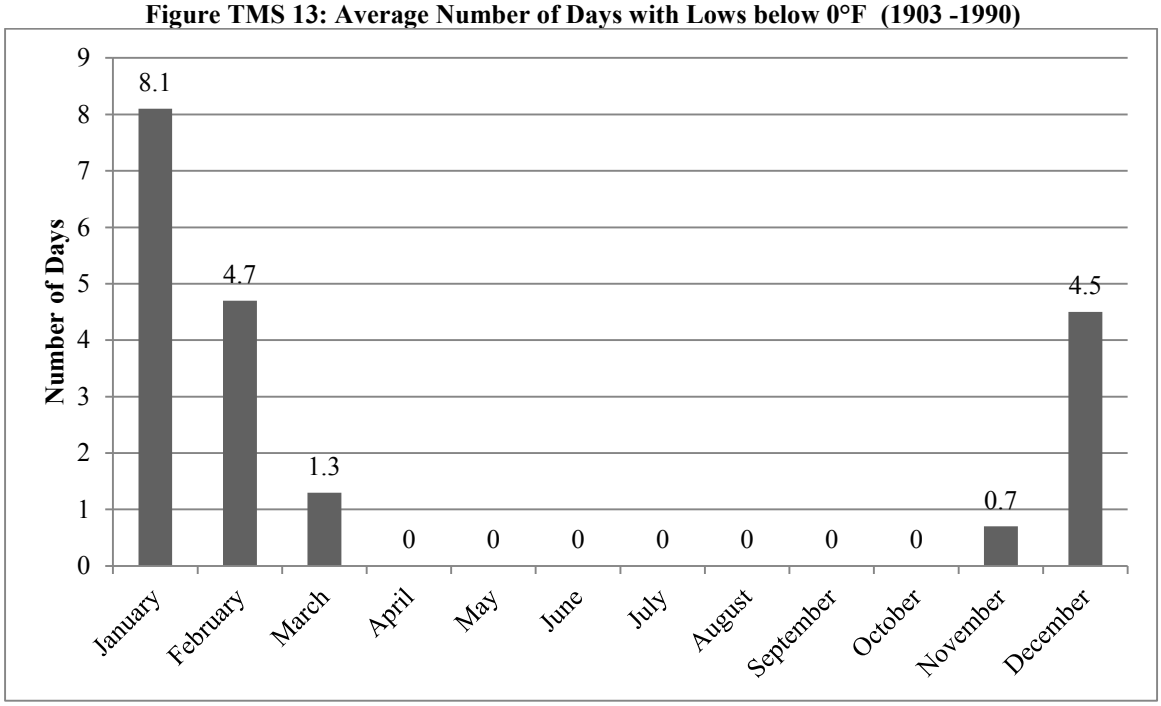
Figure TMS 12: Severe Winter Storm Trends



Source: NCDC

Most recorded events included a combination of factors including snow, wind, and ice. There were six reported events resulting from extreme cold temperatures solely. Extreme low temperatures events in Thomas County reported temperatures between 35 and 40 degrees below zero.

Figure TMS 13: Average Number of Days with Lows below 0°F (1903 -1990)



Source: High Plains Regional Climate Center

Tornado and High Winds

The county planning team identified tornados and high winds as a low threat for Thomas County. The NCDC recorded 16 high wind events with a total of $20,000 in crop damage and two tornados which caused $50,000 in property damages. A summary of the events with recorded damages can be seen in Table TMS 12.

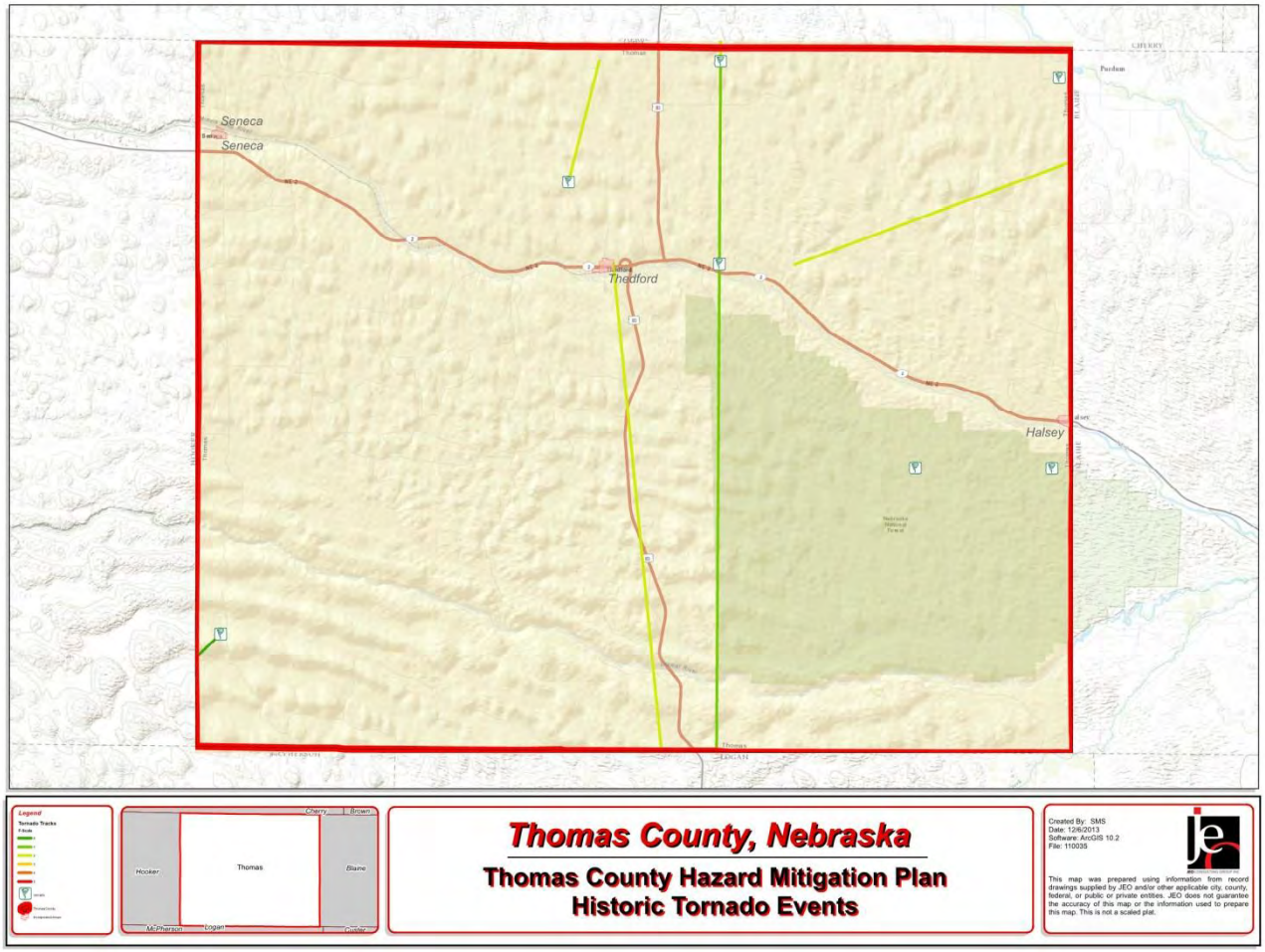
Table TMS 12: Historic Tornado Events

Hazard	Date	Extent	Property Damage	Crop Damage
High Wind	11/1/1997	40 kts.	$0	$20,000
Tornado	6/4/1999	F2	$50,000	$0

Source: NCDC

Figure TMS 14 shows historic tornado tracks that have passed through Thomas County. The most significant event was an F2 tornado which passed nearby to the village of Thedford. The tornado was on the ground for approximately 15 miles and destroyed numerous windmills, miles of fences, and numerous trees.

Figure TMS 14: Historic Tornado Tracks

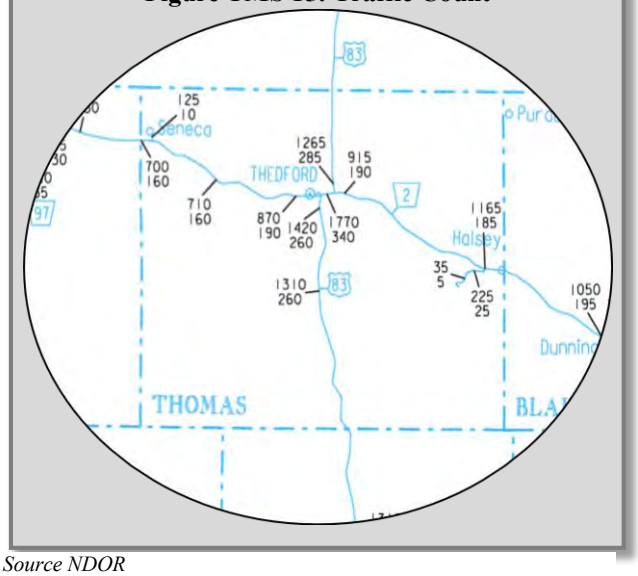


Source: NOAA SPC

Terrorist Incidents

The planning team for the county ranked terrorism as a low concern. There has been no history of terrorist activity in or around Thomas County. The primary concerns related to terrorism discussed by the planning team include agro-terrorism and school violence. While it is not likely that attacks would occur in Thomas County or throughout the planning area the community could consider facility hardening measures at critical facilities and key infrastructure to address this concern. Currently municipal water tanks and wells are located in fenced in areas to guard against tampering.

Figure TMS 15: Traffic Count



Source NDOR

Transportation Incidents /Chemical Spills/ Radiological Incident

The local planning team identified a major transportation incident as a low/moderate threat for the county. Incidents could be a train derailment or a mass casualty highway accident. According to the PHMSA incident reports there have been two spills reported from 1980 to 2013 which release approximately 8,800 liquid gallons (LGA) of gasoline mixed with ethyl alcohol causing $57,026 in damages.

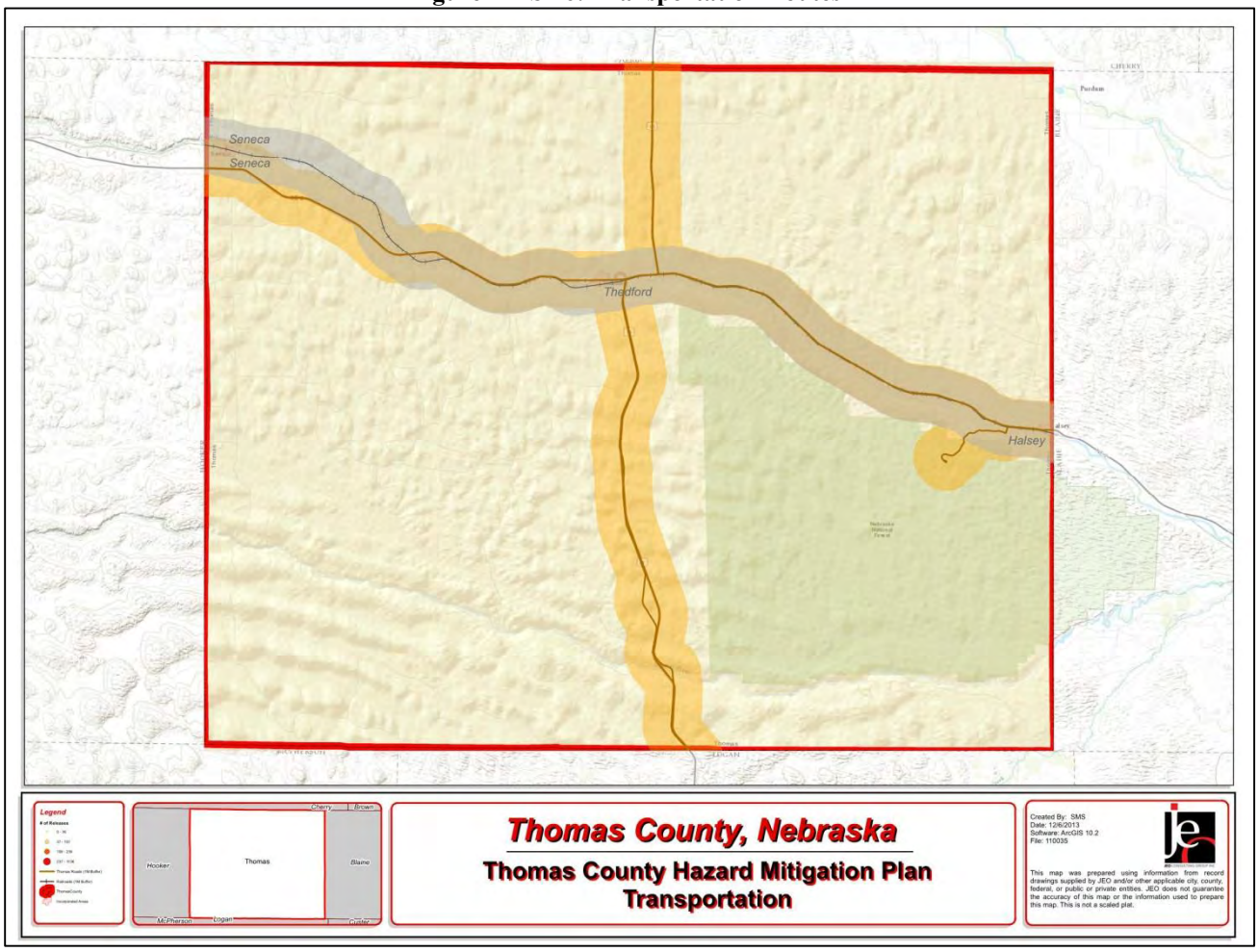
Table TMS 13: Chemical Spill Events

Location	Mode of Transport	Material Released	Amount	Impacts/Damages
Thedford	Rail	Ammonium nitrate fertilizers	0.5 SLB	$3,202
Thedford	Highway	Gasoline includes gasoline mixed with ethyl alcohol	*,800 LGA	$53,824

The primary transportation routes through the county include US HWY 2 and NE HWY 83. The heaviest traffic occurs along US HWY 2 which cuts through the center of the county. The traffic count for US HWY 2 on the eastern boarder of the county where the highway crosses the county line the NDOR reports daily usage by 1,165 light vehicles and 185 heavy trucks; on the western county board the NDOR reports 700 light vehicles and 160 heavy trucks a day. Traffic counts for NE HWY 83 center around the Thedford area. The NDOR traffic count for NE HWY 83 north of Thedford reports 1,265 light vehicles and 285 heavy trucks per day; south of Thedford the count is 1,310 light vehicles and 260 heavy trucks per day.

It is difficult to determine what materials are being transported along this route, but based on historic records from across the planning area fuel oils or agricultural materials are the most likely material to be released.

Figure TMS 16: Transportation Routes



Capability Assessment

Thus far the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism in understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capabilities, administrative & technical capability, fiscal capability, and education & outreach capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

UNINCORPORATED THOMAS COUNTY GOVERNANCE

The jurisdiction of Thomas County includes all unincorporated areas within the County boundaries. The Thomas County government structure is a three member Board of Commissioners. The Thomas County government includes the following departments and offices:

- Assessor's Office
- Attorney's Office
- Clerk's Office
- Clerk of the District Court
- Election Commissioner
- Department of Roads
- Emergency Management
- Veteran's Service Officer
- Extension Office
- GIS/IT (provided by contractor)
- Register of Deeds
- Sheriff's Office
- Technology/Website
- Treasurer's Office
- Weed Superintendent

Table TMS 14: Capability Assessment Survey

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	Yes, 2007
	Capital Improvements Plan	No
	Hazard Mitigation Plan	Yes
	Economic Development Plan	No
	Emergency Operational Plan	Yes
	National Resources Protection Plan	No
	Open Space Preservation plan	No
	Floodplain Management Plan	No
	Storm Water Management Plan	No
	Zoning Ordinance	Yes, 2007
	Subdivision Regulation/Ordinance	No
	Floodplain Ordinance	No
	Building Codes	No
	National Flood Insurance Program	No
	Community Rating System	No
	Other (if any)	NA
Administrative & Technical Capability	Planning Commission	Yes (seven person)
	Hazard Mitigation Planning Commission	Yes (three person)
	Floodplain Administration	No
	Emergency Manager	Yes (Regional and County)
	GIS Coordinator	Yes
	Chief Building Official	No
	Civil Engineering	No
	Staff Who Can Assess Community's Vulnerability to Hazards	Multiple Staff & Residents
	Grant Manager	Yes
	Other (if any)	NA
Fiscal Capability	Capital Improvement Project Funding	Yes
	Community Development Block Grant	No

Survey Components/Subcomponents		Comments
	Authority to Levy Taxes for Specific Purposes	Yes
	Gas/Electric Service Fees	No
	Storm Water Service Fees	No
	Water/Sewer Service Fees	No
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	Yes
	Other (if any)	NA
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	No
	Natural Disaster or Safety related school programs	No
	StormReady Certification	No
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	No
	Other (if any)	NA

SUMMARY

Planning mechanisms for Thomas County have not been updated since the development of the 2009 hazard mitigation plan, therefore there is little from the hazard mitigation plan that has been incorporated into planning and regulatory devices. In the next update of the county's comprehensive plan Thomas County should consider incorporating information from the hazard mitigation plan into the comprehensive plan. If the county were to develop a Capital Improvement Plan mitigation projects with a high priority should be included. The county should consider updating zoning regulations that prevent development in hazard prone areas.

Mitigation Strategy

COMPLETED MITIGATION PROJECTS

None reported.

ONGOING MITIGATION PROJECTS

Description	Backup Generators
Analysis	Provide a portable or stationary source of backup power to redundant power supplies, municipal wells, lift stations, and other critical facilities and shelters.
Goal/Objective	Goal 1/Objective 1.1
Hazard(s) Addressed	Tornados and high winds, severe winter storms, severe thunderstorms
Estimated Cost	$15,000-$30,000 per generator
Benefits	Back-up power for critical facilities (i.e. nursing home). A measure that would reduce or prevent damage to property or prevent loss of life or serious injury.
Potential Funding	HMGP
Timeline	5 years
Priority	High
Lead Agency	Thomas County Board, Region 26 EMA
Action since 2009 plan	None

Description	Storm Shelter / Safe Rooms
Analysis	Design and construct fully supplied storm shelters and safe rooms in highly vulnerable areas such as mobile home parks, campgrounds, school, and other areas.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Tornados and high winds, severe thunderstorms, severe winter storms
Estimated Cost	$200-$300/sf stand alone; $150-200/sf addition/retrofit
Benefits	Useful for many residents that do not have basements or cellars to go for shelter, especially beneficial for the nursing home and other vulnerable populations
Potential Funding	PDM, HMPG
Timeline	10 years
Priority	High
Lead Agency	Thomas County Board, Region 26 EMA
Action since 2009 plan	None

Description	Snow Fences
Analysis	Construct snow fences to protect main transportation routes and critical facilities from excessive snow drifting and road closure.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Severe winter storms
Estimated Cost	$1,000+
Benefits	Increase road accessibility to the majority of people which live in rural areas; increase road access for emergency vehicles
Potential Funding	ULNRD, PDM, HMGP, NRCS Cost-share, FAS, NGPC
Timeline	Ongoing
Priority	Low
Lead Agency	Thomas County Board, ULNRD, Custer Public Power, Nebraska Department of Roads
Action since 2009 plan	Ongoing action; snow fences are installed annually, as such this action is reported as ongoing

Description	Drainage Improvements
Analysis	The county utilizes stormwater systems comprising of ditches, culverts, and drainage ponds to convey runoff. Undersized systems can contribute to localized flooding. Drainage improvements may include ditch upsizing, ditch cleanout and culvert improvements. Drainage ponds, both retention and detention, may also be implemented to decrease runoff rates while also decreasing the need for other stormwater system improvements.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Flooding
Estimated Cost	$10,000-$50,000
Benefits	These improvements can serve to more effectively convey runoff within jurisdictions, preventing interior localized flooding resulting in damages in all villages.
Potential Funding	HMGP, CDBG
Timeline	Ongoing
Priority	Medium
Lead Agency	Thomas County Department of Roads
Action since 2009 plan	Basic maintenance activities have been completed on a regular basis; there are no specific project to report progress on.

Description	Fire Wise Defensible Space
Analysis	Work with the Nebraska Forest Service and US Forest Service to become a Fire Wise Communities/USA participant. Develop a Community Wildfire Protection Plan. Train land owners about creating defensible space. Enact ordinances and building codes to increase defensible space, improve building materials to reduce structure ignitability, and increase access to structures by responders. Develop and implement brush and fuel thinning projects.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Wildfire
Estimated Cost	$20,000
Benefits	Structures are less vulnerable to wildfire, easier for firefighters to defend structure during a wildfire event, and removes fuel from an approaching fire.
Potential Funding	HMGP, NFS, USFS, ULNRD, NGPC, National Fire Plan
Timeline	5 years
Priority	High
Lead Agency	Thomas County Board, Fire Departments, Nebraska Forestry Service
Action since 2009 plan	None

Description	Enroll in the National Flood Insurance Program (NFIP)
Analysis	Participate in the National Flood Insurance Program (NFIP). (Contact NDNR at 402.471.3932 for any questions or to request educational material on NFIP.
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Flooding
Estimated Cost	N/A
Benefits	Enable property owners to purchase insurance protection against flood losses. Good standing enables participants to apply for PDM and HMGP cost-share.
Potential Funding	N/A
Timeline	5 years
Priority	High
Lead Agency	Thomas County Board, NDNR
Action since 2009 plan	None

Description	Public Awareness / Education
Analysis	Through activities such as outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. In addition, educate citizens on erosion control and water conservation methods. Educate residents on response and rescue plans for all hazard types.
Goal/Objective	Goal 3/Objective 3.1 and Goal1/Objective 1.1
Hazard(s) Addressed	All hazards
Estimated Cost	$500+
Benefits	Increase knowledge to new comers to the area as well as elderly in how to react when an event is going to occur or is occurring. Education to reduce or prevent damage to property or prevent loss of life or serious injury.
Potential Funding	HMGP, PDM
Timeline	Ongoing
Priority	Medium
Lead Agency	Thomas County Board, Region 26 EMA, NEMA, NDNR, ULNRD
Action since 2009 plan	Ongoing educational efforts from regional emergency management office

Description	Civil Service Improvements
Analysis	Improve emergency rescue and response equipment and facilities by providing additional, or updating existing emergency response equipment. This could include fire trucks, ATV's, water tanks/truck, snow removal equipment, etc. This would also include identifying and training additional personnel for emergency response.
Goal/Objective	Goal 4/Objective 4.1
Hazard(s) Address	All Hazards
Estimated Cost	Varies depending on what equipment is needed
Benefits	Increase local capabilities to respond to disasters
Potential Funding	Homeland Security, Emergency Management, NEMA, Governing County and Board of Commissioners, Nebraska Forest Service
Timeline	On-going
Priority	Low
Lead Agency	Fire Department, Thomas County Sheriff's Office, Region 26 Emergency Management, Board of Commissioners
Action since 2009 plan	Ongoing training of emergency response staff

Description	Weather Radios
Analysis	Conduct an inventory of weather radios at schools, rural residents, and other critical facilities and provide new radios as needed.
Goal/Objective	Goal 4/Objective 4.3 and Goal 1/Objective 1.1
Hazard(s) Addressed	All hazards
Estimated Cost	$50/per radio
Benefits	Help those who do not have access to local TV or radio warnings
Potential Funding	HMGP, PDM
Timeline	Ongoing
Priority	High
Lead Agency	Thomas County Board, Fire Department, Region 26 EMA
Action since 2009 plan	None

REMOVED MITIGATION PROJECTS

None

VILLAGE OF SENECA

HISTORY

Settlement began in the community of Seneca in 1887 when the Burlington Railroad pushed through the Middle Loup River Valley into the heart of the Sandhills in 1887. When construction stopped for the winter, the town of Seneca came into being. The town served as a railroad division point for 89 years. Highway 2, graveled in the beginning, followed the path of the wagons and railroad, right through the heart of Seneca. In the late 40s, Highway 2 was paved and changed its route up through the hills. Now all that can be seen of the town from the road is the small sign saying "Seneca" that way. In the summer of 2014 the residents of Seneca voted to dissolve the community, Seneca is now unincorporated and as such is covered under Thomas County.

VILLAGE OF THEDFORD

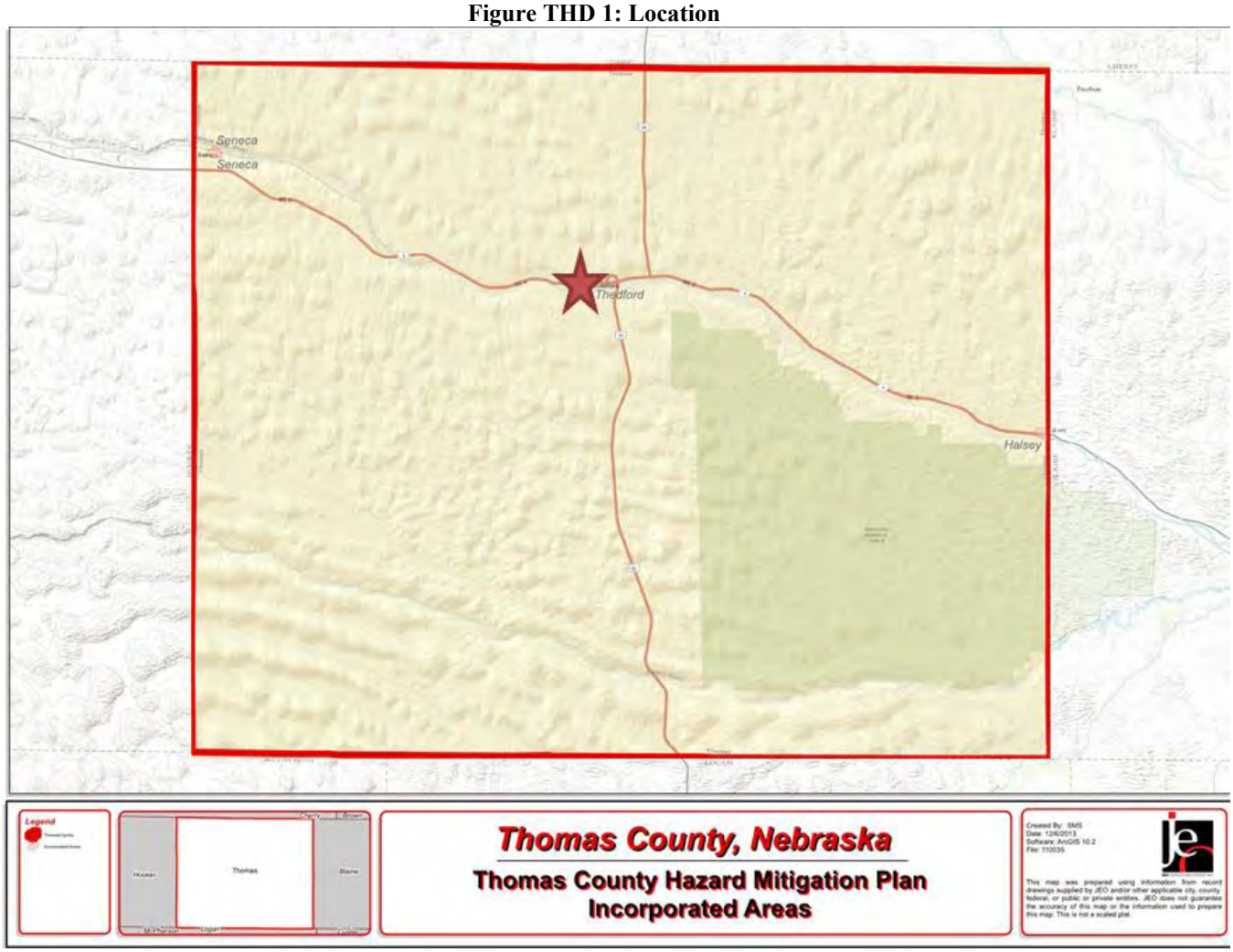
HISTORY

Settlement began in the community of Thedford in 1887 when the Chicago, Burlington & Quincy Railroad made it to the little settlement of Thedford. Many settlers arrived hoping to claim 160 acres of free land. This quickly proved to be inadequate in the semi-arid regions of the Sandhills, which was not suitable for cultivation. When the Kinkaid Act passed in 1904, 640 acres were allowed. By 1914, when Thedford was incorporated, the population was 138. Thedford is the county seat of Thomas County.

Location/Geography

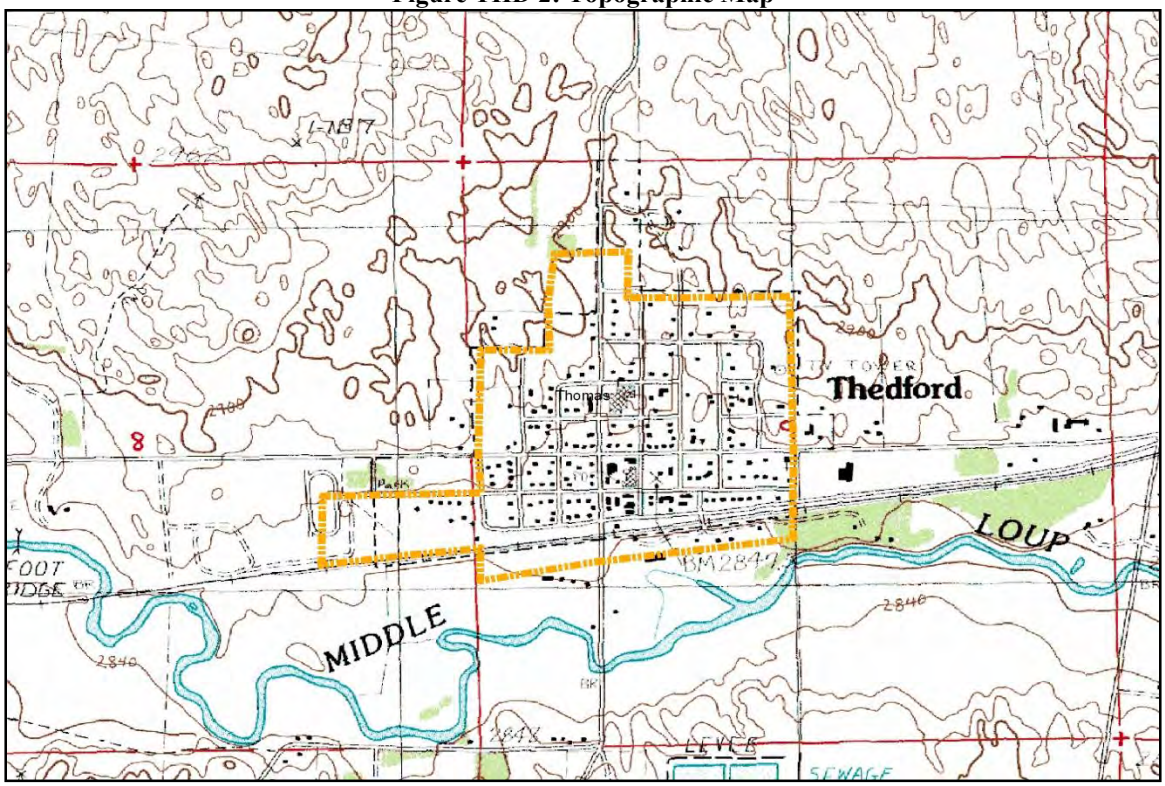
Thedford is a village located in the north central portion of Thomas County. The Village of Thedford covers an area of 153.6 acres and has an elevation of 2,848 feet above sea level. Thedford is 279.9 miles northwest of Lincoln.

Figure THD 1: Location



The community of Thedford lies in an area of sand hills. The land use surrounding the community is mainly ranching with some agricultural crops in the river valleys. Hilly land composed of low to high dunes of sand stabilized by a grass cover is prevalent. The community lies immediately north of the Middle Loup River valley. The watershed flows generally from the northwest to the southeast. A current floodplain has not been delineated for Thedford and river flooding is not a significant concern.

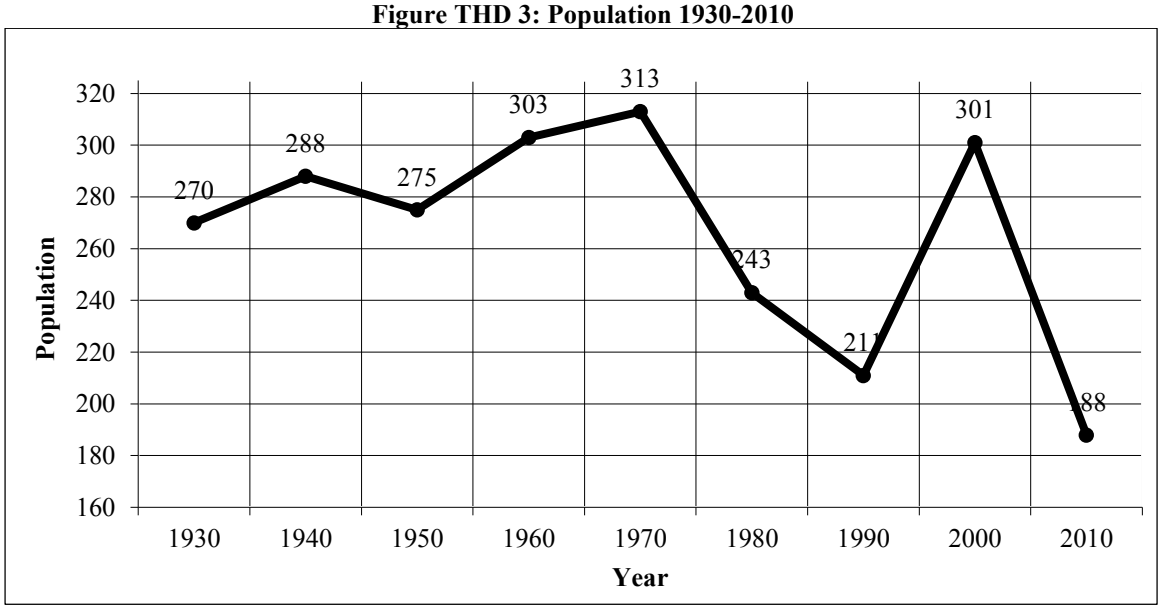
Figure THD 2: Topographic Map



DEMOGRAPHICS

The population of Thedford was fairly steady from 1930 until 1970 when it by 15 percent to 313. The population fell again in 1990 to 211 only to rebound to 301 in 2000. Since 2000 the population has declined by 38 percent to 188. This decline in population makes Thedford more vulnerable to hazards. Figure THD 3 displays the historical population trend for Thedford from 1930 to 2000.

Figure THD 3: Population 1930-2010



Source: US Census

Table THD 1 illustrates the age distribution and median age for Thomas County in comparison to the village of Thedford.

Table THD 1: Age Distribution

	Thomas County	Thedford
< 5 yrs.	5.1%	5.9%
5 - 64 yrs.	79%	71.2%
> 65 yrs.	20.9%	22.9%
Median Age	46.7	44.7

Source: U.S. Census, 2010

The average age for the residents of Thedford is close to those of the entire county. The median age is slightly lower than that of the county but not significantly.

HOUSING AND ECONOMICS

Median household income, per capita income, home value and rent for the county as a whole compare with that of Thedford are outlined in Table THD 2.

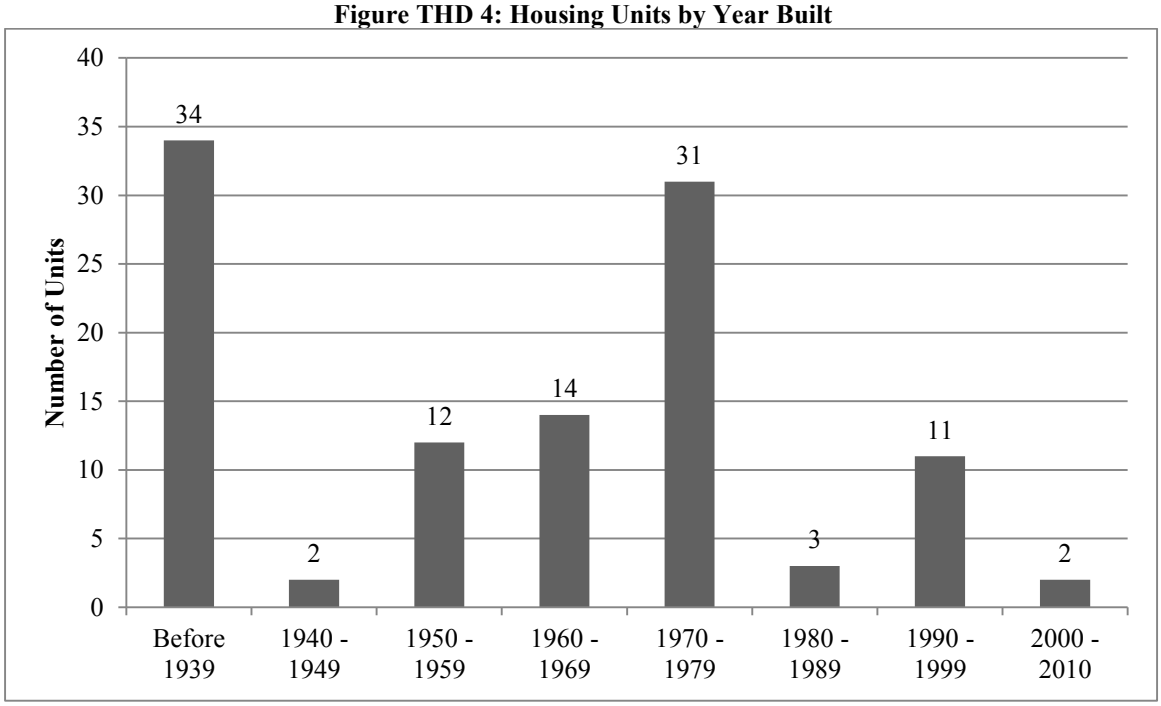
Table THD 2: Economy

	Thomas County	Thedford
Median Household Income	$48,250	$46,625
Per Capita Income	$31,499	$27,484
Median Home Value	$71,100	$51,300
Median Rent	$588	$538

Source: U.S. Census American Community Survey Housing Characteristics and Income, 2012

According to the U.S. Census there are a total of 109 housing units in Thedford. Of those 109 units only 8 percent (9 total units) are reported as vacant. More than 33 percent of all units (occupied and vacant) were constructed prior to 1950.

Figure THD 4: Housing Units by Year Built



Source: US Census 2006 - 2010 American Community Survey 5 Year Estimates

Table THD 3: Housing Unit Occupancy

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Thomas County	332	82%	73	18%		256	77.1%	76	22.9%
Thedford	100	91.7	9	8.3%		80	80%	20	20%

Source: US Census 2006 - 2010 American Community Survey 5 Year Estimates

STRUCTURAL INVENTORY AND VALUATION

A structural inventory was completed for the corporate limits of Thedford through a window survey using GIS for the 2009 hazard mitigation plan. The values of these structure types were determined from the 2013 Property Type Values as provided by the Nebraska Department of Revenue Property Assessment Division.

Results from the structural inventory completed by the Village of Thedford are found in Table THD 4.

Table THD 4: Structural Inventory

Total Structures		Structure Valuation	
Structure Type	Number of Structures	Total Value	Value per Structure
Commercial/Industrial	31	$1,701,362	$54,883
Out Building	61	$361,730	$5,930
Residential	131	$4,788,705	$36,555
Public/Quasi Public	18	$187,074	$10,393
Total	**241**	**$7,038,871**	NA

**Values are rounded to the nearest dollar.*

Critical Infrastructure/Key Resources

Figure THD 5: Critical Facilities

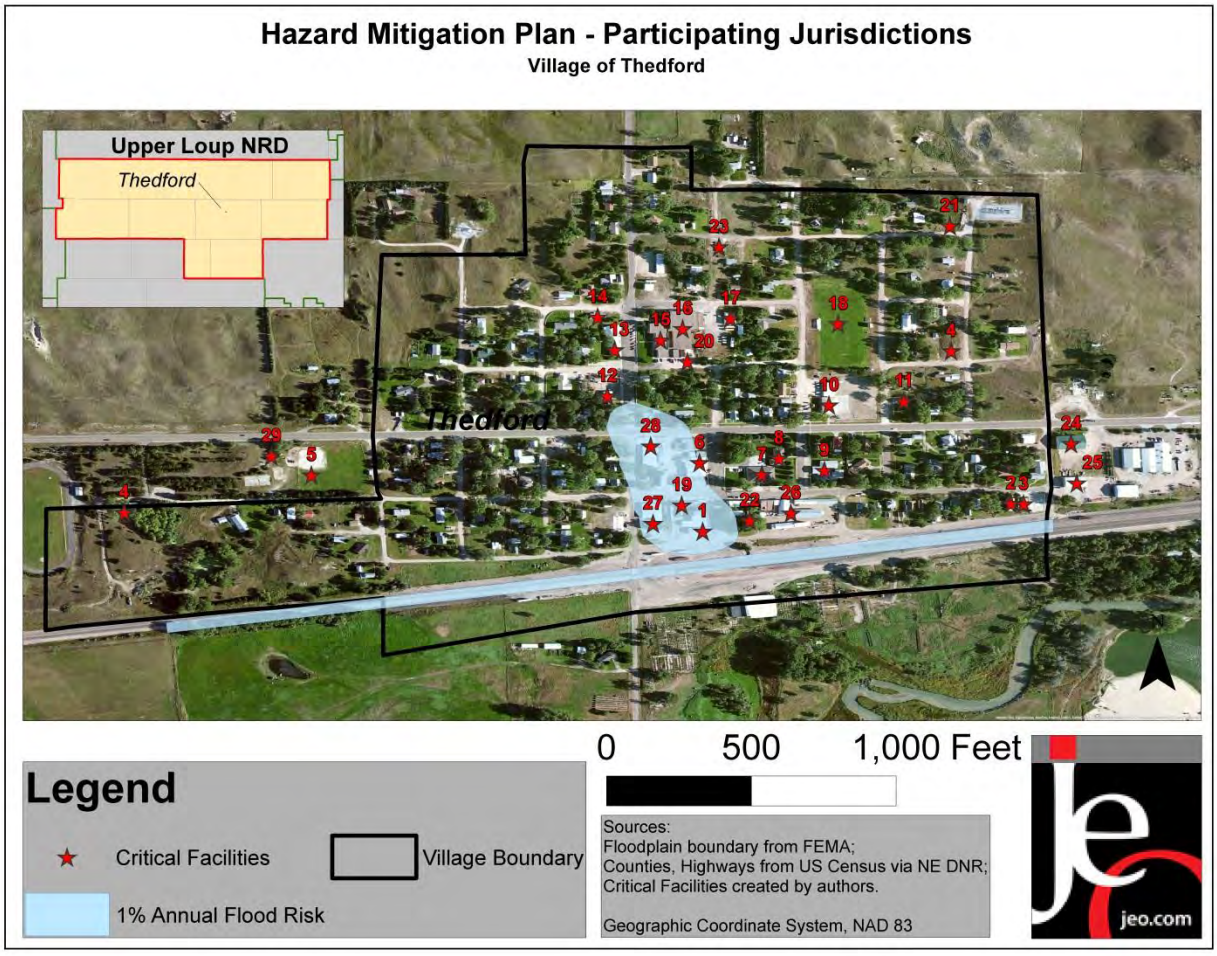


Table THD 5: Critical Facilities

Number	Name	Function
1	Fire Hall	Emergency Response
2	Church	Gathering Location/Emergency Shelter
3	Church	Gathering Location/Emergency Shelter
4	Public Park	Gathering Location
5	Ball Fields	Gathering Location
6	Post Office	Government function
#7	Thomas County Court House	Government function
#8	Public Library	Gathering Location
9	Church	Gathering Location/Emergency Shelter
10	Thedford Grade School	Vulnerable Population
11	Church	Gathering Location/Emergency Shelter
12	Village Shop	
13	Church	Gathering Location/Emergency Shelter
14	Church	Gathering Location/Emergency Shelter
15	Thedford High School	Vulnerable Population

16	Thedford High School	Vulnerable Population
17	Thedford High School: Transportation Shop	Vulnerable Population
18	Thedford Public Schools: Athletic Fields	Vulnerable Population/Gathering Location
19	Telephone Switching Station	Critical Facility
20/21/22	Well Pumping Station	Critical Facility
23	Water Tanks	Critical Facility
24	Upper Loup NRD Office	Government function
25	Custer Public Power Office/Shop	Critical Facility
26	Hardware Store	Critical Facility
27	Auto Supply/Garage	Critical Facility
28	Grocery Store	Critical Facility

FUTURE DEVELOPMENT TRENDS

The planning team identified a need for additional housing units in the near future. At this time only 8 percent of housing units are vacant. Thedford is expected to add 10 to 15 housing units within the next ten years. Growth is expected to occur north, east, and west of the village. The planning team discussed the necessity of developing outside of the floodplain as the community grows.

Risk Assessment

Hazard Identification

Table THD 6 is risk assessment completed for the community. Refer to *Section 4: Risk Assessment* for an explanation as to what this methodology is and why certain hazards did not pose a significant enough threat and were eliminated from detailed discussion due to the calculation.

Table THD 6: Risk Assessment

Hazard	Previous Occurrence: Yes or No	County Hazard Ranking in NE 2014 State HMP	Specific Concerns Identified
Natural Hazards			
Grass/Wildfires	**Yes**	**High**	**Fire moving from rangelands into incorporated areas**
Hail Events	**Yes**	**NA**	**Economic impact especially in the ag sector. Damages to homes and other structures**
Severe Thunderstorms	**Yes**	**High**	**Frequency of occurrence, potential for secondary impacts (lightning causing wildfires)**
Severe Winter Storms	**Yes**	**High**	**Roadway closures, economic impacts (livestock)**
Tornados	No	High	Lack of safe rooms
High Winds	Yes	High	Frequency of occurrence
Drought	Yes	High	Economic losses in the ag sector
Extreme Heat	Yes	NA	Elderly population and economic impacts (especially in ag sector)
Flooding	Yes	Medium	Mostly localized events, concerns related to transportation route closure(s)
Animal Disease	No	High	Economic impacts
Plant Disease	No	High	Losses in crop farming
Earthquakes	No	Medium	None
Dam Failure	No	None	None
Landslides	No	NA	None
Man-made Hazards			
Urban Fire	Yes	High	None
Chemical Spills (transportation)	Yes	Medium	Transportation of ag chemicals along roadways
Radiological Incident (transportation)	No	Medium	None
Chemical spills (fixed site)	No	Medium	Ag chemical storage areas
Radiological Fixed Sites	No	None	None
Terrorism	No	Low	Tampering with water supplies
Civil Disorder	No	Low	None

According to the risk assessment, the top hazards in the village of Thedford are grass/ wildfire, severe thunderstorms and hail events, and severe winter storms.

Historical Occurrences
The NCDC counted a total of 81 hazard events in the village of Thedford and there was no recorded of death or injury, but $254,000 of damage to property and $125,000 of damage to crops.

FIRE
Grass/wildfires
The local planning team identified grass/wildfire as a significant concern for the village. According to the Nebraska Forestry Department there were 39 reported fires by the Thedford Fire Department from 2000 to 2012 which consumed a total of 17,381 rangeland acres and 502 forest land acres. The fires also resulted in more than $57,950 in damages to crops and structures. The most significant fire took place in 2006 when more than 5,600 acres of range and forest lands were burned causing approximately $250,000 over multiple days.

Thedford is at increased risk related to wildfires due to the proximity to Halsey National Forest. Halsey National Forest was established in 1908 in an effort to establish a forest on land that had previously not had trees. The effort was successful

The Village does have an all-volunteer fire and rescue department with approximately 35 volunteers. In the past, the fire department has had sufficient resources to meet the needs of the Village and reports sufficient water pressure to support current levels of development and the expected growth.

SEVERE STORMS
Flooding
Potential losses associated with a flood event vary greatly depending on the severity of the event. In a 1 percent flood event, damages to structures in the flooding hazard area could approach the total replacement value of $778,644 for structures located in the SFHA. This does not include loss of displacement, functional downtime, economic loss, injury, or loss of life.

For the purposes of calculating potential losses, it was estimated that all structures in the flooding hazard area would sustain 20 percent building damage at a flood depth of two feet. The evaluation was based on the average for one to two story buildings with basements. This information is from the Flood Building Loss Estimation Table provided by the FEMA Benefit-Cost Analysis Full Data Module. Using this estimated flood event, the potential building damages in Thedford would be $155,731.

Table THD 7 summarizes the potential damages to structures in the corporate limits within Thedford's 1-percent annual flood hazard area.

Table THD 7: Structural Inventory in 1% Annual Floodplain

Structures in the 1-percent Annual Flood Boundary		Structural Valuation		
Structure Type	**Number of Structures**	**Average Value**	**Total Value**	**Approximate Damage Value**
Commercial/Industrial	12	$54,883	$658,596	$131,719
Out Building	0	NA	$0	$0
Residential	3	$36,555	$109,665	$21,933
Public/Quasi Public	1	$10,393	$10,393	$2,079
Total Structures	16	-	$778,644	$155,731

Hail Events
The county planning team identified hailstorms as a top threat for the village of Thedford. NCDC data records 61 events with a total of $154,000 in property damages and $125,000 in monetary losses recorded to crops. A summary of the events with recorded damages can be seen in Table THD 8.

Table THD 8: Hail Events

Date	Extent	Property Damage	Crop Damage
7/2/1996	1.75	$50,000	$0
6/5/1999	1.5	$0	$25,000
6/27/1999	1.75	$10,000	$25,000
6/27/1999	1.75	$7,000	$25,000
7/26/2000	1.75	$50,000	$0
7/26/2000	1.75	$5,000	$20,000
5/26/2002	1	$8,000	$5,000
8/11/2002	2.75	$15,000	$10,000
8/11/2002	1.75	$8,000	$3,000
8/11/2002	1	$2,000	$2,000
6/24/2003	2	$2,000	$0
5/22/2004	1.75	$30,000	$5,000
5/22/2004	1	$4,000	$0
5/22/2004	1	$1,000	$0
9/14/2004	1	$1,000	$0
6/2/2006	1.75	$3,000	$0
6/6/2009	1	$0	$5,000
6/15/2009	1.75	$8,000	$0
Total		**$252,000**	**$228,000**

Source: NCDC

Severe Thunderstorms
Severe thunderstorms are a regular part of the climate for Thomas County and Thedford. The county planning team identified severe thunderstorms as a threat for the village. The NCDC recorded 13 events with no significant damages to property or crops.

Severe thunderstorms and hail can result in loss of electricity, blocked roadways, damages to trees, and flooding. Blocked roadways, as a result of downed trees, may also present life safety concerns to those needing immediate medical attention. Currently the village has back-up power on the municipal well.

Severe Winter Storms
The local planning team identified severe winter storms as a significant concern for the community. NCDC data records severe winter storms as "zonal" events meaning there is not a specific record of what communities are impacted or at least what the level impacts were per community.

Tornados and High winds
The local planning team identified tornados and high winds significant concern for the community. According to the NCDC data, there were two tornados which passed nearby Thedford. The most severe tornado was a 1999 F2 which was profiled in the Thomas County tornado section. Reported damages occurred primarily in the unincorporated portions of the county.

In addition to the two tornados Thedford also has had multiple storms with strong winds reported. In total there were 12 storms reported that had winds reported between 60 and 91 miles per hour. Winds of this magnitude, according to the Beaufort Wind Force Ranking, can cause trees to uproot, considerable structure damage, and over turning of improperly anchored mobile homes.

Currently the village office and maintenance shop backs-up municipal records using offsite storage regularly and has surge protection on sensitive equipment. Within the community there are multiple option for seeking shelter during strong storms. Options include local church basements or sharing of residential basements.

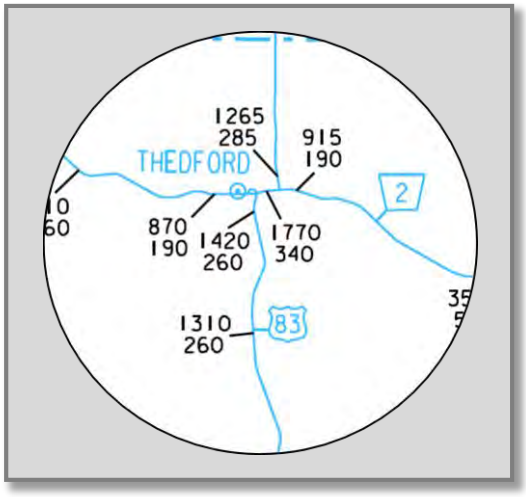
Table THD 9: Tornado Events

Hazard	Date	Extent	Property Damage	Crop Damage
Tornado	6/4/1999	F2	$50,000	$0

Source: NCDC

TRANSPORTATION

Transportation Incidents /Chemical Spills/ Radiological Incident



The local planning team identified transportation concerns as a concern for the village. According to the PHMSA incident reports there have been two spills in Thedford reported from 1980 to 2013. The largest release was recorded in 1990 when approximately 8,880 LGA of gasoline with ethyl alcohol was released during transport along HWY 83 approximately 12 miles south of Thedford. A tractor trailer was transporting the load to Valentine, NE when the driver struck a cow in the roadway while driving at night through the county.

The main transportation routes through Thedford include US HY 2 and NE HWY 83. The traffic count reported by NDOR for US HWY east of Thedford is 1,770 light vehicles and 340 heavy trucks daily. West of town there is a slight decrease in volume with 870 light vehicles and 190 heavy trucks daily. The traffic patterns from north to south are more consistent with each other. North of town on NE HWY 83 NDOR reported 1,265 light vehicles a day (1,420 south of town) and 285 heavy trucks (260 south of town).

It is difficult to ascertain exactly what materials are being transported across the state, especially along US HWY which serves as a major transportation route across central and northern Nebraska. Radiological loads are monitored during transport.

The planning team also discussed the potential for train derailment and the potential impacts that could have on the community. The BNSF railway runs along the southern border of the community and could result in closure of critical facilities if derailment occurred.

Finally the Thomas County Airport is located approximately one mile south of the town. The airport is owned by the Thomas County Airport Authority. There is one asphalt runway. The airport is reportedly in good condition and serves primarily local general aviators.

Capability Assessment

Thus far the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism in understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capabilities, administrative & technical capability, fiscal capability, and education & outreach capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

VILLAGE GOVERNANCE

Thedford is governed by a five member board. Boards and committees within the village include:

- Parks Committee
- Streets Committee
- Trash Committee
- Water/Sewer Board

Table THD 10: Capability Assessment Survey

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	No
	Capital Improvements Plan	No
	Hazard Mitigation Plan	Yes
	Economic Development Plan	No
	Emergency Operational Plan	County
	National Resources Protection Plan	No
	Open Space Preservation plan	No
	Floodplain Management Plan	No
	Storm Water Management Plan	No
	Zoning Ordinance	No
	Subdivision Regulation/Ordinance	No
	Floodplain Ordinance	No
	Building Codes	No
	National Flood Insurance Program	No
	Community Rating System	No
	Other (if any)	5 Year/10 year Roads plan
Administrative & Technical Capability	Planning Commission	Yes
	Hazard Mitigation Planning Commission	Yes
	Floodplain Administration	County
	Emergency Manager	County/Region 26

Survey Components/Subcomponents		Comments
	GIS Coordinator	County
	Chief Building Official	No
	Civil Engineering	Yes (Contractor as needed)
	Staff Who Can Assess Community's Vulnerability to Hazards	Multiple
	Grant Manager	Yes
	Other (if any)	NA
Fiscal Capability	Capital Improvement Project Funding	No
	Community Development Block Grant	No
	Authority to Levy Taxes for Specific Purposes	County
	Gas/Electric Service Fees	No
	Storm Water Service Fees	No
	Water/Sewer Service Fees	Yes
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	No
	Other (if any)	NA
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Yes (Service Club, County Fair Board)
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Yes (Water Conservation)
	Natural Disaster or Safety related school programs	No
	StormReady Certification	No
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	No
	Other (if any)	NA

SUMMARY

Thedford currently does not have comprehensive or capital improvement plans, the hazard mitigation plan has not formally be incorporated in to community planning mechanisms or regulatory tools. If the village were to develop these plans it would be advised that they incorporate mitigation projects and information on hazards from this plan into the other plans.

While the population of Thedford has fluctuated over the recent years the community is still a strong community capable of implementing mitigation projects. Thedford may require partnerships or outside funding assistance for project implementation but the municipal staff is equipped to meet needs as they arise. Through this update process the planning team reviewed previously identified mitigation projects and removed projects that were deemed unrealistic or no longer necessary. The remaining list of mitigation projects are realist for the village.

Mitigation Strategy

COMPLETED MITIGATION PROJECTS

Description	Backup Generators
Analysis	Install back-up power supply on municipal well.
Goal/Objective	Goal 1/Objective 1.1
Hazard(s) Addressed	Tornados and high winds, severe winter storms, severe thunderstorms
Benefits	Back-up power for municipal water supply..
Funding	Village
Timeline	Completed
Lead Agency	Village board, Region 26 EMA
Action since 2009 plan	Implemented

Description	Weather Radios
Analysis	Conduct an inventory of weather radios at schools, rural residents, and other critical facilities and provide new radios as needed.
Goal/Objective	Goal 4/Objective 4.3 and Goal 1/Objective 1.1
Hazard(s) Addressed	All hazards
Benefits	Help those who do not have access to local TV or radio warnings
Funding	Village
Timeline	Completed
Lead Agency	Village Board, Fire Department, Region 26 EMA
Action since 2009 plan	Weather radios or other monitoring systems are located in critical facilities

ONGOING/NEW MITIGATION PROJECTS

Description	Backup Generators
Analysis	Provide a portable or stationary source of backup power to redundant power supplies, municipal lift stations and other critical facilities and shelters.
Goal/Objective	Goal 1/Objective 1.1
Hazard(s) Addressed	Tornados and high winds, severe winter storms, severe thunderstorms
Estimated Cost	$15,000-$30,000 per generator
Benefits	Back-up power for critical facilities. A measure that would reduce or prevent damage to property or prevent loss of life or serious injury.
Potential Funding	HMGP
Timeline	Ongoing
Priority	High
Lead Agency	Village board, Region 26 EMA
Action since 2009 plan	Installed back-up power on municipal well; other generators to be installed in critical facilities.

Description	Fire Wise Defensible Space
Analysis	Work with the Nebraska Forest Service and US Forest Service to become a Fire Wise Communities/USA participant. Develop a Community Wildfire Protection Plan. Train land owners about creating defensible space. Enact ordinances and building codes to increase defensible space, improve building materials to reduce structure ignitability, and increase access to structures by responders. Develop and implement brush and fuel thinning projects.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Wildfire
Estimated Cost	$20,000
Benefits	Structures are less vulnerable to wildfire, easier for firefighters to defend structure during a wildfire event, and removes fuel from an approaching fire.
Potential Funding	HMGP, NFS, USFS, ULNRD, NGPC, National Fire Plan
Timeline	5 years
Priority	High
Lead Agency	Village Board, Fire Department, Nebraska Forestry Service
Action since 2009 plan	None

Description	Public Awareness / Education
Analysis	Through activities such as outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. In addition, educate citizens on erosion control and water conservation methods. Educate residents on response and rescue plans for all hazard types.
Goal/Objective	Goal 3/Objective 3.1 and Goal1/Objective 1.1
Hazard(s) Addressed	All hazards
Estimated Cost	$500+
Benefits	Increase knowledge to new comers to the area as well as elderly in how to react when an event is going to occur or is occurring. Education to reduce or prevent damage to property or prevent loss of life or serious injury.
Potential Funding	HMGP, PDM
Timeline	Ongoing
Priority	Medium
Lead Agency	Village Board, Region 26 EMA, NEMA, NDNR, ULNRD
Action since 2009 plan	Ongoing educational efforts from regional emergency management office

Description	Enroll in the National Flood Insurance Program (NFIP)
Analysis	Participate in the National Flood Insurance Program (NFIP). (Contact NDNR at 402.471.3932 for any questions or to request educational material on NFIP.
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Flooding
Estimated Cost	N/A
Benefits	Enable property owners to purchase insurance protection against flood losses. Good standing enables participants to apply for PDM and HMGP cost-share.
Potential Funding	N/A
Timeline	5 years
Priority	High
Lead Agency	Village Board, NDNR
Action since 2009 plan	None

Description	Continuity of Planning
Analysis	Work to develop continuity plans for critical facilities and key resources throughout the community.
Goal/Objective	Goal 4/Objective 4.1
Hazard(s) Addressed	All Hazards
Estimated Cost	N/A
Benefits	Allow critical service to resume normal functions following interruption.
Potential Funding	Village, Thomas County, Region 26 EMA
Timeline	Ongoing
Priority	Medium
Lead Agency	Village Board, Region 26 EMA
Action since 2009 plan	New To This Plan

Description	Sheltering In Place
Analysis	Ensure that all critical facilities, businesses, and resident located near major transportation corridors are aware of a[appropriate procedures to safely shelter in place in the event of a chemical release.
Goal/Objective	Goal 3/Objective 3.1
Hazard(s) Addressed	Chemical Transportation and Fix Sites
Estimated Cost	$50 - $5,000
Benefits	Educate community members regarding the proper response to community hazardous material release.
Potential Funding	Village, Thomas County EMA
Timeline	Ongoing
Priority	Medium
Lead Agency	Village Board
Action since 2009 plan	New To This Plan

Description	Infrastructure Hardening
Analysis	Install vehicular barriers and/or fencing to protect critical facilities and key infrastructure at well and water tanks sites.
Goal/Objective	Goal 2/Objective 2.2
Hazard(s) Addressed	Terrorism
Estimated Cost	$5,000 - $15,000
Benefits	Protect CFKI from tampering.
Potential Funding	NDEQ
Timeline	5 years
Priority	High
Lead Agency	Village Board
Action since 2009 plan	New To This Plan

REMOVED MITIGATION PROJECTS

Description	Storm Shelter / Safe Rooms
Analysis	Design and construct storm shelters and safe.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Tornados and high winds, severe thunderstorms, severe winter storms
Lead Agency	Village Board, Region 26 EMA
Reason for Removal	It is not realistic for the village to construct a storm shelter. At this time there are numerous churches (see critical facilities map) where community members can seek shelter during extreme weather. In addition many community members have basements which provide some measure of safety.

Description	Tree City USA
Analysis	Work to become a Tree City USA through the National Arbor Day Foundation in order to receive direction, technical assistance, and public education on how to establish a hazardous tree identification and removal program in order to limited potential tree damage and damages caused by trees in a community when a storm event occurs. The four main requirements include: 1) Establish a tree board; 2) Enact a tree care ordinance; 3) Establish a forestry care program; 4) Enact an Arbor Day observance and proclamation.
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Severe thunderstorms, tornados and high winds, severe winter storms
Lead Agency	Village Board
Reason for Removal	There is little support from the community or local officials regarding participation in the Tree City USA program. Thedford does currently have a tree care program that meets the needs of the village.

Description	Snow Fences
Analysis	Construct snow fences to protect main transportation routes and critical facilities from excessive snow drifting and road closure.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Severe winter storms
Lead Agency	Village Utilities, Nebraska Department of Roads
Reason for Removal	This is not a realistic project for the community. For the planning area snow fences and windbreaks are more valuable in the unincorporated areas.

Village of Hyannis

Upper Loup NRD

Multi-Jurisdictional Hazard Mitigation Plan

2014

Village of Hyannis

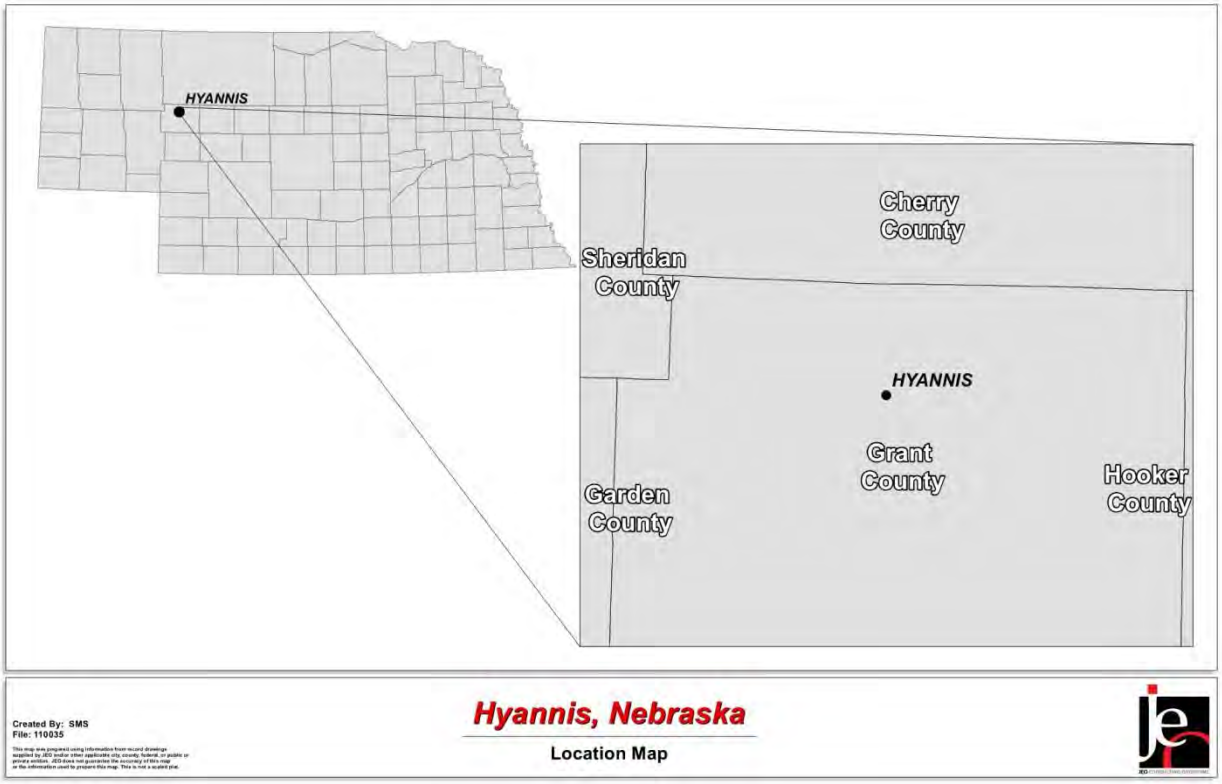
HISTORY

The Chicago, Burlington & Quincy Railroad extended its line from Broken Bow into the Sandhills in the late 1860's. A terminal station was built in what was going to become Hyannis. Due to issues with outlaws populating the area, trials were held outdoors since there were no buildings. A courthouse was built along with stores, saloons, and houses. Grant County was organized in 1887 and Hyannis was incorporated shortly after. Whitman was originally the county seat, but after a petition for the county seat to be in a more central location, Hyannis was voted in as the county seat.

LOCATION/GEOGRAPHY

Hyannis is the county seat of Grant County and is located in the northern half of the county. The village of Hyannis covers an area of .52 square miles and has an elevation of 3,757 feet above sea level

Figure HYA 1: Location



The community of Halsey lies in an area of sand hills. The land use surrounding the community is mainly ranching with some agricultural crops in the river valleys. Hilly land composed of low to high dunes of sand stabilized by a grass cover is prevalent. The community lies north of the Middle Loup River valley. The watershed flows generally from the northwest to the southeast. The floodplain has not been delineated for Hyannis and river flooding is not a significant concern.

Figure HYA 2: Topographic Map

DEMOGRAPHICS

The population of Hyannis has been steadily declining since 2000. Figure HYA 3 displays the historical population trend for Hyannis from 1960 to 2010.

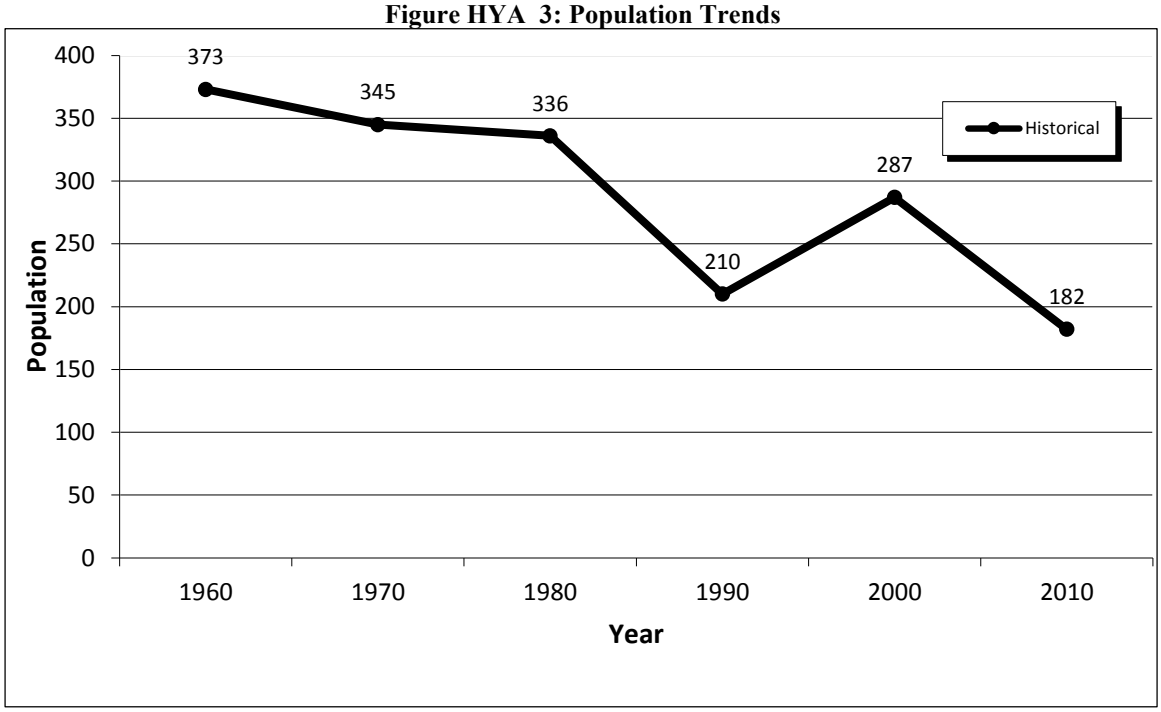
The following table illustrates the population trends by jurisdiction from 1990 – 2010 and provides a population project for 2020 by applying the percent changed from 2000 to 2010 to the next decade. Based on input from the planning team for Hyannis the population is not expected to continue to decline especially not at the rate experienced from 2000 to 2010. The Hyannis planning team expects population to remain close to 114 or potentially increase slightly.

Table HYA 1: Population 1990 - 2010

Jurisdiction	1990 Population	2000 Population	2010 Population	Change 2000-2010	2020 Projected Population
Grant County	759	746	612	-18%	502
Hyannis	207	287	181	-37%	114

Source: U.S. Census, 1990 – 2010

Figure HYA 3: Population Trends



Source: U.S. Census, 1960 – 2010

The following table illustrates the age distribution and median age of individuals by jurisdiction.

Table HYA 2: Population by Age

	Grant County	Hyannis
< 5 yrs.	5%	4%
5 - 64 yrs.	81.4%	73.7%
> 64 yrs.	13.6%	22.3%
Median Age	39.9	52

Source: US Census ACS % yr. estimate 2008 - 2012

Overall the median age for Hyannis is 52 years; this is higher than that of the county as a whole. For the village of Hyannis the percentage of residents over the age of 64 years is significantly higher than that of the county as a whole. An aging population can increase the vulnerability for a community by reducing the ability to evacuate rapidly, removal of debris and snow, and increasing potential impacts from events that result in prolonged power outages.

HOUSING AND ECONOMICS

Median household income, per capita income, home value and rent for the county as a whole compare with broader state values as shown below.

Table HYA 3: Housing and Income

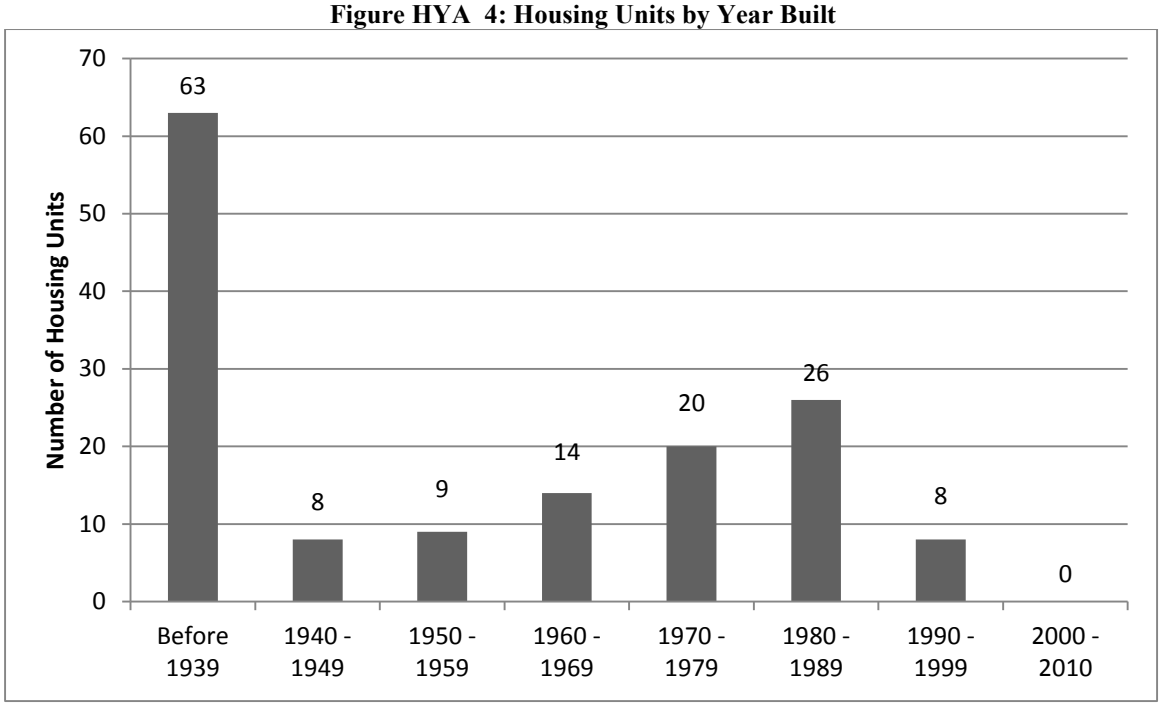
	Grant County	Hyannis
Median Household Income	$40,982	$41,563
Per Capita Income	$19,831	$25,714
Median Home Value	$48,400	$41,800

Median Rent	$823	$325

Source: U.S. Census American Community Survey Housing Characteristics and Income, 2012

There are 75 housing units in Hyannis, 26.4 percent of which are vacant. The majority of development in Hyannis occurred before 1939, with no housing units being built after 2000.

Figure HYA 4: Housing Units by Year Built



Source: U.S. Census, 2010

Table HYA 4 compares housing statistics between the village and the county as a whole. The vacant housing rate is low within the community of Hyannis than the rest of the county. There are also fewer rental housing units.

Table HYA 4: Housing Occupancy

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Grant County	292	65%	157	35%		201	68.8%	91	31.2%
Hyannis	109	73.6%	39	26.4%		90	82.5%	19	17.5%

Source: U. S. Census, 2010

STRUCTURAL INVENTORY AND VALUATION

A structural inventory was completed for the corporate limits of Hyannis though a window survey using GIS for the 2014 hazard mitigation plan. The values of these structure types were determined from the 2013 Property Type Values as provided by the Nebraska Department of Revenue Property Assessment Division.

Results from the structural inventory completed by the Village of Hyannis are found in Table HYA 5.

Table HYA 5: Structural Inventory and Valuation

Total Structures		Structure Valuation	
Structure Type	Number of Structures	Total Value	Value per Structure
Commercial/Industrial	28	$1,813,265	$64,760
Out Building	85	$431,800	$5,080
Residential	148	$5,555,731	$37,538
Public/Quasi Public	4	$47,424	$11,856
Total	**102**	**$7,848,220**	

Source: Grant County Assessor
**Values are rounded to the nearest dollar.*

CRITICAL INFRASTRUCTURE/KEY RESOURCES

Figure HYA 5: Critical Facilities Location

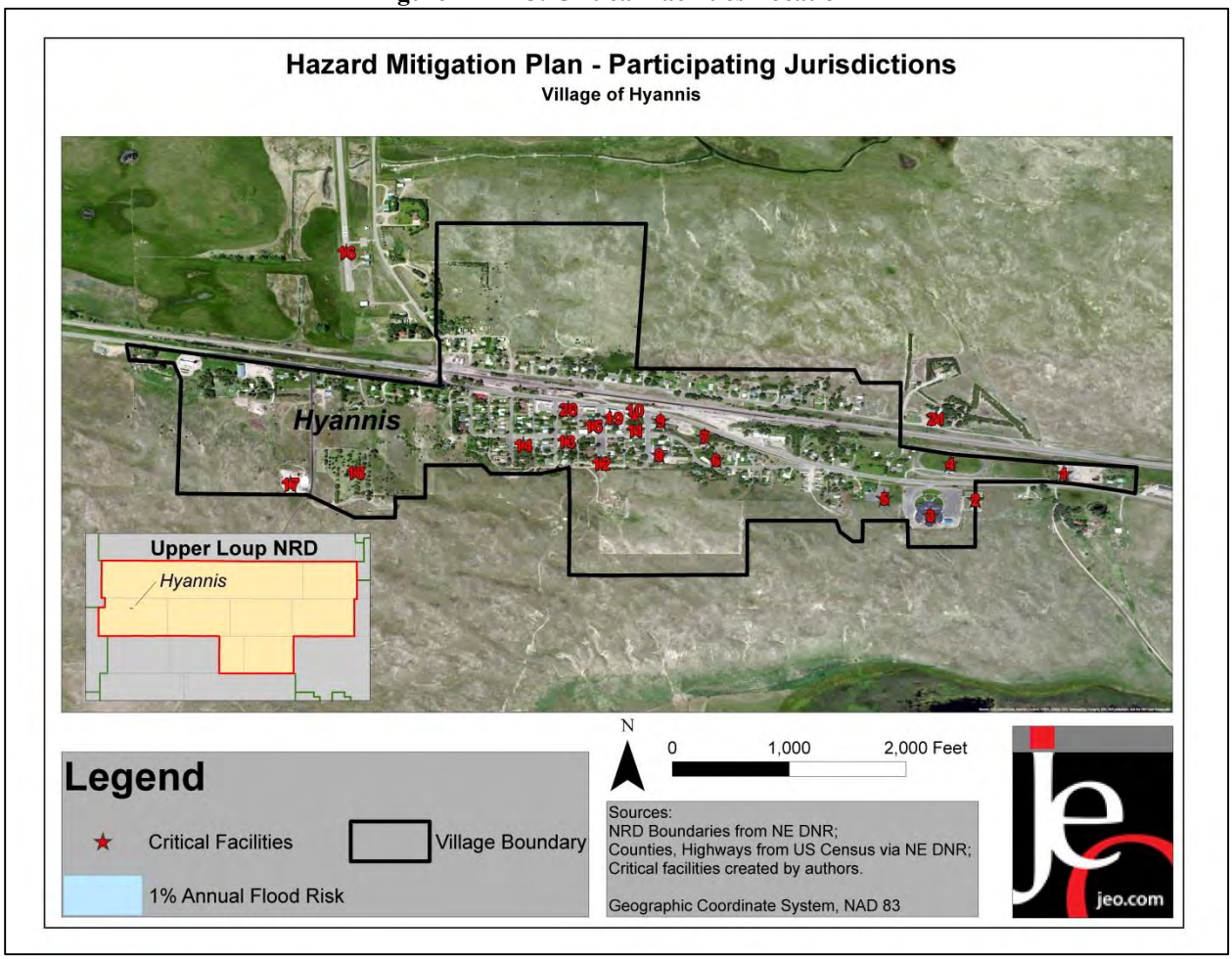


Table HYA 6: Critical Facilities

Number	Name	Function
#1	State Shop	Critical Facility
#2	Pool	Government Function
#3	High School	Vulnerable Population
#4	Sports Field	Gathering Location
#5	Church	Gathering Location
#6	Church	Gathering Location
#7	Church	Gathering Location
#8	Elementary School	Vulnerable Population
#9	Village Shop	Gathering Location
#10	Fire Station	Emergency Response
#11	Grant County Court House	Government function
#12	Community Center	Gathering Location
#13	Church	Gathering Location
#14	Church	Gathering Location
#15	Post Office	Government function
#16	Airport	Critical Facility
#17	County Shop	Critical Facility
#18	Golf Course	Gathering Location
#19	Grocery Store	Critical Facility
#20	Gas Station	Critical Facility
#21	Veterinary Clinic	Critical Facility

FUTURE DEVELOPMENT TRENDS

The planning team for Hyannis expects to not see much growth within the community. If there was to be growth, it would most likely be on the north side of Hyannis. With 17 percent of housing units being vacant, there are existing opportunities for infill within the existing corporate boundaries. There are no formal floodplains nor are there areas reported by the planning team that experience localized flooding.

Risk Assessment

HAZARD IDENTIFICATION

Table HYA 7 is risk assessment the community. Refer to *Section 4: Risk Assessment* for an explanation as to what this methodology is and why certain hazards did not pose a significant enough threat and were eliminated from detailed discussion due to the calculation.

Table HYA 7: Risk Assessment

Hazard	Previous Occurrence: Yes or No	County Hazard Ranking in NE 2014 State HMP	Specific Concerns Identified
Natural Hazards			
Severe Winter Storms	**Yes**	**High**	**Roadway closures, economic impacts (livestock)**
Severe Thunderstorms	**Yes**	**High**	**Frequency of occurrence, potential for secondary impacts (lightning causing wildfires)**
Drought	**Yes**	**High**	**Economic losses in the ag sector**
Grass/Wildfires	Yes	High	Fire moving from rangelands into incorporated areas
Hail Events	Yes	NA	Economic impact especially in the ag sector. Damages to homes and other structures
Tornados	No	High	Lack of safe rooms
High Winds	Yes	High	Frequency of occurrence
Extreme Heat	Yes	NA	Elderly population and economic impacts (especially in ag sector)
Flooding	Yes	Medium	Mostly localized events, concerns related to transportation route closure(s)
Animal Disease	No	High	Economic impacts
Plant Disease	No	High	Losses in crop farming
Earthquakes	No	Medium	None
Dam Failure	No	None	None
Landslides	No	NA	None
Man-made Hazards			
Urban Fire	Yes	High	None
Chemical Spills (transportation)	Yes	Medium	Transportation of ag chemicals along roadways
Radiological Incident (transportation)	No	Medium	None
Chemical spills (fixed site)	No	Medium	Ag chemical storage areas
Radiological Fixed Sites	No	None	None
Terrorism	No	Low	Tampering with water supplies
Civil Disorder	No	Low	None

According to the risk assessment, the top three hazards in the village of Hyannis are severe winter storms, severe thunderstorms, and drought.

Historical Occurrences
The NCDC counted a total of 85 hazard events in the village of Hyannis and there were no recorded deaths or injuries, but there were $237,500 recorded in damages to property and $43,000 recorded in crop damages.

FIRE
Grass/wildfires
The local planning team identified grass/wildfire as a low concern for the village. According to the Nebraska Forestry Department there were 49 reported fires by the Sandhills Fire Department from 2000 to 2012 which consumed a total of 9,824 rangeland acres and 2 crop land acres. The fires also resulted in more than $13,400 in damages to crops and structures. The most significant fire took place in 2005 when approximately 3,040 acres of range lands were burned causing an estimated $33,. The Sandhills Fire Department has mutual aid agreements with neighboring fire districts when fires exceed local capabilities.

The Village does have an all-volunteer fire and rescue department with approximately 55 active volunteers. In the past, the fire department has had sufficient resources to meet the needs of the Village and reports sufficient water pressure to support current levels of development.

SEVERE STORMS
Flooding
There is no floodplain for Hyannis. There have been two flash floods reported in Hyannis that caused $35,000 in property damage and $5,000 in crop damage.

Hail
The local planning team identified hailstorms as a threat for Hyannis. NCDC data records 68 events with a total of $154,555 in property damages and $33,000 in monetary losses recorded to crops. A summary of the events with recorded damages can be seen in Table HYA 8.

Table HYA 8: Hail Events

Date	Extent	Property Damage	Crop Damage
6/4/1999	1.75 in.	$4,000	$25,000
6/29/2000	1.75 in	$100,000	$0
8/29/2001	1.00 in	$8,000	$0
6/15/2002	1.00 in	$2,000	$0
8/26/2002	1.00 in	$8,000	$5,000
8/31/2002	1.00 in	$3,000	$3,000
5/3/2003	1.75 in	$1,500	$0
7/3/2003	1.75 in	$10,000	$0
7/8/2003	3.00 in	$4,000	$0
7/21/2003	1.75 in	$5,000	$0
5/21/2004	1.00 in	$4,000	$0
7/7/2009	1.00 in	$5,000	$0
Total	-	$154,555	$33,000

Source: NCDC

Severe Thunderstorms

The village planning team identified severe thunderstorms as the second greatest threat for the village of Hyannis. The NCDC recorded 8 events with a total of $38,000 in damages to property and no crop damages. A summary of the event with recorded damages can be seen in Table HYA 9.

Table HYA 9: Severe Thunderstorm Events

Date	Extent	Property Damage	Crop Damage
9/4/1997	Not provided	$1,000	$0
7/8/2004	70 kts. EG	$38,000	$0

Source: National Climatic Data Center

The most severe event reported occurred in July of 2004 when 80+ mph winds snapped off numerous large trees, damaging buildings and vehicles. In addition an airplane hangar was destroyed at the municipal airport. During this event 31 power poles were broken off resulting in closed roadways and prolonged loss of power.

Severe Winter Storms

The local planning team identified severe winter storms as the top concern for the community. NCDC data records severe winter storms as "zonal" events meaning there is not a specific record of what communities are impacted or at least what the level impacts were per community.

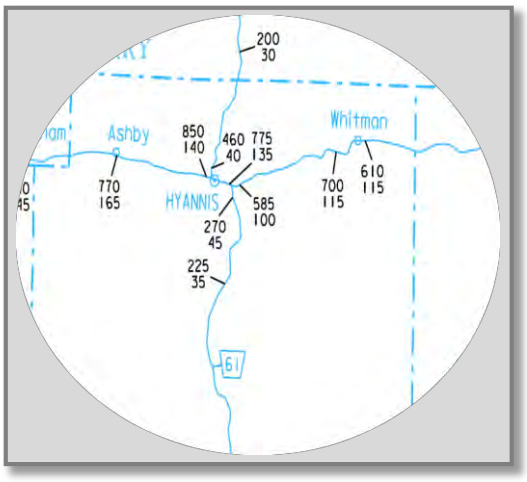
Tornado

The local planning team estimated that a direct impact from a tornado was possible but not likely. The NCDC reports a 1996 F0 tornado that touched down near Hyannis and destroyed a calving shed (estimated losses of $10,000).

TRANSPORTATION

Transportation Incidents /Chemical Spills/ Radiological Incident

The local planning team identified transportation concerns as a significant threat facing the village. According to the PHMSA incident reports there has been one spills in Hyannis reported from 1980 to 2013. This event involved the release of approximately 50 LGA of fuel oil and resulted in $4,500 in damages or clean-up and removal fees.



The primary transportation routes through Hyannis include US HWY 2 and NE HWY 61. US HWY 2 has the greatest volume of traffic across the county. The NDOR traffic count for US HWY 2 east of Hyannis is 775 light vehicles and 135 heavy trucks per day. West of Hyannis traffic volume on US HWY 2 to increases slightly to 840 light vehicles and 140 heavy trucks. NE HWY 61 reports the highest volume of traffic north the village of Hyannis. Traffic counts range from 460 light vehicles and 40 heavy trucks north of Hyannis to 270 light vehicles and 45 heavy trucks south of the village.

It is difficult to ascertain exactly what materials are being transported across the state, especially along US HWY 2 which serves as a major transportation route across central and northern Nebraska. Radiological loads are monitored during transport.

The planning team also discussed the potential for train derailment and the potential impacts that could have on the community. The BNSF railway runs along the community and could result in closure of critical facilities if derailment occurred. The local planning team reported two train derailments in the past 15 years. The most recent event occurred in 2012 when a coal train derailed near Hyannis. The train was pulling more than 100 cars. The derailment impacted a water main valve and riser; this still has not been repaired. The event was cleaned-up in less than 24 hours and occurred east of the village. Had this occurred within the village of Hyannis the impacts could have been much greater. The planning team expressed concerns related to the limited number of railroad crossings within the village. At this time there is only one railroad crossing within Hyannis, if it was not possible to cross at that location local traffic would be detoured several miles outside of the village to access the next closest crossing. This situation could present life safety issues if the Sandhills Fire Department were unable to respond to either a fire or medical call in a timely fashion.

Prolonged Power Outage
The local planning team identified prolonged power outages as a threat for the village of Hyannis. Prolonged power outages usually occur in combination with severe storms, however there are instances where the power can go out that is not related to weather events. A prolonged power outage is defined an outage that lasts for longer than 8 hours. This can lead to a loss in public services including water and loss of communication. The planning team reported instances when power was out for a prolonged period of time as a result of severe thunderstorms and winter storms. One such event occurred in 2008 when a severe thunderstorm damaged or knocked over 31 power poles in the area. During this time Hyannis as well as other communities in Grant County experienced a prolonged power outage. The local planning team did report, however, that in most situations the local public power district is able to respond promptly and remedy the situation in fewer than eight hours.

To date the village has installed back-up power generators on the new wells, sewer lift stations, the public schools, and the fire station. The local planning team also reported that many community members also own back-up power generators for this farming and ranching operations.

Capability Assessment
Thus far the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism in understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capabilities, administrative & technical capability, fiscal capability, and education & outreach capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

VILLAGE GOVERNANCE

Hyannis is governed by a five member board. Boards and committees within the village include:

- Cemetery Board (5 members)
- Housing Board (5 members)
- Health Board (3 members)

Table HYA 10: Capability Assessment

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	No
	Capital Improvements Plan	No
	Hazard Mitigation Plan	No (under development)
	Economic Development Plan	No
	Emergency Operational Plan	Yes (County)
	National Resources Protection Plan	No
	Open Space Preservation plan	No
	Floodplain Management Plan	No
	Storm Water Management Plan	No
	Zoning Ordinance	No
	Subdivision Regulation/Ordinance	No
	Floodplain Ordinance	No
	Building Codes	No
	National Flood Insurance Program	No
	Community Rating System	No
	Other (if any)	Water Emergency Plan
Administrative & Technical Capability	Planning Commission	No
	Hazard Mitigation Planning Commission	Yes (2 members)
	Floodplain Administration	No
	Emergency Manager	Yes (county/regional)
	GIS Coordinator	County by contract
	Chief Building Official	No
	Civil Engineering	No
	Staff Who Can Assess Community's Vulnerability to Hazards	Multiple staff & residents
	Grant Manager	No
	Other (if any)	NA
Fiscal Capability	Capital Improvement Project Funding	No
	Community Development Block Grant	No
	Authority to Levy Taxes for Specific Purposes	Yes (currently at the local limit)
	Gas/Electric Service Fees	No
	Storm Water Service Fees	No
	Water/Sewer Service Fees	Yes (obligated for upkeep & maintenance)
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	No
	Other (if any)	NA

Survey Components/Subcomponents		Comments
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	No
	Natural Disaster or Safety related school programs	No
	StormReady Certification	No
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	No
	Other (if any)	NA

SUMMARY

Hyannis currently does not have comprehensive or capital improvement plans therefore the hazard mitigation plan has not been incorporated into local planning or regulatory mechanisms. If the village were to develop these plans it would be advised that they incorporate mitigation projects and information on hazards from this plan into the other plans.

Hyannis has a strong community with strong social networks. When they have been impacted by disaster events in the past the community has worked together to recover. For mitigation, however, the village will have limited capabilities to implement many identified projects without partnerships or funding assistance. The local planning team reported that municipal funds for the next several years are already obligated, and with a relatively low tax base and declining population it will be a challenge to identify project funding. The village does have limited experience applying for grants, FEMA as well as other, but have struggled to secure funding from these sources.

Mitigation Strategy

COMPLETED MITIGATION PROJECTS

Description	Warning Systems – Code Red
Analysis	Implement Code Red text notification system.
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	All
Benefits	Increase response time in order to mitigate injuries, deaths, and property damages.
Timeline	Implementation is complete, maintaining the program will be ongoing
Lead Agency	Keith County EMA

NEW MITIGATION PROJECTS

Description	Warning Systems – Radio Signals
Analysis	Increase coverage of AM/FM radio signals in Hyannis
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	Tornados and high winds, severe winter storms, severe thunderstorms
Estimated Cost	Unknown
Benefits	Currently radio reception in and around Hyannis is spotty at best. Increase signal strength will help increase response time in order to mitigate injuries, deaths, and property damages. Hyannis may potentially be able to work with Grant County to utilize signal boosters already in place through the county.
Potential Funding	HMGP, PDM, Governing County and Local Governing Agency
Timeline	5 years
Priority	High
Lead Agency	Village board

Description	Warning Systems – Internet Signals
Analysis	Purchase new/updated computers and routers for internet signal strength to improve weather monitoring capabilities within the village.
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	Add
Estimated Cost	$5,000+
Benefits	Increase awareness and response time in order to mitigate injuries, deaths, and property damages.
Potential Funding	HMGP, PDM, Governing County and Local Governing Agency
Timeline	3 years
Priority	High
Lead Agency	Village board

Description	Backup Generators
Analysis	Provide a portable or stationary source of backup power to redundant power supplies, municipal lift stations and school buildings that currently do not have back-up power.
Goal/Objective	Goal 1/Objective 1.1
Hazard(s) Addressed	Tornados and high winds, severe winter storms, severe thunderstorms
Estimated Cost	$15,000-$30,000 per generator
Benefits	Back-up power for critical facilities. A measure that would reduce or prevent damage to property or prevent loss of life or serious injury.
Potential Funding	HMGP
Timeline	Ongoing
Priority	High
Lead Agency	Village Board

Description	Civil Service Improvements
Analysis	Improve emergency rescue and response equipment and facilities by providing additional, or updating existing emergency response equipment. The village needs a new vehicle with appropriate and updated radio systems.
Goal/Objective	Goal 4/Objective 4.1
Hazard(s) Address	All Hazards
Estimated Cost	$40,000+
Benefits	Municipal employees are required to respond to disaster events whether that be snow removal or assisting with derailed trains. It is important that municipal employees and volunteers be able to community effectively with each other during these events.
Potential Funding	Local budgets, County assistance
Timeline	5 years
Priority	High
Lead Agency	Sandhills Fire Dept.

Description	Water System Improvements
Analysis	During a recent train derailment there was damage to a water main riser. The village will repair/replace the damaged riser.
Goal/Objective	Goal 1/Objective 1.1
Hazard(s) Addressed	Drought, Fire (urban/wildfire)
Estimated Cost	$5,000
Benefits	The village will be able to control municipal water supply more effectively
Potential Funding	Local budget, BNSF Railroad
Timeline	1 year
Priority	High
Lead Agency	Village Maintenance

Description	Water System Improvements
Analysis	Produce a map of the municipal water supply system.
Goal/Objective	Goal 1/Objective 1.1
Hazard(s) Addressed	All
Estimated Cost	$500
Benefits	The village will be move able to address disruption in the municipal water supply through increased awareness of system locations underground.
Potential Funding	Local budget
Timeline	1 year
Priority	Medium
Lead Agency	Village Maintenance, Village Clerk

Description	Transportation System Improvement
Analysis	Install a second railroad crossing within the village
Goal/Objective	Goal 1/Objective 1.1, Goal 2/Objective 2.1
Hazard(s) Addressed	Transportation Incident
Estimated Cost	$75,000+
Benefits	Residents of Hyannis would have multiple options in crossing the railroad tracks within the village. Additionally emergency response vehicles will be able to respond to events should the current crossing be blocked for any reason.
Potential Funding	Local budget, BNSF Railroad, Grant County
Timeline	10 years
Priority	Medium
Lead Agency	BNSF Railroad, Village Board

REMOVED MITIGATION PROJECTS

None

APPENDICES

Appendix A – Adoption Letters and Resolutions
Appendix B – Documents of Public Involvement
Appendix C – Public Meeting Materials and Worksheets
Appendix D – Worksheets to Assist Community in Review and Updates
Appendix E – Hazard Mitigation Project Funding Guidebook

APPENDIX A – ADOPTION LETTERS AND RESOLUTIONS

Contains the following:

1. Adoption Letter
2. Resolutions

APPENDIX B – DOCUMENTS OF PUBLIC INVOLVEMENT

Contains the following:

1. Letters
2. Sign-in Sheets
3. Flyers

Meeting Reminder

December 2, 2013

RE: Upper Loup Natural Resources District (NRD)
Multi-jurisdictional Hazard Mitigation Plan (HMP) Update

Dear Hazard Mitigation Planning Participant:

Upper Loup NRD has secured grant funding from the Federal Emergency Management Agency (FEMA) and is in the process of updating the district-wide HMP. **You are receiving this letter because your jurisdiction is eligible and encouraged to participate in this planning effort, which would benefit your community in multiple ways.**

A HMP identifies the vulnerability of a jurisdiction to various natural hazards (e.g., flood, drought, wildfire, winter storm, etc.) as well as man-made hazards (e.g., terrorism, urban fire, transportation incidents, etc.), identifies possible impacts to the communities, and assesses their potential losses. The HMP also identifies mitigation alternatives to enhance communities' preparedness to specific hazards and establishes a prioritized list of potential mitigation projects to be implemented in the post-plan period.

The Upper Loup NRD's existing HMP was approved by FEMA in August 2009 and will expire in August 2014. As required by the Disaster Mitigation Act of 2000, a HMP must be updated and approved every five years. Generally, the FEMA approved plan update requires a 12-month to 18-month period.

At the upcoming meetings we will discuss the hazard mitigation planning process, complete the Risk Assessment for each participating county, discuss recent hazard / disaster events in the planning area, begin reviewing critical facilities for jurisdictions, and outline what information will be required for the process. If you have copies of comprehensive plans that you could bring to be scanned and returned that would be great.

FEMA requires at least one 'designated representative' from your jurisdiction to be recognized as a participating jurisdiction at one of the upcoming public meetings:

- **December 17, 2013 at 7:00 PM MST, Mullen Village Office, 501 SW 1st St, Mullen, NE;**
- **December 18, 2013 at 7:00 PM CST, Upper Loup NRD Office, 39252 Highway 2, Thedford, NE;**
- **December 19, 2013 at 3:00 PM CST, Logan County Courthouse, 317 Main St, Stapleton, NE.**

If your jurisdiction is interested in participating in this effort, please have your designated representative contact me at 402.645.2250 or by email at abaum@upperloupnrd.org. For more information go to: http://www.upperloupnrd.org/hazard-mitigation/. **We are looking forward to seeing you at the meeting!**

Sincerely,

Anna Baum, General Manager
Upper Loup NRD

CC: Jeff Henson, JEO Consulting Group, Inc.

Meeting Reminder

Dear All-

Dates have been set for the second round of meetings for the Upper Loup NRD Hazard Mitigation Plan Update. For this round of meetings we are offering an alternative to the group meeting. There will still be the option of attending a public meeting (times, dates, and locations below), but we would also like to offer the opportunity for communities to meet with us one-on-one. The focus for this round of meetings is completing project identification and prioritization. We would like the opportunity, if possible, to meet with you one-on-one to review the projects that you identified for the 2010 mitigation plan, as well as to discuss projects that you would like to add at this time. If you and your planning team are interested in meeting one-on-one, please schedule this in advance with Jeff Henson. Communities interested in one-on-one meetings will have the option of attending the public meeting held later in the day, but will not be required. Also, communities interested in one-on-one meetings are encouraged to bring a planning team that might include (but is not limited to) city administrators, clerks, board members, utilities personnel, city/county engineers, and other interested parties. One-on-one consultations will be scheduled for 30 – 45 minutes. Again, **one-on-one meetings must be scheduled in advance**.

Communities not interested in individual meetings will need to attend one of the meetings identified below to be recognized as participants by FEMA. We request that (if you have not already done so) you please bring a copy of your community's comprehensive plan, zoning ordinance, and other community plans to the meeting. JEO will "borrow" these documents for the development of your participant section and return the document back to you.

- **April 1st, 2014 at 7:00 PM at the Mullen Village Office, 501 SW 1st St, Mullen, NE;**
- **April 2nd, 2014 at 7:00 PM at the Upper Loup NRD Office, 39252 Highway 2, Thedford, NE;**
- **April 3rd, 2014 at 3:00 PM at the Logan County Courthouse, 317 Main St, Stapleton, NE.**

***ATTENTION** planning team members: Please attend a brief planning team meeting at 6:30 pm prior to the public meeting as outlined above.*

If you have any questions regarding this project or your organization's participation, please contact Anna Baum at 402.645.2250 or by email at abaum@upperloupnrd.org. To schedule a one-on-one meeting with the JEO team, please contact Jeff Henson at 402.474.8764 or by email at jhenson@jeo.com.

Thanks,
Jeff Henson

Upper Loup NRD – Hazard Mitigation Plan Update
Mitigation Project Meeting – Participant Team Meeting
Thedford, NE – Thursday, April 3, 2014
PLEASE PRINT CLEARLY- THANK YOU!

NAME	TITLE	JURISDICTION Represented	ADDRESS Street #, Street Name, City, Zip	PHONE	EMAIL
Cheryl Anderson	Village Clerk	Village of Hyannis	401 S. Main St. Hyannis, NE 69350 P.O. Box 78	308-458-2753	hyannis@nebnet.net.
Kurt Johnson	Village Maintainance Sup.	Village of Hyannis	" "	308-458-2753	hyannis@nebnet.net.
Deanna J. Barson	chairperson	Village of Brewster	395 Grant Ave Brewster, Nebr	308-547-2276	None
Ron Baker	board member	"	"	"	"
Ken Johnston	village clerk	Village of Brewster	440 Lincoln Ave Brewster 68821	308-547-2230	None
Jeff Henson	JEO Project MNGR	JEO	650 J Street	402-474-8764	jhenson@jeo.com
JACK BRUMMET	NRD	STAPLETON	54 AVE 70	308-636-2307	
Katie Swanson	JEO Planner	JEO	650 J St, Lincoln		KSwanson@jeo.com
JERRY JOHNSEN	CCHMN.	DISTRICT 1	65 AVE 14 S	308-636-8896	
Anna Baum	ULNRD Manager	NRD	39252 Hwy 2	308-645-2250	abaum@upperloupnrd.org

Please Sign In!

Upper Loup NRD – Hazard Mitigation Plan Update
Mitigation Project Meeting –Participant Team Meeting
Thedford, NE – Wednesday, April 2, 2014
PLEASE PRINT CLEARLY- THANK YOU!

NAME	TITLE	JURISDICTION Represented	ADDRESS Street #, Street Name, City, Zip	PHONE	EMAIL
Kyle Yrkoski	NRD Technician	NRD	39252 Hwy 2 Thedford, NE 69166	645-2250	Kyrkoski@upperloupnrd.org
Kevin Lem-Head	Emergency Manager	Thomas County	PO Box 163 Thedford, NE 69166	308-645-2594	Kevin.Head@ne.usda.gov
Terry J. Higgins	Village of Thedford Administrator	Village of Thedford	POBox 147 Thedford Ne 69166	308-645-2201	terry3553@msn.com
Alice Hodges	Secretary / Treasurer	Thomas Co Ag Society	Po Box 77 Thedford NE 69166	308-645-2646	dhodges@nebnet.net
Katie Swanson	Planner	JEO			

Please Sign In!

Upper Loup NRD – Hazard Mitigation Plan Update
Mitigation Project Meeting –Participant Team Meeting
Mullen, NE – Tuesday, April 1, 2014
PLEASE PRINT CLEARLY- THANK YOU!

NAME	TITLE	JURISDICTION Represented	ADDRESS Street #, Street Name, City, Zip	PHONE	EMAIL
Wynn Wiens	Hooker Co Em Upper Loup NRD director	Hooker Co Em	36651 Heritage Rd. Mullen, 69152	308-650-1183	wwiens9931@pdicable.com
Kyle Yrkoski	Upper Loup NRD	NRD	39252 Hwy 2	645-2250	KyrkoskiK@upperloupnrd.org
Melody McDowell	Mullen Village Board Member	Mullen	POBox 262	546-9231	rmmcdowell@nebnet.net
Tami Taylor	Village of Seneca/Board Member	Thomas Co.	P.O Box 97	645-7146	taylor.tami60@yahoo.com
Pat Taylor	Village of Seneca (Chairman)	Thomas Co.	P.O. Box 97	308-289-6476	pattaylor925@Yahoo.com
Deb Daly	Village of Mullen	Mullen	Box 187	308-546-2651	mullenclerk@nebnet.net
Katie Swanson	JEO	JEO			
Jeff Henson	JEO: Project Manager	JEO	605 J Street	402-474-8764	
Craig Thompson	Co. Commissioner	Blaine County	41337 Wild Hourse Creek Rd	308-538-2271	crthomps@nrb-sandhills.net
Dianna Redecker	Village Clerk	Halsey	P.O. Box 9	308-533-2513	—
Dan Sheets	Mayor	Dunning	P.O. Box 8	308-538-2216	—
KENNETH JIVIDEN	BOARD CHAIRMAN	VILLAGE of GANDY	404 GANDY HASKELL AVE	(308)636-2980	Kejiv@gpcom.net

Please Sign In!

Upper Loup NRD – Hazard Mitigation Plan Update
Hazard I.D Meeting – Planning Team Meeting
Stapleton, NE – Thursday, December 19, 2013; 2:00 PM
PLEASE PRINT CLEARLY- THANK YOU!

JEO CONSULTING GROUP INC

NAME	TITLE	JURISDICTION Represented	ADDRESS Street #, Street Name, City, Zip	PHONE	EMAIL
Anna Baum	Upper Loup NRD Mng.	Upper Loup NRD	31671 Heritage Rd Mullen	308-546-2920	nbaum@upperloupnrd.org
JERRY JOHNSON	Co. Commisser	LOGAN CO	65 AVE 145 STAPLETON	308-636-8996	
JACK BRUMMET	UPPER LOUP RECYCLE STAPLETON RECYCLE HAVE A FARM	UPPER LOUP	54 AVE 70 STAPLETON	308-636-2307 CELL 308-870-1005	
KENNETH JIVIDEN	GANDY CHAIRMAN	VILLAGE OF GANDY	404 GANDY Haskell AVE STAPLETON, NE	308)536-2980	Kcjiv@gpcom.net
Xinyu Fu	Planner	JEO			xfu@jeo.com
Jeff Henson	Planner	JEO	650 J Street	402.474-8764	jhenson@jeo.com
Donna Baker	Chairperson	Brewster	396 Grant Ave	308-547-2276	

Please Sign In!

Hazard Mitigation planning teams - hazard ID meetings

Date	name	position	represent
12-26-2013	DAN SHEETS	MAYOR	VILLAGE
26 Dec 13	CRAIG THOMPSON	Co COMISSIONER	BLAINE Co
12/30/13	ALAN ATKINS	THOMAS Co COMMISSIONER	
12.30.13	Kim Carr	Business Manager	Sandhills Public Schools
12-30-2013	Ron & Dawn Hasebroock	Treasurer	Halsey United Church of Christ
12-30-2013	Loren Eaton	Board member	Village of Halsey
12-30-13	Dianna Rodocker	Village Clerk	Village of Halsey
1-2-14	Kevin Hood	Emergency Manager	Thomas County
12-30-13	Lorissa Hartman	Thomas County Clerk	Thomas County
12-30-13	Alice Hedges	Thomas G Fairbaird	Secretary/Treasurer


Help build stronger communities.
Scan to complete the Risk Assessment Survey or attend a public meeting to help in the development of the
UPPER LOUP NRD
MULTI-JURISDICTIONAL
HAZARD MITIGATION PLAN
Is your community protected from future natural disasters?
Provide information and participate in the planning process!
Public Meetings:
Tues. Dec 17, 7:00 pm (MST)
Mullen Village Office, 501 SW 1st St
Wed. Dec 18, 7:00 pm (CST)
Upper Loup NRD Office,
39252 HWY 2, Thedford
Thurs. Dec 19, 3:00 (CST)
Logan County Courthouse,
317 Main Street, Stapleton
Contact
Anna Baum
General Manger,
Upper Loup NRD
abaum@upperloupnrrd.org
308.645.2250

APPENDIX C – PUBLIC MEETING MATERIALS AND WORKSHEETS

Contains the following:

1. Example of Hazard Identification Worksheet
2. Example of Risk Assessment Worksheet
3. Example of Critical Facility Worksheet
4. Example of STAPLEE Worksheet

Hazard Identification Worksheet

Upper Loup Hazard Mitigating Plan
Hooker County Risk Assessment Worksheet

When completing the Risk Assessment please use the following definitions to complete the survey.

- Probability of Future Occurrence:
  - ***Low***: likely to occur ***0 times in the next 10 years***
  - ***Medium***: likely to occur at least ***1-4 times in the next 10 years***
  - ***High***: likely to occur ***5 or more times in the next 10 years***

- Vulnerability of Population: *(loss of life or serious injury)*
  - ***Low***: ***less than 10%*** of the population impacted
  - ***Medium***: ***10-40%*** of the population impacted
  - ***High***: ***more than 40%*** of the population impacted

- Vulnerability of Property:
  - ***Low***: ***less than 10% of property*** in the impacted area damaged or destroyed
  - ***Medium***: ***10-40%*** of property in the impacted area damaged or destroyed
  - ***High***: ***more than 40%*** of property in the impacted area damaged or destroyed

- Impact on Critical Facilities & Infrastructure:
  - ***Low***: temporary shutdown of public services and/or infrastructure ***less than 1 day***
  - ***Medium***: shutdown of public services and/or infrastructure for ***1 day to 1 week***
  - ***High***: shutdown of public services and/or infrastructure for **more than 1 week**

- Potential Impact on Economy:
  - ***Low***: little to no impact on economy (business interruption ***1 day or less***) or **less than 10%** of economy impacted
  - ***Medium***: temporary loss of income or jobs (business interruption ***1 day to 1 week***) or **10 – 40%** of economy impacted
  - ***High***: long term disruption or permanent loss of income and jobs (business interruption ***great than 1 week***) or **more than 40%** of economy impacted

Upper Loup Hazard Mitigating Plan
Hooker County Risk Assessment Worksheet

2014 Hooker County Risk Assessment						
HAZARD	**PREVIOUSLY OCCURRED**	**PROBABILITY OF FUTURE OCCURRENCE**	**Vulnerability of Population**	**Vulnerability of Property**	**Impact on Critical Facilities**	**Impact on Local Economy**
Severe Winter Storms (Blizzard, Ext. Cold, Heavy Snow, Winter Storms)						
	2009 - 2013: 12 $32,120 Damages	2009: Likely	2009: (Extent) Severe			
Tornado / High Winds						
	2009 – 2013: 12 $5,353 Damages	2009: Likely	2009: (Extent): Severe			
Severe Thunderstorms						
	2009 - 2013: 8 $21,053 Damages	2009: Highly Likely	2009: (Extent) Severe			
Hail Events						
	2009 - 2013: 16 $133,833 Damages	NA	NA			
Flooding						
	2009 - 2013: None Reported	2009: Possible	2009: (Extent) Limited			
Extreme Heat						
	2009 - 2013: None Reported	2009: Possible	2009: (Extent) Limited			
Drought						
	2009 - 2013: 1 $1,000,000 Damages	2009: Highly Likely	2009: (Extent) Severe			
Wildfire						
	2009 - 2013: None Reported	2009: Highly Likely	2009: (Extent) Severe			

Urban Fire										
Dam Failure		2009 - 2013: None Reported	2009: Unlikely				2009: (Extent) None			
Earthquake		2009 - 2013: None Reported	2009: Unlikely				2009: (Extent) None			
Landslide		2009 - 2013: None Reported	2009: Unlikely				2009: (Extent) None			
Animal Disease										
Plant Disease										
Chemical Spills (during transport)		1980 – 2013: 1 $0 Damages	2009: NA				2009: (Extent) NA			
Chemical Spills (fixed site)		2009 - 2013: None Reported	2009: NA				2009: (Extent) NA			
Major Transportation Incident		1980 – 2013: 3 Aircraft Crashes	2009: NA				2009: (Extent) NA			
Radiological Incident (during transport)										
Radiological Incident (fixed site)										
Prolonged Power Outages										
Terrorist Incident										
Civil Disorder										

Risk Supplement Worksheet

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Upper Loup NRD – Hazard Mitigation Plan Update

Hooker County Risk Assessment Supplement Survey

Name/Title: _____ **Jurisdiction:** _____

PART ONE GENERAL INFORMATION

City Governance

The jurisdiction is governed by (mayor/city or village board?)

_____

_____

Boards and Committees Members

_____

_____

_____

_____

_____

Growth Expectation

New Structures: _____

Population: _____

Areas Expecting Growth (North, South, Etc.):_____

_____

Future Land Use Map: _____

Other: _____

_____

_____

Transportation System

Major Road Ways:

Major Concerns: _____

_____

_____

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Upper Loup NRD – Hazard Mitigation Plan Update

Hooker County Risk Assessment Supplement Survey

- Snow Removal Equipment: _____
- City Streets Cleared by: _____
- Do you use Snow Fences (if yes how): _____

  _____
- Do you have back-up power on community facilities i.e. wells fire house, etc. (if yes where):

  _____

Are there local education programs (if yes what): _____

Severe Thunderstorms
Reported Events:

Current Capabilities:

- Do you need/use surge protection at critical facilities: _____
- Do you have a tree board (if yes how many members): _____
- Do you have weather radios in critical facilities: _____
- Are there local education programs (if yes what): _____

Terrorism
Reported Incidents:

Current Capabilities:

- What type of incidents are expected (agro-terrorism, tampering with water supply, bombing, incident at a school, etc.): _____
- Targets of concern: _____
- Are critical facilities protected (fences around water towers or wells, protective barriers, etc.):

  _____

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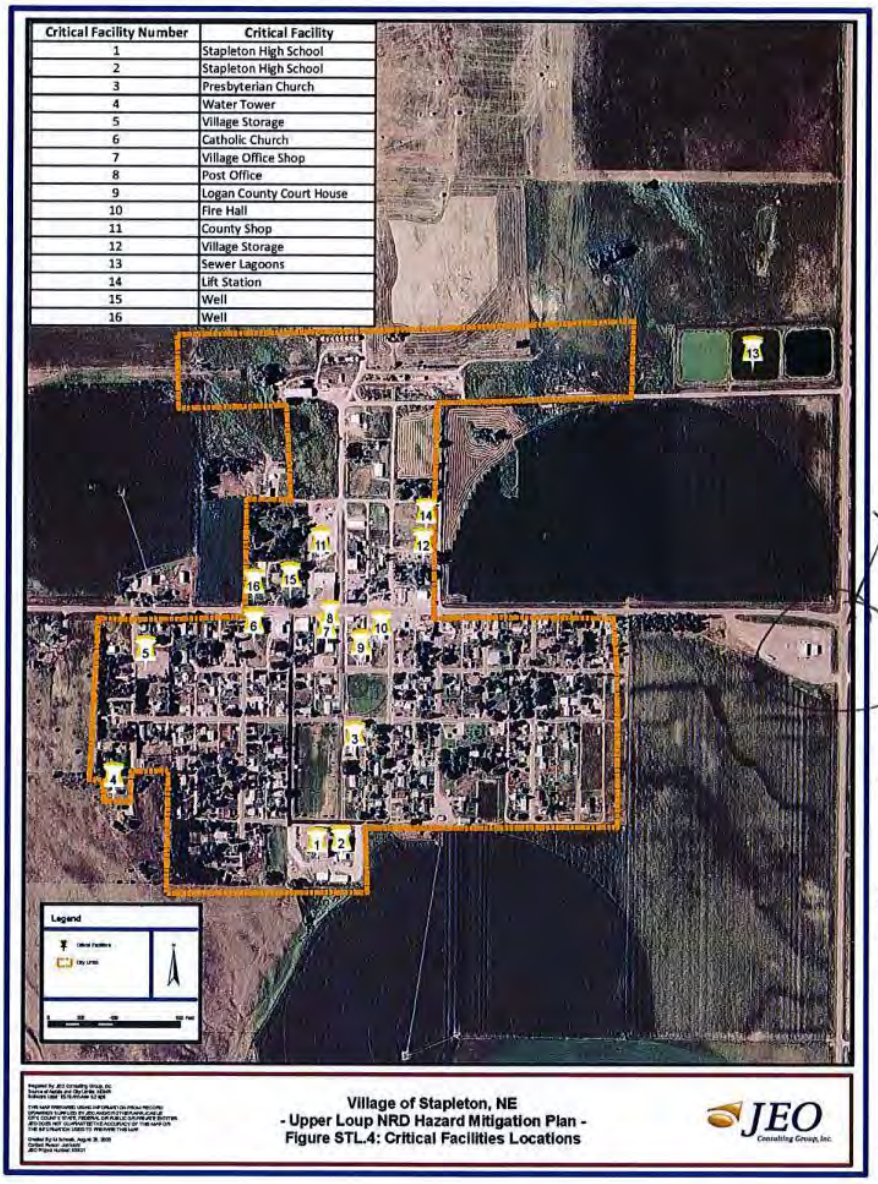
Upper Loup NRD – Hazard Mitigation Plan Update

Hooker County Risk Assessment Supplement Survey

	Grant Manager		
	Other (if any)		
Fiscal Capability	Capital Improvement Project Funding		
	Community Development Block Grant		
	Authority to Levy Taxes for Specific Purposes		
	Gas/Electric Service Fees		
	Storm Water Service Fees		
	Water/Sewer Service Fees		
	Development Impact Fees		
	General Obligation Revenue or Special Tax Bonds		
	Other (if any)		
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.		
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)		
	Natural Disaster or Safety related school programs		
	StormReady Certification		
	Firewise Communities Certification		
	Public-private partnership initiatives addressing disaster-related issues		
	Other (if any)		

Critical Facilities Worksheet

Critical Facility Number	Critical Facility
1	Stapleton High School
2	Stapleton High School
3	Presbyterian Church
4	Water Tower
5	Village Storage
6	Catholic Church
7	Village Office Shop
8	Post Office
9	Logan County Court House
10	Fire Hall
11	County Shop
12	Village Storage
13	Sewer Lagoons
14	Lift Station
15	Well
16	Well



numbers

gas station add to critical facilities

add grocery store to facilities

1			
Name of facility: Stapleton High School		Address:	
Date of construction:			
Insured value of structure:			
Current condition (indicate one):	Poor	Good	Excellent
Previous disaster impacts to structure:			
Site improvements / Mitigation efforts:			
Other relevant characteristics:			

2			
Name of facility: Stapleton High School		Address:	
Date of construction:			
Insured value of structure:			
Current condition (indicate one):	Poor	Good	Excellent
Previous disaster impacts to structure:			
Site improvements / Mitigation efforts:			
Other relevant characteristics:			

3			
Name of facility: Presbyterian Church		Address:	
Date of construction:			
Insured value of structure:			
Current condition (indicate one):	Poor	Good	Excellent
Previous disaster impacts to structure:			
Site improvements / Mitigation efforts:			
Other relevant characteristics:			

4			
Name of facility: Water Tower		Address:	
Date of construction:			
Insured value of structure:			
Current condition (indicate one):	Poor	Good	Excellent
Previous disaster impacts to structure:			
Site improvements / Mitigation efforts:			
Other relevant characteristics:			

5			
Name of facility: Village Storage		Address:	
Date of construction:			
Insured value of structure:			
Current condition (indicate one):	Poor	Good	Excellent
Previous disaster impacts to structure:			
Site improvements / Mitigation efforts:			
Other relevant characteristics:			

6			
Name of facility: Catholic Church		Address:	
Date of construction:			
Insured value of structure:			
Current condition (indicate one):	Poor	Good	Excellent
Previous disaster impacts to structure:			
Site improvements / Mitigation efforts:			
Other relevant characteristics:			

7			
Name of facility: Village Office Shop		Address:	
Date of construction:			
Insured value of structure:			
Current condition (indicate one):	Poor	Good	Excellent
Previous disaster impacts to structure:			
Site improvements / Mitigation efforts:			
Other relevant characteristics:			

8			
Name of facility: Post Office		Address:	
Date of construction:			
Insured value of structure:			
Current condition (indicate one):	Poor	Good	Excellent
Previous disaster impacts to structure:			
Site improvements / Mitigation efforts:			
Other relevant characteristics:			

9			
Name of facility: Logan County Court House		Address:	
Date of construction:			
Insured value of structure:			
Current condition (indicate one):	Poor	Good	Excellent
Previous disaster impacts to structure:			
Site improvements / Mitigation efforts:			
Other relevant characteristics:			

10			
Name of facility: Fire Hall		Address:	
Date of construction:			
Insured value of structure:			
Current condition (indicate one):	Poor	Good	Excellent
Previous disaster impacts to structure:			
Site improvements / Mitigation efforts:			
Other relevant characteristics:			

11			
Name of facility: County Shop		Address:	
Date of construction:			
Insured value of structure:			
Current condition (indicate one):	Poor	Good	Excellent
Previous disaster impacts to structure:			
Site improvements / Mitigation efforts:			
Other relevant characteristics:			

12			
Name of facility: Village Storage		Address:	
Date of construction:			
Insured value of structure:			
Current condition (indicate one):	Poor	Good	Excellent
Previous disaster impacts to structure:			
Site improvements / Mitigation efforts:			
Other relevant characteristics:			

13			
Name of facility: Sewer Lagoons		Address:	
Date of construction:			
Insured value of structure:			
Current condition (indicate one):	Poor	Good	Excellent
Previous disaster impacts to structure:			
Site improvements / Mitigation efforts:			
Other relevant characteristics:			

14			
Name of facility: Lift Station		Address:	
Date of construction:			
Insured value of structure:			
Current condition (indicate one):	Poor	Good	Excellent
Previous disaster impacts to structure:			
Site improvements / Mitigation efforts:			
Other relevant characteristics:			

STAPLEE Worksheet

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Upper Loup Natural Resource District – Hazard Mitigation Plan Update

RANKING OF PROJECTS USING STAPLEE
DATE: _____
COMMUNITY: _____
COMPLETED BY: _____

INSTRUCTIONS ON RANKING – On the following page is a list of projects that can be completed in your community to reduce the losses or damages from hazards. This list of projects has been completed based on your input from the last round of meetings, the results of the preliminary risk assessment, and by researching projects that would be beneficial to your community. Listing these projects in the plan does not mean that your community is required to do them, but it does indicate that these projects might be beneficial. These are potential activities your community could do in the future should funds become available. Please prioritize and identify projects that could be implemented within 5-10 years. **Please complete the following on the worksheet:**

1) Add any additional projects that may be beneficial.
2) Place a **'+', '-'**or **'0'** in each of the columns referring to the STAPLEE criteria. (For example, if a project is 'socially' beneficial to your community then place a '+' under the *Social* column. If the project would have a negative impact 'politically' then place a '-' under the *Political* column. If a project will have no discernible impact, use the '0')
3) Fill in the blank of who the **'responsible department/agency'** would be. If your community were to follow through with implementing this project, what department or agency would be primarily responsible for seeing the project through?
4) For the "Project Status" place the following markers as needed: 1 = In Progress, 2 = Complete, 3 = Not Yet Started and 4 = No Longer Relevant

DEFINITION OF STAPLEE – Mitigation alternatives or actions need to be prioritized based on certain considerations. FEMA recommends using the STAPLEE evaluation, as this process addresses all the major factors when weighing the costs to the benefits of implementing one action over another. Below is an explanation of the STAPLEE criteria taken from FEMA's Multi-Hazard Mitigation Planning Guidance (March 2004):

S – Social: *Mitigation actions are acceptable to the community if they do not adversely affect a particular segment of the population, do not cause relocation of lower income people, and if they are compatible with the communities social and cultural values.*

T – Technical: *Mitigation actions are technically most effective if they provide long-term reduction of losses and have minimal secondary adverse impacts.*

A – Administrative: *Mitigation actions are easier to implement if the jurisdiction has the necessary staffing and funding.*

P – Political: *Mitigation actions can truly be successful if all stakeholders have been offered an opportunity to participate in the planning process and if there is public support of the action.*

L – Legal: *It is critical that the jurisdiction or implementing agency have the legal authority to implement and enforce a mitigation action.*

E – Economical: *Budget constraints can significantly deter the implementation of mitigations actions. Hence, it is important to evaluate whether an action is cost-effective, as determined by a cost-benefit review, and possible to fund.*

E – Environmental: *Sustainable mitigation actions that do not have an adverse effect on the environment, that comply with Federal, State, and local environmental regulations, and that are consistent with the community's environmental goals, have mitigation benefits while being environmentally sound.*

RETURN TO: Jeff Henson, JEO Consulting Group, Inc. • jhenson@jeo.com • 402.474.8764 • 650 J Str. Suite 215, Lincoln, NE 68508

ENGINEERING ■ ARCHITECTURE ■ SURVEYING ■ PLANNING

Upper Loup Natural Resource District – Hazard Mitigation Plan Update

RANKING OF PROJECTS USING STAPLEE
DATE: _____
COMMUNITY: _____
COMPLETED BY: _____

Is the Project Beneficial? ***Place a '+', '-', or '0' in each STAPLEE criteria column.***
Project Status: ***1 = In Progress, 2 = Complete, 3 = Not Yet Started and 4 = No Longer Relevant***

Blaine County Projects	Social	Technical	Administrative	Political	Legal	Economical	Environmental	Project Status	Priority: High, Medium, Low	Responsible Department/Agency
Example: Update Hazard Mitigation Plan	+	+	-	+	+	+	*0*	*2*	*Medium*	*County EM*
Increase public awareness of vulnerability to hazards/education.									Low	County
Purchase and issue weather radios for schools and critical facilities.									Low	County
Identify, design and develop storm shelters									Low	Village
Generator-backup power system to provide redundant power supply									High	County + Village
Participate through the National Arbor Day Foundation									Low	County + Village
Improve drainage patterns in and around the communities-culverts									High	County
Assist communities in participating in the National Flood Insurance Program (NFIP)									Low	Village
Maintain good standing with National Flood Insurance Program (NFIP)									Low	Village
Reverse 911									High	Region 26
Improve communication									High	Region 26
Erosion control education and material									High	County
Civil service improvements-additional personnel/equipment for emergency response.									High	Fire Sheriff, Ambulance
Snow fences									Low	County
Defensible space-fire wise maintenance									Medium	Fire Department

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ENGINEERING ■ ARCHITECTURE ■ SURVEYING ■ PLANNING

Upper Loup Natural Resource District – Hazard Mitigation Plan Update

RANKING OF PROJECTS USING STAPLEE
DATE: _____
COMMUNITY: _____
COMPLETED BY: _____

Is the Project Beneficial? ***Place a '+', '-', or '0' in each STAPLEE criteria column.***
Project Status: ***1 = In Progress, 2 = Complete, 3 = Not Yet Started and 4 = No Longer Relevant***

Blaine County Projects: OPTION PROJECTS, NOT REQUIRED TO COMPLETE	Social	Technical	Administrative	Political	Legal	Economical	Environmental	Project Status	Responsible Department/Agency
Example: Update Hazard Mitigation Plan	+	+	-	+	+	+	0	2	County EM
Work with Trailer Park owners to promote the construction of Community Safe Rooms for the protection of residents									
Develop continuity plans for critical community services									
Work with stakeholders to develop a database of vulnerable populations and the organizations which support them									
Educate local businesses on the value of continuity planning									
Promote the use of higher codes and standards, such as the Fortified for Safer Living Standard, in order to provide greater protection for any new construction or building retrofits.									
Encourage the use of hail resistant roofing for any new construction.									
Preserve natural and beneficial functions of floodplain land through measures such as: retaining natural vegetation, restoring streambeds; and preserving open space in the floodplain.									
Adopt a No Adverse Impact approach to floodplain management									
Utilize Low Impact Development practices and Green Infrastructure to reduce flood risk									
Educate the public and business owners regarding rain gardens, green roofs, and other minor mitigation measures									
Ensure that facilities which will house vulnerable populations are placed in the least vulnerable areas of the community.									

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Blaine County Projects: OPTION PROJECTS, NOT REQUIRED TO COMPLETE	Social	Technical	Administrative	Political	Legal	Economical	Environmental	Project Status	Responsible Department/Agency
Ensure that all critical facilities, businesses, and residents located near major transportation corridors and near fixed site chemical facilities are aware of how to safely shelter in place in the event of a chemical incident.									
Install vehicular barriers to protect critical facilities and key infrastructure where possible.									
Promote first aid training for all residents.									

* Projects listed in RED were identified by the project team that could be beneficial to your community.

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APPENDIX D – WORKSHEETS TO ASSIST COMMUNITY IN REVIEW AND UPDATES

APPENDIX E - HAZARD MITIGATION PROJECT FUNDING GUIDEBOOK

Contents

SECTION ONE: OVERVIEW

This *Hazard Mitigation Project Funding Guidebook* is provided by JEO Consulting Group, Inc.

The intent of the Guidebook is to provide initial guidance on:

- Hazard mitigation project funding opportunities
- Where to find more information

The information in this Guidebook is consistent with established processes for hazard mitigation planning. However, it is important to note the following in terms of the context for this Guidebook relative to the overall planning process:

- Project identification includes identifying all possible options (or alternatives) to address planning objectives; i.e., at this stage, there are no "bad" options. At times, the best option may be to work with other actors in the community to design solutions that are responsive to community values while reducing risk (i.e. a bike path or ball field that can double as a retention area, or the preservation of an animal habitat that also serves as a natural buffer). These types of solutions can often be funded in very innovative ways, including solutions which increase local industry and revenue (i.e. tapping into the entrepreneurial community).
- Project identification is followed by a comprehensive evaluation of possible project options to identify viable, preferred option(s) for development of specific implementation strategies. Preferred options may change as different stakeholders come to the table and additional ideas are proposed or funding sources identified. Incremental mitigation projects, in which risk is slowly bought down through a comprehensive range of actions, can be a much more realistic strategy than identifying the one best (and often costliest) solution.
- Project evaluation criteria include the need for and the availability of funding for specific project options along with technical feasibility, environmental consequences, cost effectiveness, etc.

Even though funding availability is "technically" part of project evaluation, this Guidebook offers information regarding availability of funding in addition to information about identifying projects. The purpose is to reflect the importance of linking project options with potential funding and implementation mechanisms as early as possible to eliminate options with little or no prospects for funding but more importantly, to recognize that successful implementation of the resulting hazard mitigation plan (HMP) will require creative approaches to project funding and the documentation of successful projects. Knowledge of a broader range of funding opportunities and mechanisms beyond federal hazard mitigation grant programs will enable the planning team to keep as many implementation options open as possible, as well as to ensure that some minimal projects can be completed in between plan updates.

SECTION TWO: HAZARD MITIGATION PROJECT FUNDING OPPORTUNITIES

3.1 GENERAL

When the current FEMA hazard mitigation planning program was formulated in the late 1990s as part of the Disaster Mitigation Act of 2000 (DMA 2000), there was an assumption that federal funding would be provided on an substantial, on-going basis for implementing hazard mitigation projects. While hundreds of millions of dollars have been provided by the federal government over the last decade, primarily through FEMA hazard mitigation grant programs, the level of funding has varied from year to year and future prospects are unclear. Additionally, some communities have not been successful in their pursuit of these grants and have not seen the value of their investment in mitigation planning. As a result, while it is still important to have a grasp of how these legacy federal programs can be used to fund hazard mitigation projects, it is increasingly important to look for other opportunities.

Opportunities for funding and technical assistance exist in other federal agencies or possibly state or local agencies. In addition, alternative funding opportunities can be developed at the regional or local level with private sector businesses, private foundations, and other non-governmental organizations (NGOs). In order to fully map out the range of local and state options it is necessary to undertake a detailed stakeholder analysis – something which has not been done at this time. The following contains a brief overview of federal, state, and local government programs that may include opportunities for hazard mitigation project funding as well as alternatives within the private sector and NGOs.

3.2 FEDERAL RESOURCES

Information about federal hazard mitigation project funding opportunities is organized per the following categories:

- FEMA Unified Hazard Mitigation Assistance Grant Programs
- Other FEMA Hazard Mitigation Programs
- Other Federal Agency Programs

3.2.1 FEMA UNIFIED HAZARD MITIGATION ASSISTANCE GRANT PROGRAMS

There are three (3) grant programs administered at the federal level by FEMA that are grouped under the umbrella heading of the "Unified Hazard Mitigation Assistance Grant Programs" (HMA) including:

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

These programs also have a counterpart agency at the State level. For Nebraska, HMGP and PDM are administered at the state level by the Nebraska Emergency Management Agency (NEMA). The FMA program is managed by the Nebraska Department of Natural Resources (NDNR). Periodically, FEMA issues guidance covering the administrative elements for all three (3) programs, titled the *Hazard Mitigation Assistance Unified Guidance*. The most recent guidance was released in 2013.

There are a number of similarities and differences between these programs but it is important to note three distinctions between HMGP and the other four HMA programs:

- HMGP is only available when authorized under a Presidential major disaster declaration, i.e., post-disaster. The other four HMA programs, when funding is appropriated by Congress, are available pre-disaster.
- Project eligibility under HMGP can be limited by the State as part of the HMGP Administrative Plan developed post-disaster. For example, funding may only be made available for projects that are related to the type of disaster; i.e., HMGP related to a significant flood disaster declaration may only be designated for flood mitigation projects like acquisitions of repetitively flooded properties.
- Eligible projects can include project types that are not typically funded by FEMA hazard mitigation programs if FEMA authorizes what is referred to as the "5% initiative". Generally reserved for very large disasters,

authorizing the 5% initiative can make funding available for new, unproven mitigation techniques and technologies where benefits are not proven or not clearly measurable such as back-up generators, disaster warning equipment and systems, hazard identification or mapping efforts, and studies or plans to reduce disaster losses. The current State of Nebraska Administrative Plan for HMGP associated with FEMA 4014-DR-NE identifies the potential use of the 5% initiative for that particular disaster event.

Note: Section Three includes individual website URLs for more detailed information on these three HMA programs and the Hazard Mitigation Assistance Unified Guidance.

3.2.2 OTHER FEMA HAZARD MITIGATION PROGRAMS

Two (2) other FEMA programs include the potential for funding hazard mitigation projects that may be identified:

- Fire Management Assistance Grant Program (FMAGP) - FMAGP may be applicable to some areas of Nebraska; the NESHMP identifies Wildfires as the third highest ranked hazard on a state-wide basis. FEMA provides the following overview of the FMAGP program:

  [FMAGP] is available to States, local and tribal governments, for the mitigation, management, and control of fires on publicly or privately owned forests or grasslands, which threaten such destruction as would constitute a major disaster.

- Public Assistance (PA) Section 406 Hazard Mitigation Funding – Generally, PA funds are provided post-disaster for the restoration of public infrastructure that has sustained damaged due to a presidentially-declared disaster. The legislation authorizing PA also includes a "*provision for the consideration of funding additional measures that will enhance a facility's ability to resist similar damage in future events*." It is important to note that Section 406 funding can only be used on parts of a facility that were actually damaged by the disaster; although in some cases the damages are sufficient that the entire facility must be replaced.

  Therefore, it is often difficult to include the type of specific predictions in a HMP that would lead to identifying Section 406 as a prime option for funding but it should be noted in the HMP and referenced wherever it is potentially applicable. Areas of vulnerability for particular buildings, or building types, identified through the HMP can be a resource for the identification of PA mitigation projects. Additionally, local and state staff should receive training in the successful use of PA.

Additional FEMA programs include: Community Assistance Program which assists states with the NFIP; various post-disaster funds and programs; and Assistance to Firefighter Grants which can assist with the enhancement of response capabilities.

Note: Section Three includes individual website URLs for more detailed information on these two FEMA programs that are also the sources of the quoted passages.

3.2.3 OTHER FEDERAL AGENCY PROGRAMS

Although FEMA programs are typically thought of as the primary sources of federal agency hazard mitigation project funding, there are a significant number of agencies with programs relevant to local HMPs and hazard mitigation project implementation. The following indicates some of the federal programs which may be of assistance in funding certain types of hazard mitigation projects – or portions of those projects.

Table 1: Federal Programs

Source	Description	Additional Notes	Website
Advisory Council on Historic Preservation	The Preserve America matching-grant program provides planning funding to designated Preserve America Communities to support preservation efforts through heritage tourism, education, and historic preservation planning.	This funding source may be considered as part of efforts to ensure that historic structures are protected from natural hazards. The City of Lincoln is a Preserve America Community.	http://www.preserveamerica.gov/
National Endowment for the Humanities	The National Endowment for the Humanities manages multiple grant programs which may be relevant.	Programs support educational initiatives and cultural institutions.	http://www.neh.gov/grants
U.S. Department of Agriculture (USDA)	USDA administers several programs that are potentially relevant including the National Institute of Food and Agriculture (NIFA), Natural Resource Conservation Service (NRCS), Rural Development, and the Farm Service Agency (FSA).	There are many different NRCS programs which can provide technical assistance and construction of improvements to relieve imminent hazards to life and property from floods and erosion. There are also various rural development programs which can support essential services such as sewer services and assist with fire and police stations. USDA programs also support renewable energy efforts. However, other USDA programs should be examined relative to identified projects to find potential matches with funding and assistance provisions.	http://www.usda.gov/wps/portal/usda/usdahome?navid=GRANTS_LOANS
U.S. Department of Commerce	Economic Development Administration (EDA) – EDA primarily provides a variety of grants, loans, and technical assistance to support long-term economic recovery but also has supported grants for upgrades to critical public infrastructure and essential facilities.	There are various programs and resources available through EDA. The National Weather Service and National Oceanic and Atmospheric Administration have also had programs in the past, but are restricted by funding at the moment.	http://www.eda.gov/ffo.htm
U.S. Army Corps of	USACE can provide a broad range of assistance under legislative authority related to flood control for floodplain	USACE projects generally involve watershed level activities and long	http://www.nwo.usace.army.mil/

Engineers (USACE)	management planning, stream bank and shoreline protection, and aquatic ecosystem restoration.	project development and implementation timelines but may be applicable to regional considerations.	
U.S. Dept. of Education	Grants support LEAs in the development of communitywide approaches to creating safe and drug-free schools and promoting healthy childhood development. Programs are intended to prevent violence and the illegal use of drugs and to promote safety and discipline. Coordination with other community-based organizations (CBOs) is required. This program is jointly funded and administered by the departments of Education, Justice, and Health and Human Services. The appropriation amounts listed above do not include funds appropriated for the departments of Justice and Health and Human Services.	This program can be used to work towards safer schools, taking various potential risks into account.	http://www2.ed.gov/programs/dvpsafeschools/index.html
U.S Department of Energy (DOE)	DOE undertakes a range of missions related to electricity and energy including improving "*the ability of energy sector stakeholders to prevent, prepare for, and respond to threats, hazards, natural disasters, and other supply disruptions"*. DOE works closely with State and local governments on energy assurance issues and develops products and tools to inform and educate State and local officials to support their energy emergency response activities. DOE also partners with State and local organizations to further assist in these efforts including the National Association of State Energy Officials, National Association of Regulatory Utility Commissioners, National Governors Association, National Conference of State Legislatures, and at the local level, Public Technology Institute. Recently, DOE created the Local Energy Assurance Program (LEAP) which included more than $8 million in LEAP grants to 43 cities and towns across the country to develop or expand local energy assurance plans to improve electricity reliability and energy security in these communities	DOE programs fund weatherization efforts, support renewable energy efforts which can be a portion of an energy assurance effort, and can provide technical assistance through the Nuclear Safety and Environment Program.	http://energy.gov/public-services/funding-opportunities
US Dept. of Health & Human Services	The US Dept. of Health & Human Services and its various agencies provide a wide range of grants and technical assistance programs.	Grant programs include technical: assistance and training related to ensuring safe water and wastewater treatment for rural areas; program to	http://www.hhs.gov/grants/index.html

		provide AEDs; and programs to ensure that rural areas have access to health services.	
U.S. Department of Housing and Urban Development (HUD)	HUD administers the Community Development Block Grants (CDBG). CDBG funds have been used in conjunction with other hazard mitigation funding sources, e.g., HMGP, to implement projects including acquisitions and elevation of flood prone properties. However, HUD funding for hazard mitigation projects usually comes via special Congressional appropriations related to specific disaster events.	CDBG funds can play a key role in hazard mitigation.	http://portal.hud.gov/hudportal/HUD?src=/topics/grants
US Dept. of Justice	The Office of Community Oriented Policing services offers funding to assist with community policing capacity.	This program may be relevant to communities which identify crime, acts of violence and/or terrorism as a hazard.	http://www.justice.gov/business/
US Dept. of Labor	National Emergency Grants (NEGs) temporarily expand the service capacity of Workforce Investment Act Dislocated Worker training and employment programs at the state and local levels by providing funding assistance in response to large, unexpected economic events which cause significant job losses. NEGs generally provide resources to states and local workforce investment boards to quickly reemploy laid-off workers by offering training to increase occupational skills.	Training and temporary jobs can focus on weatherization or possibly mitigation related activities.	http://www.doleta.gov/neg/
US Dept. of the Interior	The National Parks Service has multiple grants allowing for the purchase of land for recreational facilities, the rehabilitation of recreation facilities, and protecting cultural treasures.	These programs could assist with the securing of land which can serve a dual purpose of mitigation and recreation, as well as for protecting some historic sites.	www.nps.gov
US Dept. of Transportation	Funds support recreational trails, bridge replacement, safe routes to schools, road projects in rural areas, and other programs.	These funds can be incorporated into multi-objective projects aimed at hazard mitigation.	http://www.dot.gov/grants
U.S. Environmental Protection Agency (EPA	In May, 2010, EPA signed a memorandum of agreement with FEMA to "*formalize efforts to explore opportunities to incorporate sustainability and smart growth practices into communities' hazard mitigation planning and long term disaster recovery efforts, and to incorporate hazard resilience into smart growth assistance for communities.*"	EPA programs support efforts to clean up brownfields, support water quality, provide safe drinking water, promote green communities, and watershed protection.	http://www2.epa.gov/home/grants-and-other-funding-opportunities

	The intent is to coordinate parallel activities within these agencies for an array of policy initiatives that include climate change considerations. For projects that are intended to improve land use planning practices, this joint effort could provide valuable technical assistance.		
Small Business Administration (SBA)	SBA Disaster Loan Program (DLP) is a significant source of assistance for homeowners, renters, businesses, and nonprofit organizations in the aftermath of disasters. Although this is a post-disaster funding mechanism, it is important to note that loans can be increased up to 20% for mitigation to protect property from future disasters of the same kind that caused the current damage.	Small businesses can use SBA loans for many purposes, before and after a disaster.	

These are by no means the only non-FEMA, federal agency programs that could have the potential to support hazard mitigation project implementation. Additionally many of these programs are dependent on yearly funding allocations. However, at this point, it is more important to be aware of the potential for other federal agencies to support a broad array of project types. As needs and potential hazard mitigation project options are identified, more information can begin to be gathered on the range of programs which might be utilized. It will be more efficient to start with project options and then follow-up with the identification of potential matches, working with the full range of available programs and agencies as part of a comprehensive project evaluation process.

3.3 STATE OF NEBRASKA RESOURCES AND PRIORITIES

The 2011 NESHMP identifies a number of agencies and programs with potential applicability to supporting funding and implementation of mitigation projects in addition to the federal hazard mitigation grant programs administered at the state level by NEMA and NDNR already mentioned above. These agencies will also likely be important in earlier stages of the hazard mitigation planning process by providing current hazard and risk assessment data, including:

- NDNR – Public outreach and education programs should be incorporated and cross-referenced as part of any corresponding programs recommended as part of HMPs

- Climate Assessment and Response Committee (CARC) – CARC is a committee comprised of other state agencies and other stakeholders including the University of Nebraska and private livestock and crop producers. A primary concern of the CARC appears to be drought mitigation and at a minimum, the CARC should be a good source of technical support for related mitigation actions at the region or local levels.

- Nebraska Forest Service (NFS) – Per the NESHMP, the NFS "administers state and federal grant monies for fuel treatment on private property…for thinning forested tracts and for applying firewise principles to properties."

One existing mechanism for agency collaboration, particularly in the area of flooding, is the Nebraska Silver Jackets Program (http://silverjackets.dnr.ne.gov/). Silver Jackets teams are active in many states and consist of various state and federal agencies working together in support of flood risk reduction.

Some state agencies which provide technical assistance and other resources include:

- Nebraska Department of Environmental Quality
- Nebraska Department of Economic Development
- Nebraska Department of Roads
- Nebraska Game and Parks Commission
- Nebraska State Historic Preservation Office

In addition to these programs, it is important to always have a sense of the priorities that are identified by other agencies in influential positions regarding future grant funding. For example, the 2012 State of Nebraska Administrative Plan for HMGP, consistent in many ways with aspects of the NESHMP, identifies eligible project types such as:

- Structural hazard control or protection projects
- Retrofitting of facilities
- Property acquisition or relocation
- Development or improvement of warning systems
- Dead-end storm structures
- Replacement of conductors to T-2 Conductors, e.g., for increased wind resistance for electrical transmission lines

3.4 ALTERNATIVE FUNDING SOURCES

In recent years, states and communities across the country have sought and developed innovative funding sources as alternatives to traditional government grant programs. This will be important for current and future hazard mitigation planning efforts for several reasons including:

- Decreases in funding for pre-disaster mitigation grant and assistance programs at the federal level and for state agencies - While technical assistance and other related support functions are still actively supported across federal and state agencies, and in some cases are increasing, allocations for "bricks and mortar" pre-disaster hazard mitigation projects will be competing with a broad range of government funding needs. These funds may not completely disappear but the need will continue to outstrip the supply for the foreseeable future.

- Opportunities to fund projects that might not qualify or align with traditional grant and assistance programs. Funding programs seek solutions that reduce risk for a particular threshold (i.e. 1% flood) and meet absolute cost-benefit criteria that the agencies themselves must adhere to. Therefore, these programs, by their basic nature, are not able to support efforts that may help most of the time but don't meet these thresholds, e.g., a homeowner installed flood wall in a repetitive loss area that prevents annual floods, but not larger magnitude events that come along every few years. There is a related concept that can be referred to as "cumulative risk reduction". For example, a homeowner with limited resources (and no real access to grant funds) might be willing to spend a little time and money each year getting just a little bit safer.

The following identifies general kinds of alternative funding sources and techniques that have been employed in other communities:

- Local Funding Options
- Public-Private Partnerships
- Private Foundations

3.4.1 LOCAL FUNDING OPTIONS

Local funding options are just what they sounds like, using local funds for local mitigation projects. Local funds are also needed as the non-federal share or "matching funds" for federal grant programs but can also be used independently to fund a range of project types. Local funding options include the following:

- Capital Improvement Programs – On-going civic improvements can include prioritized hazard mitigation projects or mitigation can be included as one aspect of a larger project. For example, improving the hydraulic capacity of a culvert or bridge to prevent upstream flooding while undertaking periodic replacements for end of service considerations is one example. Replacing windows in a school with shatter resistant glass as part of an overall renovation is another example. Capital improvement programs are generally funded with local tax revenues and municipal bonds.

- Permits, Fees, and Developer Contributions- Communities can establish fees, earmark a portion of existing permit and fee structures, and/or establish requirements for developer contributions for new developments in hazard prone areas that can then be used to fund local mitigation projects. The proceeds can be accumulated in what is often referred to as a "Mitigation Trust Fund" and the uses are typically tied to specific project types and/or relationships with projects already identified in specific plans or documents such as an HMP. These types of funds can also be used to create vouchers or other incentives to individual action.

- Force Account / In-Kind Services – Although there is a "cost" associated with activities of public employees, there are a wide range of activities that can be undertaken by local government staff and officials as well as interested parties on their behalf that would yield significant benefits. Some of the obvious examples are public outreach and education for individual property owners, business and institutions to reduce their risk

through correspondingly inexpensive or essentially activities. This would include tapping into available educations resources[1], promoting individual action, etc.

- Property Owners – For a project that directly benefits one or more specific properties, the property owner can be asked to contribute. Through the HIRA process, property owners can become better aware of their risks and options. Owners that recognize they have a real flood problem may be willing to pay a portion of the cost. In recent years, property owners have voluntarily agreed to pay the non-federal share (up to 25% of the total project cost) for FEMA HMA grants in some states. In some cases, the owners have paid even higher percentages of the cost. In addition, after a flood, owners may have cash from insurance claims or disaster assistance that they will be using to repair their homes and properties. By including the right floodproofing and mitigation project components into the repairs, the resilience of the property to future flooding may be improved.

  Having property owners contribute to the project can help stretch available local funds and also gives the property owner an enhanced stake in the outcome of the project and incentive to make sure the property is properly maintained.

- Individual Participation – Although mitigation is ultimately intended to benefit individuals, HMPs often neglect to integrate participation of potential beneficiaries into the process. The participation by individuals, including small business owners, is important for making sure the resulting HMP reflects community needs and priorities but it also allows for the planning team to identify measures and options that individuals can take to reduce their own risk at a cost they can afford.

3.4.2 PUBLIC-PRIVATE PARTNERSHIPS

Developing a "public-private partnership" is a phrase used frequently in a wide range of government programs and for good reason, especially in the content of hazard mitigation. Similar to the point made in the preceding subsection regarding individual participation, participation of private sector organizations in solving their own hazard risk situations can be a low-cost and effective method. The phrase also encompasses finding opportunities for public and private sector partners to share costs equitably for larger projects that require substantial funds to implement. Private sector businesses and organizations have their own cost-benefit calculations to perform but joint efforts may make the balance sheets work for both sides.

3.4.3 PRIVATE FOUNDATIONS

Cultivating relationships with local, regional, or even national foundations with interests or missions consistent with hazard mitigation, community sustainability, climate change adaptation, and other related topics can yield successful results in terms of funding and other means of support.

There are many local foundations around the State of Nebraska, many of which fund programs that can be utilized for components of hazard mitigation projects. Many of these foundations only support non-profit organizations, so the applicability of these funds to projects depends upon the partners involved.

This approach is not as easy to develop as simply listing grants and funding mechanisms as it involves engaging a broad spectrum of stakeholders and employing combinations of funding sources in solving what are increasingly sticky issues related to funding for any public endeavor. However, as noted throughout this guidebook, the reality is that significant federal or state grant allocations for pre-disaster mitigation efforts are not apparent on the immediate horizon and communities will need to be creative, cooperative and proactive to realize risk reduction on a meaningful level.

[1] Several states and agencies have created resources for homeowners, some of which could be readily adapted for use in Nebraska.

SECTION FOUR: REFERENCES

4.1 HAZARD MITIGATION PROJECT FUNDING

The following includes current websites with more detailed information about several of the programs and documents mentioned in this Guidebook.

- *Hazard Mitigation Assistance Unified Guidance*. The current version of this guidance document was developed in 2013 and can be found at: http://www.fema.gov/library/viewRecord.do?id=3649.

In addition, the individual grant programs each have specific websites per the following:

- Hazard Mitigation Grant Program (HMGP)
  http://www.fema.gov/hazard-mitigation-grant-program

- Pre-Disaster Mitigation (PDM)
  http://www.fema.gov/pre-disaster-mitigation-grant-program

- Flood Mitigation Assistance (FMA)
  http://www.fema.gov/flood-mitigation-assistance-program

- Fire Management Assistance Grant Program (FMAGP) -
  http://www.fema.gov/fire-management-assistance-grant-program

- Public Assistance (PA) Section 406 Hazard Mitigation Funding
  http://www.fema.gov/public-assistance-local-state-tribal-and-non-profit/hazard-mitigation-funding-under-section-406-0

Note: These websites and reference materials are as current as possible. However, one important aspect of grant programs that is not just applicable to hazard mitigation or to government agencies, is that the status, priorities, and administration of funding sources and programs is dynamic, i.e., subject to frequent changes in direction and emphasis. Therefore, it is useful to be familiar with the current information but it is equally, if not more important, to engage candidate federal and state agencies in a dialog as soon as possible. The intent is to determine the most current information about grant project status and priorities for inclusion in the evaluation of hazard mitigation projects and the development of implementation strategies.

On a related note, it is also recommended to include specific reference in plan maintenance procedures to the monitoring and updating of information regarding grant programs and the agencies or foundations that administer these grants.

There are also a number of documents that include a broad range of project types and how these have been implemented in communities across the country including:

Mitigation Best Practices Portfolio
http://www.fema.gov/mitigation-best-practices-portfolio